

Traffic Summary COSTCO at Evergreen Walk

September 2019; Revised June 2020

A revision to the current master plan at Evergreen Walk is proposed. This revision consolidates several smaller lots and proposes a COSTCO in their stead. This summary discusses proposed improvements to the Site with regards to traffic flow.

It is our opinion that Evergreen Walk should implement the following improvements to the Site whether the COSTCO project proceeds or not:

- Provide appropriate signing and pavement markings on the overly wide Tamarack Avenue approach to Deming Street to establish two travel lanes, as is operationally the condition.
- Install “Keep Right” signs at both ends of Tamarack Avenue’s median at Deming Street.
- Install a “Keep Right” sign at the Buckland Road end of the Hemlock Avenue median.

These measures will be discussed further in the following paragraphs.

Evergreen Walk is an ongoing mixed use, master planned development located along the westerly side of Buckland Road, north of the Interstate 84 interchange in the Town of South Windsor. This section of South Windsor and adjacent Manchester is generally known as the Buckland area and includes a regional mall, numerous smaller shopping centers, residential developments, restaurants and other uses.

The approved Evergreen Walk master plan has been built out to about 35% of the total square footage, which allows for 1.5± million square feet of retail, office, other commercial and residential space; however, approximately 85% to 90% of the parcels have been developed on site. Most of the remaining build out square footage and parcels are lower traffic generating residential in nature. The COSTCO development program will include a 161,200± square foot membership warehouse building with a 24-position fueling facility. This will replace approximately 170,500 square feet of general retail space in the Evergreen Walk master plan.

The potential impact on traffic operations during the weekday afternoon and Saturday mid-day peak traffic periods was studied at 13 nearby intersections. Capacity analyses were prepared for the study area intersections using the approved Evergreen Walk build out and the revised COSTCO scenarios.

The net change in peak hour traffic volumes above the currently approved master plan using previously approved trip rates for the retail components of Evergreen Walk and criteria established by the Office of State Traffic Administration. (OSTA) for membership clubs are very conservatively estimated at 170 new weekday afternoon and 265 new Saturday mid-day peak hour trips. ITE general use codes for membership clubs mentions that “some” clubs included gas stations. To be ultra conservative, we include additional trips due to the proposed 24-position fueling station.

Under existing no build conditions, there are approximately 4,000 vehicles travelling on Buckland Road during the PM and Saturday shopping peak hours. These additional trips are less than the traffic expected from the other approved projects in the corridor and represent about a 4%-7% maximum peak hour traffic increase on Buckland Road right at the Site. They were assigned to the roadway network and superimposed onto projected base build out traffic volumes.

The Buckland Road/Buckland Street corridor has longstanding traffic operational deficiencies, which will continue into the foreseeable future, as the remainder of Evergreen Walk and other approved projects come online. Under “background” conditions, which reflect the build out of the current Evergreen Walk master plan plus other approved developments, there are 8 overall intersectional (4 each in South Windsor and Manchester) and 48 individual traffic movements (18 in South Windsor and 30 in Manchester) projected to operate at a poor level of service. This should not be surprising, as the last detailed study for Evergreen Walk (AECOM, 2016) projected 3 overall intersectional and 36 individual traffic movements would operate at a poor level of service upon the Evergreen Walk build out, without the traffic from the four (4) additional development projects since approved and included in this study. Under “COSTCO-

build” conditions during the two time periods analyzed, there are 9 overall intersectional (5 in South Windsor and 4 Manchester) and 50 individual traffic movements (19 in South Windsor and 31 in Manchester) projected to operate at a poor level of service.

The only condition of the current Evergreen Walk Certificate of Operation issued by the Office of State Traffic Administration (OSTA) still outstanding is the implementation of an advanced traffic signal system at several intersections in Manchester. This work should be underway shortly, and may improve operations at the I-84 interchange. The soon to be constructed improvement at the Buckland Street/Pleasant Valley Road/Buckland Hills Drive intersection by the Town of Manchester will address safety concerns.

As Evergreen Walk has an existing Certificate of Operation issued by the Office of State Traffic Administration the proposed development will require approval from OSTA. The process is anticipated to be an Administrative Decision.

Recommendations and Conclusions

Costco Application Proposed Improvements

It is our opinion that Evergreen Walk should implement the following improvements to the Site whether the COSTCO project proceeds or not:

- Provide appropriate signing and pavement markings on the overly wide Tamarack Avenue approach to Deming Street to establish two travel lanes, as is operationally the condition.
- Install “Keep Right” signs at Tamarack Avenue’s median at Deming Street.
- Install a “Keep Right” sign at the Buckland Road end of the Hemlock Avenue median.

The Town should reestablish the coordinated traffic signal system along Buckland Road in South Windsor and optimize the timings. The optimization of the traffic signal timings better allocates the “green” time to the actual traffic flows and thereby decreases the amount of time the traveling public “sits” in traffic. The five (5) traffic signals along Buckland Road from Tamarack Avenue to Terry Office Park were designed, and initially operated, as a coordinated system. It appears that

this is no longer the case. This was confirmed and similar recommendations made in a recent signal system study prepared for the Town (VHB, March 2020). The Town could investigate Local Transportation Capital Improvement Program (LOTICIP) or Congestion Mitigation and Air Quality (CMAQ) funding to implement the reestablishment of the coordinated traffic signal system.

If, after reestablishment of the coordinated traffic signal system along Buckland Road, future traffic operations warrant additional improvements the Town could investigate the following:

- Construct a southbound Buckland Road right turn lane at the Hemlock Avenue intersection, if right of way is available. The southbound through traffic volume may eventually exceed capacity.
- If future traffic operations warrant, lengthen the northbound Buckland Road left turn lane at Cedar Avenue by cutting into the median.
- If future traffic operations warrant, lengthen the northbound Buckland Road left turn lane at Hemlock Avenue by cutting into the median.
- If future traffic operations warrant, lengthen the northbound Buckland Road double left turn into Tamarack Avenue by cutting into the median and possible other roadway widening.

This memorandum has been prepared by the following individuals:

Michael Dion, PE, PTOE: Mr. Dion has more than 21 years of experience in traffic engineering/transportation planning including numerous state and municipal infrastructure projects. He has been the traffic project lead on many projects involving major highway/roadway improvements, roadway realignment, intersection improvements, and resurfacing and safety improvements. Mr. Dion is experienced in the application of CTDOT and FHWA Design Standards as well as all documentation required for the development of a project. Mr. Dion has expertise in the areas of lighting design and traffic planning studies. This experience includes traffic signal design, traffic impact studies, capacity/level of service analysis, safety/crash analysis, traffic simulation modeling, roadway lighting design maintenance and protection of traffic design, pavement marking design and signing design. Mr. Dion has broad knowledge of most traffic analysis tools including SYNCHRO, Highway Capacity Software, TSDWIN, Highway Safety Analysis software, and Simtraffic as well as Visual and AGI32 lighting design software. As a Sr. Project Manager at BL Companies, Michael's responsibilities include

overseeing and managing the entire project delivery process, including planning, schedule, scope and budget.

Fred Greenberg, PE: Mr. Greenberg has more than 44 years of experience in the areas of traffic engineering and transportation planning. He oversees a variety of transportation projects at BL Companies and is responsible for traffic impact studies, traffic control improvements, corridor analyses and the development of work zone traffic control plans. Mr. Greenberg has been published frequently in Public Works and ITE Journal, including an expert article titled “Pedestrian Signal Usage in the Central Business District of Medium Sized Cities.” He is an active member and former President of the Connecticut chapter of the Institute of Transportation Engineers.

Regards,



Michael Dion, PE, PTOE
Principal
Senior Project Manager
CT PE Number: 23758
Attachments



Table 1
Peak Hour Traffic Operations Summary

Intersection/Lane Group	Background		COSTCO-Build	
	PM	SAT	PM	SAT
Buckland Road at Rte 30 and Rte 194¹	E (68" delay)	D (52" delay)	E (69" delay)	E (57" delay)
Buckland Rd NB Left (175')	C/.49/32"/110'	C/.47/26"/115'	C/.50/32"/110'	C/.48/27"/115'
Buckland Rd NB Through	F/1.11/104"/975'	E/1.04/75"/715'	F/1.12/108"/990'	F/1.08/87"/750'
Rte 194 SB Left (170')	F/1.04/96"/555'	D/.84/49"/355'	F/1.04/96"/555'	D/.84/49"/355'
Rte 194 SB Through	D/.88/49"/910'	D/.95/55"/745'	D/.90/50"/930'	E/.98/58"/765'
Rte 30 EB Left (640')	D/.85/47"/435'	C/.61/30"/280'	D/.85/47"/440'	C/.61/30"/380'
Rte 30 EB Through (850')	D/.50/42"/285'	D/.53/37"/205'	D/.51/43"/290'	D/.53/37"/210'
Rte 30 WB Left (240')	C/.41/29"/155'	C/.44/25"/165'	C/.42/29"/160'	C/.46/26"/170'
Rte 30 WB Through	D/.55/54"/265'	D/.37/36"/170'	D/.55/54"/265'	D/.37/36"/170'
Rte 30 WB Right (240')	F/.90/81"/400'	D/.73/49"/290'	F/.90/81"/400'	D/.73/49"/290'
Buckland Road at Terry Office Park¹	B (13" delay)	B (15" delay)	B (13" delay)	B (15" delay)
Buckland Rd NB Left (130')	A/.31/9"/60'	B/.38/11"/65'	A/.31/9"/60'	B/.39/11"/65'
Buckland Rd NB Through	A/.45/8"/380'	A/.46/9"/345'	A/.46/8"/385'	A/.47/9"/360'
Buckland Rd SB	B/.57/16"/590'	B/.68/18"/675'	B/.58/16"/610'	B/.70/19"/695'
Office Park Left	D/.41/40"/100'	D/.42/40"/100'	D/.41/40"/100'	D/.42/40"/100'
Office Park Right (85')	B/.31/13"/45'	B/.41/13"/50'	B/.31/13"/45'	B/.41/13"/50'
Buckland Road at Deming Street¹	B (19" delay)	B (18" delay)	B (19" delay)	B (19" delay)
Buckland Rd NB Left (150')	B/.40/11"/85'	B/.40/11"/70'	B/.42/11"/85'	B/.42/13"/80'
Buckland Rd NB Through	B/.65/17"/635'	B/.57/15"/470'	B/.66/17"/640'	B/.58/16"/515'
Buckland Rd SB Left (140')	A/.19/9"/40'	A/.63/8"/40'	A/.19/9"/40'	A/.17/8"/40'
Buckland Rd SB Through	B/.62/19"/445'	B/.54/19"/665'	B/.64/19"/460'	C/.73/20"/720'
Deming St EB Left (150')	D/.18/35"/50'	D/.23/38"/60'	D/.23/36"/60'	D/.34/40"/80'
Deming St EB Through	D/.38/37"/120'	D/.24/37"/75'	D/.38/37"/120'	D/.24/36"/80'
Deming St EB Right (375')	B/.51/11"/65'	B/.42/12"/55'	B/.51/11"/65'	B/.42/11"/55'
Deming St WB Left (100')	D/.35/39"/90'	D/.32/40"/75'	D/.35/39"/90'	D/.30/39"/75'
Deming St WB Through	C/.40/30"/125'	C/.38/31"/105'	C/.41/31"/125'	C/.37/31"/105'
Deming Street at Tamarack Ave²	-	-	-	-
Tamarack NB Left	B/.09/13"/25'	B/.05/13"/25'	B/.11/14"/25'	B/.08/13"/25'
Tamarack NB Right (155')	B/.19/10"/25'	A/.10/10"/25'	B/.21/11"/25'	A/.13/10"/25'
Deming Street WB Left (200')	A/.06/8"/25'	A/.07/8"/25'	A/.07/8"/25'	A/.09/8"/25'
Buckland Street at Cedar Ave and Hotel¹	B (20" delay)	B (20" delay)	C (21" delay)	C (21" delay)
Buckland St NB Left (275')	B/.55/18"/140'	C/.59/23"/235'	C/.66/25"/240'	C/.74/32"/345'
Buckland St NB Through	B/.61/18"/700'	B/.52/15"/475'	B/.60/18"/710'	B/.52/15"/470'
Buckland St NB Right ³	A/.05/1"/25'	A/.05/1"/25'	A/.05/1"/25'	A/.05/1"/25'
Buckland St SB Left ³ (50')	B/.18/11"/45'	A/.15/10"/45'	B/.17/12"/45'	A/.15/10"/45'
Buckland St SB Through	C/.67/22"/750'	C/.75/22"/685'	C/.69/23"/750'	C/.75/23"/675'
Buckland St SB Right (150')	A/.18/8"/80'	A/.20/6"/70'	A/.21/9"/95'	A/.23/7"/80'
Cedar Ave Left (200')	D/.63/48"/200'	D/.69/53"/250'	D/.70/53"/215'	E/.80/63"/300'
Cedar Ave Through (410')	B/.51/13"/80'	B/.62/17"/105'	B/.56/13"/85'	B/.71/17"/135'
Hotel Left ³	C/.08/34"/30'	D/.12/36"/40'	C/.08/34"/30'	D/.12/36"/40'
Hotel Through ³	C/.13/26"/35'	C/.17/25"/40'	C/.13/27"/35'	C/.17/25"/40'

Notes: X/0.0/00 - Level of Service/V/C ratio/Average Delay/95% Q length

¹ - Signalized intersection

² - Unsignalized

³-To be constructed by Hotel

Table 1 (con't)
Peak Hour Traffic Operations Summary

Intersection/Lane Group	Background		COSTCO-Build	
	PM	SAT	PM	SAT
Buckland Road at Hemlock Ave and Aldi's driveway¹	E (70" delay)	F (82" delay)	E (74" delay)	F (97" delay)
Buckland Rd NB Left (210')	C/.67/29"/245'	E/.97/69"/380'	D/.82/42"/315'	F/1.12/114"/450'
Buckland Rd NB Through	C/.85/30"/795'	C/.86/31"/765'	C/.89/32"/830'	C/.89/33"/800'
Buckland Rd SB Left (60')	B/.18/15"/45'	B/.20/15"/50'	B/.18/15"/45'	B/.20/15"/50'
Buckland Rd SB Through	F/1.22/130"/930'	F/1.28/157"/950'	F/1.25/139"/945'	F/1.34/185"/1010'
Hemlock Ave Left (250')	D/.70/40"/260'	D/.64/36"/240'	D/.72/41"/270'	D/.66/37"/250'
Hemlock Ave Through/Right (105')	B/.66/15"/100'	B/.72/16"/125'	B/.67/15"/110'	B/.75/16"/140'
Aldi Left	D/.49/46"/135'	D/.53/48"/150'	D/.49/46"/135'	D/.53/48"/150'
Aldi Through/Right	B/.28/17"/50'	B/.30/17"/50'	B/.28/17"/50'	B/.30/17"/50'
Buckland Road at Tamarack Ave/Lowes¹	D (47" delay)	E (68" delay)	D (48" delay)	E (71" delay)
Buckland Rd NB Double Left (300')	F/1.19/145"/540'	F/1.42/237"/700'	F/1.19/145"/540'	F/1.42/237"/700'
Buckland Rd NB Through	C/.79/32"/850'	D/.86/39"/995'	C/.84/34"/945'	D/.91/43"/1095'
Buckland Rd NB Right (175')	A/.09/5"/40'	A/.10/6"/45'	A/.09/6"/45'	A/.20/6"/50'
Buckland Rd SB Left (140')	E/.67/62"/290'	E/.74/69"/375'	E/.67/62"/290'	E/.76/70"/385'
Buckland Rd SB Through	D/.85/35"/950'	D/.89/41"/1050'	D/.88/37"/1000'	D/.97/51"/1190'
Tamarack Ave Left/Through (575')	E/.63/58"/160'	E/.58/58"/175'	E/.63/58"/160'	E/.58/58"/175'
Tamarack Ave Through (575')	E/.63/58"/160'	E/.58/58"/175'	E/.63/58"/160'	E/.58/58"/175'
Tamarack Ave Right (125')	A/.60/6"/75'	B/.75/16"/270'	A/.60/6"/65'	B/.76/16"/270'
Lowes Left (300')	E/.58/62"/170'	E/.70/67"/235'	E/.58/62"/170'	E/.70/67"/235'
Lowes Through	E/.49/58"/150'	E/.46/56"/170'	E/.49/58"/150'	E/.46/56"/170'
Lowes Right (200')	A/.28/5"/30'	A/.09/4"/25'	A/.29/5"/30'	A/.10/4"/25'
Buckland St at Pleasant Valley Rd/Buckland Hills Dr¹	E (72" delay)	F (85" delay)	E (75" delay)	F (91" delay)
Buckland St NB Double Left (750')	F/1.05/118"/665'	F/1.07/128"/665'	F/1.06/119"/670'	F/1.08/130"/670'
Buckland St NB Through	D/.78/45"/890'	D/.84/55"/970'	D/.82/47"/955'	E/.89/57"/1045'
Buckland St NB Right (750')	B/.49/12"/225'	B/.49/15"/250'	B/.49/12"/225'	B/.49/15"/255'
Buckland St SB Double Left (615')	F/.78/94"/345'	F/.83/98"/300'	F/.78/94"/250'	F/.83/98"/315'
Buckland St SB Through	D/.68/49"/610'	D/.66/50"/595'	D/.69/50"/625'	D/.69/51"/635'
Buckland St SB Right (700')	E/.98/66"/1310'	E/.96/64"/1270'	E/1.00/72"/1370'	E/1.02/79"/1425'
Pleasant Valley Double Left (210')	F/1.31/223"/445'	F/1.58/326"/535'	F/1.39/250"/475'	F/1.67/362"/575'
Pleasant Valley Through	E/.52/71"/260'	E/.53/73"/295'	E/.53/71"/260'	E/.53/73"/295'
Pleasant Valley Right	C/.45/29"/300'	C/.44/30"/305'	C/.45/29"/300'	C/.44/30"/305'
Buckland Hills Double Left (320')	F/.80/105"/215'	F/1.07/153"/330'	F/.80/105"/215'	F/1.08/155"/330'
Buckland Hills Through	E/.88/90"/440'	F/.92/95/550'	F/.88/90"/440'	F/.93/96"/555'
Buckland Hills Right (200')	B/.33/15"/105'	C/.45/23"/190'	B/.35/17"/115'	C/.46/23"/200'
Pleasant Valley Road at I-84 WB Ramps¹	C (22" delay)	C (22" delay)	C (22" delay)	C (23" delay)
Ramp Left (290')	E/.50/61"/115'	D/.43/55"/110'	E/.50/61"/115'	D/.43/55"/110'
Ramp Through	E/.45/58"/110'	E/.53/58"/140'	E/.45/58"/110'	E/.53/58"/140'
Ramp Right (290')	A/.33/2"/35'	A/.46/2"/45'	A/.34/2"/35'	A/.46/2"/45'
Pleasant Valley EB Left (100')	E/.28/61"/50'	E/.28/61"/50'	E/.28/61"/50'	E/.28/61"/50'
Pleasant Valley EB Through	D/.63/43"/270'	D/.58/40"/265'	D/.64/43"/275'	D/.59/40"/265'
Pleasant Valley EB Right (620')	A/.34/4"/50'	A/.30/3"/45'	A/.34/4"/50'	A/.30/3"/45'
Pleasant Valley WB Double Left (610')	C/.75/29"/510'	C/.80/34"/545'	C/.75/29"/525'	D/.83/36"/610'
Pleasant Valley WB Through	A/.29/8"/190'	A/.26/8"/170'	A/.29/8"/190'	A/.26/8"/175'
Pleasant Valley WB Right (190')	A/.29/1"/25'	A/.36/1"/25'	A/.29/1"/25'	A/.36/1"/25'

Notes: X/0.0/00 - Level of Service/V/C ratio/Average Delay/95% Q length

¹ - Signalized intersection

² - Unsignalized

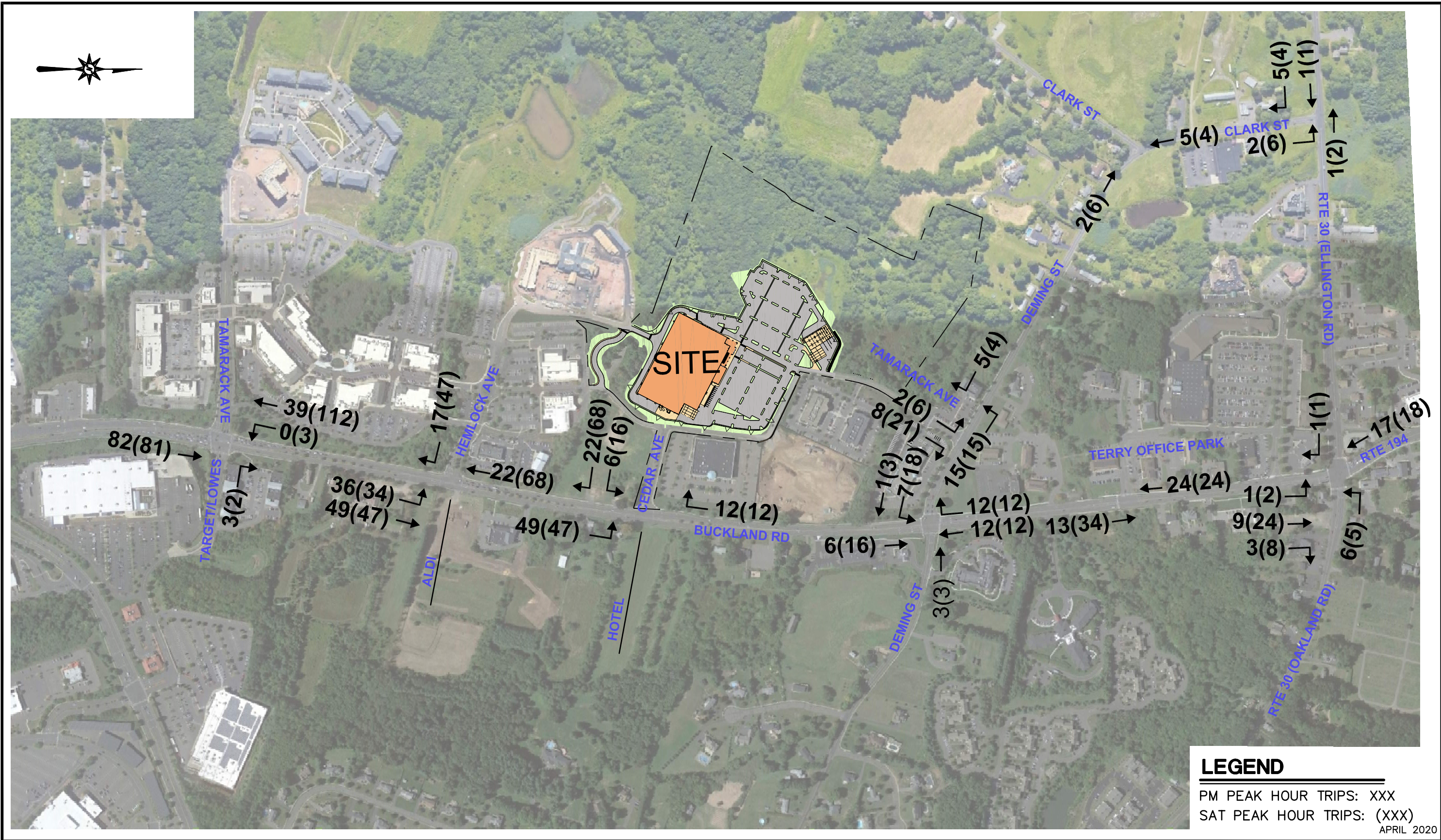
Table 1 (con't)
Peak Hour Traffic Operations Summary

Intersection/Lane Group	Background		COSTCO-Build	
	PM	SAT	PM	SAT
Buckland Street at Pavilions Dr¹	C (20" delay)	C (24" delay)	C (21" delay)	C (26" delay)
Buckland St NB Through (310')	C/.87/22"/825'	C/.89/30"/850'	C/.89/23"/860'	C/.91/34"/885'
Buckland St NB Right (310')	A/.58/3"/25'	A/.71/6"/25'	A/.58/3"/25'	A/.71/6"/25'
Buckland St SB Left (340')	E/.62/65"/140'	E/.70/67"/180'	E/.62/64"/140'	E/.70/67"/180'
Buckland St SB Through	B/.58/11"/385'	B/.56/11"/370'	B/.59/11"/395'	B/.58/11"/390'
Pavilions Dr Double Left	E/.80/56"/245'	D/.80/55"/255'	E/.80/56"/245'	D/.80/55"/255'
Pavilions Dr Right (375')	C/.45/32"/195'	C/.45/29"/195'	C/.45/32"/195'	C/.45/29"/195'
Buckland Street at I-84 HOV Lanes¹	B (18" delay)	B (13" delay)	B (18" delay)	B (14" delay)
Buckland St NB Left (100')	D/.23/41"/25'	D/.41/48"/40'	D/.23/41"/25"	D/.41/48"/40'
Buckland St NB Through (430')	B/.68/15"/420'	B/.68/11"/405'	B/.69/16"/430'	B/.69/12"/425'
Buckland St SB Through (310')	B/.62/16"/350'	B/.58/12"/360'	B/.62/16"/355'	B/.59/12"/370'
HOV Left	E/.80/64"/275'	E/.69/66"/180'	E/.80/64"/275'	E/.69/66"/175'
HOV Right (210')	A/.24/9"/40'	B/.10/17"/25'	A/.24/9"/40'	B/.10/17"/25'
Buckland Street at I-84 EB Ramps¹	F (102" delay)	F (84" delay)	F (109" delay)	F (89" delay)
Buckland St NB Through (625')	F/1.10/96"/605'	F/1.06/81"/615'	F/1.12/104"/625'	F/1.08/87"/630'
Buckland St NB Right (75')	C/.50/22"/175'	B/.33/18"/115'	C/.50/23"/175'	B/.33/18"/115'
Buckland St SB Double Left (400')	E/.87/67"/235'	F/1.05/103"/295'	E/.88/67"/255'	F/1.09/114"/310'
Buckland St SB Through (400')	B/.87/18"/130'	B/.82/17"/525'	B/.88/18"/135'	B/.84/18"/545'
Ramp Double Left (1400')	F/1.42/231"/1105'	F/1.25/154"/1155'	F/1.45/246"/1140'	F/1.27/163"/1160'
Ramp Right (1400')	D/.85/45"/490'	C/.53/24"/265'	D/.85/45"/490'	C/.53/24"/265'
Route 30 (Ellington Road) at Clark Street¹	C (22" delay)	B (12" delay)	C (23" delay)	B (12" delay)
Route 30 EB	B/.70/17"/430'	B/.56/14"/160'	B/.71/18"/440'	B/.57/14"/160'
Route 30 WB	C/.86/26"/315'	A/.51/9"/115'	C/.87/28"/325'	A/.52/9"/115'
Clark St Left	D/.65/39"/165'	C/.46/22"/85'	D/.65/39"/165'	C/.47/22"/85'
Clark St Right (100')	A/.38/8"/45'	A/.31/7"/35'	A/.39/8"/50'	A/.32/7"/35'

Notes: X/0.0/00 - Level of Service/V/C ratio/Average Delay/95% Q length

¹ - Signalized intersection

² - Unsignalized



ARCHITECTURE
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