

7. ENVIRONMENTAL CONSEQUENCES AND MITIGATION

7.1 Introduction

This chapter includes assessments of traffic impacts, work zone/construction impacts and any impacts on the safety performance of the roadway segments and intersections in the Maple and King Street Neighborhood. If any disproportionately high and adverse effects on environmental justice communities are identified, FHWA may require the local project sponsor to implement additional environmental mitigation measures to avoid, minimize and mitigate the impacts as a condition of the project's NEPA approval.

7.2 Land Use and Socioeconomics

7.2.1 Existing Neighborhoods

The Maple and King Street Neighborhood, which is located along Pine Street for approximately 800 feet immediately south of the intersection of Pine Street and Main Street, is at the northern end of the Project.

The neighborhood is in a downtown transitional area consisting predominately of medium density multi-family residential homes, bordered by the CCD to the north and limited commercial/industrial and mixed-use buildings to the south. There is a continuous sidewalk, in need of repair, and a green strip along both sides of Pine Street with overhead utility poles and wires on the western side of Pine Street.

As described in Chapter 4, an EJ analysis was completed within the Project study area. Although none of the Project study area census tracts meet the criteria for low-income populations, Census Tract 10 was identified as a minority population given the substantially higher percentage of minority residents than the City or county. The residential portion of this census tract that is within the Project study area comprises much of the Maple and King Street Neighborhood.

In more recent (2018) U.S. Census data made available in December 2019, the percentage of minority residents in the Maple and King Street Neighborhood is only marginally higher than the citywide average. However, given the meaningfully greater percentage of minority residents there in prior, yet still recent, census data, combined with local knowledge and the results of outreach/engagement effort, it has been determined that the Maple and King Street Neighborhood is a minority population and will require an EJ analysis.

Due to the nature of the work in the project areas, there will be no adverse effects to land use or socioeconomics to the Maple and King Street Neighborhood.

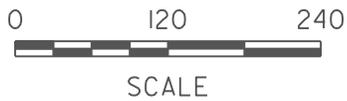
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LEGEND

-  SIDEWALK
-  SHARED USE PATH
-  PROPOSED ROADWAY

PROPOSED CONDITION



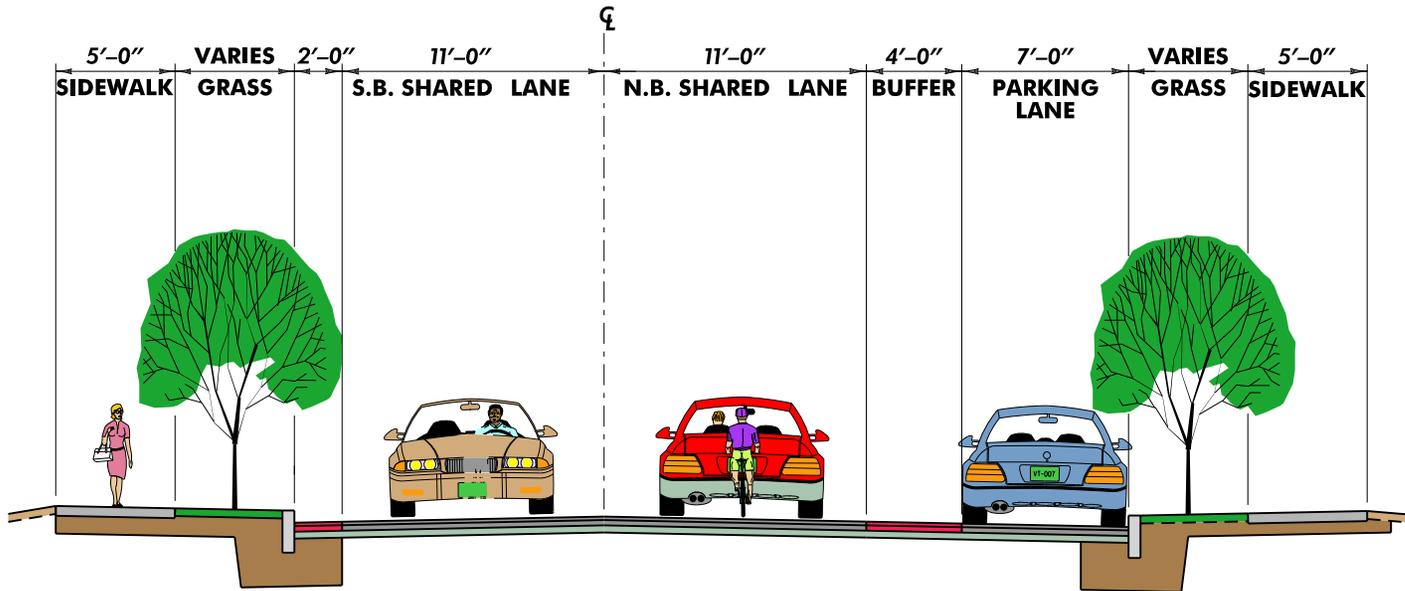
**Southern Connector/
 Champlain Parkway
 MEGC-M5000(1)**

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**FIGURE 7-1
 MAPLE-KING NEIGHBORHOOD**



**PROPOSED TYPICAL SECTION
PINE STREET
MAPLE STREET TO KING STREET**

**Southern Connector/
Champlain Parkway
MEGC-M5000(1)**



FIGURE 7-2

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7.3 Transportation Systems Impacts

The Project will expand and improve the transportation network available for the movement of people and goods to/from and within the City. The street network in the Maple and King Street Neighborhood is characterized by a dense urban grid of two-way streets with a typical block spacing of about 400 feet. Most of the streets in this grid (including Pine Street, Maple Street and King Street) are two-lane roads. The Project will not change the street grid in the Maple and King Street Neighborhood nor change the functional roles of these streets in this area. There will also not be any roadway widening as part of the Project other than minor adjustments to reset curb lines to provide a uniform pavement width along Pine Street. The Project will include changes in traffic control at two intersections from All-Way Stop Control (AWSC) to traffic signal control: at the Pine/Maple intersection and at the Pine/King intersection (See Figure 7-3). This change will improve traffic flow and intersection level of service along Pine Street. See discussion below for more detailed information about traffic operations in the Maple and King Street Neighborhood.

Figure 7-3: Intersection Control Changes



The design process for the Project considered a variety of intersection configurations and control strategies for the intersections of the Pine Street/Maple Street and Pine Street/King Street intersections, including a roundabout option. In this process, it was identified that a

standard single-lane roundabout designed to accommodate the design vehicle is not feasible to be constructed at either of these two intersections because of the physical constraints and impacts to the existing built environment around the intersection. Smaller variations of a roundabout, such as a mini-roundabout or neighborhood traffic circle were also considered, but these smaller configurations are not intended or advised for use on arterial roadways such as Pine Street. Trucks and buses would not be able to follow the same circular traffic pattern as cars which would reduce the performance and safety of the intersection. These smaller versions of roundabouts in the context of this corridor also present mobility and safety issues for pedestrians and bicyclists that are better addressed by signal control. Although they might be able to fit physically in the intersection area, the mini-roundabout and neighborhood traffic circle options are not recommended for the intersections of Pine Street/Maple Street or Pine Street/King Street because of these issues related to the arterial function of Pine Street, intersection volumes, truck/bus accommodation, traffic performance, vehicle safety and pedestrian/bicyclist safety.

7.3.1 Traffic Volumes

Traffic moving along Pine Street is already coming from the interstate system and other commuter routes to the Maple and King Street Neighborhood. Currently this traffic is filtering through the residential street network to access the Pine Street arterial corridor and then to continue to the CCD. Pine Street is, and will continue to be, functionally classified as an arterial and the traffic volumes and patterns on this street are consistent with that transportation function and purpose. This arterial function is also consistent with the City's Transportation Plan and the Regional Transportation Plan. The Project will provide a transition from the primary regional roadways of I-189 and U.S. Route 7 (Shelburne Street) to Pine Street which will help to divert commuter and through traffic away from the local residential streets.

There is projected to be an increase in traffic on the northern portion of Pine Street from Lakeside Avenue to Main Street associated with improved accessibility to the CCD achieved by the Project. The Maple and King Street Neighborhood is located within this northern portion of the Project corridor. Daily traffic volumes on the section of Pine Street between Lakeside Avenue and Maple Street are estimated to increase by approximately 1,400 vehicles per day (vpd) (a 9% increase) because of the Project. During the peak hours, traffic on this section is estimated to increase by 260 vehicles (20%) in the AM peak hour and 235 vehicles (16%) in the PM peak hour in the ETC design horizon. This is the amount of additional two-way traffic estimated to impact the Maple Street and King Street neighborhood area of the Project.

The Project includes a change in traffic control at the Maple Street/Pine Street intersection and at the King Street/Pine Street intersection from AWSC to signal control. The traffic signal control is intended to serve several purposes:

- address existing and future traffic congestion
- accommodate the traffic increase associated with the Project
- promote progressive traffic flow on Pine Street with coordinated signals to reduce use of Maple Street and King Street as short-cuts to the CCD.
- improve pedestrian safety

The change in traffic control at these two intersections will affect the traffic volumes in the Maple and King Street Neighborhood by redistributing the traffic flow. Specifically, it will reduce the high volumes of turning traffic at the Maple Street/Pine Street intersection and redistribute this traffic to the Pine Street/King Street and Pine Street/Main Street intersections.

As was reported in the 2009 FSEIS, this redistribution of traffic will result in higher traffic volumes on Pine Street between Maple Street and Main Street under the Selected Alternative (Build condition) than in the No-Build condition. The ETC and ETC+20 traffic volumes along Pine Street during the AM and PM peak hours are shown without the Champlain Parkway (No-Build condition) and with the Selected Alternative for the Champlain Parkway (Build condition) in Figure 7-4 and Figure 7-5.

As shown in these Figures, while the traffic volumes on Pine Street in the one block between Maple Street and King Street will be higher than existing, they will be lower than the adjacent segments of Pine Street from Lakeside Avenue to Maple Street. The traffic volumes on Pine Street on the block between King Street and Main Street will be comparable to the volumes on Pine Street between Flynn Avenue and Lakeside Avenue.

Traffic volumes on the sections of Maple Street and King Street, between Battery Street and Pine Street, will also be affected by the Project. This impact is primarily associated with the change from AWSC to signal control at the Maple Street/Pine Street and King Street/Pine Street intersections. As noted previously, this change in control will induce a redistribution of traffic using Maple Street and King Street which will balance the traffic on these two parallel streets. The traffic volumes on the section of Maple Street and King Street between Pine Street and St. Paul Street will not change significantly from the No-Build condition. The peak hour volumes on this segment will vary by 20 or fewer vehicles on either street from the No-Build condition.

The ETC and ETC+20 traffic volumes along Maple Street and King Street during the AM and PM peak hours are shown without the Champlain Parkway (No-Build Condition) and with the Champlain Parkway (Build) in Figure 7-6 and Figure 7-7.

Figure 7-4: ETC Design Horizon Traffic Volumes - Pine Street

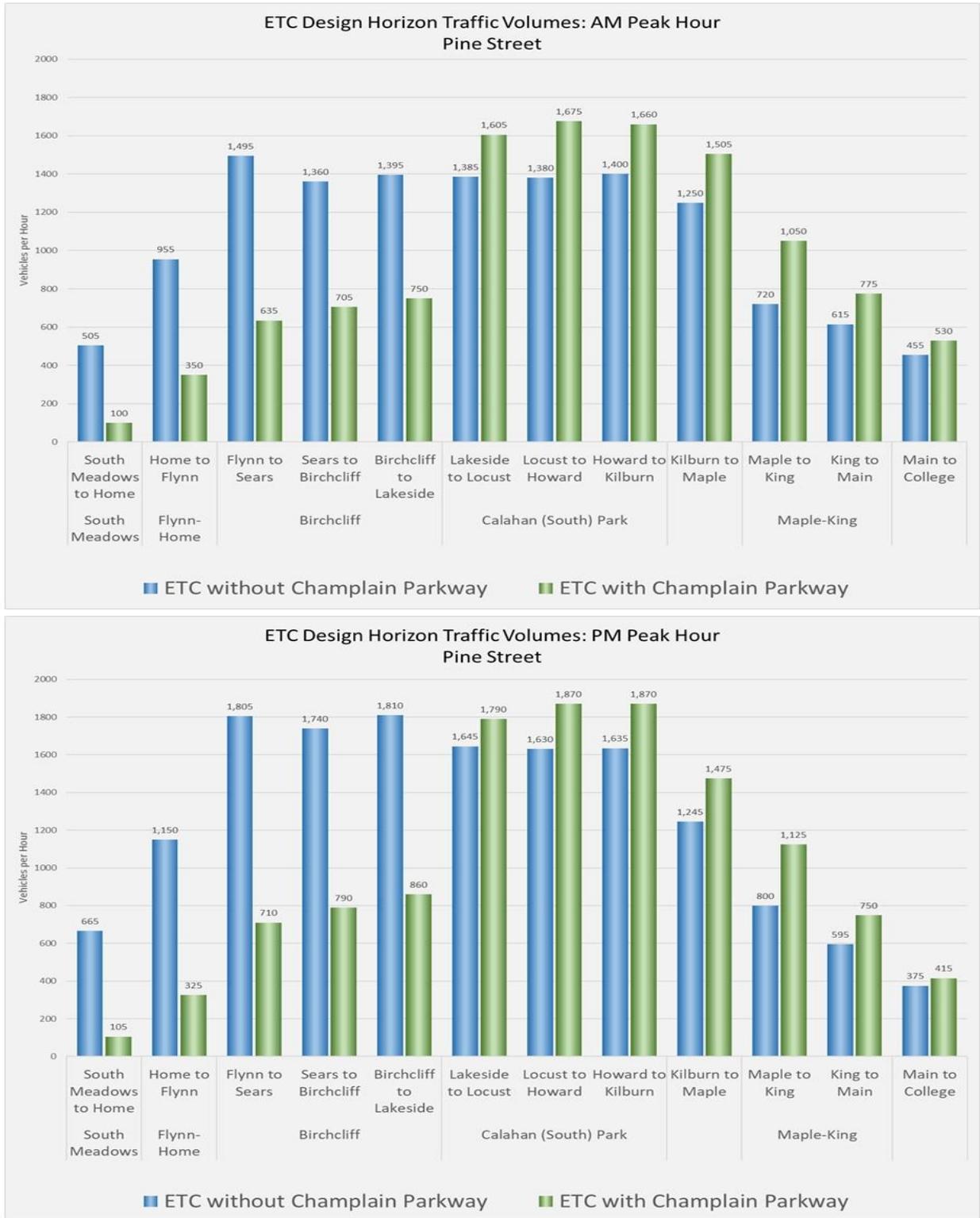


Figure 7-5: ETC+20 Design Horizon Traffic Volumes - Pine Street

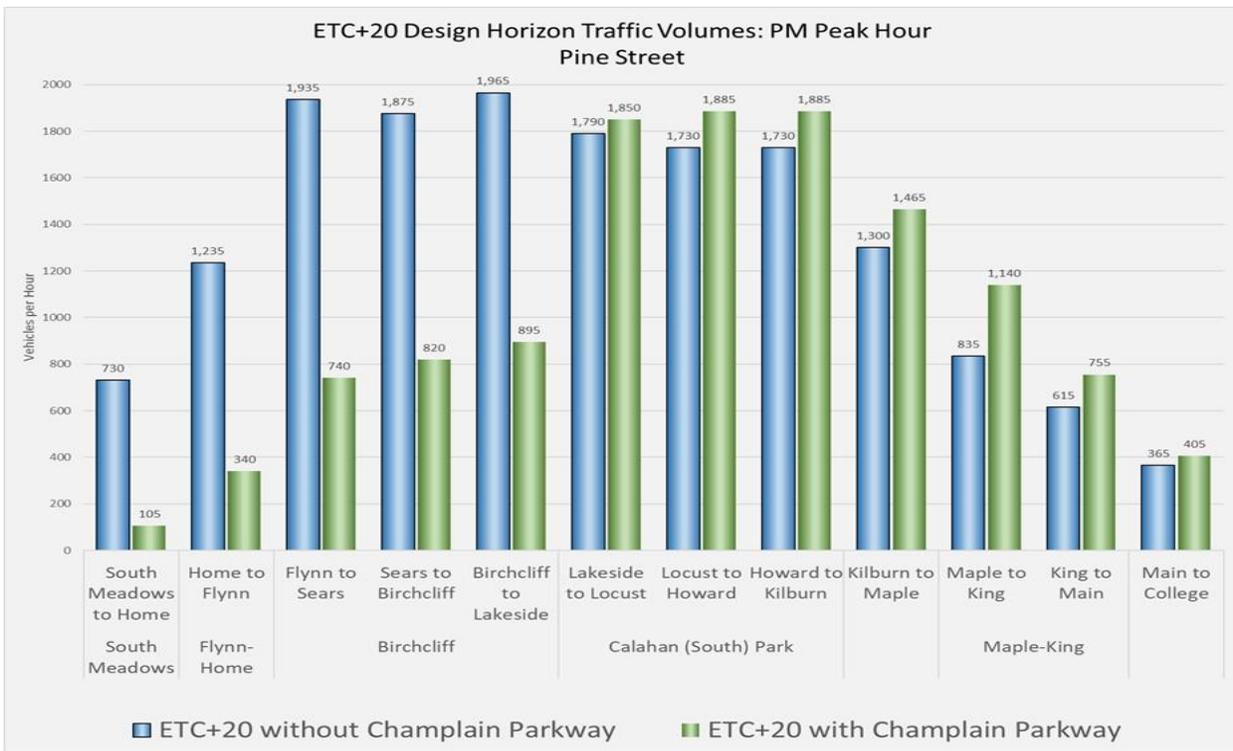
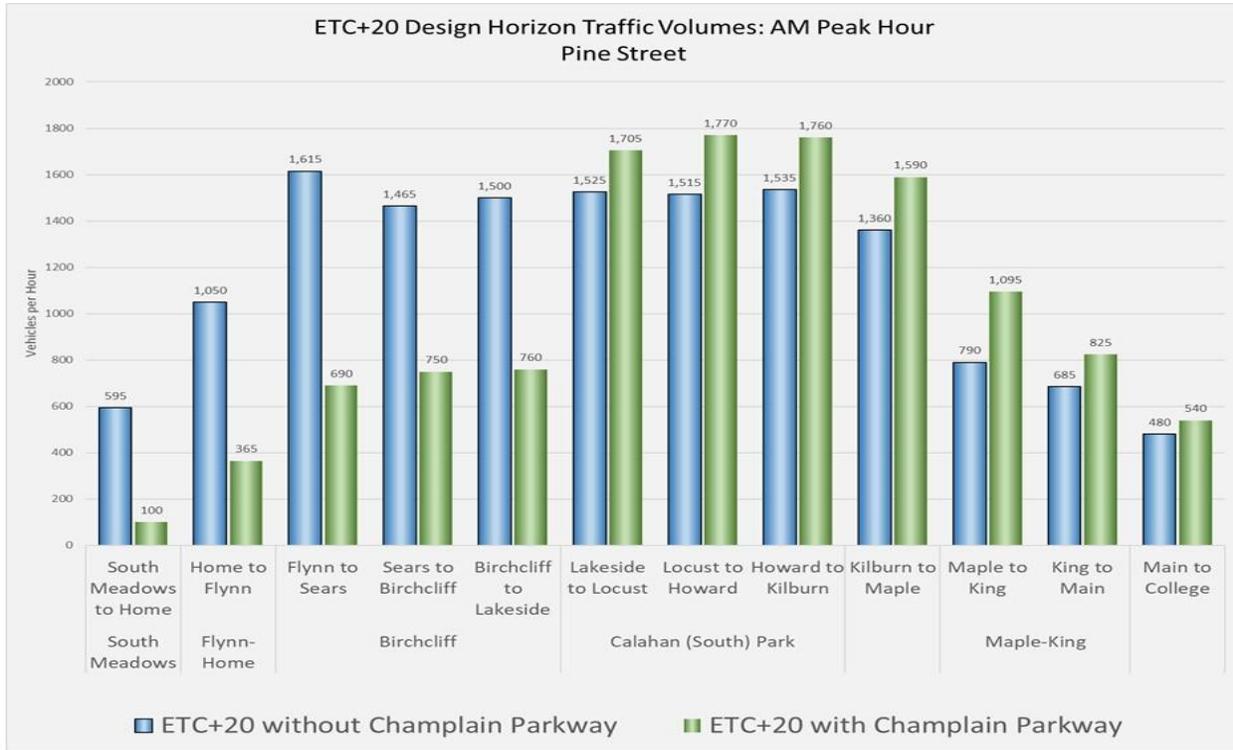


Figure 7-6: ETC Design Horizon Traffic Volumes – Maple Street/King Street

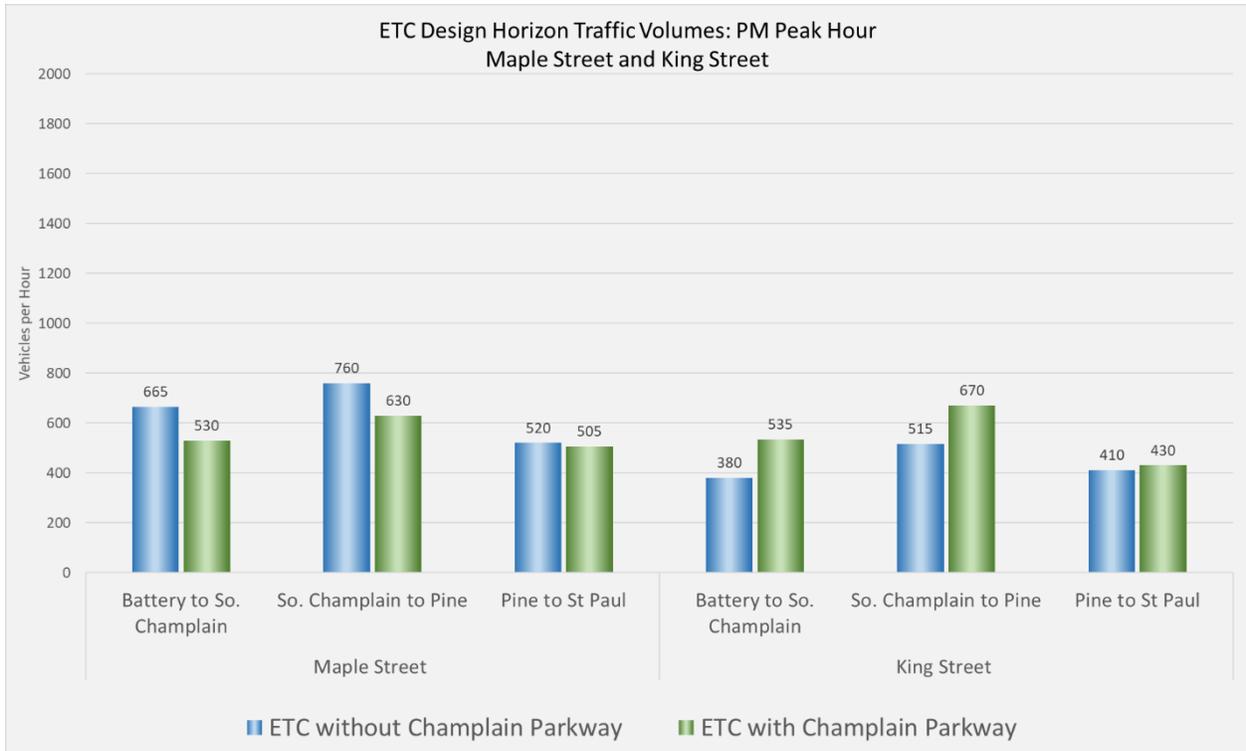
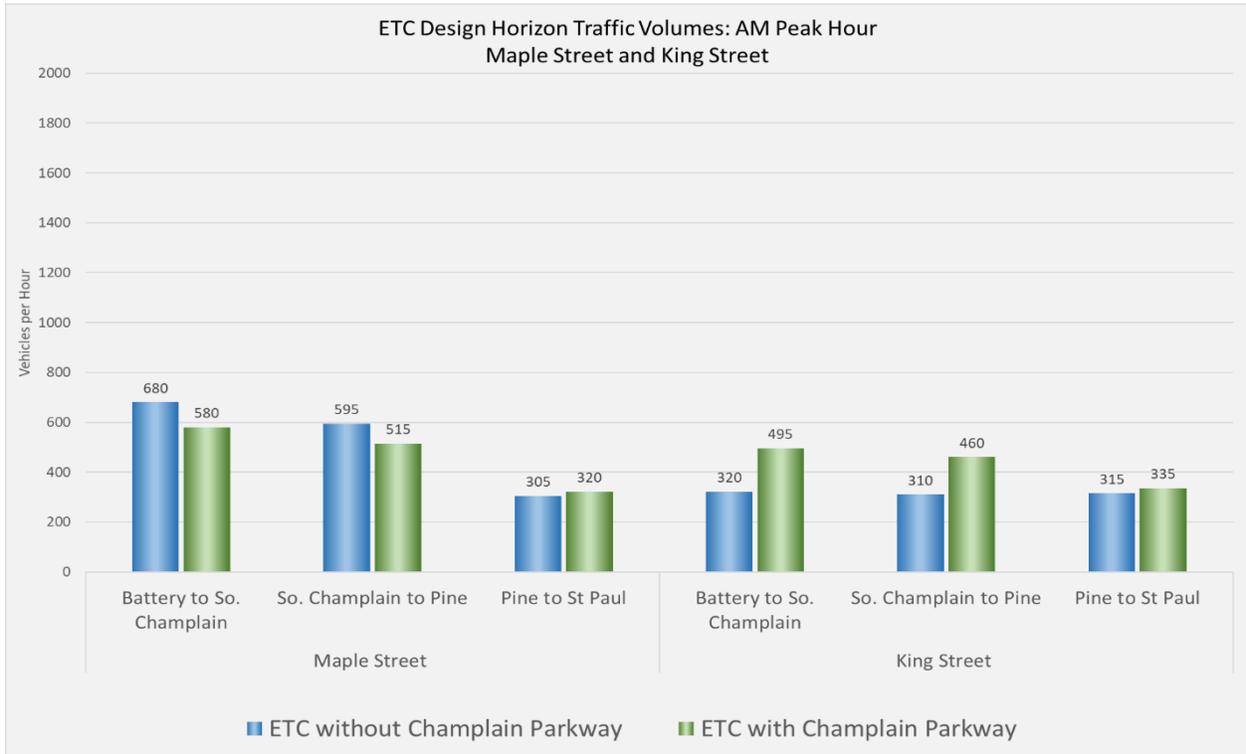
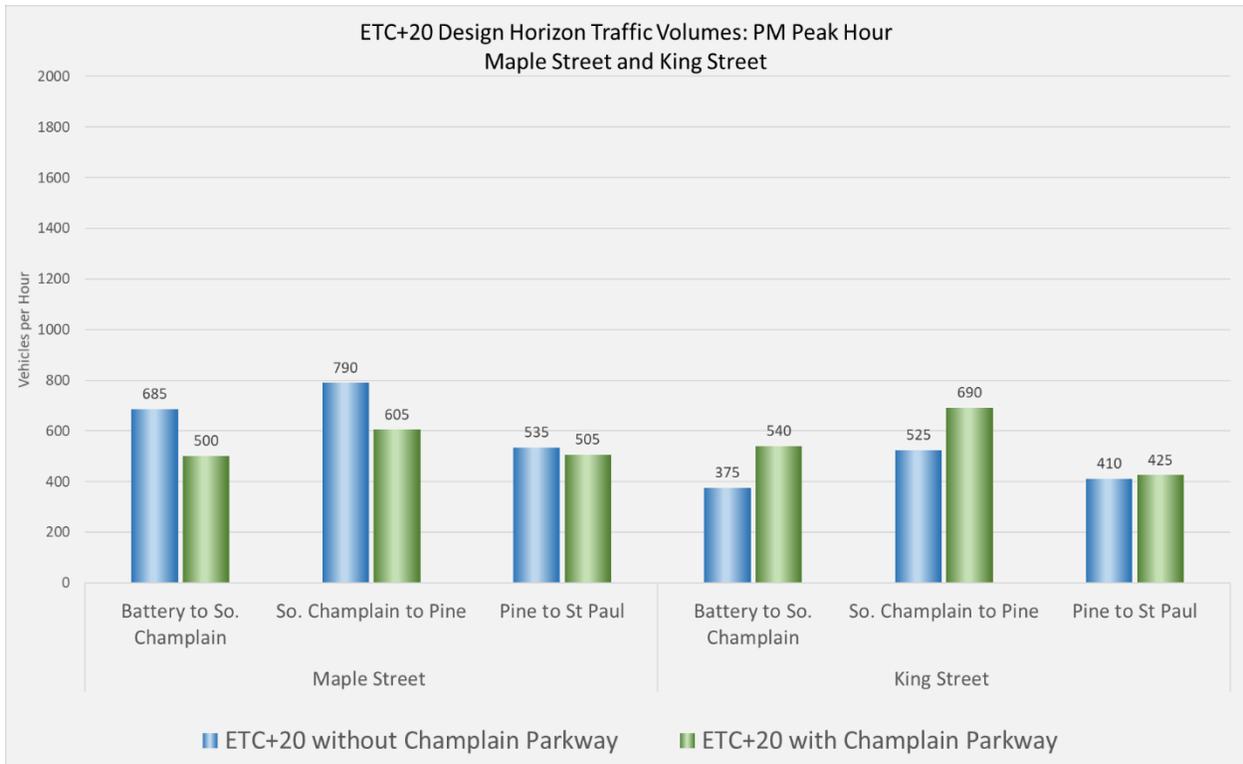
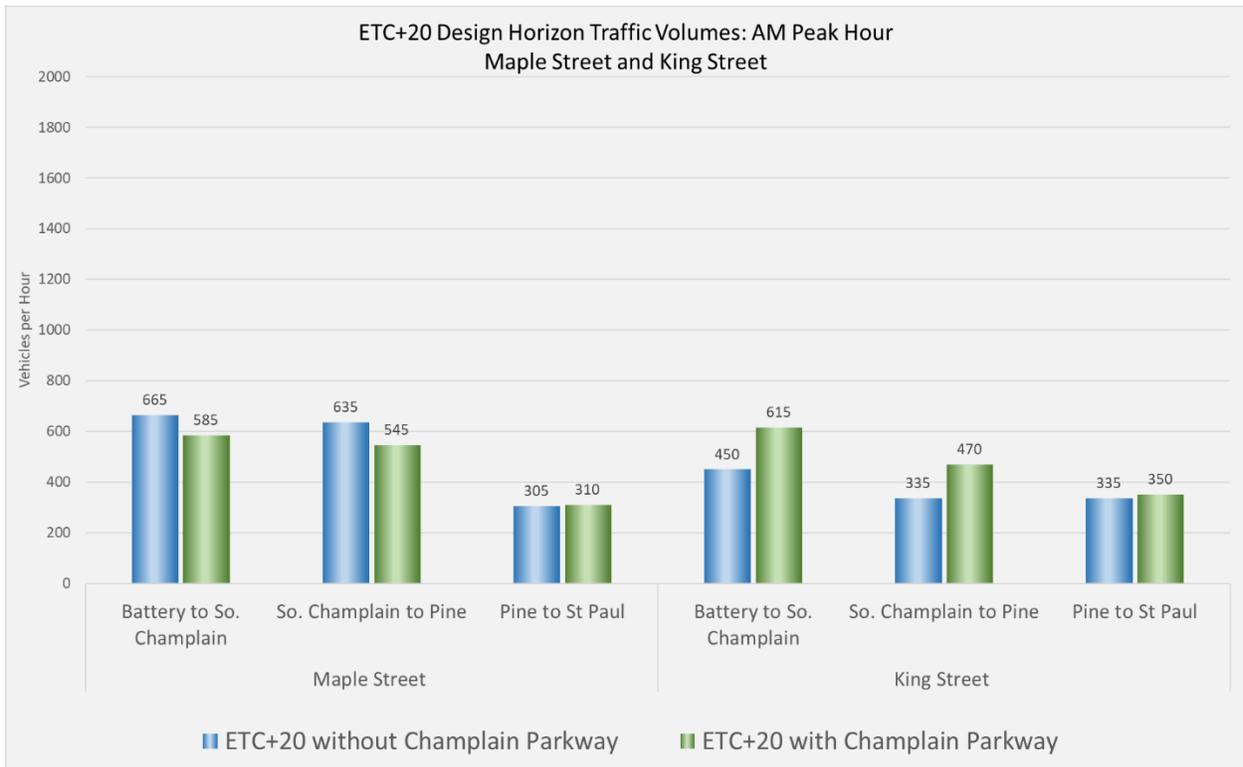
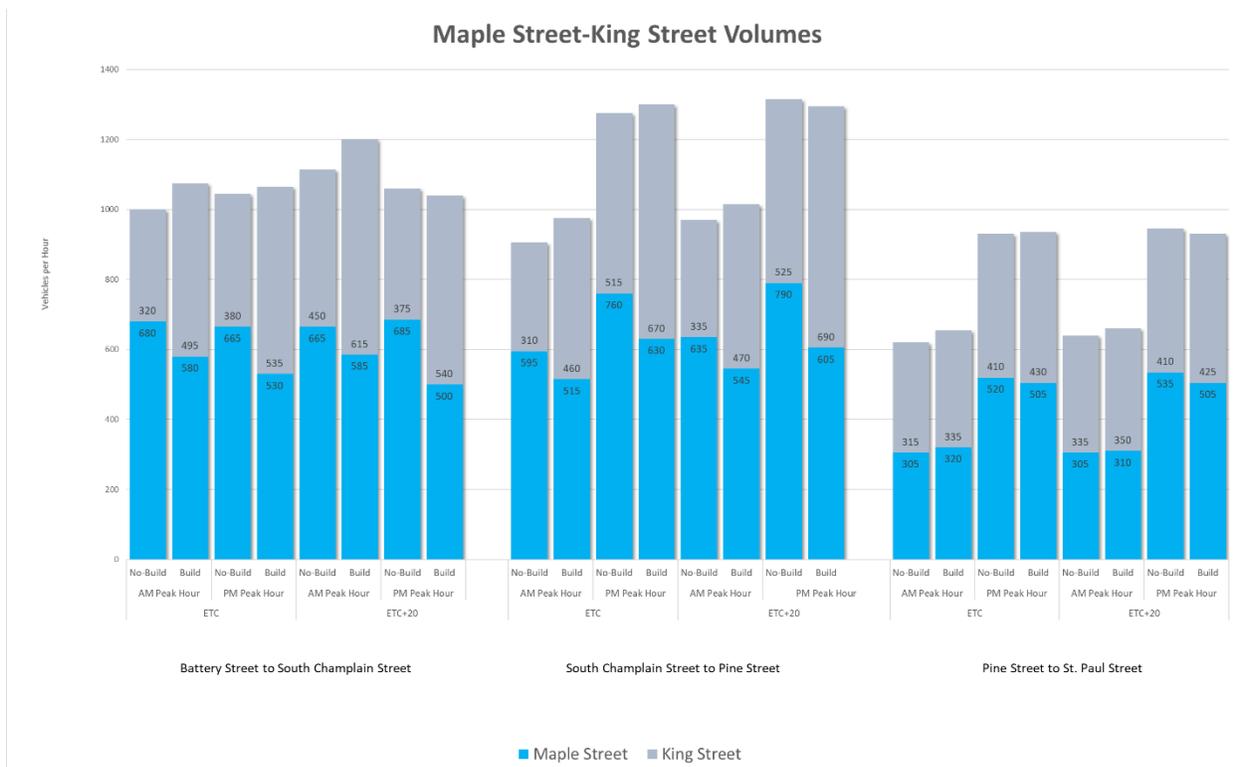


Figure 7-7: ETC+20 Design Horizon Traffic Volumes - Maple Street/King Street



Although traffic using Maple Street and King Street in the two-block section between Battery Street and Pine Street will change because of the signal control, the total combined volume of traffic on these two streets will not change much as a result of the Project. Figure 7-8 below provides a comparison of the combined volumes using these streets during the AM and PM peak hours in the No-Build and Build conditions for the ETC and ETC+20 design horizon years and shows the shift in volume between the two streets associated with the change to signal control.

Figure 7-8: Maple Street/King Street Aggregate Volume



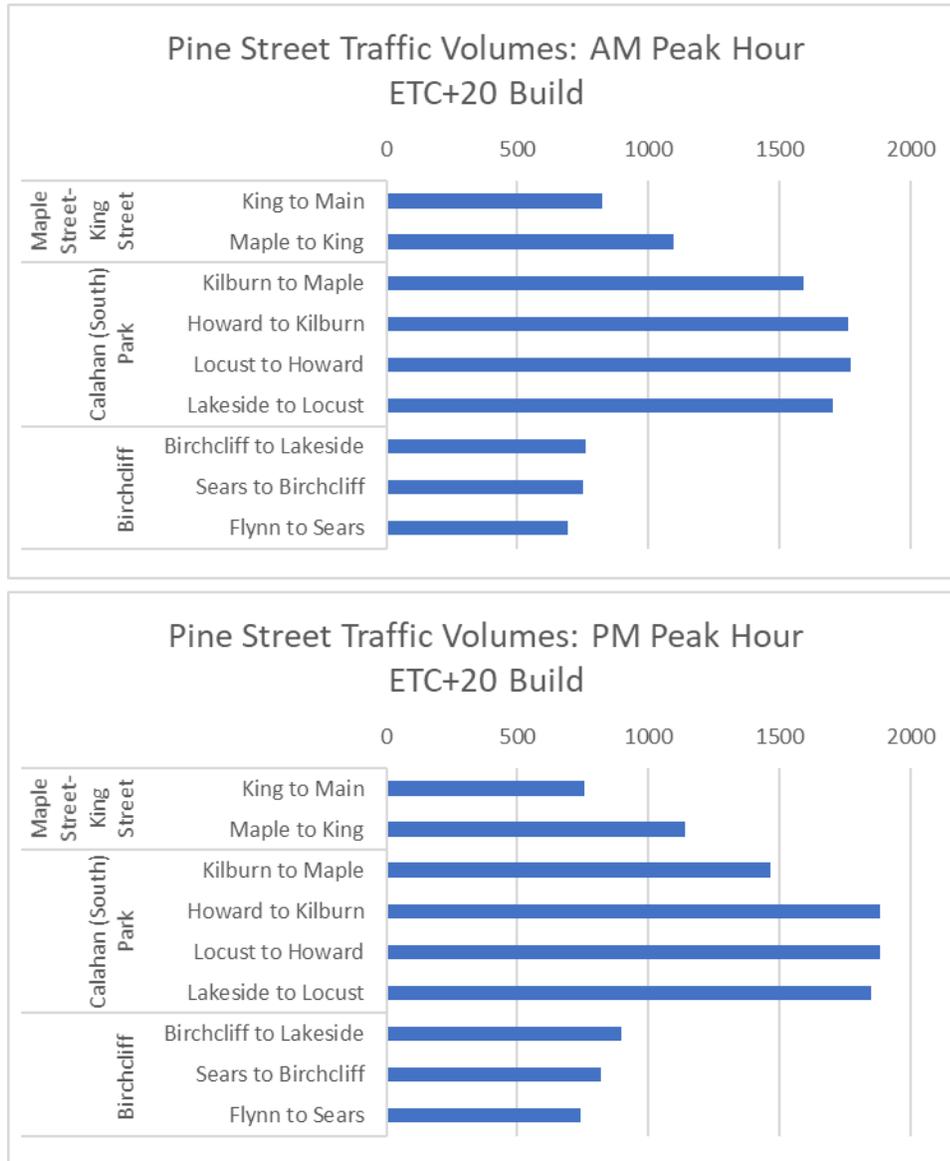
As illustrated on Figure 7-8, the overall combined volumes on these two streets will be generally the same in the Build condition as in the No-Build condition for both ETC and ETC+20. The highest combined change in volume on these streets occurs during the AM peak hour with an increase of 75-85 vehicles (40+/- additional vehicles on each street). The change during the PM peak hour is less, with an increase of only 20-25 vehicles (10-15 additional vehicles on each street). This amount of new traffic on Maple Street and King Street is not considered to be significant.

In summary, the Project will increase traffic volume in the Maple and King Street Neighborhood. This increase is associated with traffic drawn to the corridor by the construction of the Champlain Parkway section of the Project and secondarily by changes in traffic circulation within the Maple and King Street Neighborhood associated with the signalization of these intersections. Pine Street is an urban arterial on the National Highway

System and is intended to carry higher volumes of through traffic. Although an increase from the No-Build condition, the volumes on Pine Street between Maple Street and Main Street will be comparable to the volumes on other segments of Pine Street, and consistent with the arterial function of the road. While the traffic volumes on King Street will increase, there will be a corresponding decrease in volume on Maple Street. The adverse effects of these changes in traffic volume are not considered to be significant or disproportionate. Furthermore, considerations of the improvements in traffic operations and safety improvements discussed in the following sections of this report will also have a mitigative effect on the increased volume.

Traffic volumes on Pine Street in the Maple Street-King Street neighborhood were compared to the volumes in other neighborhoods of the Project. Traffic volumes on Pine Street between Maple Street and Main Street will increase as a result of the Project. Traffic volumes will also similarly increase on Pine Street from Lakeside Avenue to Maple Avenue. The future peak hour volumes on the segment of Pine Street from Maple Street to King Street will be 20-30% lower than the volumes on the adjacent segment from Kilburn Street to Maple Street, and as much as 40% lower than the segment between Lakeside Avenue and Kilburn Street. The volume of traffic on the segment of Pine Street from King Street to Main will be lower than the Maple-to-King segment, and these volumes will be comparable to the future traffic volumes on the segment of Pine Street in the Birchcliff Parkway neighborhood (between Flynn Avenue and Lakeside Avenue) with the traffic diversions from this part of Pine Street to the Champlain Parkway. The volumes on Pine Street in each neighborhood section are shown in Figure 7-9 for the AM and PM peak hours in the ETC+20 Build condition.

Figure 7-9: Pine Street Volumes – Neighborhood Comparison



7.3.2 Mobility

Traffic congestion exists at the intersection of Pine Street and Maple Street during peak hours with the current AWSC. The existing LOS F conditions during peak hours produce long traffic delays and vehicle queues. The projected conditions in the ETC+20 design horizon shows that these congestion levels will worsen significantly without the Project.

The analysis of the future operations without the Project shows that traffic demand will significantly exceed the capacity of the AWSC during peak hours. The average traffic delay of all traffic moving through the intersection in the ETC+20 No-Build condition will be 124 seconds/vehicle during the AM peak hour and 200 seconds/vehicle during the PM peak

hour. The queues associated with this congestion spill over to adjacent intersections (such as to the Pine Street/King Street intersection), which then increases congestion there, too. The vehicle queue lengths at the intersection of Maple Street and Pine Street in the ETC and ETC+20 No-Build conditions are as follows in Table 7-1:

Table 7-1: Pine Street and Maple Street Queues – No-Build Condition

Intersection	Approach	Vehicle Queues (feet)			
		ETC No-Build		ETC+20 No-Build	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Pine Street & Maple Street	NB	675	875	775	1025
	SB	200	625	300	650
	EB	225	275	375	325
	WB	75	175	100	200

The Project will replace the AWSC at the Pine Street/Maple Street and Pine Street/King Street intersections with traffic signals. Although the Pine Street/King Street intersection would continue to operate acceptably in the ETC+20 Build condition with the AWSC, this intersection will be signalized so that the three intersections on Pine Street (Pine Street/Maple Street, Pine Street/King Street and Pine Street/Main Street) can work in coordination due to the short (400 ft) block spacing.

The analyses of traffic operations of these three Project intersections for the Build condition were updated using the current version of the Synchro analysis software (version 10) to reflect design refinements that have been incorporated into the Project subsequent to the 2009 FSEIS (such as the traffic calming curb extensions) and the City’s reduction of the citywide statutory speed limit in 2011 from 30 mph to 25 mph.

With signal control, these three intersections will operate acceptably with overall delays that are typical of urban design conditions (LOS D or better). The levels of service results from the updated analyses are also consistent with the analyses presented in the 2009 FSEIS. Table 7-2 below provides a comparison of the LOS analysis for the ETC+20

No-Build and Build conditions. Table 7-3 provides a comparison of the LOS results for the ETC+20 Build conditions from the 2009 FSEIS and the updated current analyses.

Table 7-2: LOS Comparison - ETC+20 Conditions

Intersection	Street	Approach	ETC+20 No-Build		ETC+20 Build					
			Weekday AM Peak Hour	Weekday PM Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour				
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)				
Pine Street & Maple Street	Pine Street	NB	F	230.7	F	348.1	C	24.9	D	45.1
		SB	F	66.8	F	207.5	B	18.6	B	16.6
	Maple Street	EB	F	79.2	F	71.9	E	59.9	E	60.9
		WB	C	23.6	E	43.6	D	51.9	F	80.3
Overall Intersection			F	124.1	F	200.7	C	32.6	D	45.0
Pine Street & King Street	Pine Street	NB	D	25.1	D	31.1	A	9.8	B	13.6
		SB	C	17.1	D	26.0	A	9.4	B	13.9
	King Street	EB	B	14.4	D	25.5	D	47.1	D	49.9
		WB	B	13.3	C	19.6	C	29.6	D	41.0
Overall Intersection			C	19.1	D	26.1	C	20.3	C	26.1
Pine Street & Main Street	Pine Street	NB	C	22.0	B	14.9	C	29.0	B	17.6
		SB	B	11.3	B	13.4	B	19.0	B	13.5
	Main Street	EB	C	24.3	B	12.9	D	44.7	D	46.8
		WB	B	16.6	B	13.9	C	23.8	D	35.5
Overall Intersection			B	19.3	B	13.8	C	30.9	C	29.2

Table 7-3: LOS Comparison - 2009 FSEIS and Updated Analysis

Intersection	Street	Approach	ETC+20 Build (2009 FSEIS)				ETC+20 Build (Current Analysis)			
			Weekday AM Peak Hour		Weekday PM Peak Hour		Weekday AM Peak Hour		Weekday PM Peak Hour	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Pine Street & Maple Street	Pine Street	NB	C	23.0	D	44.9	C	24.9	D	45.1
		SB	B	16.7	C	22.5	B	18.6	B	16.6
	Maple Street	EB	E	56.9	D	51.6	E	59.9	E	60.9
		WB	E	74.6	F	87.3	D	51.9	F	80.3
Overall Intersection			C	33.2	D	45.6	C	32.6	D	45.0
Pine Street & King Street	Pine Street	NB	A	3.1	A	5.5	A	9.8	B	13.6
		SB	A	6.5	A	8.2	A	9.4	B	13.9
	King Street	EB	D	45.0	D	52.0	D	47.1	D	49.9
		WB	D	45.5	F	95.2	C	29.6	D	41.0
Overall Intersection			B	18.4	C	30.8	C	20.3	C	26.1
Pine Street & Main Street	Pine Street	NB	C	26.9	B	16.8	C	29.0	B	17.6
		SB	B	18.4	B	19.4	B	19.0	B	13.5
	Main Street	EB	C	27.4	C	30.6	D	44.7	D	46.8
		WB	B	18.6	C	33.9	C	23.8	D	35.5
Overall Intersection			C	23.7	C	25.5	C	30.9	C	29.2

The average delay at the Pine Street and Maple Street intersection in the ETC+20 condition will decrease from 124 sec/veh (No-Build condition) to 33 sec/veh (Build condition) in the AM peak hour, and from 200 seconds/vehicle (No-Build condition) to 45 seconds/vehicle (Build condition) in the PM peak hour.

The average delay per vehicle at Pine Street and King Street intersection will remain at about the same levels in the Build condition as in the No-Build condition even with the shifts in traffic on Pine Street associated with the Project. It is noted that the LOS designation for the PM peak hour changes from LOS D to LOS C even though the amount of overall delay is the same. This is because of the different LOS delay thresholds associated with unsignalized and signalized intersections (see Table 6-1 in 6.3.2).

The LOS changes at the Pine Street and Main Street intersection between No-Build and Build conditions are similarly associated with the shifts in traffic flow along Pine Street and are consistent with the operations presented in the 2009 FSEIS. The Build condition operations at all intersections are consistent with the purpose and need of the Project.

Vehicle queues will also be generally improved as a result of the traffic signal control and coordination. Table 7-4 compares the No-Build and Build queues at the Pine Street and Maple Street intersection for the ETC+20 conditions are:

Table 7-4: Vehicle Queues

		ETC+20 No-Build (All-Way Stop control)		ETC+20 Build (Signal control)			
		AM Peak Hour	PM Peak Hour	AM Peak Hour		PM Peak Hour	
Intersection	Approach	95th %tile Queue (feet)	95th %tile Queue (feet)	50th %tile Queue (feet)	95th %tile Queue (feet)	50th %tile Queue (feet)	95th %tile Queue (feet)
Pine Street & Maple Street	NB	775	1025	247	644	316	747
	SB	300	650	310	555	192	497
	EB	375	325	216	387	246	435
	WB	100	200	111	235	159	321

(note: 50th percentile queues are not calculated for All-Way Stop controlled intersections per the HCM analysis methodologies)

The average queues during peak hours will be accommodated within the existing block spacing between adjacent intersections. 95th percentile design queues will be longer and may cause periodic additional delay at adjacent intersections, but the Pine Street queues will still be less than would occur without the Project’s improvements. It is noted however, that the 95th percentile queues along Maple Street will generally be longer than in the No-Build condition. This is because of the priority given in the signal timing to favor Pine Street traffic movement consistent with the arterial function of this roadway.

One of the characteristics of the current AWSC is that it does not differentiate between the functional roles of the intersecting streets and therefore cannot assign priority to Pine Street which is an arterial roadway whose primary function is traffic mobility, and which is also intended to carry more traffic than other area streets such as Maple Street or King Street. The process of right-of-way transfer between pedestrians at the crosswalks and vehicle traffic is also less efficient with the AWSC operations under higher volume conditions such as exist because of added decision time used by pedestrians to confirm that it is safe to cross and then for drivers to reestablish who goes next when there is vehicle demand on more than one approach following the pedestrian crossing. This process of right-of-way assignment also induces through traffic to divert to Maple Street and King Street rather than continuing along Pine Street to access the CCD.

The Project will improve traffic mobility along Pine Street in the Maple Street and King Street area of the Project by signaling the Pine Street/Maple Street and Pine Street/King Street intersections and coordinating the operations of these two intersections with the existing signal at the intersection of Pine Street and Main Street. This improvement will promote smoother traffic flow along Pine Street by reducing vehicle delays and reducing the length of queues. The signals will also provide safer crossing opportunities for pedestrians by providing an exclusive pedestrian phase where all vehicles are stopped.

The signal operations will also promote a more stable and uniform travel speed through the corridor, as the signals will be timed to provide for coordinated movement through the three signals on Pine Street from Maple Street to Main Street at the City’s statutory speed limit of 25 mph or lower. This reduction of “stop-and-go” traffic and reduction of the time spent idling at the intersections are expected to have a corresponding reduction in traffic noise. These improvements will also reduce vehicle emissions and contribute to improved air quality in the corridor.

7.3.3 Traffic Safety

This section of the report presents an assessment of safety issues in the Project study area by examining the crash history and discussing how projected traffic pattern changes resulting from the Champlain Parkway may affect areas of concern within the Maple and King Street Neighborhood.

Vehicular Traffic Safety

As noted in 6.3.3 Traffic Safety, the section of Pine Street between Maple Street and Main Street is part of an HCL segment (Kilburn to Main). There was a total of 82 crashes in this HCL Segment over the 5-year period from January 2015 through December 2019. This number includes crashes at intersections, on the segments of Pine Street between intersections, and the crashes that occurred on the side streets near their intersection with Pine Street. This crash data is summarized in Table 7-5.

Table 7-5: Crash Summary Table – Pine Street (Kilburn to Main)

Crash Type	Location		Number of Crashes
Intersection Crashes	Pine Street & Main Street		11
	Pine Street & King Street		4
	Pine Street & Maple Street		14
Non-intersection (Link) Crashes	Pine Street	Main Street to Maple Street	16
		Maple Street to Kilburn Street	11
	Maple Street	Near Pine Street	5
	King Street	Near Pine Street	6
	Main Street	Near Pine Street	15
Total Crashes			82

There were 29 crashes at the three intersections of Pine Street in the Maple and King Street Neighborhood (at Main Street, King Street and Maple Street) and 16 crashes on Pine Street between these intersections. Four of these total crashes involved a pedestrian or bicyclist (two at Main Street and one each at King Street and Maple Street).

There were eleven additional crashes occurring along Pine Street south of Maple in the area between Bobbin Mill Apartments and Kilburn Street; two of these crashes involved a pedestrian or bicyclist. There were also 26 link crashes identified along Main Street, King Street and Maple Street near Pine Street. These crashes were all property damage only and more than half of these crashes (15) were on Main Street beyond the limits of the Project.

The predominant types of crashes in the Maple Street-to-Main Street segment of Pine Street were rear-end and no-turn broadside events at the Maple Street and King Street intersections with Pine Street. These two crash types accounted for about 50% of the crashes in this area. This is consistent with the pattern that was identified in the assessment of the 2006-2010 data for the Act 250 permit process. While the Project will increase traffic volumes along this section of Pine Street, the geometric and signal control improvements proposed for this area will promote more orderly progression of traffic movement and more positive assignments of travel rights of way, which should help reduce these types of crashes.

Pedestrian/Bicyclist Safety

Given the low number of reported incidents involving pedestrians or bicyclists, it is not possible to identify HCL for these travel modes or to identify any specific patterns or contributing factors. The Project will include a variety of improvements in the Maple and King Street Neighborhood that will enhance pedestrian and bicyclist accessibility and safety. Pine Street will be modified and rehabilitated to include curb extensions and new high-contrast crosswalks at the intersections. This will make the area safer for pedestrians by reduced crossing distance and improved pedestrian conspicuity at the crossings. The sidewalks on both sides of Pine Street will also be reconstructed and new ADA-compliant sidewalk access ramps and detectable warning surfaces will be incorporated at the crosswalk locations. Pedestrian signals and pushbuttons will be provided at the Pine Street and Maple Street intersection, Pine Street and King Street intersection, and Pine Street and Main Street intersection. The signals will operate with an exclusive phase so that pedestrians will be able to cross at these intersections without interacting with vehicular traffic. This feature will help to make crossing safer and easier, especially for larger family groups with young children which was noted to be a concern of local residents during the public outreach for the project. Pedestrian facility improvements will also extend beyond the Maple and King Street Neighborhood to enhance pedestrian connectivity and safety between this neighborhood and schools, parks, businesses and shopping within the surrounding area.

On-road bicyclists will continue to share the traffic lanes with motor vehicles along Pine Street within the Maple and King Street Neighborhood. The bicycle accommodation in this area is restricted by land use/development patterns and narrow right-of-way available. The Project will provide signing and pavement markings to increase awareness of the shared vehicle and bicycle use of the roadway. The Project also includes a new shared-use path to the south and enhanced on-road bicycle treatments along Pine Street that will expand the

network and quality of facilities available to bicyclists having origins/destinations within the Maple and King Street Neighborhood.

7.3.4 Emergency Vehicle Access

An emergency vehicle preemption system will be installed on the Champlain Parkway and Pine Street as part of the Project. There are no new impacts to emergency vehicle access beyond those discussed in the 2009 FSEIS. Response time for emergency vehicles would be enhanced as a result of providing the emergency vehicle preemption. This would benefit residents in the Project Area, including the Maple and King Street Neighborhood.

7.3.5 Parking

There are no permanent impacts to parking in the Maple and King Street Neighborhood as a result of the Project. No loss of parking on Pine Street is anticipated; a parking lane in the northbound direction will be maintained.

7.4 Air Quality

The air quality analysis performed as part of the 2009 FSEIS remains valid. Changes to traffic operations as discussed in Section 7.3.2 will reduce the impacts to air quality stated in the 2009 FSEIS. A microscale analysis was performed for the 2009 FSEIS at the intersection of Pine Street and Maple Street representing the worst-case intersection due to traffic volumes in the neighborhood. As a result of the microscale analysis, this intersection was found to be below the Vermont and NAAQS standards and resulted in no impact to the air quality for the adjacent sensitive receptors.

7.5 Noise

The noise analysis included in the 2009 FSEIS remains valid. Noise abatement or other mitigation is not considered necessary. Additionally, the 2009 FSEIS noise assessment evaluated residences adjacent to the Pine Street and King Street intersection for possible noise impacts. No noise impacts were identified at this receptor location; therefore, no abatement was considered necessary.

7.6 Historic and Archaeological Resources

Of the four historic districts discussed in the 2009 FSEIS, only the Battery Street Historic District overlaps with the Maple and King Street Neighborhood. The Selected Alternative for the Project has been evaluated under Section 106 and a determination of No Adverse Effect was issued on May 18, 2011. No further analysis is necessary for historic and archaeological resource impacts.

7.7 Construction Impacts

Construction of the Project in the Maple and King Street Neighborhood will involve temporary impacts to normal traffic patterns due to paving and temporary sidewalk closures with detours to construct the new curbing, sidewalk, and traffic signal equipment. These impacts include typical construction-related adverse effects to pedestrian space, traffic, dust, and noise. Concerns and comments regarding construction and work zone impacts were raised from members of the Maple and King Street Neighborhood during the public outreach events. To the extent feasible, appropriate measures have been incorporated into, if not already included in, the Project's construction and planning documents to address these concerns. This section describes the measures that will be utilized to ensure that the residents of the Maple and King Street Neighborhood are adequately informed and that construction activities will not result in adverse effects to public health.

7.7.1 Work Zone Safety and Mobility

The Project will include provisions that provide safe passage for pedestrians, bicyclists, and motorized vehicles during and after construction work hours while minimizing impact on traffic flow in the Maple and King Street Neighborhood. Construction phasing and scheduling will ensure safe pedestrian access through the construction area and to adjacent properties, buildings, residences, commercial properties and transit stops.

Short-term lane closures will be used to create isolated areas to complete construction within the roadway in the Maple and King Street Neighborhood. Access shall be maintained to all roadway users including vehicles, bicycles and pedestrians during these short-term lane closures.

Regular and timely coordination involving the contractor with emergency response personnel, the City's bus route and school bus routes shall be to ensure the continuity of these vital services.

Pedestrians may be directed around isolated work areas. The contractor is required to prepare a temporary pedestrian and bicyclist traffic control plan in advance of the plan being implemented. This plan will detail construction phasing and schedule as well as the specific methods of maintaining safe pedestrian and bicyclist access throughout the work zone. This includes any pedestrian crossing locations that are at locations with ADA-compliant sidewalk access ramps as well as any temporary sidewalk access ramps which will include ADA-compliant sidewalk access ramps to maintain access.

When school is in session, school bus stop accommodations will be included and coordinated with the appropriate entities. Additional flaggers will be stationed at these locations during typical pick up and drop off times while work is being performed in the area.

Other efforts that will mitigate temporary neighborhood impacts include the following:

- Time-of-day restrictions on the contractor's activities,
- MUTCD-compliant signage including changeable message boards with timely and meaningful messages consistent with the current construction activities,
- Providing pedestrian, bicycle, and vehicle detours as necessary,
- Ensuring the site is secured and accessible each evening,
- Installing temporary ramps and pedestrian access, and
- Maintaining bicycle travel paths to be free of ruts, sand, mud and other debris.

The Project will also be constructed in accordance with the City's noise ordinances which will place limitations on contractor's disruptive construction operations. Fugitive dust will be minimized by imposing requirements such as pick-up broom sweepers and other dust control measures.

7.7.2 Public Involvement Plan

In addition to work zone safety and mobility provisions, a concerted Public Involvement Plan (PIP) has been developed between the City, the Champlain Parkway Municipal Project Manager (MPM), and a dedicated Project Information Manager (PIM). This PIP will utilize communication strategies that seek to inform the general public and the EJ community of work zone impacts and the changing conditions of the Project. Weekly correspondence between the resident engineer and contractor will be performed during construction. The public information team will also conduct outreach to residents and businesses adjacent to construction activities including door-to-door outreach, stakeholder interviews, calls, and visits. A database of key constituents and stakeholders will also be developed to share project information and updates throughout the construction of the Project. This list will include businesses and residents along in the Maple and King Street Neighborhood. Informational outreach will include updates to provide advance warning of expectations during construction such as traffic pattern changes or other disruptive activities and to ascertain community specific issues or concerns before construction activities commence.

Print materials for education and outreach such as project factsheets, door hangers, brochures, and flyers will be produced and distributed as part of the PIP. These materials will be translated and multi-lingual versions similar to the advance public notice approach used for the September 26, 2019 Maple and King Street Neighborhood public outreach meeting. The target languages have been verified with City personnel as part of that EJ community public involvement effort. These materials will be distributed in a variety of manners: mailed directly to residences and businesses, distributed door-to-door, posted in businesses, restaurants, and other public places, and/or posted on sign boards along the project corridor. Conventional press releases and other media alerts are also anticipated and materials will be posed to the Project's website and on the City's social media accounts.

The PIP also includes provisions to coordinate, plan, and facilitate periodic public meetings throughout the eight phases of construction on the Project. These meetings will also be advertised in advance and opportunities will be provided for public comment.

A project hotline and email address for the public to submit questions and comments will also be established as well as weekly project email updates to the stakeholder distribution list. Weekly social media posts will also be released by the City DPW on their Facebook and Twitter accounts.

The Parkway's website (www.champlainparkway.com) will be used to provide information about construction progress and upcoming construction activities anticipated. This information will include the overall construction schedule as well of the anticipated schedule of key construction activities. The City's municipal website will also include links to the Parkway's website (www.champlainparkway.com) to facilitate access to these construction updates. The website will be redesigned to be updated daily and provide an interactive project map to provide a closer look at the phased construction work and ongoing progress.

7.8 Overall Project Impacts

This section reviews project improvements, adverse effects, and mitigation measures by affected environment in each neighborhood identified in the 2009 FSEIS. These neighborhoods include both the EJ Maple and King Street Neighborhood and seven other neighborhoods. Table 7-6 summarizes the impact to each neighborhood and shows that project improvements and adverse effects will be borne throughout the Project Area.

Table 7-6: Summary of Project Impacts by Neighborhood

Affected Environment*	Neighborhoods							
	Maple and King Street	Calahan (South) Park	Birchcliff Parkway	Lakeside	Flynn Avenue/Home Avenue	South Meadows	Oakledge	Austin Drive
Land Use and Socioeconomics	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None
Traffic Volumes	Negative	Negative	Positive	Negative	Positive	Positive	Neutral / None	Neutral / None
Mobility <i>(Traffic Operations and Bicycle and Pedestrian Access)</i>	Positive	Neutral / None	Positive	Neutral / None	Positive	Negative	Neutral / None	Neutral / None
Traffic Safety	Positive	Positive	Positive	Neutral / None	Positive	Positive	Neutral / None	Neutral / None
Air Quality	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None
Noise Environment	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None
Historic and Archaeological Resources	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None	Neutral / None
Construction Impacts	Negative	Negative	Neutral / None	Negative	Negative	Negative	Neutral / None	Neutral / None

* Mitigation Measures have been incorporated into this matrix.

7.8.1 Land Use and Socioeconomics

This Project will have no impact to the land use and socioeconomics in any of the neighborhoods within the Project Area. Some of the non-residential areas of the Project Area may experience improved economic development opportunities and vacant land has been secured for the new right-of-way at the southern end of the Project.

7.8.2 Traffic Volumes

Traffic volumes in the Maple and King Street neighborhood will increase as a result of the project, as will volumes along Pine Street in the Calahan (South) Park Neighborhood (Lakeside Avenue to Kilburn Street). The Lakeside Avenue Neighborhood will also be affected by increased traffic volumes because vehicular access to this neighborhood is only available via Lakeside Avenue. Other neighborhoods along Pine Street will see traffic volumes decrease or remain consistent with current and no-build volumes. Although the traffic volumes on Pine Street in the block from Maple Street to King Street will increase, these volumes will be 20-30% lower than the volumes on the immediately adjacent segment of Pine Street between Maple Street and Kilburn Street and as much as 40% lower than the segments between Kilburn Street and Lakeside Avenue. The volume of traffic on the block of Pine Street from King Street to Main Street will be lower than the Maple-to-King segment and these volumes will be comparable to the future (reduced) traffic volumes on the segment of Pine Street in the Birchcliff Parkway Neighborhood (between Flynn Avenue and Lakeside Avenue).

7.8.3 Mobility

The Project will significantly improve mobility in the Maple and King Street Neighborhood and on the segment of Pine Street between Maple Street and King Street. Generally, all neighborhoods will experience the same or improved mobility due to the Project. However, access to areas of South Burlington such as Red Rocks and Queen City Park from the South Meadows Neighborhood will be changed as a result of the Project, which will require longer trips for people in this neighborhood to access South Burlington via the Champlain Parkway connection (vehicle access) or the shared-use path connections included in the Project.

7.8.4 Traffic Safety

The Project will improve traffic safety in the Maple and King Street Neighborhood and on the segment of Pine Street between Maple Street and King Street. Other neighborhoods will either benefit from improved traffic safety from the Project or the Project will have no impact on traffic safety.

7.8.5 Air Quality

The Project will not result in any air quality impacts to any neighborhoods.

7.8.6 Noise Environment

In most neighborhoods, the noise environment will not be impacted by the Project. The Birchcliff Parkway Neighborhood will benefit from reduced noise and the South Meadows will experience unmitigated noise impacts.

7.8.7 Historic and Archaeological Resources

The Project will not result in any impacts to historic and archaeological resources.

7.8.8 Construction Impacts

Neighborhoods along the Champlain Parkway will experience temporary negative construction impacts from the Project. Neighborhoods away from the Parkway's alignment will not experience construction impacts.