

## Assessment

**To:** Scott Leonard, One Buckland Center, PO Box 799, Rocky Hill, CT 06067

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**Phone:** (860) 550-2323

**Date:** August 27, 2020

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**Re:** *Evaluation of Improved Access Provisions*

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*One Buckland Center, South Windsor, Connecticut*

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### Update Request

At the request of the Town Planner, we have updated herein our last iteration of this assessment for the One Buckland Center project, dated December 30, 2019, to account for the latest update by AECOM of the ultimate Evergreen Walk development proposal, to include the impact of the proposed Costco development at the north end of Evergreen Walk, and to incorporate the proposed revisions by the Town of Manchester to the intersection of Buckland Street at Pleasant Valley Road and Buckland Hills Drive.

For the purposes of the traffic operations analyses included in this assessment, we utilized the combined weekday pm and Saturday peak combined (build) traffic volumes from the Traffic Impact Analysis of the proposed Costco development prepared by BL Companies, dated September 2019, revised July 2020. In the case of the weekday am peak, since not included in the Costco study, we developed our own estimates for the weekday am peak with the aforementioned Evergreen Walk revisions and the proposed Costco development in place.

### Description

We are pleased to submit herein our latest, updated evaluation of a possible provision to facilitate access to the subject One Buckland Center site from the northbound lanes of Buckland Road.

As One Buckland Center currently exists, the subject site has one site drive on the west side of Buckland Road that is only accessible by southbound right-turning traffic both inbound and outbound, with no easy way for northbound traffic to access the site without passing the site in the northbound direction and then negotiating a U-turn somewhere to the north of the site to then approach the site in the southbound direction.

It is understood and proposed that exiting traffic will continue to exit the site by making a right turn onto Buckland Road and heading south on Buckland Road to either continue south, or by negotiating a U-turn at the signalized intersection at the entrance to Buckland Mall, to head north on Buckland Road.

### **Option Considered**

There has been some concern raised over the illegal U-turns that currently occur at the northern end of the median separating the northbound and southbound lanes of Buckland Road in the vicinity of One Buckland Center, presumably to reach the subject site from points west, south and east of the site; as well as to improve the restricted access currently afforded to the subject development. Note that this U-turn is posted as an illegal maneuver and poses a potential hazard to those making the maneuver as well as to southbound traffic that may come into conflict with those making this illegal maneuver.

Please refer to Exhibit 1 of the Appendix which shows what we consider a viable manner to avoid this illegal U-turn maneuver and instead provide a safe alternative for those wishing to gain access to the subject site at One Buckland Road from the northbound lanes of Buckland Road safely and efficiently. This alternative involves making a median break between the northbound and southbound lanes in line with the site drive and providing a northbound left-turn lane for storing, sheltering and processing traffic entering the site from the south.

### **Supporting Information**

In support of our recommendation, we have included herein the following information in the way of Exhibits in the Appendix and/or Tables below, some of which have been updated from the previous December 30, 2019 version of this assessment:

- A. Site-generated traffic volumes and distributions for the subject development assuming the proposed median break in place allowing additional access from the south:

Exhibit 8 - Site-Generated Weekday (build) AM Peak Hour Volumes

Exhibit 9 - Site-Generated Weekday (build) PM Peak Hour Volumes

Exhibit 10 - Site-Generated Saturday (build) Midday Peak Hour Volumes

A review of Exhibits 8 through 10 show that the proposed full development of One Buckland Center with a combination of office and retail uses will remain a very low traffic generator.



- B. Revised Combined (Build) peak hour traffic volumes for the subject study area based on the information made available in the aforementioned Costco Study which addresses the aforementioned Evergreen Walk modifications and addition of Costco:

Revised Exhibit 11 - Combined (Build) Weekday AM Peak Hour

Revised Exhibit 12 - Combined (Build) Weekday PM Peak Hour

Revised Exhibit 13 - Combined (Build) Saturday Mid-Day Peak Hour

- C. Updated traffic operations analyses of projected combined (build) peak hour conditions with the aforementioned Evergreen Walk, Costco and One Buckland Center revisions and updates in place:

Revised Exhibit 18 - Traffic Operations Analysis Worksheets  
Combined Weekday AM Peak Hour

Revised Exhibit 19 - Traffic Operations Analysis Worksheets  
Combined Weekday PM Peak Hour

Revised Exhibit 20 - Traffic Operations Analysis Worksheets  
Combined Saturday Mid-Day Peak Hour

- D. Revised Table 3 which summarizes the updated traffic operations analyses during the three selected study peak periods based on projected combined (build) conditions with the aforementioned Evergreen Walk, Costco and One Buckland Center revisions and updates in place.

**A review of revised Table 3 indicates that the proposed addition of One Buckland Center's traffic, with the proposed improvements in place, will continue to provide satisfactory levels of service, and have an insignificant impact on the levels of service that would otherwise be in place without any revisions to One Buckland Center as proposed.**

- E. Revised Table 4 which summarizes the estimated 95<sup>th</sup> percentile queues at the three study intersections based on projected combined (build) conditions with the aforementioned Evergreen Walk, Costco and One Buckland Center revisions and updates in place.

**A review of revised Table 4 indicates that the proposed addition of One Buckland Center's traffic, with the proposed improvements in place, can be accommodated satisfactorily without causing conditions where queued vehicles block key turn lanes and/or intersections.**

**Revised Table 3**  
**Summary of Traffic Operations Analysis**  
**Levels of Service**  
**Proposed Retail Center**  
**One Buckland Center**  
**South Windsor, Connecticut**

| <b><u>Combined Build</u></b>                                                         |                       |                       |                        |
|--------------------------------------------------------------------------------------|-----------------------|-----------------------|------------------------|
| <b><u>(With Updated Evergreen Walk Traffic and Costco Traffic as Background)</u></b> |                       |                       |                        |
|                                                                                      | <b><u>AM Peak</u></b> | <b><u>PM Peak</u></b> | <b><u>Sat Peak</u></b> |
| <b><u>Buckland Road at Evergreen Walk (Tamarack) and Lowe's Drive</u></b>            |                       |                       |                        |
| Buckland Road northbound approach                                                    | C                     | E                     | D                      |
| Buckland Road southbound approach                                                    | C                     | D                     | D                      |
| Tamarack Road eastbound approach                                                     | B                     | C                     | D                      |
| Lowe's Site Drive westbound approach                                                 | B                     | D                     | E                      |
| <b>Overall</b>                                                                       | <b>- C -</b>          | <b>- D -</b>          | <b>- D -</b>           |
| <b>Average Delay per Vehicle (sec.)</b>                                              | <b>23.6</b>           | <b>53.7</b>           | <b>49.4</b>            |
| <b><u>Buckland Road at One Buckland Center Site Drive</u></b>                        |                       |                       |                        |
| Buckland Road northbound approach                                                    | A                     | A                     | A                      |
| Buckland Road southbound approach                                                    | B                     | B                     | B                      |
| Proposed Site Drive eastbound (outbound) right                                       | A                     | A                     | A                      |
| <b>Overall</b>                                                                       | <b>- A -</b>          | <b>- A -</b>          | <b>- A -</b>           |
| <b>Average Delay per Vehicle (sec.)</b>                                              | <b>7.3</b>            | <b>6.6</b>            | <b>9.4</b>             |
| <b><u>Buckland Street at Pleasant Valley Road and Buckland Hills Road</u></b>        |                       |                       |                        |
| Buckland Street northbound approach                                                  | B                     | D                     | E                      |
| Buckland Street southbound approach                                                  | B                     | D                     | E                      |
| Pleasant Valley Road eastbound approach                                              | C                     | D                     | E                      |
| Buckland Hills Drive westbound approach                                              | C                     | D                     | E                      |
| <b>Overall</b>                                                                       | <b>- B -</b>          | <b>- D -</b>          | <b>- E -</b>           |
| <b>Average Delay per Vehicle (sec.)</b>                                              | <b>19.9</b>           | <b>46.4</b>           | <b>63.5</b>            |



**Revised Table 4**  
**Summary of Queuing Analyses**  
**95th Percentile Queues**  
**Proposed Retail Center**  
**One Buckland Center**  
**South Windsor, Connecticut**

| Approach                 | Segment                                                      | Available Storage (feet) | <--- Combined Build --->                                                                     |          |          |       | STATUS                         | COMMENT |
|--------------------------|--------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------|----------|----------|-------|--------------------------------|---------|
|                          |                                                              |                          | <--- (With Updated Evergreen Walk Traffic ---><br><--- and Costco Traffic as Background)---> |          |          |       |                                |         |
|                          |                                                              |                          | AM Peak                                                                                      | PM Peak  | SAT Peak |       |                                |         |
| Buckland Road southbound | <u>Between Tamarack Avenue and One Buckland Center:</u>      |                          |                                                                                              |          |          |       |                                |         |
|                          | Southbound Through Lanes:                                    | 750 feet                 | 367 feet                                                                                     | 356 feet | 644 feet | OK    |                                |         |
|                          | Southbound Right-Turn Lane:                                  | 125 feet                 | 0 feet                                                                                       | 0 feet   | 0 feet   | OK    |                                |         |
|                          | <u>Between proposed site drive and Pleasant Valley Road:</u> |                          |                                                                                              |          |          |       |                                |         |
|                          | Southbound Left-Turn Lanes:                                  | 550 feet                 | 34 feet                                                                                      | 201 feet | 230 feet | OK    |                                |         |
|                          | Southbound Through Lanes:                                    | 650 feet                 | 108 feet                                                                                     | 325 feet | 406 feet | OK    |                                |         |
| Buckland Road northbound | Southbound Right-Turn Lane:                                  | 650 feet                 | 194 feet                                                                                     | 663 feet | 59 feet  | OK    |                                |         |
|                          | <u>Between Buckland Hills Road and One Buckland Center:</u>  |                          |                                                                                              |          |          |       |                                |         |
|                          | Northbound left-turn lane:                                   | 150 feet                 | 46 feet                                                                                      | 106 feet | 141 feet | ----- | Provide minimum 150-foot long, |         |
|                          | Northbound through lanes:                                    | 600 feet                 | 0 feet                                                                                       | 0 feet   | 0 feet   | OK    | full width left turn lane.     |         |
|                          | <u>Between One Buckland Center and Lowe's Site Drive:</u>    |                          |                                                                                              |          |          |       |                                |         |
|                          | Northbound Left-Turn Lanes:                                  | 450 feet                 | 105 feet                                                                                     | 357 feet | 415 feet | OK    |                                |         |
|                          | Northbound Through Lanes:                                    | 775 feet                 | 393 feet                                                                                     | 635 feet | 778 feet | OK    |                                |         |
|                          | Northbound Right-Turn Lane:                                  | 100 feet                 | 3 feet                                                                                       | 11 feet  | 12 feet  | OK    |                                |         |

## Recommendation

Our previous and updated findings indicate that the provision of a signalized left-turn lane in the Buckland Road northbound direction at the site drive serving One Buckland Center, which is located on the west side of the road, can be accommodated and would serve this site and area well with no apparent adverse impacts.

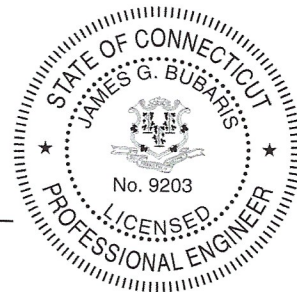
We recommend that a traffic signal be installed on Buckland Road at the subject site drive which only stops Buckland Road southbound traffic when there is either demand for a northbound vehicle to make a left-turn into the site, or for an exiting vehicle to make a right-turn out of the site. Left-turns OUT of the site will continue NOT to be allowed. This revision would also enable Buckland Road northbound traffic wishing to make a U-turn to head south to do so in protected fashion as well. Approaching northbound left-turning traffic should be provided a dedicated left-turn lane in the median area that is controlled by a left-turn signal which displays only upon demand at a designated point in the signal's cycle.

We further recommend that this signal be interconnected to the immediate traffic signal to the north at the intersection of Buckland Road at Tamarack Road (Evergreen Walk) and Lowe's site drive. Specifically, the display of the left-turn phase at the proposed signal and turn lane should coincide with the display of the northbound double-left turn phase at the Tamarack Road signal when Buckland Road southbound traffic is already stopped at that location to allow the left-turn movement into Evergreen Walk. Additionally, the outbound right-turn out of the subject site should coincide with the phase allocated for moving Lowe's traffic out of that site. Such should pose the least constraints to existing traffic operations while providing a significant improvement.

Very truly yours,  
Bubaris Traffic Associates



James G. Bubaris, P.E.  
Conn. Reg. No. 9203  
Principal





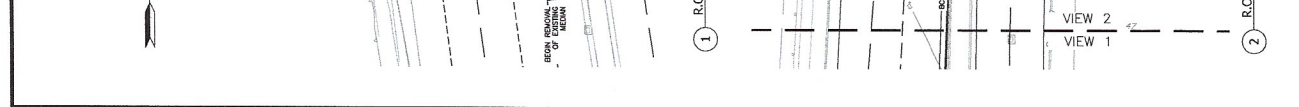
**Site Traffic Evaluation Study  
One Buckland Center  
South Windsor, Connecticut**

**Revised Appendix**

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| Revised Exhibit 12 | Combined (Build) Weekday PM Peak Hour                                                  |
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| Exhibit 14         | Definitions of Levels of Service – Signalized Intersections<br>-----                   |
| Revised Exhibit 18 | Traffic Operations Analysis Worksheets<br>Combined Weekday AM Peak Hour                |
| Revised Exhibit 19 | Traffic Operations Analysis Worksheets<br>Combined Weekday PM Peak Hour                |
| Revised Exhibit 20 | Traffic Operations Analysis Worksheets<br>Combined Saturday Mid-Day Peak Hour<br>----- |

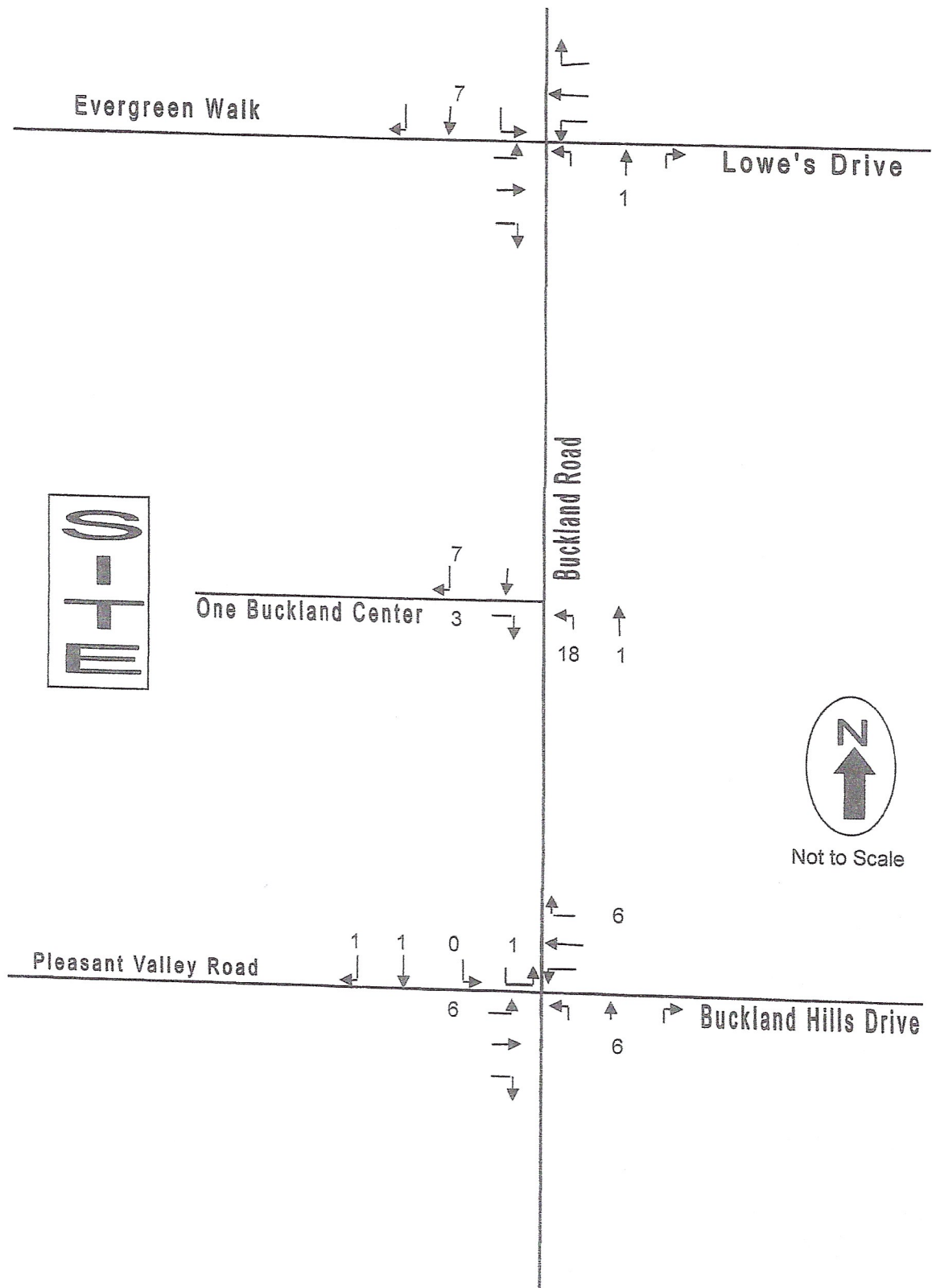
**Revised Exhibit 2**  
**Proposed Northbound Left-Turn Lane**  
**One Buckland Center**  
**South Windsor, Connecticut**



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**Exhibit 8**  
**One Buckland Center Site Generated Weekday AM Peak Hour**

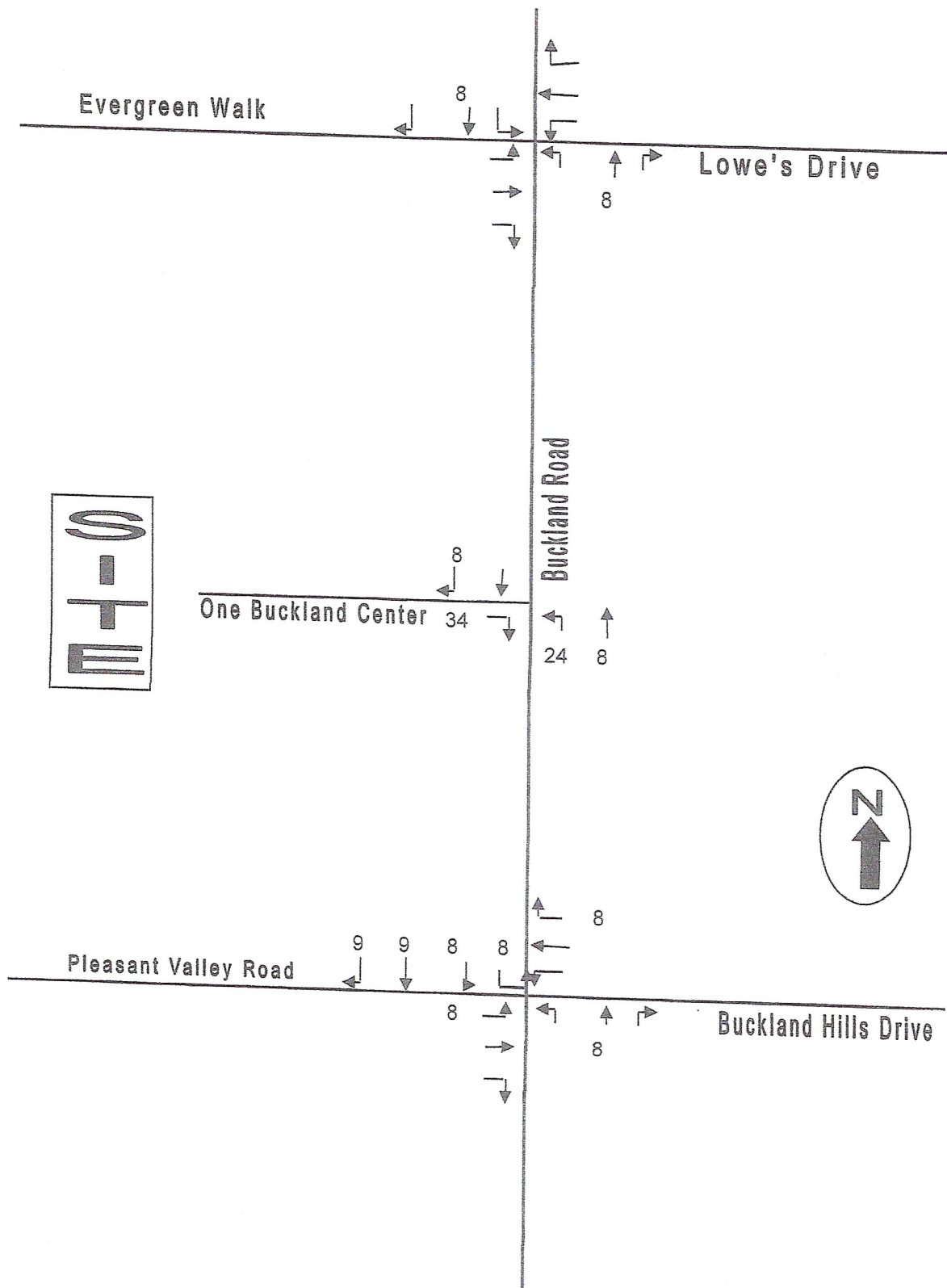


**Exhibit 9**  
**One Buckland Center Site Generated Weekday PM Peak Hour**

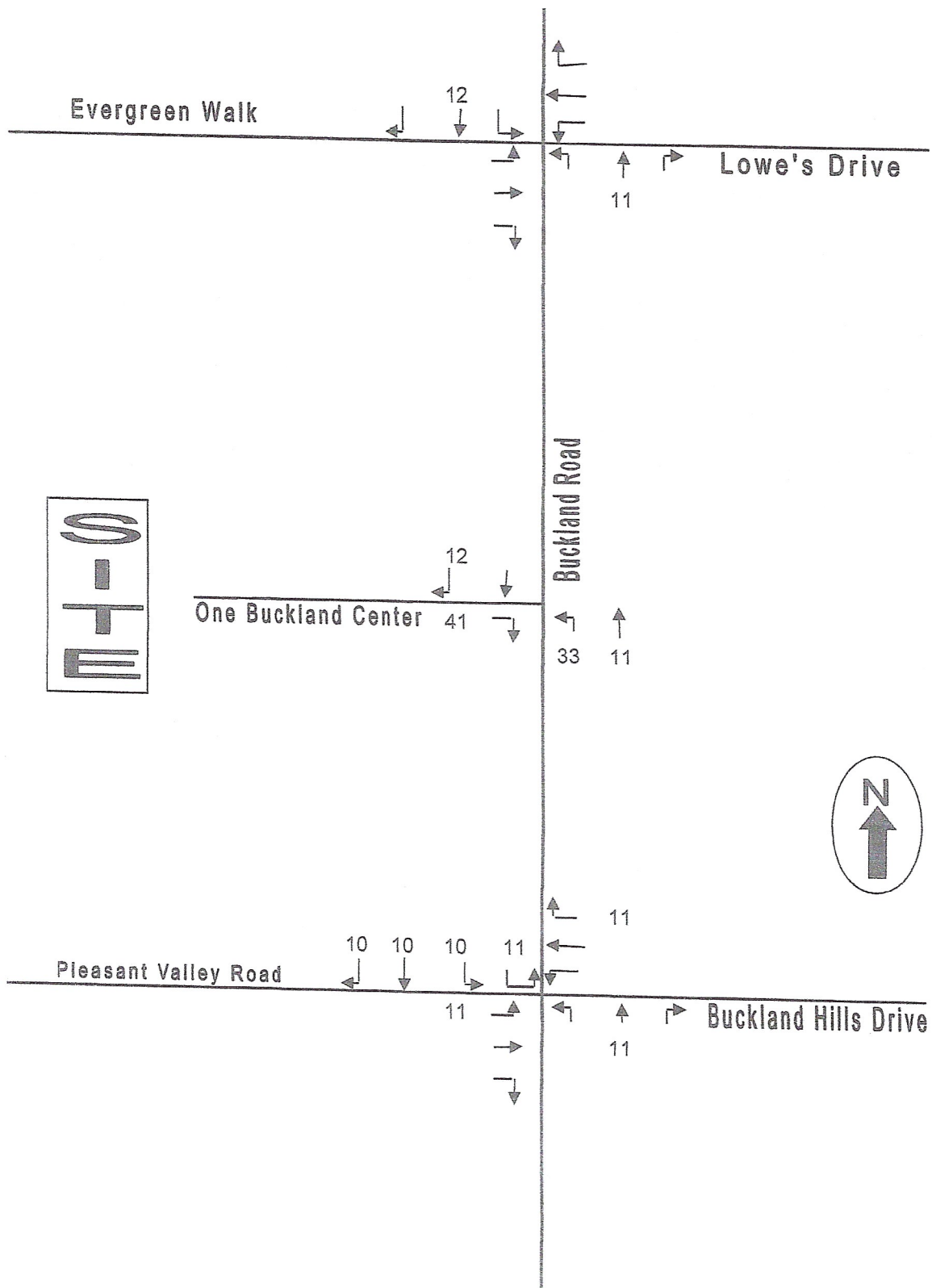


July 2018

One Buckland Center  
South Windsor, Connecticut

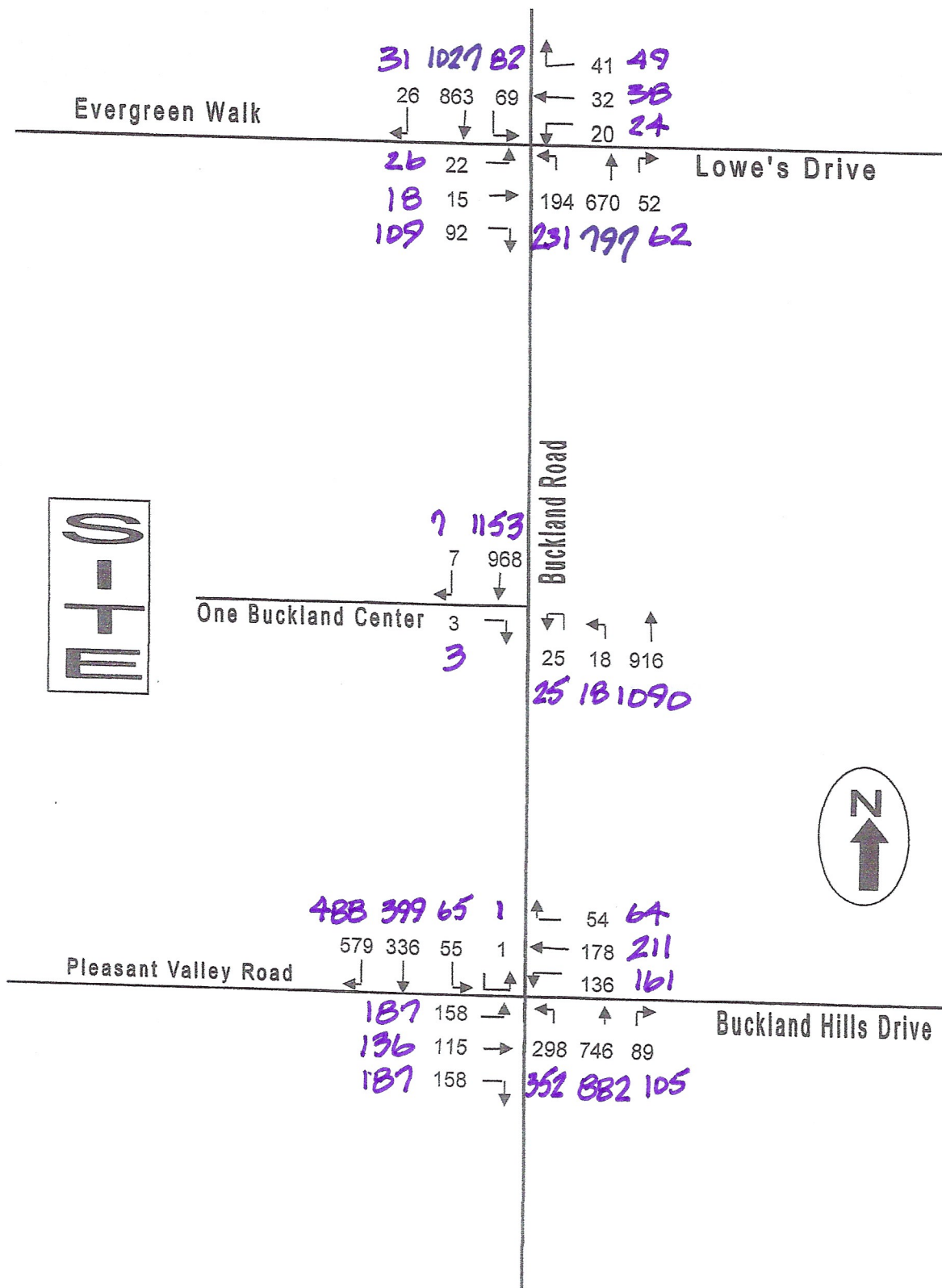


**Exhibit 10**  
**One Buckland Center Site Generated Saturday Mid-day Peak Hour**



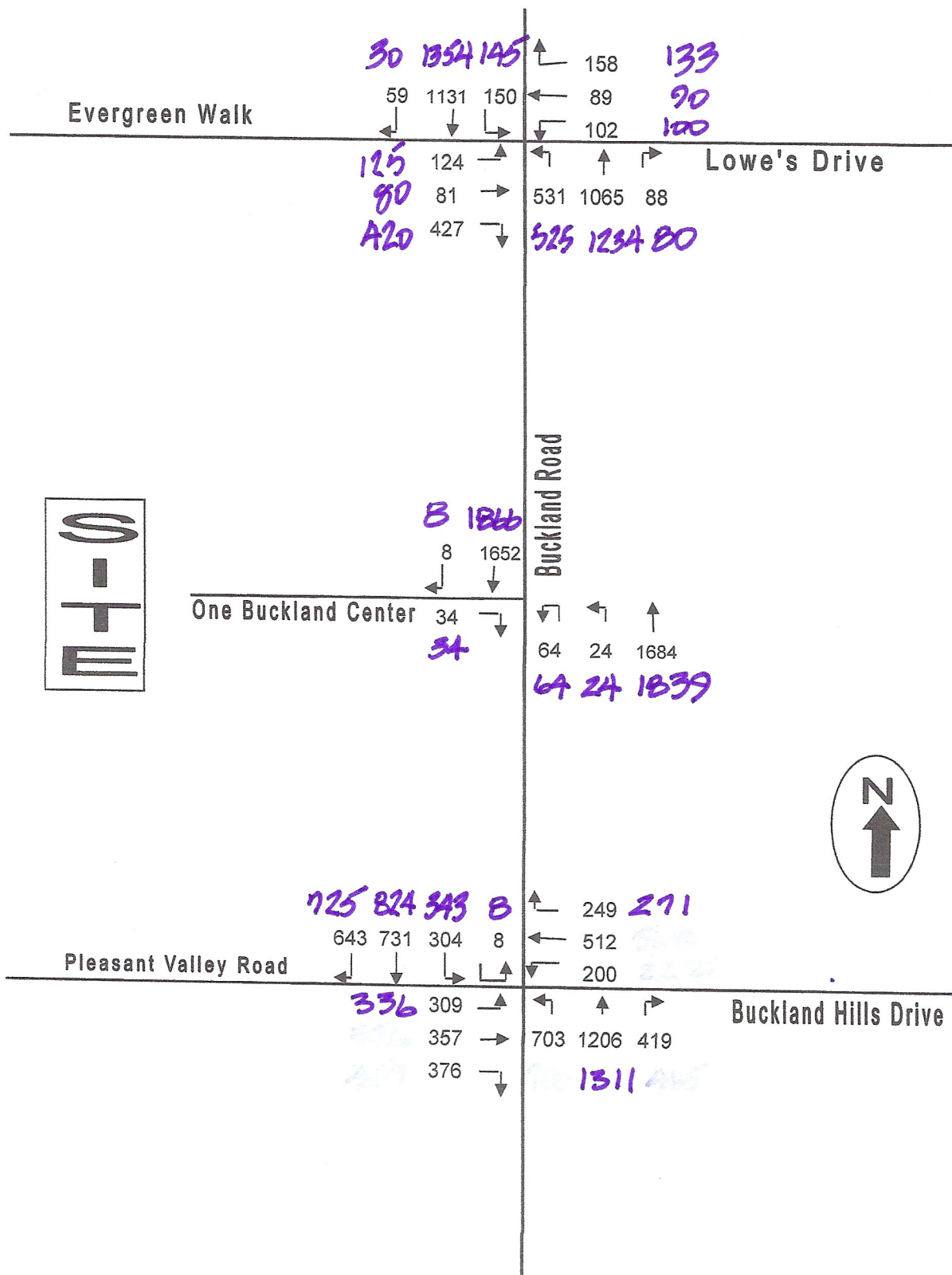
**Revised Exhibit 11**  
**Combined (Build) Weekday AM Peak Hour**





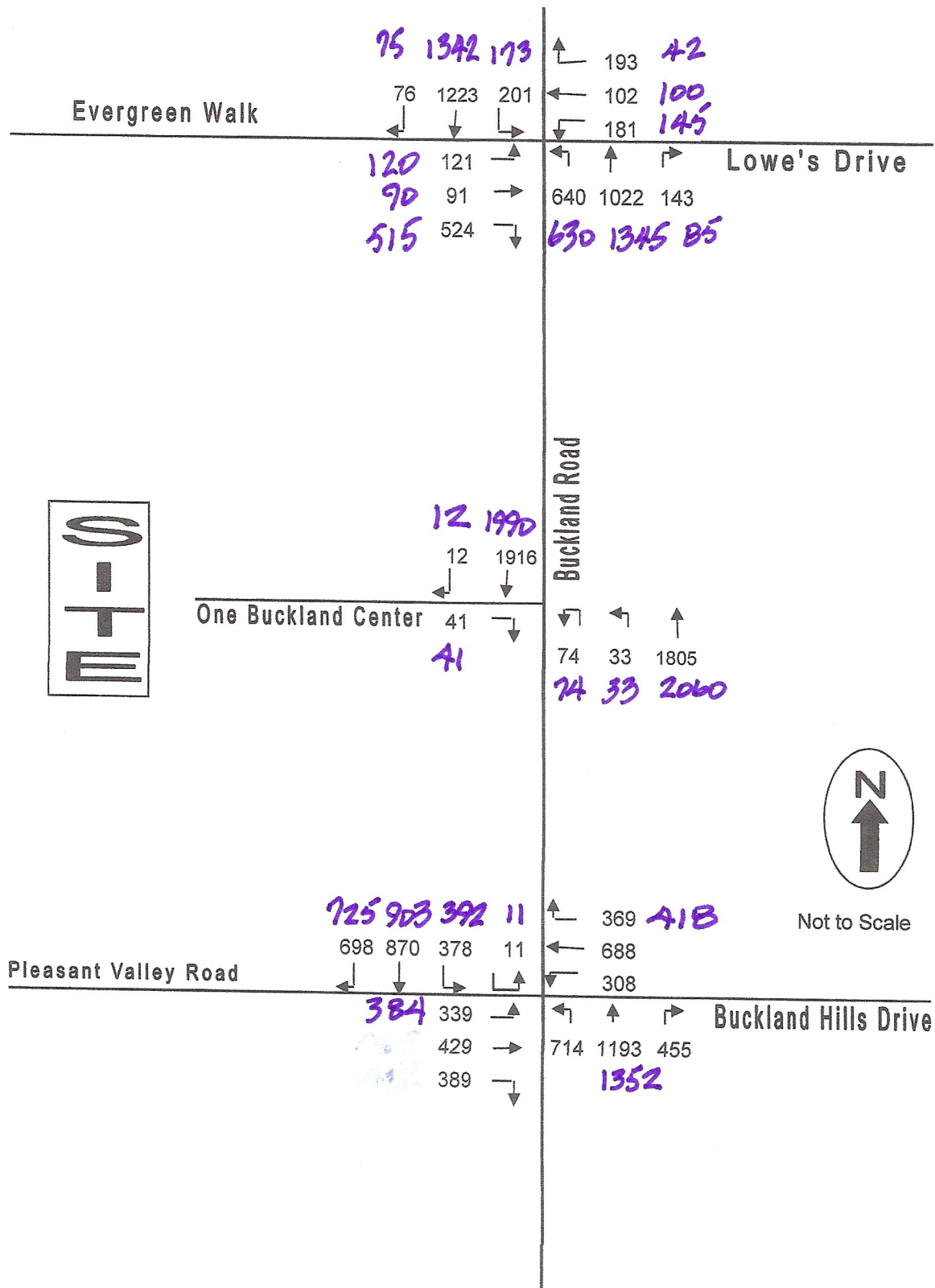
Revised

**Revised Exhibit 12**  
**Combined (Build) Weekday PM Peak Hour**



Revised

**Revised Exhibit 13**  
**Combined (Build) Saturday Mid-Day Peak Hour**



Revised

Exhibit 13

Combined 2020 Saturday Mid-Day  
Peak Hour Traffic Volumes



**EXHIBIT 14**  
**LEVEL OF SERVICE CRITERIA**  
**SIGNALIZED INTERSECTIONS**

**SOURCE: HIGHWAY CAPACITY MANUAL (HCM), 2010**  
**TRANSPORTATION RESEARCH BOARD (1)**

Level of Service for **signalized intersections** is defined in terms of control delay, which is a measure of driver discomfort, frustration, increased fuel consumption, and lost travel time. The delay experienced by a motorist is comprised of a number of factors that relate to control, geometric, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the volume-to-capacity (v/c) ratio for the lane group.

In the case of **signalized intersections**, the Level of Service for each approach is computed, and an overall Level of Service for the entire intersection is determined.

Levels of Service (LOS) for **signalized intersections** are defined as follows:

| LEVEL OF SERVICE | CONTROL DELAY PER VEHICLE (SECONDS) | CONDITION                 |
|------------------|-------------------------------------|---------------------------|
| LOS A            | $\leq 10$                           | LOW DELAY                 |
| LOS B            | > 10 TO 20                          | SHORT DELAY               |
| LOS C            | > 20 TO 35                          | AVERAGE DELAY             |
| LOS D            | > 35 TO 55                          | CONGESTION NOTICEABLE     |
| LOS E            | > 55 TO 80                          | LIMIT OF ACCEPTABLE DELAY |
| LOS F            | > 80                                | UNACCEPTABLE              |

In today's environment, Levels of Service C to D are considered acceptable, and Levels of Service A to B are seldomly achieved at signalized intersections.

(1) **HCM**, Exhibit 16-2.

**Revised Exhibit 18**  
**Traffic Operations Analysis Worksheets**  
**Combined Weekday AM Peak Hour**



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday AM with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)       | 26                                                                                | 18                                                                                | 109                                                                               | 24                                                                                | 38                                                                                | 49                                                                                | 231                                                                                 | 797                                                                                 | 62                                                                                  | 82                                                                                  | 1027                                                                                | 31                                                                                  |
| Future Volume (vph)        | 26                                                                                | 18                                                                                | 109                                                                               | 24                                                                                | 38                                                                                | 49                                                                                | 231                                                                                 | 797                                                                                 | 62                                                                                  | 82                                                                                  | 1027                                                                                | 31                                                                                  |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Storage Length (ft)        | 0                                                                                 |                                                                                   | 250                                                                               | 250                                                                               |                                                                                   | 250                                                                               | 300                                                                                 |                                                                                     | 0                                                                                   | 250                                                                                 |                                                                                     | 0                                                                                   |
| Storage Lanes              | 0                                                                                 |                                                                                   | 1                                                                                 | 1                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                   |                                                                                     | 1                                                                                   | 1                                                                                   |                                                                                     | 0                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                  |                                                                                     |                                                                                     | 25                                                                                  |                                                                                     |                                                                                     |
| Lane Util. Factor          | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 0.95                                                                                |
| Frts                       |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                     |                                                                                     | 0.850                                                                               |                                                                                     | 0.996                                                                               |                                                                                     |
| Flt Protected              |                                                                                   | 0.972                                                                             |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (prot)          | 0                                                                                 | 3440                                                                              | 1583                                                                              | 1770                                                                              | 1863                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 1770                                                                                | 3525                                                                                | 0                                                                                   |
| Flt Permitted              |                                                                                   | 0.972                                                                             |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (perm)          | 0                                                                                 | 3440                                                                              | 1583                                                                              | 1770                                                                              | 1863                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 1770                                                                                | 3525                                                                                | 0                                                                                   |
| Right Turn on Red          |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   |                                                                                   | 125                                                                               |                                                                                   |                                                                                   | 125                                                                               |                                                                                     |                                                                                     | 125                                                                                 |                                                                                     | 4                                                                                   |                                                                                     |
| Link Speed (mph)           |                                                                                   | 35                                                                                |                                                                                   |                                                                                   | 35                                                                                |                                                                                   |                                                                                     | 45                                                                                  |                                                                                     |                                                                                     | 45                                                                                  |                                                                                     |
| Link Distance (ft)         |                                                                                   | 1049                                                                              |                                                                                   |                                                                                   | 1178                                                                              |                                                                                   |                                                                                     | 840                                                                                 |                                                                                     |                                                                                     | 377                                                                                 |                                                                                     |
| Travel Time (s)            |                                                                                   | 20.4                                                                              |                                                                                   |                                                                                   | 22.9                                                                              |                                                                                   |                                                                                     | 12.7                                                                                |                                                                                     |                                                                                     | 5.7                                                                                 |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)            | 28                                                                                | 20                                                                                | 118                                                                               | 26                                                                                | 41                                                                                | 53                                                                                | 251                                                                                 | 866                                                                                 | 67                                                                                  | 89                                                                                  | 1116                                                                                | 34                                                                                  |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Group Flow (vph)      | 0                                                                                 | 48                                                                                | 118                                                                               | 26                                                                                | 41                                                                                | 53                                                                                | 251                                                                                 | 866                                                                                 | 67                                                                                  | 89                                                                                  | 1150                                                                                | 0                                                                                   |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  |
| Lane Alignment             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                                | Left                                                                                | Right                                                                               | Left                                                                                | Left                                                                                | Right                                                                               |
| Median Width(ft)           |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                     | 24                                                                                  |                                                                                     |                                                                                     | 24                                                                                  |                                                                                     |
| Link Offset(ft)            |                                                                                   | 0                                                                                 |                                                                                   |                                                                                   | 0                                                                                 |                                                                                   |                                                                                     | 0                                                                                   |                                                                                     |                                                                                     | 0                                                                                   |                                                                                     |
| Crosswalk Width(ft)        |                                                                                   | 16                                                                                |                                                                                   |                                                                                   | 16                                                                                |                                                                                   |                                                                                     | 16                                                                                  |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                  |                                                                                     | 9                                                                                   | 15                                                                                  |                                                                                     | 9                                                                                   |
| Number of Detectors        | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   |                                                                                     |
| Detector Template          | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                                | Thru                                                                                | Right                                                                               | Left                                                                                | Thru                                                                                |                                                                                     |
| Leading Detector (ft)      | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                  | 100                                                                                 | 20                                                                                  | 20                                                                                  | 100                                                                                 |                                                                                     |
| Trailing Detector (ft)     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Detector 1 Position(ft)    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Detector 1 Size(ft)        | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                  | 6                                                                                   | 20                                                                                  | 20                                                                                  | 6                                                                                   |                                                                                     |
| Detector 1 Type            | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               |                                                                                     |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 1 Extend (s)      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 1 Queue (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 1 Delay (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 2 Position(ft)    |                                                                                   | 94                                                                                |                                                                                   |                                                                                   | 94                                                                                |                                                                                   |                                                                                     | 94                                                                                  |                                                                                     |                                                                                     | 94                                                                                  |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Detector 2 Type            |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                     | CI+Ex                                                                               |                                                                                     |                                                                                     | CI+Ex                                                                               |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Turn Type                  | Split                                                                             | NA                                                                                | pt+ov                                                                             | Split                                                                             | NA                                                                                | pt+ov                                                                             | Prot                                                                                | NA                                                                                  | pm+ov                                                                               | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases           | 8                                                                                 | 8                                                                                 | 8 5                                                                               | 7                                                                                 | 7                                                                                 | 7 1                                                                               | 5                                                                                   | 2                                                                                   | 7                                                                                   | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     |                                                                                     |



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday AM with Cosco (08.20)  
08/26/2020

|                            |    |
|----------------------------|----|
| Lane Group                 | Ø3 |
| Lane Configurations        |    |
| Traffic Volume (vph)       |    |
| Future Volume (vph)        |    |
| Ideal Flow (vphpl)         |    |
| Storage Length (ft)        |    |
| Storage Lanes              |    |
| Taper Length (ft)          |    |
| Lane Util. Factor          |    |
| Frt                        |    |
| Flt Protected              |    |
| Satd. Flow (prot)          |    |
| Flt Permitted              |    |
| Satd. Flow (perm)          |    |
| Right Turn on Red          |    |
| Satd. Flow (RTOR)          |    |
| Link Speed (mph)           |    |
| Link Distance (ft)         |    |
| Travel Time (s)            |    |
| Peak Hour Factor           |    |
| Adj. Flow (vph)            |    |
| Shared Lane Traffic (%)    |    |
| Lane Group Flow (vph)      |    |
| Enter Blocked Intersection |    |
| Lane Alignment             |    |
| Median Width(ft)           |    |
| Link Offset(ft)            |    |
| Crosswalk Width(ft)        |    |
| Two way Left Turn Lane     |    |
| Headway Factor             |    |
| Turning Speed (mph)        |    |
| Number of Detectors        |    |
| Detector Template          |    |
| Leading Detector (ft)      |    |
| Trailing Detector (ft)     |    |
| Detector 1 Position(ft)    |    |
| Detector 1 Size(ft)        |    |
| Detector 1 Type            |    |
| Detector 1 Channel         |    |
| Detector 1 Extend (s)      |    |
| Detector 1 Queue (s)       |    |
| Detector 1 Delay (s)       |    |
| Detector 2 Position(ft)    |    |
| Detector 2 Size(ft)        |    |
| Detector 2 Type            |    |
| Detector 2 Channel         |    |
| Detector 2 Extend (s)      |    |
| Turn Type                  |    |
| Protected Phases           | 3  |
| Permitted Phases           |    |



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday AM with Cosco (08.20)

08/26/2020

|                         |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Detector Phase          | 8                                                                                 | 8                                                                                 | 8 5                                                                               | 7                                                                                 | 7                                                                                 | 7 1                                                                               | 5                                                                                  | 2                                                                                   | 7                                                                                   | 1                                                                                   | 6                                                                                   |                                                                                     |
| Switch Phase            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)     | 8.0                                                                               | 8.0                                                                               |                                                                                   | 8.0                                                                               | 8.0                                                                               |                                                                                   | 8.0                                                                                | 15.0                                                                                | 8.0                                                                                 | 8.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Minimum Split (s)       | 12.0                                                                              | 12.0                                                                              |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   | 12.0                                                                               | 19.0                                                                                | 12.0                                                                                | 12.0                                                                                | 19.0                                                                                |                                                                                     |
| Total Split (s)         | 11.0                                                                              | 11.0                                                                              |                                                                                   | 11.0                                                                              | 11.0                                                                              |                                                                                   | 11.0                                                                               | 15.0                                                                                | 11.0                                                                                | 11.0                                                                                | 15.0                                                                                |                                                                                     |
| Total Split (%)         | 15.7%                                                                             | 15.7%                                                                             |                                                                                   | 15.7%                                                                             | 15.7%                                                                             |                                                                                   | 15.7%                                                                              | 21.4%                                                                               | 15.7%                                                                               | 15.7%                                                                               | 21.4%                                                                               |                                                                                     |
| Maximum Green (s)       | 7.0                                                                               | 7.0                                                                               |                                                                                   | 7.0                                                                               | 7.0                                                                               |                                                                                   | 7.0                                                                                | 11.0                                                                                | 7.0                                                                                 | 7.0                                                                                 | 11.0                                                                                |                                                                                     |
| Yellow Time (s)         | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                                | 3.5                                                                                 | 3.5                                                                                 | 3.5                                                                                 | 3.5                                                                                 |                                                                                     |
| All-Red Time (s)        | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                                | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 |                                                                                     |
| Lost Time Adjust (s)    |                                                                                   | 0.0                                                                               |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Lost Time (s)     |                                                                                   | 4.0                                                                               |                                                                                   | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                                | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |                                                                                     |
| Lead/Lag                | Lag                                                                               | Lag                                                                               |                                                                                   | Lead                                                                              | Lead                                                                              |                                                                                   | Lead                                                                               | Lag                                                                                 | Lead                                                                                | Lead                                                                                | Lag                                                                                 |                                                                                     |
| Lead-Lag Optimize?      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Vehicle Extension (s)   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Recall Mode             | None                                                                              | None                                                                              |                                                                                   | None                                                                              | None                                                                              |                                                                                   | None                                                                               | C-Max                                                                               | None                                                                                | None                                                                                | C-Max                                                                               |                                                                                     |
| Walk Time (s)           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Flash Dont Walk (s)     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Pedestrian Calls (#/hr) |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Act Effct Green (s)     |                                                                                   | 7.0                                                                               | 15.8                                                                              | 7.0                                                                               | 7.0                                                                               | 12.6                                                                              | 7.0                                                                                | 36.0                                                                                | 44.0                                                                                | 7.0                                                                                 | 33.0                                                                                |                                                                                     |
| Actuated g/C Ratio      |                                                                                   | 0.10                                                                              | 0.23                                                                              | 0.10                                                                              | 0.10                                                                              | 0.18                                                                              | 0.10                                                                               | 0.51                                                                                | 0.63                                                                                | 0.10                                                                                | 0.47                                                                                |                                                                                     |
| v/c Ratio               |                                                                                   | 0.14                                                                              | 0.26                                                                              | 0.15                                                                              | 0.22                                                                              | 0.14                                                                              | 0.73                                                                               | 0.48                                                                                | 0.06                                                                                | 0.50                                                                                | 0.69                                                                                |                                                                                     |
| Control Delay           |                                                                                   | 29.9                                                                              | 5.8                                                                               | 31.0                                                                              | 32.2                                                                              | 0.7                                                                               | 44.4                                                                               | 20.5                                                                                | 0.6                                                                                 | 40.4                                                                                | 23.7                                                                                |                                                                                     |
| Queue Delay             |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Delay             |                                                                                   | 29.9                                                                              | 5.8                                                                               | 31.0                                                                              | 32.2                                                                              | 0.7                                                                               | 44.4                                                                               | 20.5                                                                                | 0.6                                                                                 | 40.4                                                                                | 23.7                                                                                |                                                                                     |
| LOS                     |                                                                                   | C                                                                                 | A                                                                                 | C                                                                                 | C                                                                                 | A                                                                                 | D                                                                                  | C                                                                                   | A                                                                                   | D                                                                                   | C                                                                                   |                                                                                     |
| Approach Delay          |                                                                                   | 12.7                                                                              |                                                                                   |                                                                                   | 18.0                                                                              |                                                                                   |                                                                                    | 24.4                                                                                |                                                                                     |                                                                                     | 24.9                                                                                |                                                                                     |
| Approach LOS            |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Queue Length 50th (ft)  |                                                                                   | 10                                                                                | 0                                                                                 | 10                                                                                | 17                                                                                | 0                                                                                 | 55                                                                                 | 130                                                                                 | 0                                                                                   | 37                                                                                  | 192                                                                                 |                                                                                     |
| Queue Length 95th (ft)  |                                                                                   | 25                                                                                | 33                                                                                | 32                                                                                | 44                                                                                | 0                                                                                 | #105                                                                               | #393                                                                                | 3                                                                                   | #81                                                                                 | #550                                                                                |                                                                                     |
| Internal Link Dist (ft) |                                                                                   | 969                                                                               |                                                                                   |                                                                                   | 1098                                                                              |                                                                                   |                                                                                    | 760                                                                                 |                                                                                     |                                                                                     | 297                                                                                 |                                                                                     |
| Turn Bay Length (ft)    |                                                                                   |                                                                                   | 250                                                                               | 250                                                                               |                                                                                   | 250                                                                               | 300                                                                                |                                                                                     |                                                                                     | 250                                                                                 |                                                                                     |                                                                                     |
| Base Capacity (vph)     |                                                                                   | 344                                                                               | 453                                                                               | 177                                                                               | 186                                                                               | 387                                                                               | 343                                                                                | 1820                                                                                | 1041                                                                                | 177                                                                                 | 1663                                                                                |                                                                                     |
| Starvation Cap Reductn  |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Spillback Cap Reductn   |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Storage Cap Reductn     |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Reduced v/c Ratio       |                                                                                   | 0.14                                                                              | 0.26                                                                              | 0.15                                                                              | 0.22                                                                              | 0.14                                                                              | 0.73                                                                               | 0.48                                                                                | 0.06                                                                                | 0.50                                                                                | 0.69                                                                                |                                                                                     |

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 23.6

Intersection LOS: C

Intersection Capacity Utilization 54.1%

ICU Level of Service A

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday AM with Cosco (08.20)  
08/26/2020

|                         |      |
|-------------------------|------|
| Lane Group              | Ø3   |
| Detector Phase          |      |
| Switch Phase            |      |
| Minimum Initial (s)     | 7.0  |
| Minimum Split (s)       | 23.0 |
| Total Split (s)         | 22.0 |
| Total Split (%)         | 31%  |
| Maximum Green (s)       | 19.0 |
| Yellow Time (s)         | 2.0  |
| All-Red Time (s)        | 1.0  |
| Lost Time Adjust (s)    |      |
| Total Lost Time (s)     |      |
| Lead/Lag                |      |
| Lead-Lag Optimize?      |      |
| Vehicle Extension (s)   | 3.0  |
| Recall Mode             | None |
| Walk Time (s)           | 7.0  |
| Flash Dont Walk (s)     | 13.0 |
| Pedestrian Calls (#/hr) | 5    |
| Act Effct Green (s)     |      |
| Actuated g/C Ratio      |      |
| v/c Ratio               |      |
| Control Delay           |      |
| Queue Delay             |      |
| Total Delay             |      |
| LOS                     |      |
| Approach Delay          |      |
| Approach LOS            |      |
| Queue Length 50th (ft)  |      |
| Queue Length 95th (ft)  |      |
| Internal Link Dist (ft) |      |
| Turn Bay Length (ft)    |      |
| Base Capacity (vph)     |      |
| Starvation Cap Reductn  |      |
| Spillback Cap Reductn   |      |
| Storage Cap Reductn     |      |
| Reduced v/c Ratio       |      |
| Intersection Summary    |      |

Lanes, Volumes, Timings  
 3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday AM with Cosco (08.20)

08/26/2020

Queue shown is maximum after two cycles.

Splits and Phases: 3: Buckland /Buckland & Tamarack/Lowes

|                                                                                      |                                                                                                                                                                            |                                                                                      |                                                                                        |                                                                                        |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  Ø1 |  Ø2 (R)  |  Ø3 |  Ø7 |  Ø8 |
| 11 s                                                                                 | 15 s                                                                                                                                                                       | 22 s                                                                                 | 11 s                                                                                   | 11 s                                                                                   |
|  Ø5 |  Ø6 (R)  |                                                                                      |                                                                                        |                                                                                        |
| 11 s                                                                                 | 15 s                                                                                                                                                                       |                                                                                      |                                                                                        |                                                                                        |



Lanes, Volumes, Timings  
6: One Buckland Center & Buckland

Combined Weekday AM with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBR                                                                               | NBU                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                                 |
| Lane Configurations        |                                                                                   |  |                                                                                   |  |  |  |  |
| Traffic Volume (vph)       | 0                                                                                 | 3                                                                                 | 25                                                                                | 18                                                                                | 1090                                                                              | 1153                                                                              | 7                                                                                   |
| Future Volume (vph)        | 0                                                                                 | 3                                                                                 | 25                                                                                | 18                                                                                | 1090                                                                              | 1153                                                                              | 7                                                                                   |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                |
| Storage Length (ft)        | 0                                                                                 | 0                                                                                 |                                                                                   | 150                                                                               |                                                                                   |                                                                                   | 200                                                                                 |
| Storage Lanes              | 0                                                                                 | 1                                                                                 |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   | 1                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   |                                                                                     |
| Lane Util. Factor          | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                              | 0.95                                                                              | 0.95                                                                              | 1.00                                                                                |
| Frt                        |                                                                                   | 0.865                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.850                                                                               |
| Flt Protected              |                                                                                   |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   |                                                                                     |
| Satd. Flow (prot)          | 0                                                                                 | 1611                                                                              | 0                                                                                 | 1770                                                                              | 3539                                                                              | 3539                                                                              | 1583                                                                                |
| Flt Permitted              |                                                                                   |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   |                                                                                     |
| Satd. Flow (perm)          | 0                                                                                 | 1611                                                                              | 0                                                                                 | 1770                                                                              | 3539                                                                              | 3539                                                                              | 1583                                                                                |
| Right Turn on Red          |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   | 219                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                   |
| Link Speed (mph)           | 30                                                                                |                                                                                   |                                                                                   |                                                                                   | 30                                                                                | 45                                                                                |                                                                                     |
| Link Distance (ft)         | 981                                                                               |                                                                                   |                                                                                   |                                                                                   | 163                                                                               | 840                                                                               |                                                                                     |
| Travel Time (s)            | 22.3                                                                              |                                                                                   |                                                                                   |                                                                                   | 3.7                                                                               | 12.7                                                                              |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                |
| Adj. Flow (vph)            | 0                                                                                 | 3                                                                                 | 27                                                                                | 20                                                                                | 1185                                                                              | 1253                                                                              | 8                                                                                   |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Lane Group Flow (vph)      | 0                                                                                 | 3                                                                                 | 0                                                                                 | 47                                                                                | 1185                                                                              | 1253                                                                              | 8                                                                                   |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                  |
| Lane Alignment             | Left                                                                              | Right                                                                             | R NA                                                                              | Left                                                                              | Left                                                                              | Left                                                                              | Right                                                                               |
| Median Width(ft)           | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   | 24                                                                                | 24                                                                                |                                                                                     |
| Link Offset(ft)            | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   | 0                                                                                 | 0                                                                                 |                                                                                     |
| Crosswalk Width(ft)        | 16                                                                                |                                                                                   |                                                                                   |                                                                                   | 16                                                                                | 16                                                                                |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                | 9                                                                                 | 9                                                                                 | 15                                                                                |                                                                                   |                                                                                   | 9                                                                                   |
| Number of Detectors        |                                                                                   | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 2                                                                                 | 1                                                                                   |
| Detector Template          |                                                                                   | Right                                                                             | Left                                                                              | Left                                                                              | Thru                                                                              | Thru                                                                              | Right                                                                               |
| Leading Detector (ft)      |                                                                                   | 20                                                                                | 20                                                                                | 20                                                                                | 100                                                                               | 100                                                                               | 20                                                                                  |
| Trailing Detector (ft)     |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |
| Detector 1 Position(ft)    |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |
| Detector 1 Size(ft)        |                                                                                   | 20                                                                                | 20                                                                                | 20                                                                                | 6                                                                                 | 6                                                                                 | 20                                                                                  |
| Detector 1 Type            |                                                                                   | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                               |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Detector 1 Extend (s)      |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 |
| Detector 1 Queue (s)       |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 |
| Detector 1 Delay (s)       |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 |
| Detector 2 Position(ft)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 94                                                                                | 94                                                                                |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 6                                                                                 | 6                                                                                 |                                                                                     |
| Detector 2 Type            |                                                                                   |                                                                                   |                                                                                   |                                                                                   | CI+Ex                                                                             | CI+Ex                                                                             |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                     |
| Turn Type                  |                                                                                   | Prot                                                                              | Prot                                                                              | Prot                                                                              | NA                                                                                | NA                                                                                | custom                                                                              |
| Protected Phases           |                                                                                   | 3                                                                                 | 1                                                                                 | 1                                                                                 | 1 2 3                                                                             | 2                                                                                 | 2                                                                                   |
| Permitted Phases           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1 2 3                                                                             |                                                                                   | 2                                                                                   |



Lanes, Volumes, Timings  
6: One Buckland Center & Buckland

Combined Weekday AM with Cosco (08.20)

08/26/2020



| Lane Group              | EBL | EBR   | NBU   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-----|-------|-------|-------|-------|-------|-------|
| Detector Phase          |     | 3     | 1     | 1     | 1 2 3 | 2     | 2     |
| Switch Phase            |     |       |       |       |       |       |       |
| Minimum Initial (s)     |     | 5.0   | 5.0   | 5.0   |       | 5.0   | 5.0   |
| Minimum Split (s)       |     | 9.5   | 9.5   | 9.5   |       | 22.5  | 22.5  |
| Total Split (s)         |     | 10.0  | 14.0  | 14.0  |       | 46.0  | 46.0  |
| Total Split (%)         |     | 14.3% | 20.0% | 20.0% |       | 65.7% | 65.7% |
| Maximum Green (s)       |     | 5.5   | 10.0  | 10.0  |       | 41.5  | 41.5  |
| Yellow Time (s)         |     | 3.5   | 3.5   | 3.5   |       | 3.5   | 3.5   |
| All-Red Time (s)        |     | 1.0   | 0.5   | 0.5   |       | 1.0   | 1.0   |
| Lost Time Adjust (s)    |     | 0.0   |       | 0.0   |       | 0.0   | 0.0   |
| Total Lost Time (s)     |     | 4.5   |       | 4.0   |       | 4.5   | 4.5   |
| Lead/Lag                |     |       | Lead  | Lead  |       | Lag   | Lag   |
| Lead-Lag Optimize?      |     |       |       |       |       |       |       |
| Vehicle Extension (s)   |     | 3.0   | 3.0   | 3.0   |       | 3.0   | 3.0   |
| Recall Mode             |     | None  | None  | None  |       | C-Min | C-Min |
| Act Effect Green (s)    |     | 5.5   |       | 10.0  | 70.0  | 41.5  | 41.5  |
| Actuated g/C Ratio      |     | 0.08  |       | 0.14  | 1.00  | 0.59  | 0.59  |
| v/c Ratio               |     | 0.01  |       | 0.19  | 0.33  | 0.60  | 0.01  |
| Control Delay           |     | 0.0   |       | 28.6  | 0.3   | 13.2  | 11.3  |
| Queue Delay             |     | 0.0   |       | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             |     | 0.0   |       | 28.6  | 0.3   | 13.2  | 11.3  |
| LOS                     |     | A     |       | C     | A     | B     | B     |
| Approach Delay          |     |       |       |       | 1.3   | 13.2  |       |
| Approach LOS            |     |       |       |       | A     | B     |       |
| Queue Length 50th (ft)  |     | 0     |       | 18    | 0     | 70    | 0     |
| Queue Length 95th (ft)  |     | 0     |       | 46    | 0     | 367   | m3    |
| Internal Link Dist (ft) | 901 |       |       |       | 83    | 760   |       |
| Turn Bay Length (ft)    |     |       |       | 150   |       |       | 200   |
| Base Capacity (vph)     |     | 328   |       | 252   | 3500  | 2100  | 942   |
| Starvation Cap Reductn  |     | 0     |       | 0     | 0     | 0     | 0     |
| Spillback Cap Reductn   |     | 0     |       | 0     | 0     | 0     | 0     |
| Storage Cap Reductn     |     | 0     |       | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio       |     | 0.01  |       | 0.19  | 0.34  | 0.60  | 0.01  |

Intersection Summary

Area Type: Other  
Cycle Length: 70  
Actuated Cycle Length: 70  
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow  
Natural Cycle: 45  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.60  
Intersection Signal Delay: 7.3  
Intersection Capacity Utilization 47.0%  
Analysis Period (min) 15  
Intersection LOS: A  
ICU Level of Service A  
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: One Buckland Center & Buckland



One Buckland Center, South Windsor 03/07/2017 Combined Weekday AM with Cosco (08.20)

Synchro 9 Light Report

Bubaris Traffic Associates

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Lanes, Volumes, Timings  
9: Buckland & Pleasant Valley/Buckland Hills

Combined Weekday AM with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)       | 187                                                                               | 136                                                                               | 187                                                                               | 161                                                                               | 211                                                                               | 64                                                                                | 352                                                                                 | 882                                                                                 | 105                                                                                 | 66                                                                                  | 399                                                                                 | 488                                                                                 |
| Future Volume (vph)        | 187                                                                               | 136                                                                               | 187                                                                               | 161                                                                               | 211                                                                               | 64                                                                                | 352                                                                                 | 882                                                                                 | 105                                                                                 | 66                                                                                  | 399                                                                                 | 488                                                                                 |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Storage Length (ft)        | 300                                                                               |                                                                                   | 0                                                                                 | 400                                                                               |                                                                                   | 250                                                                               | 0                                                                                   |                                                                                     | 300                                                                                 | 400                                                                                 |                                                                                     | 500                                                                                 |
| Storage Lanes              | 2                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                   |                                                                                     | 1                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                  |                                                                                     |                                                                                     | 25                                                                                  |                                                                                     |                                                                                     |
| Lane Util. Factor          | 0.97                                                                              | 0.95                                                                              | 1.00                                                                              | 0.97                                                                              | 0.95                                                                              | 1.00                                                                              | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                        |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                     |                                                                                     | 0.850                                                                               |                                                                                     |                                                                                     | 0.850                                                                               |
| Flt Protected              | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (prot)          | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 3433                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted              | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (perm)          | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 3433                                                                                | 3539                                                                                | 1583                                                                                |
| Right Turn on Red          |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   |                                                                                   | 210                                                                               |                                                                                   |                                                                                   | 140                                                                               |                                                                                     |                                                                                     | 114                                                                                 |                                                                                     |                                                                                     | 148                                                                                 |
| Link Speed (mph)           |                                                                                   | 35                                                                                |                                                                                   |                                                                                   | 35                                                                                |                                                                                   |                                                                                     | 45                                                                                  |                                                                                     |                                                                                     | 45                                                                                  |                                                                                     |
| Link Distance (ft)         |                                                                                   | 1080                                                                              |                                                                                   |                                                                                   | 1125                                                                              |                                                                                   |                                                                                     | 794                                                                                 |                                                                                     |                                                                                     | 545                                                                                 |                                                                                     |
| Travel Time (s)            |                                                                                   | 21.0                                                                              |                                                                                   |                                                                                   | 21.9                                                                              |                                                                                   |                                                                                     | 12.0                                                                                |                                                                                     |                                                                                     | 8.3                                                                                 |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)            | 203                                                                               | 148                                                                               | 203                                                                               | 175                                                                               | 229                                                                               | 70                                                                                | 383                                                                                 | 959                                                                                 | 114                                                                                 | 72                                                                                  | 434                                                                                 | 530                                                                                 |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Group Flow (vph)      | 203                                                                               | 148                                                                               | 203                                                                               | 175                                                                               | 229                                                                               | 70                                                                                | 383                                                                                 | 959                                                                                 | 114                                                                                 | 72                                                                                  | 434                                                                                 | 530                                                                                 |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  |
| Lane Alignment             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                                | Left                                                                                | Right                                                                               | Left                                                                                | Left                                                                                | Right                                                                               |
| Median Width(ft)           |                                                                                   | 24                                                                                |                                                                                   |                                                                                   | 24                                                                                |                                                                                   |                                                                                     | 24                                                                                  |                                                                                     |                                                                                     | 24                                                                                  |                                                                                     |
| Link Offset(ft)            |                                                                                   | 0                                                                                 |                                                                                   |                                                                                   | 0                                                                                 |                                                                                   |                                                                                     | 0                                                                                   |                                                                                     |                                                                                     | 0                                                                                   |                                                                                     |
| Crosswalk Width(ft)        |                                                                                   | 16                                                                                |                                                                                   |                                                                                   | 16                                                                                |                                                                                   |                                                                                     | 16                                                                                  |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                  |                                                                                     | 9                                                                                   | 15                                                                                  |                                                                                     | 9                                                                                   |
| Number of Detectors        | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Detector Template          | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                                | Thru                                                                                | Right                                                                               | Left                                                                                | Thru                                                                                | Right                                                                               |
| Leading Detector (ft)      | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                  | 100                                                                                 | 20                                                                                  | 20                                                                                  | 100                                                                                 | 20                                                                                  |
| Trailing Detector (ft)     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Detector 1 Position(ft)    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Detector 1 Size(ft)        | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                  | 6                                                                                   | 20                                                                                  | 20                                                                                  | 6                                                                                   | 20                                                                                  |
| Detector 1 Type            | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 1 Extend (s)      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 1 Queue (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 1 Delay (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 2 Position(ft)    |                                                                                   | 94                                                                                |                                                                                   |                                                                                   | 94                                                                                |                                                                                   |                                                                                     | 94                                                                                  |                                                                                     |                                                                                     | 94                                                                                  |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Detector 2 Type            |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                     | CI+Ex                                                                               |                                                                                     |                                                                                     | CI+Ex                                                                               |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Turn Type                  | Prot                                                                              | NA                                                                                | Perm                                                                              | Prot                                                                              | NA                                                                                | custom                                                                            | Prot                                                                                | NA                                                                                  | custom                                                                              | Prot                                                                                | NA                                                                                  | custom                                                                              |
| Protected Phases           | 3                                                                                 | 8                                                                                 |                                                                                   | 7                                                                                 | 4                                                                                 | 4 5                                                                               | 1                                                                                   | 6                                                                                   | 6 7                                                                                 | 5                                                                                   | 2                                                                                   | 2 3                                                                                 |
| Permitted Phases           |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   |                                                                                   | 5                                                                                 |                                                                                     |                                                                                     | 7                                                                                   |                                                                                     |                                                                                     | 3                                                                                   |



Lanes, Volumes, Timings  
9: Buckland & Pleasant Valley/Buckland Hills

Combined Weekday AM with Cosco (08.20)

08/26/2020

|                         |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Detector Phase          | 3                                                                                 | 8                                                                                 | 8                                                                                 | 7                                                                                 | 4                                                                                 | 4 5                                                                               | 1                                                                                  | 6                                                                                   | 6 7                                                                                 | 5                                                                                   | 2                                                                                   | 2 3                                                                                 |
| Switch Phase            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)     | 4.0                                                                               | 8.0                                                                               | 8.0                                                                               | 4.0                                                                               | 8.0                                                                               |                                                                                   | 4.0                                                                                | 15.0                                                                                |                                                                                     | 5.0                                                                                 | 15.0                                                                                |                                                                                     |
| Minimum Split (s)       | 8.0                                                                               | 12.0                                                                              | 12.0                                                                              | 8.0                                                                               | 12.0                                                                              |                                                                                   | 8.0                                                                                | 19.0                                                                                |                                                                                     | 9.5                                                                                 | 19.0                                                                                |                                                                                     |
| Total Split (s)         | 12.0                                                                              | 14.0                                                                              | 14.0                                                                              | 11.0                                                                              | 13.0                                                                              |                                                                                   | 17.0                                                                               | 35.5                                                                                |                                                                                     | 9.5                                                                                 | 28.0                                                                                |                                                                                     |
| Total Split (%)         | 17.1%                                                                             | 20.0%                                                                             | 20.0%                                                                             | 15.7%                                                                             | 18.6%                                                                             |                                                                                   | 24.3%                                                                              | 50.7%                                                                               |                                                                                     | 13.6%                                                                               | 40.0%                                                                               |                                                                                     |
| Maximum Green (s)       | 8.0                                                                               | 10.0                                                                              | 10.0                                                                              | 7.0                                                                               | 9.0                                                                               |                                                                                   | 13.0                                                                               | 31.5                                                                                |                                                                                     | 5.0                                                                                 | 24.0                                                                                |                                                                                     |
| Yellow Time (s)         | 3.5                                                                               | 3.5                                                                               | 3.5                                                                               | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                                | 3.5                                                                                 |                                                                                     | 3.5                                                                                 | 3.5                                                                                 |                                                                                     |
| All-Red Time (s)        | 0.5                                                                               | 0.5                                                                               | 0.5                                                                               | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                                | 0.5                                                                                 |                                                                                     | 1.0                                                                                 | 0.5                                                                                 |                                                                                     |
| Lost Time Adjust (s)    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                                | 0.0                                                                                 |                                                                                     | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Lost Time (s)     | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                                | 4.0                                                                                 |                                                                                     | 4.5                                                                                 | 4.0                                                                                 |                                                                                     |
| Lead/Lag                | Lead                                                                              | Lag                                                                               | Lag                                                                               | Lead                                                                              | Lag                                                                               |                                                                                   | Lead                                                                               | Lag                                                                                 |                                                                                     | Lead                                                                                | Lag                                                                                 |                                                                                     |
| Lead-Lag Optimize?      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Vehicle Extension (s)   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Recall Mode             | None                                                                              | None                                                                              | None                                                                              | None                                                                              | None                                                                              |                                                                                   | None                                                                               | Max                                                                                 |                                                                                     | None                                                                                | Max                                                                                 |                                                                                     |
| Act Effct Green (s)     | 7.7                                                                               | 9.6                                                                               | 9.6                                                                               | 6.9                                                                               | 8.7                                                                               | 18.3                                                                              | 11.9                                                                               | 32.7                                                                                | 43.6                                                                                | 5.0                                                                                 | 24.3                                                                                | 36.1                                                                                |
| Actuated g/C Ratio      | 0.11                                                                              | 0.14                                                                              | 0.14                                                                              | 0.10                                                                              | 0.13                                                                              | 0.27                                                                              | 0.17                                                                               | 0.48                                                                                | 0.63                                                                                | 0.07                                                                                | 0.35                                                                                | 0.53                                                                                |
| v/c Ratio               | 0.53                                                                              | 0.30                                                                              | 0.51                                                                              | 0.51                                                                              | 0.51                                                                              | 0.13                                                                              | 0.65                                                                               | 0.57                                                                                | 0.11                                                                                | 0.29                                                                                | 0.35                                                                                | 0.59                                                                                |
| Control Delay           | 34.4                                                                              | 28.6                                                                              | 9.2                                                                               | 35.4                                                                              | 32.7                                                                              | 0.9                                                                               | 32.1                                                                               | 15.3                                                                                | 1.6                                                                                 | 34.0                                                                                | 17.7                                                                                | 11.3                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 34.4                                                                              | 28.6                                                                              | 9.2                                                                               | 35.4                                                                              | 32.7                                                                              | 0.9                                                                               | 32.1                                                                               | 15.3                                                                                | 1.6                                                                                 | 34.0                                                                                | 17.7                                                                                | 11.3                                                                                |
| LOS                     | C                                                                                 | C                                                                                 | A                                                                                 | D                                                                                 | C                                                                                 | A                                                                                 | C                                                                                  | B                                                                                   | A                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |
| Approach Delay          |                                                                                   | 23.6                                                                              |                                                                                   |                                                                                   | 29.0                                                                              |                                                                                   |                                                                                    | 18.7                                                                                |                                                                                     |                                                                                     | 15.5                                                                                |                                                                                     |
| Approach LOS            |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Queue Length 50th (ft)  | 43                                                                                | 30                                                                                | 0                                                                                 | 37                                                                                | 49                                                                                | 0                                                                                 | 78                                                                                 | 156                                                                                 | 0                                                                                   | 15                                                                                  | 72                                                                                  | 102                                                                                 |
| Queue Length 95th (ft)  | 74                                                                                | 56                                                                                | 51                                                                                | 66                                                                                | 82                                                                                | 4                                                                                 | 120                                                                                | 213                                                                                 | 16                                                                                  | 34                                                                                  | 108                                                                                 | 194                                                                                 |
| Internal Link Dist (ft) |                                                                                   | 1000                                                                              |                                                                                   |                                                                                   | 1045                                                                              |                                                                                   |                                                                                    | 714                                                                                 |                                                                                     |                                                                                     | 465                                                                                 |                                                                                     |
| Turn Bay Length (ft)    | 300                                                                               |                                                                                   |                                                                                   | 400                                                                               |                                                                                   | 250                                                                               |                                                                                    |                                                                                     | 300                                                                                 | 400                                                                                 |                                                                                     | 500                                                                                 |
| Base Capacity (vph)     | 400                                                                               | 515                                                                               | 410                                                                               | 350                                                                               | 464                                                                               | 494                                                                               | 650                                                                                | 1686                                                                                | 1049                                                                                | 250                                                                                 | 1254                                                                                | 907                                                                                 |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 0.51                                                                              | 0.29                                                                              | 0.50                                                                              | 0.50                                                                              | 0.49                                                                              | 0.14                                                                              | 0.59                                                                               | 0.57                                                                                | 0.11                                                                                | 0.29                                                                                | 0.35                                                                                | 0.58                                                                                |

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 68.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 19.9

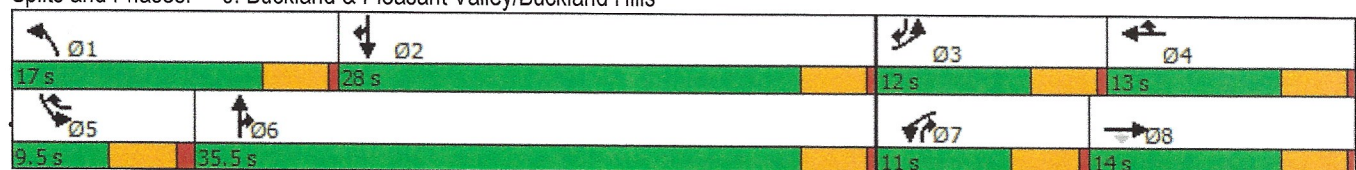
Intersection LOS: B

Intersection Capacity Utilization 56.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 9: Buckland & Pleasant Valley/Buckland Hills



**Revised Exhibit 19**  
**Traffic Operations Analysis Worksheets**  
**Combined Weekday PM Peak Hour**



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday PM with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |   |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)       | 125                                                                               | 80                                                                                | 420                                                                               | 100                                                                               | 90                                                                                | 133                                                                               | 525                                                                                 | 1242                                                                                | 80                                                                                  | 145                                                                                 | 1362                                                                                | 30                                                                                  |
| Future Volume (vph)        | 125                                                                               | 80                                                                                | 420                                                                               | 100                                                                               | 90                                                                                | 133                                                                               | 525                                                                                 | 1242                                                                                | 80                                                                                  | 145                                                                                 | 1362                                                                                | 30                                                                                  |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Storage Length (ft)        | 0                                                                                 |                                                                                   | 250                                                                               | 250                                                                               |                                                                                   | 250                                                                               | 300                                                                                 |                                                                                     | 0                                                                                   | 250                                                                                 |                                                                                     | 0                                                                                   |
| Storage Lanes              | 0                                                                                 |                                                                                   | 1                                                                                 | 1                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                   |                                                                                     | 1                                                                                   | 1                                                                                   |                                                                                     | 0                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                  |                                                                                     |                                                                                     | 25                                                                                  |                                                                                     |                                                                                     |
| Lane Util. Factor          | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 0.95                                                                                |
| Frt                        |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                     |                                                                                     | 0.850                                                                               |                                                                                     | 0.997                                                                               |                                                                                     |
| Flt Protected              |                                                                                   | 0.970                                                                             |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (prot)          | 0                                                                                 | 3433                                                                              | 1583                                                                              | 1770                                                                              | 1863                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 1770                                                                                | 3529                                                                                | 0                                                                                   |
| Flt Permitted              |                                                                                   | 0.970                                                                             |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (perm)          | 0                                                                                 | 3433                                                                              | 1583                                                                              | 1770                                                                              | 1863                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 1770                                                                                | 3529                                                                                | 0                                                                                   |
| Right Turn on Red          |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   |                                                                                   | 383                                                                               |                                                                                   |                                                                                   | 145                                                                               |                                                                                     |                                                                                     | 87                                                                                  |                                                                                     | 2                                                                                   |                                                                                     |
| Link Speed (mph)           |                                                                                   | 35                                                                                |                                                                                   |                                                                                   | 35                                                                                |                                                                                   |                                                                                     | 45                                                                                  |                                                                                     |                                                                                     | 45                                                                                  |                                                                                     |
| Link Distance (ft)         |                                                                                   | 1049                                                                              |                                                                                   |                                                                                   | 1178                                                                              |                                                                                   |                                                                                     | 840                                                                                 |                                                                                     |                                                                                     | 377                                                                                 |                                                                                     |
| Travel Time (s)            |                                                                                   | 20.4                                                                              |                                                                                   |                                                                                   | 22.9                                                                              |                                                                                   |                                                                                     | 12.7                                                                                |                                                                                     |                                                                                     | 5.7                                                                                 |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)            | 136                                                                               | 87                                                                                | 457                                                                               | 109                                                                               | 98                                                                                | 145                                                                               | 571                                                                                 | 1350                                                                                | 87                                                                                  | 158                                                                                 | 1480                                                                                | 33                                                                                  |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Group Flow (vph)      | 0                                                                                 | 223                                                                               | 457                                                                               | 109                                                                               | 98                                                                                | 145                                                                               | 571                                                                                 | 1350                                                                                | 87                                                                                  | 158                                                                                 | 1513                                                                                | 0                                                                                   |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  |
| Lane Alignment             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                                | Left                                                                                | Right                                                                               | Left                                                                                | Left                                                                                | Right                                                                               |
| Median Width(ft)           |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                     | 24                                                                                  |                                                                                     |                                                                                     | 24                                                                                  |                                                                                     |
| Link Offset(ft)            |                                                                                   | 0                                                                                 |                                                                                   |                                                                                   | 0                                                                                 |                                                                                   |                                                                                     | 0                                                                                   |                                                                                     |                                                                                     | 0                                                                                   |                                                                                     |
| Crosswalk Width(ft)        |                                                                                   | 16                                                                                |                                                                                   |                                                                                   | 16                                                                                |                                                                                   |                                                                                     | 16                                                                                  |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                  |                                                                                     | 9                                                                                   | 15                                                                                  |                                                                                     | 9                                                                                   |
| Number of Detectors        | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   |                                                                                     |
| Detector Template          | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                                | Thru                                                                                | Right                                                                               | Left                                                                                | Thru                                                                                |                                                                                     |
| Leading Detector (ft)      | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                  | 100                                                                                 | 20                                                                                  | 20                                                                                  | 100                                                                                 |                                                                                     |
| Trailing Detector (ft)     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Detector 1 Position(ft)    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Detector 1 Size(ft)        | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                  | 6                                                                                   | 20                                                                                  | 20                                                                                  | 6                                                                                   |                                                                                     |
| Detector 1 Type            | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                               | Cl+Ex                                                                               | Cl+Ex                                                                               | Cl+Ex                                                                               | Cl+Ex                                                                               |                                                                                     |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 1 Extend (s)      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 1 Queue (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 1 Delay (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 2 Position(ft)    |                                                                                   | 94                                                                                |                                                                                   |                                                                                   | 94                                                                                |                                                                                   |                                                                                     | 94                                                                                  |                                                                                     |                                                                                     | 94                                                                                  |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Detector 2 Type            |                                                                                   | Cl+Ex                                                                             |                                                                                   |                                                                                   | Cl+Ex                                                                             |                                                                                   |                                                                                     | Cl+Ex                                                                               |                                                                                     |                                                                                     | Cl+Ex                                                                               |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Turn Type                  | Split                                                                             | NA                                                                                | pt+ov                                                                             | Split                                                                             | NA                                                                                | pt+ov                                                                             | Prot                                                                                | NA                                                                                  | pm+ov                                                                               | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases           | 8                                                                                 | 8                                                                                 | 8 5                                                                               | 7                                                                                 | 7                                                                                 | 7 1                                                                               | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     |                                                                                     |



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday PM with Cosco (08.20)  
08/26/2020

| Lane Group                 | Ø3 |
|----------------------------|----|
| Lane Configurations        |    |
| Traffic Volume (vph)       |    |
| Future Volume (vph)        |    |
| Ideal Flow (vphpl)         |    |
| Storage Length (ft)        |    |
| Storage Lanes              |    |
| Taper Length (ft)          |    |
| Lane Util. Factor          |    |
| Frt                        |    |
| Flt Protected              |    |
| Satd. Flow (prot)          |    |
| Flt Permitted              |    |
| Satd. Flow (perm)          |    |
| Right Turn on Red          |    |
| Satd. Flow (RTOR)          |    |
| Link Speed (mph)           |    |
| Link Distance (ft)         |    |
| Travel Time (s)            |    |
| Peak Hour Factor           |    |
| Adj. Flow (vph)            |    |
| Shared Lane Traffic (%)    |    |
| Lane Group Flow (vph)      |    |
| Enter Blocked Intersection |    |
| Lane Alignment             |    |
| Median Width(ft)           |    |
| Link Offset(ft)            |    |
| Crosswalk Width(ft)        |    |
| Two way Left Turn Lane     |    |
| Headway Factor             |    |
| Turning Speed (mph)        |    |
| Number of Detectors        |    |
| Detector Template          |    |
| Leading Detector (ft)      |    |
| Trailing Detector (ft)     |    |
| Detector 1 Position(ft)    |    |
| Detector 1 Size(ft)        |    |
| Detector 1 Type            |    |
| Detector 1 Channel         |    |
| Detector 1 Extend (s)      |    |
| Detector 1 Queue (s)       |    |
| Detector 1 Delay (s)       |    |
| Detector 2 Position(ft)    |    |
| Detector 2 Size(ft)        |    |
| Detector 2 Type            |    |
| Detector 2 Channel         |    |
| Detector 2 Extend (s)      |    |
| Turn Type                  |    |
| Protected Phases           | 3  |
| Permitted Phases           |    |



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday PM with Cosco (08.20)

08/26/2020



| Lane Group              | EBL   | EBT    | EBR  | WBL   | WBT   | WBR  | NBL   | NBT   | NBR   | SBL   | SBT   | SBR |
|-------------------------|-------|--------|------|-------|-------|------|-------|-------|-------|-------|-------|-----|
| Detector Phase          | 8     | 8      | 8 5  | 7     | 7     | 7 1  | 5     | 2     | 7     | 1     | 6     |     |
| Switch Phase            |       |        |      |       |       |      |       |       |       |       |       |     |
| Minimum Initial (s)     | 8.0   | 8.0    |      | 8.0   | 8.0   |      | 8.0   | 15.0  | 8.0   | 8.0   | 5.0   |     |
| Minimum Split (s)       | 12.0  | 12.0   |      | 12.0  | 12.0  |      | 12.0  | 19.0  | 12.0  | 12.0  | 19.0  |     |
| Total Split (s)         | 12.0  | 12.0   |      | 12.0  | 12.0  |      | 16.0  | 40.0  | 12.0  | 13.0  | 37.0  |     |
| Total Split (%)         | 12.0% | 12.0%  |      | 12.0% | 12.0% |      | 16.0% | 40.0% | 12.0% | 13.0% | 37.0% |     |
| Maximum Green (s)       | 8.0   | 8.0    |      | 8.0   | 8.0   |      | 12.0  | 36.0  | 8.0   | 9.0   | 33.0  |     |
| Yellow Time (s)         | 3.5   | 3.5    |      | 3.5   | 3.5   |      | 3.5   | 3.5   | 3.5   | 3.5   | 3.5   |     |
| All-Red Time (s)        | 0.5   | 0.5    |      | 0.5   | 0.5   |      | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   |     |
| Lost Time Adjust (s)    |       | 0.0    |      | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |     |
| Total Lost Time (s)     |       | 4.0    |      | 4.0   | 4.0   |      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   |     |
| Lead/Lag                | Lag   | Lag    |      | Lead  | Lead  |      | Lead  | Lag   | Lead  | Lead  | Lag   |     |
| Lead-Lag Optimize?      |       |        |      |       |       |      |       |       |       |       |       |     |
| Vehicle Extension (s)   | 3.0   | 3.0    |      | 3.0   | 3.0   |      | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |     |
| Recall Mode             | None  | None   |      | None  | None  |      | None  | C-Max | None  | None  | C-Max |     |
| Walk Time (s)           |       |        |      |       |       |      |       |       |       |       |       |     |
| Flash Dont Walk (s)     |       |        |      |       |       |      |       |       |       |       |       |     |
| Pedestrian Calls (#/hr) |       |        |      |       |       |      |       |       |       |       |       |     |
| Act Effct Green (s)     |       | 8.0    | 24.0 | 8.0   | 8.0   | 17.0 | 12.0  | 54.4  | 65.6  | 9.0   | 51.4  |     |
| Actuated g/C Ratio      |       | 0.08   | 0.24 | 0.08  | 0.08  | 0.17 | 0.12  | 0.54  | 0.66  | 0.09  | 0.51  |     |
| v/c Ratio               |       | 0.96dl | 0.68 | 0.77  | 0.66  | 0.37 | 1.39  | 0.70  | 0.08  | 0.99  | 0.83  |     |
| Control Delay           |       | 68.8   | 12.4 | 79.5  | 66.3  | 7.3  | 222.3 | 21.1  | 1.8   | 117.3 | 27.5  |     |
| Queue Delay             |       | 0.0    | 0.0  | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |     |
| Total Delay             |       | 68.8   | 12.4 | 79.5  | 66.3  | 7.3  | 222.3 | 21.1  | 1.8   | 117.3 | 27.5  |     |
| LOS                     |       | E      | B    | E     | E     | A    | F     | C     | A     | F     | C     |     |
| Approach Delay          |       | 30.9   |      |       | 46.1  |      |       | 77.5  |       |       | 36.0  |     |
| Approach LOS            |       | C      |      |       | D     |      |       | E     |       |       | D     |     |
| Queue Length 50th (ft)  |       | 74     | 38   | 69    | 62    | 0    | ~251  | 278   | 0     | 102   | 367   |     |
| Queue Length 95th (ft)  |       | #137   | 145  | #160  | #135  | 42   | #357  | #635  | m11   | #233  | #796  |     |
| Internal Link Dist (ft) |       | 969    |      |       | 1098  |      |       | 760   |       |       | 297   |     |
| Turn Bay Length (ft)    |       |        | 250  | 250   |       | 250  | 300   |       |       | 250   |       |     |
| Base Capacity (vph)     |       | 274    | 671  | 141   | 149   | 389  | 411   | 1925  | 1068  | 159   | 1815  |     |
| Starvation Cap Reductn  |       | 0      | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     |     |
| Spillback Cap Reductn   |       | 0      | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     |     |
| Storage Cap Reductn     |       | 0      | 0    | 0     | 0     | 0    | 0     | 0     | 0     | 0     | 0     |     |
| Reduced v/c Ratio       |       | 0.81   | 0.68 | 0.77  | 0.66  | 0.37 | 1.39  | 0.70  | 0.08  | 0.99  | 0.83  |     |

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.39

Intersection Signal Delay: 53.7

Intersection LOS: D

Intersection Capacity Utilization 81.3%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday PM with Cosco (08.20)  
08/26/2020

|                         |      |
|-------------------------|------|
| Lane Group              | Ø3   |
| Detector Phase          |      |
| Switch Phase            |      |
| Minimum Initial (s)     | 7.0  |
| Minimum Split (s)       | 23.0 |
| Total Split (s)         | 23.0 |
| Total Split (%)         | 23%  |
| Maximum Green (s)       | 20.0 |
| Yellow Time (s)         | 2.0  |
| All-Red Time (s)        | 1.0  |
| Lost Time Adjust (s)    |      |
| Total Lost Time (s)     |      |
| Lead/Lag                |      |
| Lead-Lag Optimize?      |      |
| Vehicle Extension (s)   | 3.0  |
| Recall Mode             | None |
| Walk Time (s)           | 7.0  |
| Flash Dont Walk (s)     | 13.0 |
| Pedestrian Calls (#/hr) | 5    |
| Act Effct Green (s)     |      |
| Actuated g/C Ratio      |      |
| v/c Ratio               |      |
| Control Delay           |      |
| Queue Delay             |      |
| Total Delay             |      |
| LOS                     |      |
| Approach Delay          |      |
| Approach LOS            |      |
| Queue Length 50th (ft)  |      |
| Queue Length 95th (ft)  |      |
| Internal Link Dist (ft) |      |
| Turn Bay Length (ft)    |      |
| Base Capacity (vph)     |      |
| Starvation Cap Reductn  |      |
| Spillback Cap Reductn   |      |
| Storage Cap Reductn     |      |
| Reduced v/c Ratio       |      |
| Intersection Summary    |      |

Lanes, Volumes, Timings  
 3: Buckland /Buckland & Tamarack/Lowes

Combined Weekday PM with Cosco (08.20)

08/26/2020

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Buckland /Buckland & Tamarack/Lowes

|                                                                                      |                                                                                          |                                                                                      |                                                                                        |                                                                                        |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø7 |  Ø8 |
| 13 s                                                                                 | 40 s                                                                                     | 23 s                                                                                 | 12 s                                                                                   | 12 s                                                                                   |
|  Ø5 |  Ø6 (R) |                                                                                      |                                                                                        |                                                                                        |
| 16 s                                                                                 | 37 s                                                                                     |                                                                                      |                                                                                        |                                                                                        |



Lanes, Volumes, Timings  
6: One Buckland Center & Buckland

Combined Weekday PM with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBR                                                                               | NBU                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                                 |
| Lane Configurations        |                                                                                   |  |                                                                                   |  |  |  |  |
| Traffic Volume (vph)       | 0                                                                                 | 34                                                                                | 64                                                                                | 24                                                                                | 1839                                                                              | 1866                                                                              | 8                                                                                   |
| Future Volume (vph)        | 0                                                                                 | 34                                                                                | 64                                                                                | 24                                                                                | 1839                                                                              | 1866                                                                              | 8                                                                                   |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                |
| Storage Length (ft)        | 0                                                                                 | 0                                                                                 |                                                                                   | 150                                                                               |                                                                                   |                                                                                   | 200                                                                                 |
| Storage Lanes              | 0                                                                                 | 1                                                                                 |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   | 1                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   |                                                                                     |
| Lane Util. Factor          | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                              | 0.95                                                                              | 0.95                                                                              | 1.00                                                                                |
| Frt                        |                                                                                   | 0.865                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.850                                                                               |
| Flt Protected              |                                                                                   |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   |                                                                                     |
| Satd. Flow (prot)          | 0                                                                                 | 1611                                                                              | 0                                                                                 | 1770                                                                              | 3539                                                                              | 3539                                                                              | 1583                                                                                |
| Flt Permitted              |                                                                                   |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   |                                                                                     |
| Satd. Flow (perm)          | 0                                                                                 | 1611                                                                              | 0                                                                                 | 1770                                                                              | 3539                                                                              | 3539                                                                              | 1583                                                                                |
| Right Turn on Red          |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   | 124                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                   |
| Link Speed (mph)           | 30                                                                                |                                                                                   |                                                                                   |                                                                                   | 30                                                                                | 45                                                                                |                                                                                     |
| Link Distance (ft)         | 981                                                                               |                                                                                   |                                                                                   |                                                                                   | 163                                                                               | 840                                                                               |                                                                                     |
| Travel Time (s)            | 22.3                                                                              |                                                                                   |                                                                                   |                                                                                   | 3.7                                                                               | 12.7                                                                              |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                |
| Adj. Flow (vph)            | 0                                                                                 | 37                                                                                | 70                                                                                | 26                                                                                | 1999                                                                              | 2028                                                                              | 9                                                                                   |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Lane Group Flow (vph)      | 0                                                                                 | 37                                                                                | 0                                                                                 | 96                                                                                | 1999                                                                              | 2028                                                                              | 9                                                                                   |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                  |
| Lane Alignment             | Left                                                                              | Right                                                                             | R NA                                                                              | Left                                                                              | Left                                                                              | Left                                                                              | Right                                                                               |
| Median Width(ft)           | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   | 24                                                                                | 24                                                                                |                                                                                     |
| Link Offset(ft)            | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   | 0                                                                                 | 0                                                                                 |                                                                                     |
| Crosswalk Width(ft)        | 16                                                                                |                                                                                   |                                                                                   |                                                                                   | 16                                                                                | 16                                                                                |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                | 9                                                                                 | 9                                                                                 | 15                                                                                |                                                                                   |                                                                                   | 9                                                                                   |
| Number of Detectors        |                                                                                   | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 2                                                                                 | 1                                                                                   |
| Detector Template          |                                                                                   | Right                                                                             | Left                                                                              | Left                                                                              | Thru                                                                              | Thru                                                                              | Right                                                                               |
| Leading Detector (ft)      |                                                                                   | 20                                                                                | 20                                                                                | 20                                                                                | 100                                                                               | 100                                                                               | 20                                                                                  |
| Trailing Detector (ft)     |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |
| Detector 1 Position(ft)    |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |
| Detector 1 Size(ft)        |                                                                                   | 20                                                                                | 20                                                                                | 20                                                                                | 6                                                                                 | 6                                                                                 | 20                                                                                  |
| Detector 1 Type            |                                                                                   | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                               |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Detector 1 Extend (s)      |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 |
| Detector 1 Queue (s)       |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 |
| Detector 1 Delay (s)       |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 |
| Detector 2 Position(ft)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 94                                                                                | 94                                                                                |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 6                                                                                 | 6                                                                                 |                                                                                     |
| Detector 2 Type            |                                                                                   |                                                                                   |                                                                                   |                                                                                   | CI+Ex                                                                             | CI+Ex                                                                             |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                     |
| Turn Type                  |                                                                                   | Prot                                                                              | Prot                                                                              | Prot                                                                              | NA                                                                                | NA                                                                                | custom                                                                              |
| Protected Phases           |                                                                                   | 3                                                                                 | 1                                                                                 | 1                                                                                 | 1 2 3                                                                             | 2                                                                                 | 2                                                                                   |
| Permitted Phases           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1 2 3                                                                             |                                                                                   | 2                                                                                   |



Lanes, Volumes, Timings  
6: One Buckland Center & Buckland

Combined Weekday PM with Cosco (08.20)

08/26/2020



| Lane Group              | EBL | EBR  | NBU   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-----|------|-------|-------|-------|-------|-------|
| Detector Phase          |     | 3    | 1     | 1     | 1 2 3 | 2     | 2     |
| Switch Phase            |     |      |       |       |       |       |       |
| Minimum Initial (s)     |     | 5.0  | 5.0   | 5.0   |       | 5.0   | 5.0   |
| Minimum Split (s)       |     | 9.5  | 9.5   | 9.5   |       | 22.5  | 22.5  |
| Total Split (s)         |     | 9.5  | 19.0  | 19.0  |       | 71.5  | 71.5  |
| Total Split (%)         |     | 9.5% | 19.0% | 19.0% |       | 71.5% | 71.5% |
| Maximum Green (s)       |     | 5.0  | 15.0  | 15.0  |       | 67.0  | 67.0  |
| Yellow Time (s)         |     | 3.5  | 3.5   | 3.5   |       | 3.5   | 3.5   |
| All-Red Time (s)        |     | 1.0  | 0.5   | 0.5   |       | 1.0   | 1.0   |
| Lost Time Adjust (s)    |     | 0.0  |       | 0.0   |       | 0.0   | 0.0   |
| Total Lost Time (s)     |     | 4.5  |       | 4.0   |       | 4.5   | 4.5   |
| Lead/Lag                |     |      | Lead  | Lead  |       | Lag   | Lag   |
| Lead-Lag Optimize?      |     |      |       |       |       |       |       |
| Vehicle Extension (s)   |     | 3.0  | 3.0   | 3.0   |       | 3.0   | 3.0   |
| Recall Mode             |     | None | None  | None  |       | C-Min | C-Min |
| Act Effct Green (s)     |     | 5.0  |       | 15.0  | 100.0 | 67.0  | 67.0  |
| Actuated g/C Ratio      |     | 0.05 |       | 0.15  | 1.00  | 0.67  | 0.67  |
| v/c Ratio               |     | 0.19 |       | 0.36  | 0.56  | 0.86  | 0.01  |
| Control Delay           |     | 2.1  |       | 42.6  | 0.7   | 10.8  | 0.2   |
| Queue Delay             |     | 0.0  |       | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             |     | 2.1  |       | 42.6  | 0.7   | 10.8  | 0.2   |
| LOS                     |     | A    |       | D     | A     | B     | A     |
| Approach Delay          | 2.1 |      |       |       | 2.6   | 10.8  |       |
| Approach LOS            | A   |      |       |       | A     | B     |       |
| Queue Length 50th (ft)  |     | 0    |       | 56    | 0     | 115   | 0     |
| Queue Length 95th (ft)  |     | 0    |       | 106   | 0     | 356   | m0    |
| Internal Link Dist (ft) | 901 |      |       |       | 83    | 760   |       |
| Turn Bay Length (ft)    |     |      |       | 150   |       |       | 200   |
| Base Capacity (vph)     |     | 198  |       | 265   | 3539  | 2371  | 1063  |
| Starvation Cap Reductn  |     | 0    |       | 0     | 0     | 10    | 0     |
| Spillback Cap Reductn   |     | 0    |       | 0     | 0     | 0     | 0     |
| Storage Cap Reductn     |     | 0    |       | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio       |     | 0.19 |       | 0.36  | 0.56  | 0.86  | 0.01  |

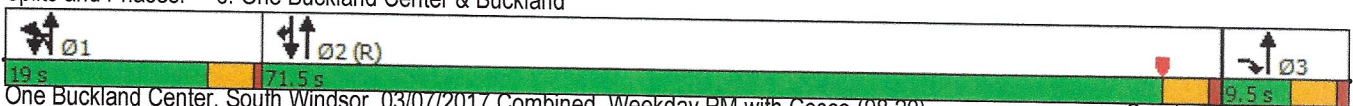
Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 13 (13%), Referenced to phase 2:NBSB, Start of Yellow  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 6.6  
 Intersection Capacity Utilization 71.5%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A

ICU Level of Service C

Splits and Phases: 6: One Buckland Center & Buckland



One Buckland Center, South Windsor 03/07/2017 Combined Weekday PM with Cosco (08.20)

Synchro 9 Light Report

Bubaris Traffic Associates



Lanes, Volumes, Timings  
9: Buckland & Pleasant Valley/Buckland Hills

Combined Weekday PM with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)       | 342                                                                               | 357                                                                               | 376                                                                               | 200                                                                               | 512                                                                               | 279                                                                               | 703                                                                                | 1319                                                                                | 419                                                                                 | 367                                                                                 | 833                                                                                 | 734                                                                                 |
| Future Volume (vph)        | 342                                                                               | 357                                                                               | 376                                                                               | 200                                                                               | 512                                                                               | 279                                                                               | 703                                                                                | 1319                                                                                | 419                                                                                 | 367                                                                                 | 833                                                                                 | 734                                                                                 |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Storage Length (ft)        | 300                                                                               |                                                                                   | 0                                                                                 | 400                                                                               |                                                                                   | 250                                                                               | 0                                                                                  |                                                                                     | 300                                                                                 | 400                                                                                 |                                                                                     | 500                                                                                 |
| Storage Lanes              | 2                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                  |                                                                                     | 1                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                 |                                                                                     |                                                                                     | 25                                                                                  |                                                                                     |                                                                                     |
| Lane Util. Factor          | 0.97                                                                              | 0.95                                                                              | 1.00                                                                              | 0.97                                                                              | 0.95                                                                              | 1.00                                                                              | 0.97                                                                               | 0.95                                                                                | 1.00                                                                                | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                        |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                    |                                                                                     | 0.850                                                                               |                                                                                     |                                                                                     | 0.850                                                                               |
| Flt Protected              | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                              |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (prot)          | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                               | 3539                                                                                | 1583                                                                                | 3433                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted              | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                              |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (perm)          | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                               | 3539                                                                                | 1583                                                                                | 3433                                                                                | 3539                                                                                | 1583                                                                                |
| Right Turn on Red          |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                    |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   |                                                                                   | 61                                                                                |                                                                                   |                                                                                   | 109                                                                               |                                                                                    |                                                                                     | 67                                                                                  |                                                                                     |                                                                                     | 115                                                                                 |
| Link Speed (mph)           |                                                                                   | 35                                                                                |                                                                                   |                                                                                   | 35                                                                                |                                                                                   |                                                                                    | 45                                                                                  |                                                                                     |                                                                                     | 45                                                                                  |                                                                                     |
| Link Distance (ft)         |                                                                                   | 1080                                                                              |                                                                                   |                                                                                   | 1125                                                                              |                                                                                   |                                                                                    | 794                                                                                 |                                                                                     |                                                                                     | 545                                                                                 |                                                                                     |
| Travel Time (s)            |                                                                                   | 21.0                                                                              |                                                                                   |                                                                                   | 21.9                                                                              |                                                                                   |                                                                                    | 12.0                                                                                |                                                                                     |                                                                                     | 8.3                                                                                 |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)            | 372                                                                               | 388                                                                               | 409                                                                               | 217                                                                               | 557                                                                               | 303                                                                               | 764                                                                                | 1434                                                                                | 455                                                                                 | 399                                                                                 | 905                                                                                 | 798                                                                                 |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Group Flow (vph)      | 372                                                                               | 388                                                                               | 409                                                                               | 217                                                                               | 557                                                                               | 303                                                                               | 764                                                                                | 1434                                                                                | 455                                                                                 | 399                                                                                 | 905                                                                                 | 798                                                                                 |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                 | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  |
| Lane Alignment             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                               | Left                                                                                | Right                                                                               | Left                                                                                | Left                                                                                | Right                                                                               |
| Median Width(ft)           |                                                                                   | 24                                                                                |                                                                                   |                                                                                   | 24                                                                                |                                                                                   |                                                                                    | 24                                                                                  |                                                                                     |                                                                                     | 24                                                                                  |                                                                                     |
| Link Offset(ft)            |                                                                                   | 0                                                                                 |                                                                                   |                                                                                   | 0                                                                                 |                                                                                   |                                                                                    | 0                                                                                   |                                                                                     |                                                                                     | 0                                                                                   |                                                                                     |
| Crosswalk Width(ft)        |                                                                                   | 16                                                                                |                                                                                   |                                                                                   | 16                                                                                |                                                                                   |                                                                                    | 16                                                                                  |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                 |                                                                                     | 9                                                                                   | 15                                                                                  |                                                                                     | 9                                                                                   |
| Number of Detectors        | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Detector Template          | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                               | Thru                                                                                | Right                                                                               | Left                                                                                | Thru                                                                                | Right                                                                               |
| Leading Detector (ft)      | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                 | 100                                                                                 | 20                                                                                  | 20                                                                                  | 100                                                                                 | 20                                                                                  |
| Trailing Detector (ft)     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Detector 1 Position(ft)    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Detector 1 Size(ft)        | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                 | 6                                                                                   | 20                                                                                  | 20                                                                                  | 6                                                                                   | 20                                                                                  |
| Detector 1 Type            | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                             | Cl+Ex                                                                              | Cl+Ex                                                                               | Cl+Ex                                                                               | Cl+Ex                                                                               | Cl+Ex                                                                               | Cl+Ex                                                                               |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 1 Extend (s)      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 1 Queue (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 1 Delay (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 2 Position(ft)    |                                                                                   | 94                                                                                |                                                                                   |                                                                                   | 94                                                                                |                                                                                   |                                                                                    | 94                                                                                  |                                                                                     |                                                                                     | 94                                                                                  |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                    | 6                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Detector 2 Type            |                                                                                   | Cl+Ex                                                                             |                                                                                   |                                                                                   | Cl+Ex                                                                             |                                                                                   |                                                                                    | Cl+Ex                                                                               |                                                                                     |                                                                                     | Cl+Ex                                                                               |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Turn Type                  | Prot                                                                              | NA                                                                                | custom                                                                            | Prot                                                                              | NA                                                                                | custom                                                                            | Prot                                                                               | NA                                                                                  | custom                                                                              | Prot                                                                                | NA                                                                                  | custom                                                                              |
| Protected Phases           | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 45                                                                                | 1                                                                                  | 6                                                                                   | 67                                                                                  | 5                                                                                   | 2                                                                                   | 23                                                                                  |
| Permitted Phases           |                                                                                   |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   | 5                                                                                 |                                                                                    |                                                                                     | 7                                                                                   |                                                                                     |                                                                                     | 3                                                                                   |



Lanes, Volumes, Timings  
9: Buckland & Pleasant Valley/Buckland Hills

Combined Weekday PM with Cosco (08.20)

08/26/2020

|                         |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Detector Phase          | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 4 5                                                                               | 1                                                                                  | 6                                                                                   | 6 7                                                                                 | 5                                                                                   | 2                                                                                   | 2 3                                                                                 |
| Switch Phase            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)     | 4.0                                                                               | 8.0                                                                               |                                                                                   | 4.0                                                                               | 8.0                                                                               |                                                                                   | 4.0                                                                                | 15.0                                                                                |                                                                                     | 5.0                                                                                 | 15.0                                                                                |                                                                                     |
| Minimum Split (s)       | 8.0                                                                               | 12.0                                                                              |                                                                                   | 8.0                                                                               | 12.0                                                                              |                                                                                   | 8.0                                                                                | 19.0                                                                                |                                                                                     | 9.5                                                                                 | 19.0                                                                                |                                                                                     |
| Total Split (s)         | 14.0                                                                              | 20.0                                                                              |                                                                                   | 13.0                                                                              | 19.0                                                                              |                                                                                   | 25.0                                                                               | 41.0                                                                                |                                                                                     | 16.0                                                                                | 32.0                                                                                |                                                                                     |
| Total Split (%)         | 15.6%                                                                             | 22.2%                                                                             |                                                                                   | 14.4%                                                                             | 21.1%                                                                             |                                                                                   | 27.8%                                                                              | 45.6%                                                                               |                                                                                     | 17.8%                                                                               | 35.6%                                                                               |                                                                                     |
| Maximum Green (s)       | 10.0                                                                              | 16.0                                                                              |                                                                                   | 9.0                                                                               | 15.0                                                                              |                                                                                   | 21.0                                                                               | 37.0                                                                                |                                                                                     | 11.5                                                                                | 28.0                                                                                |                                                                                     |
| Yellow Time (s)         | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                                | 3.5                                                                                 |                                                                                     | 3.5                                                                                 | 3.5                                                                                 |                                                                                     |
| All-Red Time (s)        | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                                | 0.5                                                                                 |                                                                                     | 1.0                                                                                 | 0.5                                                                                 |                                                                                     |
| Lost Time Adjust (s)    | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                                | 0.0                                                                                 |                                                                                     | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Lost Time (s)     | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                                | 4.0                                                                                 |                                                                                     | 4.5                                                                                 | 4.0                                                                                 |                                                                                     |
| Lead/Lag                | Lead                                                                              | Lag                                                                               |                                                                                   | Lead                                                                              | Lag                                                                               |                                                                                   | Lead                                                                               | Lag                                                                                 |                                                                                     | Lead                                                                                | Lag                                                                                 |                                                                                     |
| Lead-Lag Optimize?      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Vehicle Extension (s)   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Recall Mode             | None                                                                              | None                                                                              |                                                                                   | None                                                                              | None                                                                              |                                                                                   | None                                                                               | Max                                                                                 |                                                                                     | None                                                                                | Max                                                                                 |                                                                                     |
| Act Effect Green (s)    | 10.0                                                                              | 16.2                                                                              | 41.2                                                                              | 8.8                                                                               | 15.0                                                                              | 31.0                                                                              | 21.0                                                                               | 37.0                                                                                | 49.8                                                                                | 11.5                                                                                | 28.0                                                                                | 42.0                                                                                |
| Actuated g/C Ratio      | 0.11                                                                              | 0.18                                                                              | 0.46                                                                              | 0.10                                                                              | 0.17                                                                              | 0.34                                                                              | 0.23                                                                               | 0.41                                                                                | 0.55                                                                                | 0.13                                                                                | 0.31                                                                                | 0.47                                                                                |
| v/c Ratio               | 0.98                                                                              | 0.61                                                                              | 0.54                                                                              | 0.65                                                                              | 0.95                                                                              | 0.49                                                                              | 0.95                                                                               | 0.99                                                                                | 0.50                                                                                | 0.91                                                                                | 0.82                                                                                | 1.00                                                                                |
| Control Delay           | 82.3                                                                              | 38.7                                                                              | 18.0                                                                              | 48.7                                                                              | 64.3                                                                              | 17.7                                                                              | 57.6                                                                               | 47.9                                                                                | 12.7                                                                                | 65.8                                                                                | 36.2                                                                                | 53.6                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 82.3                                                                              | 38.7                                                                              | 18.0                                                                              | 48.7                                                                              | 64.3                                                                              | 17.7                                                                              | 57.6                                                                               | 47.9                                                                                | 12.7                                                                                | 65.8                                                                                | 36.2                                                                                | 53.6                                                                                |
| LOS                     | F                                                                                 | D                                                                                 | B                                                                                 | D                                                                                 | E                                                                                 | B                                                                                 | E                                                                                  | D                                                                                   | B                                                                                   | E                                                                                   | D                                                                                   | D                                                                                   |
| Approach Delay          |                                                                                   | 45.3                                                                              |                                                                                   |                                                                                   | 48.1                                                                              |                                                                                   |                                                                                    | 44.7                                                                                |                                                                                     |                                                                                     | 48.4                                                                                |                                                                                     |
| Approach LOS            |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Queue Length 50th (ft)  | 110                                                                               | 108                                                                               | 137                                                                               | 62                                                                                | 166                                                                               | 83                                                                                | 221                                                                                | 414                                                                                 | 125                                                                                 | 117                                                                                 | 249                                                                                 | 392                                                                                 |
| Queue Length 95th (ft)  | #200                                                                              | 156                                                                               | 225                                                                               | 98                                                                                | #269                                                                              | 160                                                                               | #336                                                                               | #577                                                                                | 204                                                                                 | #201                                                                                | 325                                                                                 | #663                                                                                |
| Internal Link Dist (ft) |                                                                                   | 1000                                                                              |                                                                                   |                                                                                   | 1045                                                                              |                                                                                   |                                                                                    | 714                                                                                 |                                                                                     |                                                                                     | 465                                                                                 |                                                                                     |
| Turn Bay Length (ft)    | 300                                                                               |                                                                                   |                                                                                   | 400                                                                               |                                                                                   | 250                                                                               |                                                                                    |                                                                                     | 300                                                                                 | 400                                                                                 |                                                                                     | 500                                                                                 |
| Base Capacity (vph)     | 381                                                                               | 638                                                                               | 758                                                                               | 343                                                                               | 589                                                                               | 616                                                                               | 801                                                                                | 1454                                                                                | 909                                                                                 | 438                                                                                 | 1101                                                                                | 800                                                                                 |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 0.98                                                                              | 0.61                                                                              | 0.54                                                                              | 0.63                                                                              | 0.95                                                                              | 0.49                                                                              | 0.95                                                                               | 0.99                                                                                | 0.50                                                                                | 0.91                                                                                | 0.82                                                                                | 1.00                                                                                |

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 46.4

Intersection LOS: D

Intersection Capacity Utilization 89.7%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 9: Buckland & Pleasant Valley/Buckland Hills

|                                                                                        |                                                                                        |                                                                                         |                                                                                          |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|  Ø1 |  Ø2 |  Ø3 |  Ø4 |
| 25 s                                                                                   | 32 s                                                                                   | 14 s                                                                                    | 19 s                                                                                     |
|  Ø5 |  Ø6 |  Ø7 |  Ø8 |
| 16 s                                                                                   | 41 s                                                                                   | 13 s                                                                                    | 20 s                                                                                     |



**Revised Exhibit 20**  
**Traffic Operations Analysis Worksheets**  
**Combined Saturday Mid-Day Peak Hour**

Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Saturday Peak with Cosco (08.20)

08/26/2020

|                            |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)       | 120                                                                               | 90                                                                                | 515                                                                               | 145                                                                               | 100                                                                               | 42                                                                                | 630                                                                                | 1345                                                                                | 85                                                                                  | 173                                                                                 | 1342                                                                                | 75                                                                                  |
| Future Volume (vph)        | 120                                                                               | 90                                                                                | 515                                                                               | 145                                                                               | 100                                                                               | 42                                                                                | 630                                                                                | 1345                                                                                | 85                                                                                  | 173                                                                                 | 1342                                                                                | 75                                                                                  |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Storage Length (ft)        | 0                                                                                 |                                                                                   | 250                                                                               | 250                                                                               |                                                                                   | 250                                                                               | 300                                                                                |                                                                                     | 0                                                                                   | 250                                                                                 |                                                                                     | 0                                                                                   |
| Storage Lanes              | 0                                                                                 |                                                                                   | 1                                                                                 | 1                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                  |                                                                                     | 1                                                                                   | 1                                                                                   |                                                                                     | 0                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                 |                                                                                     |                                                                                     | 25                                                                                  |                                                                                     |                                                                                     |
| Lane Util. Factor          | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.97                                                                               | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 0.95                                                                                |
| Frt                        |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                    |                                                                                     | 0.850                                                                               |                                                                                     | 0.992                                                                               |                                                                                     |
| Flt Protected              |                                                                                   | 0.972                                                                             |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                              |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (prot)          | 0                                                                                 | 3440                                                                              | 1583                                                                              | 1770                                                                              | 1863                                                                              | 1583                                                                              | 3433                                                                               | 3539                                                                                | 1583                                                                                | 1770                                                                                | 3511                                                                                | 0                                                                                   |
| Flt Permitted              |                                                                                   | 0.972                                                                             |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                              |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (perm)          | 0                                                                                 | 3440                                                                              | 1583                                                                              | 1770                                                                              | 1863                                                                              | 1583                                                                              | 3433                                                                               | 3539                                                                                | 1583                                                                                | 1770                                                                                | 3511                                                                                | 0                                                                                   |
| Right Turn on Red          |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                    |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   |                                                                                   | 342                                                                               |                                                                                   |                                                                                   | 109                                                                               |                                                                                    |                                                                                     | 80                                                                                  |                                                                                     | 5                                                                                   |                                                                                     |
| Link Speed (mph)           |                                                                                   | 35                                                                                |                                                                                   |                                                                                   | 35                                                                                |                                                                                   |                                                                                    | 45                                                                                  |                                                                                     |                                                                                     | 45                                                                                  |                                                                                     |
| Link Distance (ft)         |                                                                                   | 1049                                                                              |                                                                                   |                                                                                   | 1178                                                                              |                                                                                   |                                                                                    | 840                                                                                 |                                                                                     |                                                                                     | 377                                                                                 |                                                                                     |
| Travel Time (s)            |                                                                                   | 20.4                                                                              |                                                                                   |                                                                                   | 22.9                                                                              |                                                                                   |                                                                                    | 12.7                                                                                |                                                                                     |                                                                                     | 5.7                                                                                 |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)            | 130                                                                               | 98                                                                                | 560                                                                               | 158                                                                               | 109                                                                               | 46                                                                                | 685                                                                                | 1462                                                                                | 92                                                                                  | 188                                                                                 | 1459                                                                                | 82                                                                                  |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Group Flow (vph)      | 0                                                                                 | 228                                                                               | 560                                                                               | 158                                                                               | 109                                                                               | 46                                                                                | 685                                                                                | 1462                                                                                | 92                                                                                  | 188                                                                                 | 1541                                                                                | 0                                                                                   |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                 | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  |
| Lane Alignment             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                               | Left                                                                                | Right                                                                               | Left                                                                                | Left                                                                                | Right                                                                               |
| Median Width(ft)           |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                    | 24                                                                                  |                                                                                     |                                                                                     | 24                                                                                  |                                                                                     |
| Link Offset(ft)            |                                                                                   | 0                                                                                 |                                                                                   |                                                                                   | 0                                                                                 |                                                                                   |                                                                                    | 0                                                                                   |                                                                                     |                                                                                     | 0                                                                                   |                                                                                     |
| Crosswalk Width(ft)        |                                                                                   | 16                                                                                |                                                                                   |                                                                                   | 16                                                                                |                                                                                   |                                                                                    | 16                                                                                  |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                 |                                                                                     | 9                                                                                   | 15                                                                                  |                                                                                     | 9                                                                                   |
| Number of Detectors        | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   |                                                                                     |
| Detector Template          | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                               | Thru                                                                                | Right                                                                               | Left                                                                                | Thru                                                                                |                                                                                     |
| Leading Detector (ft)      | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                 | 100                                                                                 | 20                                                                                  | 20                                                                                  | 100                                                                                 |                                                                                     |
| Trailing Detector (ft)     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Detector 1 Position(ft)    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Detector 1 Size(ft)        | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                 | 6                                                                                   | 20                                                                                  | 20                                                                                  | 6                                                                                   |                                                                                     |
| Detector 1 Type            | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                              | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               |                                                                                     |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 1 Extend (s)      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 1 Queue (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 1 Delay (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Detector 2 Position(ft)    |                                                                                   | 94                                                                                |                                                                                   |                                                                                   | 94                                                                                |                                                                                   |                                                                                    | 94                                                                                  |                                                                                     |                                                                                     | 94                                                                                  |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                    | 6                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Detector 2 Type            |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                    | CI+Ex                                                                               |                                                                                     |                                                                                     | CI+Ex                                                                               |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                    | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Turn Type                  | Split                                                                             | NA                                                                                | pt+ov                                                                             | Split                                                                             | NA                                                                                | pt+ov                                                                             | Prot                                                                               | NA                                                                                  | pm+ov                                                                               | Prot                                                                                | NA                                                                                  |                                                                                     |
| Protected Phases           | 8                                                                                 | 8                                                                                 | 8 5                                                                               | 7                                                                                 | 7                                                                                 | 7 1                                                                               | 5                                                                                  | 2                                                                                   | 7                                                                                   | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     |                                                                                     |



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Saturday Peak with Cosco (08.20)  
08/26/2020

| Lane Group                 | Ø3 |
|----------------------------|----|
| Lane Configurations        |    |
| Traffic Volume (vph)       |    |
| Future Volume (vph)        |    |
| Ideal Flow (vphpl)         |    |
| Storage Length (ft)        |    |
| Storage Lanes              |    |
| Taper Length (ft)          |    |
| Lane Util. Factor          |    |
| Frt                        |    |
| Flt Protected              |    |
| Satd. Flow (prot)          |    |
| Flt Permitted              |    |
| Satd. Flow (perm)          |    |
| Right Turn on Red          |    |
| Satd. Flow (RTOR)          |    |
| Link Speed (mph)           |    |
| Link Distance (ft)         |    |
| Travel Time (s)            |    |
| Peak Hour Factor           |    |
| Adj. Flow (vph)            |    |
| Shared Lane Traffic (%)    |    |
| Lane Group Flow (vph)      |    |
| Enter Blocked Intersection |    |
| Lane Alignment             |    |
| Median Width(ft)           |    |
| Link Offset(ft)            |    |
| Crosswalk Width(ft)        |    |
| Two way Left Turn Lane     |    |
| Headway Factor             |    |
| Turning Speed (mph)        |    |
| Number of Detectors        |    |
| Detector Template          |    |
| Leading Detector (ft)      |    |
| Trailing Detector (ft)     |    |
| Detector 1 Position(ft)    |    |
| Detector 1 Size(ft)        |    |
| Detector 1 Type            |    |
| Detector 1 Channel         |    |
| Detector 1 Extend (s)      |    |
| Detector 1 Queue (s)       |    |
| Detector 1 Delay (s)       |    |
| Detector 2 Position(ft)    |    |
| Detector 2 Size(ft)        |    |
| Detector 2 Type            |    |
| Detector 2 Channel         |    |
| Detector 2 Extend (s)      |    |
| Turn Type                  |    |
| Protected Phases           | 3  |
| Permitted Phases           |    |



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Saturday Peak with Cosco (08.20)

08/26/2020

|                         |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Detector Phase          | 8                                                                                 | 8                                                                                 | 8 5                                                                               | 7                                                                                 | 7                                                                                 | 7 1                                                                               | 5                                                                                  | 2                                                                                   | 7                                                                                   | 1                                                                                   | 6                                                                                   |                                                                                     |
| Switch Phase            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)     | 8.0                                                                               | 8.0                                                                               |                                                                                   | 8.0                                                                               | 8.0                                                                               |                                                                                   | 8.0                                                                                | 15.0                                                                                | 8.0                                                                                 | 8.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Minimum Split (s)       | 12.0                                                                              | 12.0                                                                              |                                                                                   | 12.0                                                                              | 12.0                                                                              |                                                                                   | 12.0                                                                               | 19.0                                                                                | 12.0                                                                                | 12.0                                                                                | 19.0                                                                                |                                                                                     |
| Total Split (s)         | 12.0                                                                              | 12.0                                                                              |                                                                                   | 17.0                                                                              | 17.0                                                                              |                                                                                   | 27.0                                                                               | 52.0                                                                                | 17.0                                                                                | 16.0                                                                                | 41.0                                                                                |                                                                                     |
| Total Split (%)         | 10.0%                                                                             | 10.0%                                                                             |                                                                                   | 14.2%                                                                             | 14.2%                                                                             |                                                                                   | 22.5%                                                                              | 43.3%                                                                               | 14.2%                                                                               | 13.3%                                                                               | 34.2%                                                                               |                                                                                     |
| Maximum Green (s)       | 8.0                                                                               | 8.0                                                                               |                                                                                   | 13.0                                                                              | 13.0                                                                              |                                                                                   | 23.0                                                                               | 48.0                                                                                | 13.0                                                                                | 12.0                                                                                | 37.0                                                                                |                                                                                     |
| Yellow Time (s)         | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                                | 3.5                                                                                 | 3.5                                                                                 | 3.5                                                                                 | 3.5                                                                                 |                                                                                     |
| All-Red Time (s)        | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                                | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 |                                                                                     |
| Lost Time Adjust (s)    |                                                                                   | 0.0                                                                               |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Lost Time (s)     |                                                                                   | 4.0                                                                               |                                                                                   | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                                | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |                                                                                     |
| Lead/Lag                | Lag                                                                               | Lag                                                                               |                                                                                   | Lead                                                                              | Lead                                                                              |                                                                                   | Lead                                                                               | Lag                                                                                 | Lead                                                                                | Lead                                                                                | Lag                                                                                 |                                                                                     |
| Lead-Lag Optimize?      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Vehicle Extension (s)   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Recall Mode             | None                                                                              | None                                                                              |                                                                                   | None                                                                              | None                                                                              |                                                                                   | None                                                                               | C-Max                                                                               | None                                                                                | None                                                                                | C-Max                                                                               |                                                                                     |
| Walk Time (s)           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Flash Dont Walk (s)     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Pedestrian Calls (#/hr) |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Act Effct Green (s)     |                                                                                   | 8.0                                                                               | 35.0                                                                              | 12.7                                                                              | 12.7                                                                              | 24.7                                                                              | 23.0                                                                               | 66.7                                                                                | 82.6                                                                                | 12.0                                                                                | 55.7                                                                                |                                                                                     |
| Actuated g/C Ratio      |                                                                                   | 0.07                                                                              | 0.29                                                                              | 0.11                                                                              | 0.11                                                                              | 0.21                                                                              | 0.19                                                                               | 0.56                                                                                | 0.69                                                                                | 0.10                                                                                | 0.46                                                                                |                                                                                     |
| v/c Ratio               |                                                                                   | 1.10dl                                                                            | 0.80                                                                              | 0.85                                                                              | 0.56                                                                              | 0.11                                                                              | 1.04                                                                               | 0.74                                                                                | 0.08                                                                                | 1.06                                                                                | 0.94                                                                                |                                                                                     |
| Control Delay           |                                                                                   | 114.5                                                                             | 24.3                                                                              | 88.6                                                                              | 62.4                                                                              | 0.5                                                                               | 89.6                                                                               | 24.1                                                                                | 1.9                                                                                 | 136.5                                                                               | 43.6                                                                                |                                                                                     |
| Queue Delay             |                                                                                   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Delay             |                                                                                   | 114.5                                                                             | 24.3                                                                              | 88.6                                                                              | 62.4                                                                              | 0.5                                                                               | 89.6                                                                               | 24.1                                                                                | 1.9                                                                                 | 136.5                                                                               | 43.6                                                                                |                                                                                     |
| LOS                     |                                                                                   | F                                                                                 | C                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                  | C                                                                                   | A                                                                                   | F                                                                                   | D                                                                                   |                                                                                     |
| Approach Delay          |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 66.5                                                                              |                                                                                   |                                                                                    | 43.3                                                                                |                                                                                     |                                                                                     | 53.7                                                                                |                                                                                     |
| Approach LOS            |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Queue Length 50th (ft)  |                                                                                   | 94                                                                                | 163                                                                               | 122                                                                               | 81                                                                                | 0                                                                                 | ~295                                                                               | 391                                                                                 | 2                                                                                   | ~160                                                                                | 540                                                                                 |                                                                                     |
| Queue Length 95th (ft)  |                                                                                   | #181                                                                              | 321                                                                               | #239                                                                              | 142                                                                               | 0                                                                                 | #415                                                                               | #778                                                                                | m12                                                                                 | #310                                                                                | #994                                                                                |                                                                                     |
| Internal Link Dist (ft) |                                                                                   | 969                                                                               |                                                                                   |                                                                                   | 1098                                                                              |                                                                                   |                                                                                    | 760                                                                                 |                                                                                     |                                                                                     | 297                                                                                 |                                                                                     |
| Turn Bay Length (ft)    |                                                                                   |                                                                                   | 250                                                                               | 250                                                                               |                                                                                   | 250                                                                               | 300                                                                                |                                                                                     |                                                                                     | 250                                                                                 |                                                                                     |                                                                                     |
| Base Capacity (vph)     |                                                                                   | 229                                                                               | 703                                                                               | 191                                                                               | 201                                                                               | 416                                                                               | 657                                                                                | 1967                                                                                | 1118                                                                                | 177                                                                                 | 1633                                                                                |                                                                                     |
| Starvation Cap Reductn  |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Spillback Cap Reductn   |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Storage Cap Reductn     |                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Reduced v/c Ratio       |                                                                                   | 1.00                                                                              | 0.80                                                                              | 0.83                                                                              | 0.54                                                                              | 0.11                                                                              | 1.04                                                                               | 0.74                                                                                | 0.08                                                                                | 1.06                                                                                | 0.94                                                                                |                                                                                     |

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 49.4

Intersection LOS: D

Intersection Capacity Utilization 89.4%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.



Lanes, Volumes, Timings  
3: Buckland /Buckland & Tamarack/Lowes

Combined Saturday Peak with Cosco (08.20)  
08/26/2020

|                         |      |
|-------------------------|------|
| Lane Group              | Ø3   |
| Detector Phase          |      |
| Switch Phase            |      |
| Minimum Initial (s)     | 7.0  |
| Minimum Split (s)       | 23.0 |
| Total Split (s)         | 23.0 |
| Total Split (%)         | 19%  |
| Maximum Green (s)       | 20.0 |
| Yellow Time (s)         | 2.0  |
| All-Red Time (s)        | 1.0  |
| Lost Time Adjust (s)    |      |
| Total Lost Time (s)     |      |
| Lead/Lag                |      |
| Lead-Lag Optimize?      |      |
| Vehicle Extension (s)   | 3.0  |
| Recall Mode             | None |
| Walk Time (s)           | 7.0  |
| Flash Dont Walk (s)     | 13.0 |
| Pedestrian Calls (#/hr) | 5    |
| Act Effct Green (s)     |      |
| Actuated g/C Ratio      |      |
| v/c Ratio               |      |
| Control Delay           |      |
| Queue Delay             |      |
| Total Delay             |      |
| LOS                     |      |
| Approach Delay          |      |
| Approach LOS            |      |
| Queue Length 50th (ft)  |      |
| Queue Length 95th (ft)  |      |
| Internal Link Dist (ft) |      |
| Turn Bay Length (ft)    |      |
| Base Capacity (vph)     |      |
| Starvation Cap Reductn  |      |
| Spillback Cap Reductn   |      |
| Storage Cap Reductn     |      |
| Reduced v/c Ratio       |      |
| Intersection Summary    |      |

# Lanes, Volumes, Timings

Combined Saturday Peak with Cosco (08.20)

## 3: Buckland /Buckland & Tamarack/Lowes

08/26/2020

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Buckland /Buckland & Tamarack/Lowes

|                                                                                      |                                                                                          |                                                                                      |                                                                                        |                                                                                        |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø7 |  Ø8 |
| 16 s                                                                                 | 52 s                                                                                     | 23 s                                                                                 | 17 s                                                                                   | 12 s                                                                                   |
|  Ø5 |  Ø6 (R) |                                                                                      |                                                                                        |                                                                                        |
| 27 s                                                                                 | 41 s                                                                                     |                                                                                      |                                                                                        |                                                                                        |



Lanes, Volumes, Timings  
6: One Buckland Center & Buckland

Combined Saturday Peak with Cosco (08.20)

08/26/2020

|                            |  |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|----------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                                | EBR                                                                               | NBU   | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                                |
| Lane Configurations        |                                                                                    |  |       |  |  |  |  |
| Traffic Volume (vph)       | 0                                                                                  | 41                                                                                | 74    | 33                                                                                | 2060                                                                              | 1990                                                                              | 12                                                                                 |
| Future Volume (vph)        | 0                                                                                  | 41                                                                                | 74    | 33                                                                                | 2060                                                                              | 1990                                                                              | 12                                                                                 |
| Ideal Flow (vphpl)         | 1900                                                                               | 1900                                                                              | 1900  | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               |
| Storage Length (ft)        | 0                                                                                  | 0                                                                                 |       | 150                                                                               |                                                                                   |                                                                                   | 200                                                                                |
| Storage Lanes              | 0                                                                                  | 1                                                                                 |       | 1                                                                                 |                                                                                   |                                                                                   | 1                                                                                  |
| Taper Length (ft)          | 25                                                                                 |                                                                                   |       | 25                                                                                |                                                                                   |                                                                                   |                                                                                    |
| Lane Util. Factor          | 1.00                                                                               | 1.00                                                                              | 0.95  | 1.00                                                                              | 0.95                                                                              | 0.95                                                                              | 1.00                                                                               |
| Frt                        |                                                                                    | 0.865                                                                             |       |                                                                                   |                                                                                   |                                                                                   | 0.850                                                                              |
| Flt Protected              |                                                                                    |                                                                                   |       | 0.950                                                                             |                                                                                   |                                                                                   |                                                                                    |
| Satd. Flow (prot)          | 0                                                                                  | 1611                                                                              | 0     | 1770                                                                              | 3539                                                                              | 3539                                                                              | 1583                                                                               |
| Flt Permitted              |                                                                                    |                                                                                   |       | 0.950                                                                             |                                                                                   |                                                                                   |                                                                                    |
| Satd. Flow (perm)          | 0                                                                                  | 1611                                                                              | 0     | 1770                                                                              | 3539                                                                              | 3539                                                                              | 1583                                                                               |
| Right Turn on Red          |                                                                                    | Yes                                                                               |       |                                                                                   |                                                                                   |                                                                                   | Yes                                                                                |
| Satd. Flow (RTOR)          |                                                                                    | 127                                                                               |       |                                                                                   |                                                                                   |                                                                                   | 10                                                                                 |
| Link Speed (mph)           | 30                                                                                 |                                                                                   |       |                                                                                   | 30                                                                                | 45                                                                                |                                                                                    |
| Link Distance (ft)         | 981                                                                                |                                                                                   |       |                                                                                   | 163                                                                               | 840                                                                               |                                                                                    |
| Travel Time (s)            | 22.3                                                                               |                                                                                   |       |                                                                                   | 3.7                                                                               | 12.7                                                                              |                                                                                    |
| Peak Hour Factor           | 0.92                                                                               | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               |
| Adj. Flow (vph)            | 0                                                                                  | 45                                                                                | 80    | 36                                                                                | 2239                                                                              | 2163                                                                              | 13                                                                                 |
| Shared Lane Traffic (%)    |                                                                                    |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| Lane Group Flow (vph)      | 0                                                                                  | 45                                                                                | 0     | 116                                                                               | 2239                                                                              | 2163                                                                              | 13                                                                                 |
| Enter Blocked Intersection | No                                                                                 | No                                                                                | No    | No                                                                                | No                                                                                | No                                                                                | No                                                                                 |
| Lane Alignment             | Left                                                                               | Right                                                                             | R NA  | Left                                                                              | Left                                                                              | Left                                                                              | Right                                                                              |
| Median Width(ft)           | 0                                                                                  |                                                                                   |       |                                                                                   | 24                                                                                | 24                                                                                |                                                                                    |
| Link Offset(ft)            | 0                                                                                  |                                                                                   |       |                                                                                   | 0                                                                                 | 0                                                                                 |                                                                                    |
| Crosswalk Width(ft)        | 16                                                                                 |                                                                                   |       |                                                                                   | 16                                                                                | 16                                                                                |                                                                                    |
| Two way Left Turn Lane     |                                                                                    |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| Headway Factor             | 1.00                                                                               | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               |
| Turning Speed (mph)        | 15                                                                                 | 9                                                                                 | 9     | 15                                                                                |                                                                                   |                                                                                   | 9                                                                                  |
| Number of Detectors        |                                                                                    | 1                                                                                 | 1     | 1                                                                                 | 2                                                                                 | 2                                                                                 | 1                                                                                  |
| Detector Template          |                                                                                    | Right                                                                             | Left  | Left                                                                              | Thru                                                                              | Thru                                                                              | Right                                                                              |
| Leading Detector (ft)      |                                                                                    | 20                                                                                | 20    | 20                                                                                | 100                                                                               | 100                                                                               | 20                                                                                 |
| Trailing Detector (ft)     |                                                                                    | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Detector 1 Position(ft)    |                                                                                    | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Detector 1 Size(ft)        |                                                                                    | 20                                                                                | 20    | 20                                                                                | 6                                                                                 | 6                                                                                 | 20                                                                                 |
| Detector 1 Type            |                                                                                    | CI+Ex                                                                             | CI+Ex | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                              |
| Detector 1 Channel         |                                                                                    |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| Detector 1 Extend (s)      |                                                                                    | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                |
| Detector 1 Queue (s)       |                                                                                    | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                |
| Detector 1 Delay (s)       |                                                                                    | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                |
| Detector 2 Position(ft)    |                                                                                    |                                                                                   |       |                                                                                   | 94                                                                                | 94                                                                                |                                                                                    |
| Detector 2 Size(ft)        |                                                                                    |                                                                                   |       |                                                                                   | 6                                                                                 | 6                                                                                 |                                                                                    |
| Detector 2 Type            |                                                                                    |                                                                                   |       |                                                                                   | CI+Ex                                                                             | CI+Ex                                                                             |                                                                                    |
| Detector 2 Channel         |                                                                                    |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| Detector 2 Extend (s)      |                                                                                    |                                                                                   |       |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                    |
| Turn Type                  |                                                                                    | Prot                                                                              | Prot  | Prot                                                                              | NA                                                                                | NA                                                                                | custom                                                                             |
| Protected Phases           |                                                                                    | 3                                                                                 | 1     | 1                                                                                 | 1 2 3                                                                             | 2                                                                                 | 2                                                                                  |
| Permitted Phases           |                                                                                    |                                                                                   |       |                                                                                   | 1 2 3                                                                             |                                                                                   | 2                                                                                  |



Lanes, Volumes, Timings  
6: One Buckland Center & Buckland

Combined Saturday Peak with Cosco (08.20)

08/26/2020

|                         | EBL | EBR  | NBU   | NBL   | NBT   | SBT   | SBR   |
|-------------------------|-----|------|-------|-------|-------|-------|-------|
| Lane Group              |     |      |       |       |       |       |       |
| Detector Phase          |     | 3    | 1     | 1     | 1 2 3 | 2     | 2     |
| Switch Phase            |     |      |       |       |       |       |       |
| Minimum Initial (s)     |     | 5.0  | 5.0   | 5.0   |       | 5.0   | 5.0   |
| Minimum Split (s)       |     | 9.5  | 9.5   | 9.5   |       | 22.5  | 22.5  |
| Total Split (s)         |     | 9.5  | 24.0  | 24.0  |       | 86.5  | 86.5  |
| Total Split (%)         |     | 7.9% | 20.0% | 20.0% |       | 72.1% | 72.1% |
| Maximum Green (s)       |     | 5.0  | 20.0  | 20.0  |       | 82.0  | 82.0  |
| Yellow Time (s)         |     | 3.5  | 3.5   | 3.5   |       | 3.5   | 3.5   |
| All-Red Time (s)        |     | 1.0  | 0.5   | 0.5   |       | 1.0   | 1.0   |
| Lost Time Adjust (s)    |     | 0.0  |       | 0.0   |       | 0.0   | 0.0   |
| Total Lost Time (s)     |     | 4.5  |       | 4.0   |       | 4.5   | 4.5   |
| Lead/Lag                |     |      | Lead  | Lead  |       | Lag   | Lag   |
| Lead-Lag Optimize?      |     |      |       |       |       |       |       |
| Vehicle Extension (s)   |     | 3.0  | 3.0   | 3.0   |       | 3.0   | 3.0   |
| Recall Mode             |     | Min  | None  | None  |       | C-Min | C-Min |
| Act Effct Green (s)     |     | 5.0  |       | 20.0  | 120.0 | 82.0  | 82.0  |
| Actuated g/C Ratio      |     | 0.04 |       | 0.17  | 1.00  | 0.68  | 0.68  |
| v/c Ratio               |     | 0.24 |       | 0.39  | 0.63  | 0.89  | 0.01  |
| Control Delay           |     | 3.0  |       | 49.1  | 0.9   | 16.3  | 4.2   |
| Queue Delay             |     | 0.0  |       | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay             |     | 3.0  |       | 49.1  | 0.9   | 16.3  | 4.2   |
| LOS                     |     | A    |       | D     | A     | B     | A     |
| Approach Delay          | 3.0 |      |       |       | 3.2   | 16.2  |       |
| Approach LOS            | A   |      |       |       | A     | B     |       |
| Queue Length 50th (ft)  |     | 0    |       | 81    | 0     | 305   | 0     |
| Queue Length 95th (ft)  |     | 0    |       | 141   | 0     | m644  | m1    |
| Internal Link Dist (ft) | 901 |      |       |       | 83    | 760   |       |
| Turn Bay Length (ft)    |     |      |       | 150   |       |       | 200   |
| Base Capacity (vph)     |     | 188  |       | 295   | 3539  | 2418  | 1084  |
| Starvation Cap Reductn  |     | 0    |       | 0     | 0     | 0     | 0     |
| Spillback Cap Reductn   |     | 0    |       | 0     | 0     | 0     | 0     |
| Storage Cap Reductn     |     | 0    |       | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio       |     | 0.24 |       | 0.39  | 0.63  | 0.89  | 0.01  |

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 9.4

Intersection LOS: A

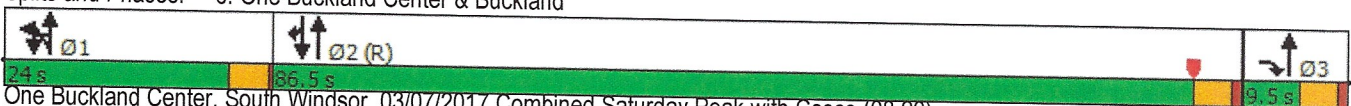
Intersection Capacity Utilization 75.9%

ICU Level of Service D

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: One Buckland Center & Buckland



One Buckland Center, South Windsor 03/07/2017 Combined Saturday Peak with Cosco (08.20)

Synchro 9 Light Report

Bubaris Traffic Associates

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Lanes, Volumes, Timings  
9: Buckland & Pleasant Valley/Buckland Hills

Combined Saturday Peak with Cosco (08.20)

08/27/2020

|                            |  |  |  |  |  |  |   |  |  |  |  |  |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)       | 384                                                                               | 429                                                                               | 389                                                                               | 308                                                                               | 688                                                                               | 418                                                                               | 714                                                                                 | 1352                                                                                | 455                                                                                 | 403                                                                                 | 903                                                                                 | 725                                                                                 |
| Future Volume (vph)        | 384                                                                               | 429                                                                               | 389                                                                               | 308                                                                               | 688                                                                               | 418                                                                               | 714                                                                                 | 1352                                                                                | 455                                                                                 | 403                                                                                 | 903                                                                                 | 725                                                                                 |
| Ideal Flow (vphpl)         | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Storage Length (ft)        | 300                                                                               |                                                                                   | 0                                                                                 | 400                                                                               |                                                                                   | 250                                                                               | 0                                                                                   |                                                                                     | 300                                                                                 | 300                                                                                 |                                                                                     | 600                                                                                 |
| Storage Lanes              | 2                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                 |                                                                                   | 1                                                                                 | 2                                                                                   |                                                                                     | 1                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   |
| Taper Length (ft)          | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 25                                                                                  |                                                                                     |                                                                                     | 25                                                                                  |                                                                                     |                                                                                     |
| Lane Util. Factor          | 0.97                                                                              | 0.95                                                                              | 1.00                                                                              | 0.97                                                                              | 0.95                                                                              | 1.00                                                                              | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                | 0.97                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frnt                       |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                   |                                                                                   | 0.850                                                                             |                                                                                     |                                                                                     | 0.850                                                                               |                                                                                     |                                                                                     | 0.850                                                                               |
| Flt Protected              | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (prot)          | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 3433                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted              | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                             |                                                                                   |                                                                                   | 0.950                                                                               |                                                                                     |                                                                                     | 0.950                                                                               |                                                                                     |                                                                                     |
| Satd. Flow (perm)          | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                              | 3539                                                                              | 1583                                                                              | 3433                                                                                | 3539                                                                                | 1583                                                                                | 3433                                                                                | 3539                                                                                | 1583                                                                                |
| Right Turn on Red          |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |
| Satd. Flow (RTOR)          |                                                                                   |                                                                                   | 61                                                                                |                                                                                   |                                                                                   | 109                                                                               |                                                                                     |                                                                                     | 67                                                                                  |                                                                                     |                                                                                     | 115                                                                                 |
| Link Speed (mph)           |                                                                                   | 35                                                                                |                                                                                   |                                                                                   | 35                                                                                |                                                                                   |                                                                                     | 45                                                                                  |                                                                                     |                                                                                     | 45                                                                                  |                                                                                     |
| Link Distance (ft)         |                                                                                   | 1080                                                                              |                                                                                   |                                                                                   | 1125                                                                              |                                                                                   |                                                                                     | 794                                                                                 |                                                                                     |                                                                                     | 573                                                                                 |                                                                                     |
| Travel Time (s)            |                                                                                   | 21.0                                                                              |                                                                                   |                                                                                   | 21.9                                                                              |                                                                                   |                                                                                     | 12.0                                                                                |                                                                                     |                                                                                     | 8.7                                                                                 |                                                                                     |
| Peak Hour Factor           | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)            | 417                                                                               | 466                                                                               | 423                                                                               | 335                                                                               | 748                                                                               | 454                                                                               | 776                                                                                 | 1470                                                                                | 495                                                                                 | 438                                                                                 | 982                                                                                 | 788                                                                                 |
| Shared Lane Traffic (%)    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Group Flow (vph)      | 417                                                                               | 466                                                                               | 423                                                                               | 335                                                                               | 748                                                                               | 454                                                                               | 776                                                                                 | 1470                                                                                | 495                                                                                 | 438                                                                                 | 982                                                                                 | 788                                                                                 |
| Enter Blocked Intersection | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  |
| Lane Alignment             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                              | Left                                                                              | Right                                                                             | Left                                                                                | Left                                                                                | Right                                                                               | Left                                                                                | Left                                                                                | Right                                                                               |
| Median Width(ft)           |                                                                                   | 24                                                                                |                                                                                   |                                                                                   | 24                                                                                |                                                                                   |                                                                                     | 24                                                                                  |                                                                                     |                                                                                     | 24                                                                                  |                                                                                     |
| Link Offset(ft)            |                                                                                   | 0                                                                                 |                                                                                   |                                                                                   | 0                                                                                 |                                                                                   |                                                                                     | 0                                                                                   |                                                                                     |                                                                                     | 0                                                                                   |                                                                                     |
| Crosswalk Width(ft)        |                                                                                   | 16                                                                                |                                                                                   |                                                                                   | 16                                                                                |                                                                                   |                                                                                     | 16                                                                                  |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |
| Two way Left Turn Lane     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Headway Factor             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Turning Speed (mph)        | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                |                                                                                   | 9                                                                                 | 15                                                                                  |                                                                                     | 9                                                                                   | 15                                                                                  |                                                                                     | 9                                                                                   |
| Number of Detectors        | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Detector Template          | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                              | Thru                                                                              | Right                                                                             | Left                                                                                | Thru                                                                                | Right                                                                               | Left                                                                                | Thru                                                                                | Right                                                                               |
| Leading Detector (ft)      | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                | 100                                                                               | 20                                                                                | 20                                                                                  | 100                                                                                 | 20                                                                                  | 20                                                                                  | 100                                                                                 | 20                                                                                  |
| Trailing Detector (ft)     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Detector 1 Position(ft)    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Detector 1 Size(ft)        | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                | 6                                                                                 | 20                                                                                | 20                                                                                  | 6                                                                                   | 20                                                                                  | 20                                                                                  | 6                                                                                   | 20                                                                                  |
| Detector 1 Type            | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                             | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               | CI+Ex                                                                               |
| Detector 1 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 1 Extend (s)      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 1 Queue (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 1 Delay (s)       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Detector 2 Position(ft)    |                                                                                   | 94                                                                                |                                                                                   |                                                                                   | 94                                                                                |                                                                                   |                                                                                     | 94                                                                                  |                                                                                     |                                                                                     | 94                                                                                  |                                                                                     |
| Detector 2 Size(ft)        |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Detector 2 Type            |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                   | CI+Ex                                                                             |                                                                                   |                                                                                     | CI+Ex                                                                               |                                                                                     |                                                                                     | CI+Ex                                                                               |                                                                                     |
| Detector 2 Channel         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Detector 2 Extend (s)      |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Turn Type                  | Prot                                                                              | NA                                                                                | custom                                                                            | Prot                                                                              | NA                                                                                | custom                                                                            | Prot                                                                                | NA                                                                                  | custom                                                                              | Prot                                                                                | NA                                                                                  | custom                                                                              |
| Protected Phases           | 3                                                                                 | 8                                                                                 | 1 8                                                                               | 7                                                                                 | 4                                                                                 | 4 5                                                                               | 1                                                                                   | 6                                                                                   | 6 7                                                                                 | 5                                                                                   | 2                                                                                   | 2 3                                                                                 |
| Permitted Phases           |                                                                                   |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   | 5                                                                                 |                                                                                     |                                                                                     | 7                                                                                   |                                                                                     |                                                                                     | 3                                                                                   |



Lanes, Volumes, Timings  
9: Buckland & Pleasant Valley/Buckland Hills

Combined Saturday Peak with Cosco (08.20)

08/27/2020

|                         |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Detector Phase          | 3                                                                                 | 8                                                                                 | 1 8                                                                               | 7                                                                                 | 4                                                                                 | 4 5                                                                               | 1                                                                                  | 6                                                                                   | 6 7                                                                                 | 5                                                                                   | 2                                                                                   | 2 3                                                                                 |
| Switch Phase            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)     | 4.0                                                                               | 8.0                                                                               |                                                                                   | 4.0                                                                               | 8.0                                                                               |                                                                                   | 4.0                                                                                | 15.0                                                                                |                                                                                     | 5.0                                                                                 | 15.0                                                                                |                                                                                     |
| Minimum Split (s)       | 8.0                                                                               | 12.0                                                                              |                                                                                   | 8.0                                                                               | 12.0                                                                              |                                                                                   | 8.0                                                                                | 19.0                                                                                |                                                                                     | 9.5                                                                                 | 19.0                                                                                |                                                                                     |
| Total Split (s)         | 14.0                                                                              | 21.0                                                                              |                                                                                   | 15.0                                                                              | 22.0                                                                              |                                                                                   | 23.0                                                                               | 38.2                                                                                |                                                                                     | 15.8                                                                                | 31.0                                                                                |                                                                                     |
| Total Split (%)         | 15.6%                                                                             | 23.3%                                                                             |                                                                                   | 16.7%                                                                             | 24.4%                                                                             |                                                                                   | 25.6%                                                                              | 42.4%                                                                               |                                                                                     | 17.6%                                                                               | 34.4%                                                                               |                                                                                     |
| Maximum Green (s)       | 10.0                                                                              | 17.0                                                                              |                                                                                   | 11.0                                                                              | 18.0                                                                              |                                                                                   | 19.0                                                                               | 34.2                                                                                |                                                                                     | 11.3                                                                                | 27.0                                                                                |                                                                                     |
| Yellow Time (s)         | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                               | 3.5                                                                               |                                                                                   | 3.5                                                                                | 3.5                                                                                 |                                                                                     | 3.5                                                                                 | 3.5                                                                                 |                                                                                     |
| All-Red Time (s)        | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                                | 0.5                                                                                 |                                                                                     | 1.0                                                                                 | 0.5                                                                                 |                                                                                     |
| Lost Time Adjust (s)    | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                                | 0.0                                                                                 |                                                                                     | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Lost Time (s)     | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                               | 4.0                                                                               |                                                                                   | 4.0                                                                                | 4.0                                                                                 |                                                                                     | 4.5                                                                                 | 4.0                                                                                 |                                                                                     |
| Lead/Lag                | Lead                                                                              | Lag                                                                               |                                                                                   | Lead                                                                              | Lag                                                                               |                                                                                   | Lead                                                                               | Lag                                                                                 |                                                                                     | Lead                                                                                | Lag                                                                                 |                                                                                     |
| Lead-Lag Optimize?      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Vehicle Extension (s)   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Recall Mode             | None                                                                              | None                                                                              |                                                                                   | None                                                                              | None                                                                              |                                                                                   | None                                                                               | C-Max                                                                               |                                                                                     | None                                                                                | C-Max                                                                               |                                                                                     |
| Act Effct Green (s)     | 10.0                                                                              | 17.1                                                                              | 40.1                                                                              | 10.9                                                                              | 18.0                                                                              | 33.8                                                                              | 19.0                                                                               | 34.2                                                                                | 49.1                                                                                | 11.3                                                                                | 27.0                                                                                | 41.0                                                                                |
| Actuated g/C Ratio      | 0.11                                                                              | 0.19                                                                              | 0.45                                                                              | 0.12                                                                              | 0.20                                                                              | 0.38                                                                              | 0.21                                                                               | 0.38                                                                                | 0.55                                                                                | 0.13                                                                                | 0.30                                                                                | 0.46                                                                                |
| v/c Ratio               | 1.09                                                                              | 0.69                                                                              | 0.57                                                                              | 0.81                                                                              | 1.06                                                                              | 0.69                                                                              | 1.07                                                                               | 1.09                                                                                | 0.55                                                                                | 1.02                                                                                | 0.93                                                                                | 1.01                                                                                |
| Control Delay           | 113.2                                                                             | 40.3                                                                              | 19.4                                                                              | 54.6                                                                              | 86.5                                                                              | 23.9                                                                              | 89.9                                                                               | 82.8                                                                                | 14.1                                                                                | 88.2                                                                                | 46.2                                                                                | 56.6                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 113.2                                                                             | 40.3                                                                              | 19.4                                                                              | 54.6                                                                              | 86.5                                                                              | 23.9                                                                              | 89.9                                                                               | 82.8                                                                                | 14.1                                                                                | 88.2                                                                                | 46.2                                                                                | 56.6                                                                                |
| LOS                     | F                                                                                 | D                                                                                 | B                                                                                 | D                                                                                 | F                                                                                 | C                                                                                 | F                                                                                  | F                                                                                   | B                                                                                   | F                                                                                   | D                                                                                   | E                                                                                   |
| Approach Delay          |                                                                                   | 56.8                                                                              |                                                                                   |                                                                                   | 61.1                                                                              |                                                                                   |                                                                                    | 72.4                                                                                |                                                                                     |                                                                                     | 58.2                                                                                |                                                                                     |
| Approach LOS            |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | E                                                                                   |                                                                                     |                                                                                     | E                                                                                   |                                                                                     |
| Queue Length 50th (ft)  | ~139                                                                              | 131                                                                               | 148                                                                               | 96                                                                                | ~247                                                                              | 162                                                                               | ~254                                                                               | ~501                                                                                | 147                                                                                 | ~132                                                                                | 283                                                                                 | ~396                                                                                |
| Queue Length 95th (ft)  | #231                                                                              | 184                                                                               | 242                                                                               | #162                                                                              | #362                                                                              | 275                                                                               | #367                                                                               | #635                                                                                | 237                                                                                 | #230                                                                                | #406                                                                                | #659                                                                                |
| Internal Link Dist (ft) |                                                                                   | 1000                                                                              |                                                                                   |                                                                                   | 1045                                                                              |                                                                                   |                                                                                    | 714                                                                                 |                                                                                     |                                                                                     | 493                                                                                 |                                                                                     |
| Turn Bay Length (ft)    | 300                                                                               |                                                                                   |                                                                                   | 400                                                                               |                                                                                   | 250                                                                               |                                                                                    |                                                                                     | 300                                                                                 | 300                                                                                 |                                                                                     | 600                                                                                 |
| Base Capacity (vph)     | 381                                                                               | 671                                                                               | 738                                                                               | 419                                                                               | 707                                                                               | 662                                                                               | 724                                                                                | 1344                                                                                | 895                                                                                 | 431                                                                                 | 1061                                                                                | 783                                                                                 |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 1.09                                                                              | 0.69                                                                              | 0.57                                                                              | 0.80                                                                              | 1.06                                                                              | 0.69                                                                              | 1.07                                                                               | 1.09                                                                                | 0.55                                                                                | 1.02                                                                                | 0.93                                                                                | 1.01                                                                                |

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 63.5

Intersection LOS: E

Intersection Capacity Utilization 94.3%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



# Lanes, Volumes, Timings

## 9: Buckland & Pleasant Valley/Buckland Hills

Combined Saturday Peak with Cosco (08.20)

08/27/2020

Splits and Phases: 9: Buckland & Pleasant Valley/Buckland Hills

