6. AFFECTED ENVIRONMENT

6.1 Introduction

The following sections provide updated information specific to resources located in the Maple and King Street Neighborhood that were considered in the EJ analysis. Other resources were evaluated and found to either not be present in the geographic area or not affected by the project: rail operations; water resources; vegetation and wildlife resources; public, conservation, and recreation land; hazardous materials; and visual setting.

6.2 Land Use and Socioeconomics

6.2.1 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 Southern Connector/Champlain Parkway project within the section described as C-6 in the project description and shown on Figure 6-1 below.

Figure 6-2 shows the eight neighborhoods within the Project Area as identified in the 2009 FSEIS. These neighborhoods were used to review overall project impacts and make a determination of high and adverse effects on the EJ population in the Maple and King Street Neighborhood.

LEGEND

- SIDEWALK
- SHARED USE PATH
- PROPOSED ROADWAY
- MAPLE AND KING STREET NEIGHBORHOOD

0 825 1650
SCALE

Southern Connector/Champlain Parkway MEGC-M5000(1)

CHA
III Winners Circle, PO Box 5269 • Albany, NY 12205-0269
Main: (518) 453-4500 • www.chacompanies.com

FIGURE 6-1

PROJECT CORRIDOR

Page 6-2

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DATE/TIME =10/6/2020
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Figure 6-2: Land Use - Maple and King Street Neighborhood

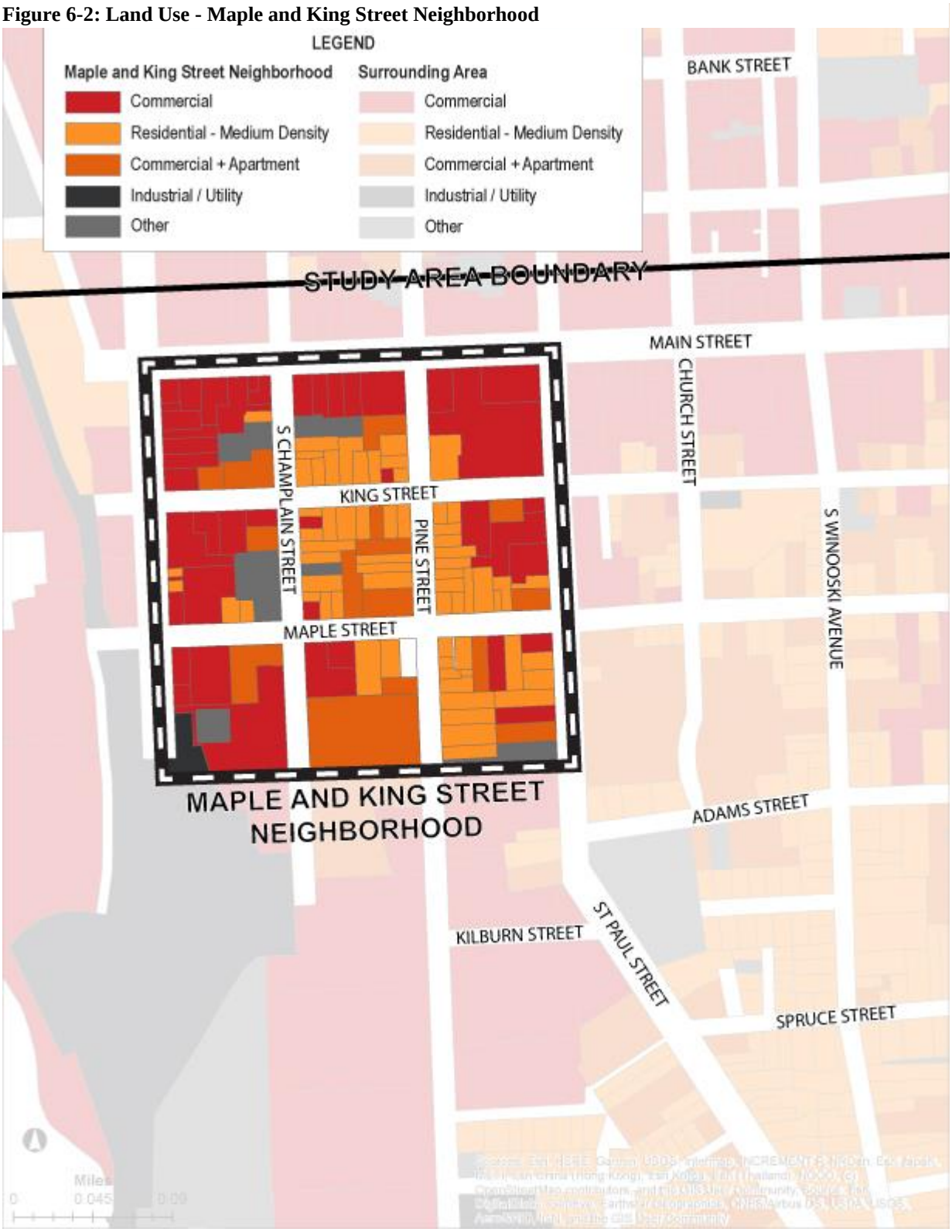
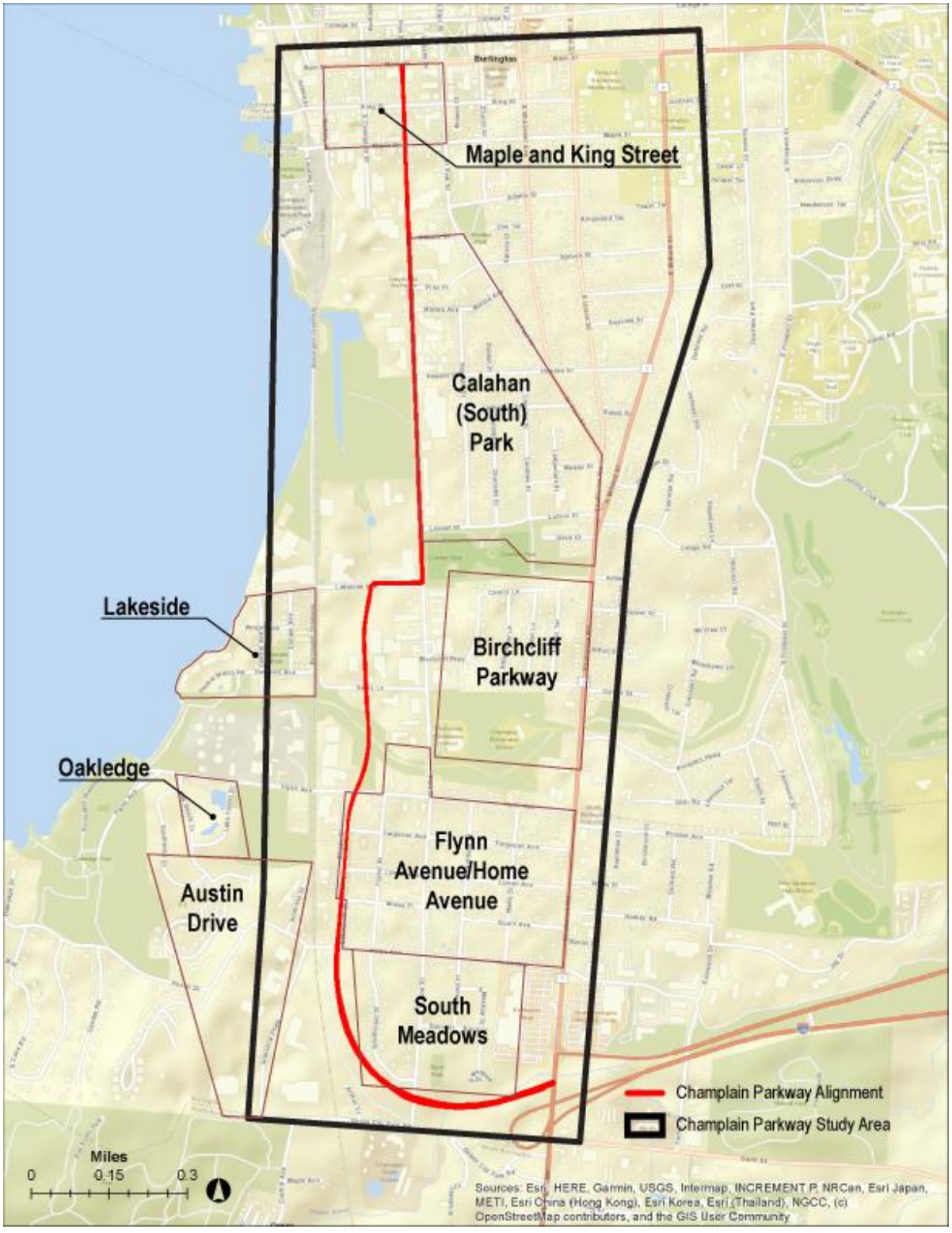


Figure 6-3: Project Area Neighborhoods



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 (See Figure 6-4). 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. The following images show current conditions in the Maple and King Street Neighborhood.

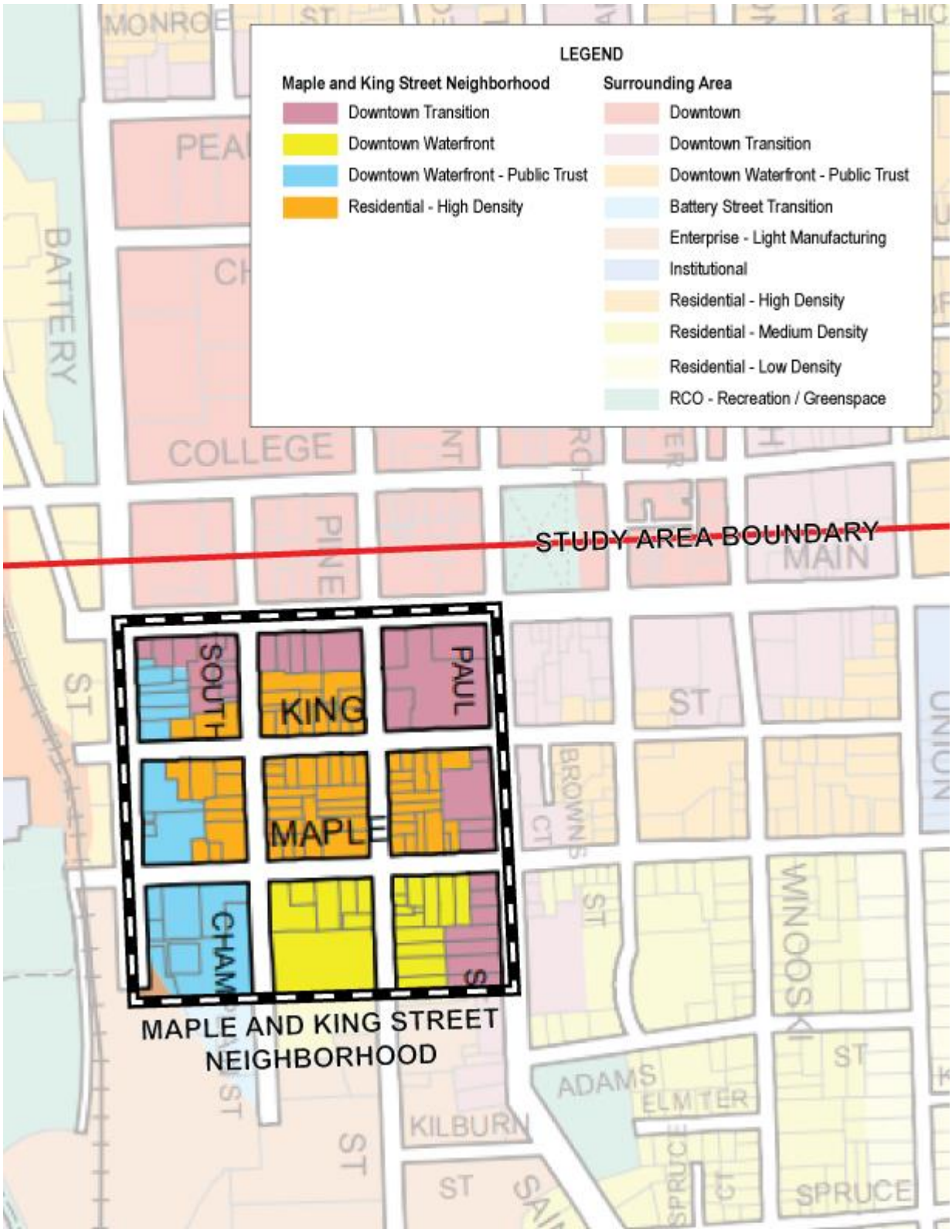
Photo 6-1: Pine Street facing north

Photo 6-2: Numerous deficient sidewalk access ramps

Photo 6-3: Existing Sidewalk Conditions

Photo 6-4: Existing Sidewalk Discontinuities

Figure 6-4: Zoning - Maple and King Street Neighborhood



In recent years, the areas along Pine Street south of the Maple and King Street Neighborhood have been transitioning from its heavy industrial and manufacturing past to industries such as technology, art and design and small-scale retail uses. Several buildings along Pine Street and Lakeside Avenue have been converted from industrial uses to commercial and retail spaces.

Notable examples of development that has occurred since the 2009 FSEIS include the following:

- Dealer.com (Pine Street)
- Innovation Center (Lakeside Avenue)
- The Howard Center (Flynn Avenue)
- Champlain College (Lakeside Avenue)
- City Market Co-op (Flynn Avenue)
- Various microbreweries (Flynn Avenue and Pine Street)

As stated in the 2009 FSEIS, a shift in land use from industrial to commercial typically results in increased automobile traffic and reduced commercial vehicle movements. However, there are still industrial uses along the Project corridor that will continue to attract commercial vehicle traffic. The Project will provide a suitable and efficient access route for this traffic, consistent with the purpose and need. In some instances, such as City Market, the traffic impact mitigation for the redevelopment was predicated on the construction of the Project to alleviate access and circulation for employees, customers and truck deliveries.

As described in Chapter 4, an EJ analysis was completed within the Project study area. Although it was determined that 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 considered to be a minority community for the purposes of the project's EJ analysis.

6.3 Transportation Systems

6.3.1 Traffic Volumes and Design Forecasts

Vehicle traffic volumes were originally developed for the Project's NEPA evaluation and Project design in 2004, for the Draft Supplemental Environmental Impact Statement (DSEIS) published in 2006 and FSEIS in 2009. These design volumes were based on the regional travel demand model developed by the regional Metropolitan Planning Organization (MPO).

The design horizons considered in the 2009 FSEIS were 2008 (ETC) and 2028 (ETC+20). Because the path to construction did not follow the Project schedule anticipated in the 2009 FSEIS, traffic volumes in the Project study area were reviewed as part of a Project Reevaluation prepared in May 2019.[2] The Reevaluation included a comprehensive compilation of historic volume data for the period 2003-2016. The reevaluation of traffic conditions concluded that, although the Project's construction schedule has been pushed out, the traffic data and forecasts utilized for the Project from the 2009 FSEIS are still relevant. This is because actual traffic data collected in the Project area in recent years shows that the modeling for the 2009 FSEIS used aggressive growth assumptions, resulting in a higher forecast of traffic volumes than has occurred to date. Thus, traffic volumes have not yet reached the levels forecast for the 2008 ETC, making it appropriate to continue to use the 2008 forecast traffic volumes for the ETC of the Project. However, these design volumes are not so high as to affect the overall objectives of the Project or the elements of the design.

The fact that traffic volumes have increased at a slower rate makes it appropriate to continue to use the previous ETC and ETC+20 volumes from the 2009 FSEIS as the ETC and ETC+20 traffic forecasts for the Project. Further, the fact that traffic increased at a slower rate than forecasted does not invalidate the results of the traffic analysis, it simply makes the traffic analysis a more conservative forecast of future conditions. One conclusion from the slower traffic growth is that if traffic continues to grow at a slower pace, the design life of the Project will effectively be extended.

6.3.2 Mobility

Considering the correlation of existing and projected volumes as documented in the May 2019 Reevaluation (Appendix 8), traffic operations within the corridor are expected to be consistent with the analysis presented in the 2009 FSEIS, although actual level of service

[2] *Southern Connector/Champlain Parkway Project MEGC-M5000(1) – Reevaluation of 2009 Final Supplemental Environmental Impact Statement, Clough Harbour & Associates, LLP in association with Stantec Consulting Services, Inc., March 2019*

(LOS) may be better with less vehicular delay through the horizon years of the Project if development and traffic growth does not occur as rapidly as was forecasted.

The 2009 FSEIS described the operating conditions of the following three Project intersections in the Maple and King Street Neighborhood:

- Pine Street and Maple Street
- Pine Street and King Street
- Pine Street and Main Street

Methodology: The operations analyses of these intersections as documented in the 2009 FSEIS were conducted using the 2000 *Highway Capacity Manual* (HCM). These analytical procedures provide a quantitative basis to characterize the quality of traffic flow based on a LOS concept, where LOS A represents essentially unconstrained operations and LOS F represents highly congested conditions. An overall intersection LOS D has been the targeted threshold for acceptable design for the Project. However, specific approaches or lane groups have been designed to operate at lower LOS in the design horizon years based on considerations of volume, existing LOS, functional priority of the approach/lane group, and/or the feasibility and impacts of additional capacity enhancement. These performance goals were established by VTrans and the City of Burlington and were the basis of the 2009 FSEIS alternatives analyses and for the design of the Selected Alternative. Because Pine Street is an urban arterial and on the National Highway System (NHS), the traffic operations along Pine Street have a higher functional priority in the transportation network than Maple Street and King Street. Main Street is also an urban arterial on the NHS and thus also has a functional priority in the network.

For signalized and unsignalized intersections, LOS is defined in terms of average control delay (seconds). Control delay is a measure of stopped delay and the associated delay of slowing and queuing experienced by vehicles moving through an intersection. At signalized intersections, control delay is determined for each individual approach and for the intersection as a whole. At unsignalized intersections, control delay is determined for the traffic movements from the stop sign controlled approaches. The delay thresholds for LOS at signalized and unsignalized intersections differ because of the different driver expectations of operating efficiency of these two types of control conditions. Table 6-1 summarizes the LOS criteria for signalized and unsignalized intersections.

Table 6-1: Intersection Levels of Service (LOS) Criteria

Level of Service (LOS)	Characteristics	Unsignalized Control Delay per Vehicle (sec)	Signalized Control Delay per Vehicle (sec)
A	Little or no delay	≤ 10	≤ 10
B	Short delays	> 10 and ≤ 15	> 10 and ≤ 20
C	Average delays	> 15 and ≤ 25	> 20 and ≤ 35
D	Long delays	> 25 and ≤ 35	> 35 and ≤ 55
E	Very long delays	> 35 and ≤ 50	> 55 and ≤ 80
F	Extreme delays	> 50	> 80

Source: *Highway Capacity Manual, Transportation Research Board, National Research Council, 2000 and 2016*

Traffic Operations without the Project: The Pine Street-Maple Street and Pine Street-King Street intersections are both controlled by All-Way Stop Control (AWSC), and the intersection of Pine Street and Main Street is controlled by a traffic signal. The operations analyses of these locations from the 2009 FSEIS documented that the intersection of Pine Street-Maple Street experiences significant traffic congestion (LOS F) during the AM and PM peak hours, and projected that the levels of congestion were expected to increase over the 20-year planning horizon of the Project in the No-Build condition.

The operations at Pine Street-King Street and Pine Street-Main Street were documented to operate at acceptable levels of service. Table 6-2 provides a summary of the overall LOS for the AM and PM peak hours at each intersection for the ETC and ETC+20 No-Build conditions.

Table 6-2: LOS Summary: Maple and King Street Area Project Intersections

Location	**Control Type**	**ETC No-Build**		**ETC+20 No-Build**	
		AM Peak Hour	**PM Peak Hour**	**AM Peak Hour**	**PM Peak Hour**
Pine Street & Main Street	Signal	B	B	B	B
Pine Street & King Street Pine Street & Maple Street	AWSC AWSC	C F	C F	C F	D F

The existing LOS F conditions during peak hours at the intersection of Pine Street and Maple Street produce long traffic delays and vehicle queues. The projected conditions in the ETC+20 design horizon shows that these congestion levels will worsen substantially if the Project is not built. 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 will be 124 seconds/vehicle during the AM peak hour and 202 seconds/vehicle during the PM peak hour in the ETC+20 No-Build condition. The queues associated with this congestion spills over to adjacent intersections (such as to the Pine Street/King Street intersection), which then also increases congestion there.

6.3.3 Traffic Safety

Traffic safety has been an integral consideration for the Project's design. The 2009 FSEIS noted the safety concerns created by through traffic using local neighborhood streets as short cuts. Considerations of pedestrian and bicyclist safety was a key factor in the decision to reduce the cross-section of the new Champlain Parkway segments (between the Home Avenue and Lakeside Avenue) from four lanes to two lanes, to add exclusive pedestrian phases to the intersection signals, and to reduce the design speed of the Project.

This section of the report presents an assessment of safety issues in the Maple and King Street Neighborhood by examining the locations and characteristics of crashes in the Project area. VTrans maintains a statewide database of all reported crashes along all state highways and federal-aid road segments.[3]

A reportable crash is a collision with at least one of the following results caused by the event:

- property damage exceeding $3,000
- personal injury
- fatality

Areas of interest are screened by identifying High Crash Locations (HCL). An HCL is a segment of road or an intersection where the actual crash rate is substantially higher than expected values for a similar type of facility. In order to be classified as an HCL, an intersection or road segment (0.3-mile segment) must meet the following two conditions:

It must have at least five crashes over a five-year period (one crash per year); and

The Actual Crash Rate must exceed the Critical Crash Rate. The actual crash rate is equal to the number of crashes at a location divided by the number of entering vehicles. The

[3] *This data is exempt from Discovery or Admission under 23 U.S.C. 409.*

critical crash rate is also calculated for each specific location based on the functional class of the roadways involved and the number of entering vehicles.

VTrans performs these calculations and publishes the results in *High Crash Location Reports* for each five-year periods of available data. The VTrans' reports also provide additional background information regarding the methodologies used for the statistical analyses. These documents are available at the following VTrans' website:

(*https://vtrans.vermont.gov/docs/highway-research*).

Safety analyses conducted as part of the Act 250 permitting process for the Project included a screening of the VTrans' HCL data for the periods January 2003 - December 2007 and January 2006 - December 2010. Table 6-3 lists the HCL locations along Pine Street identified in these reports

The Maple Street-King Street portion of the Project is part of the same HCL Section of Pine Street from Kilburn Street to Main Street that was identified in the 2006-2010 data.

There was one crash involving a pedestrian or bicyclist in the Maple Street-King Street area of the Project in the 2003-2007 reporting period, which occurred at the Maple Street and Pine Street intersection. There were no pedestrian or bicyclist related crashes in this area of the Project in the 2006-2010 reporting period.

Table 6-3: HCL Locations

Years	HCL Intersections	HCL Sections
2003-2007	Pine St & Main St	Flynn Ave to Birchcliff Pkwy Howard St to Kilburn St
2006-2010	None	Flynn Ave to Birchcliff Pkwy Howard St to Kilburn St Kilburn St to Main St
2012-2016	None	Birchcliff Pkwy to Electric Ave Howard St to Kilburn St Kilburn St to Main St

The VTrans' *High Crash Location Report* for the period 2012-2016 (latest report available) was reviewed to provide an updated context of safety considerations in the Maple Street-King Street neighborhood. This report identifies that there were no HCL Intersections along Pine Street, but three linear sections of Pine Street are HCL Sections. This is the same as what was identified in the report of the 2006-2010 data, although the current boundaries of the southerly HCL Section are different. The HCL locations on Pine Street from the HCL Report for years 2012-2016 are also shown in Table 6-3.

The Project will improve traffic safety along the Pine Street corridor in different ways. In the South Meadow neighborhood south of Home Avenue and the Home-Flynn and Birchcliff Parkway neighborhoods of Pine Street between Home Avenue and Lakeside Avenue, the reduced volume of traffic associated with the Project will have a positive effect on traffic safety. Most of this part of Pine Street is outside of the limits of the physical improvements to be constructed by the Project.

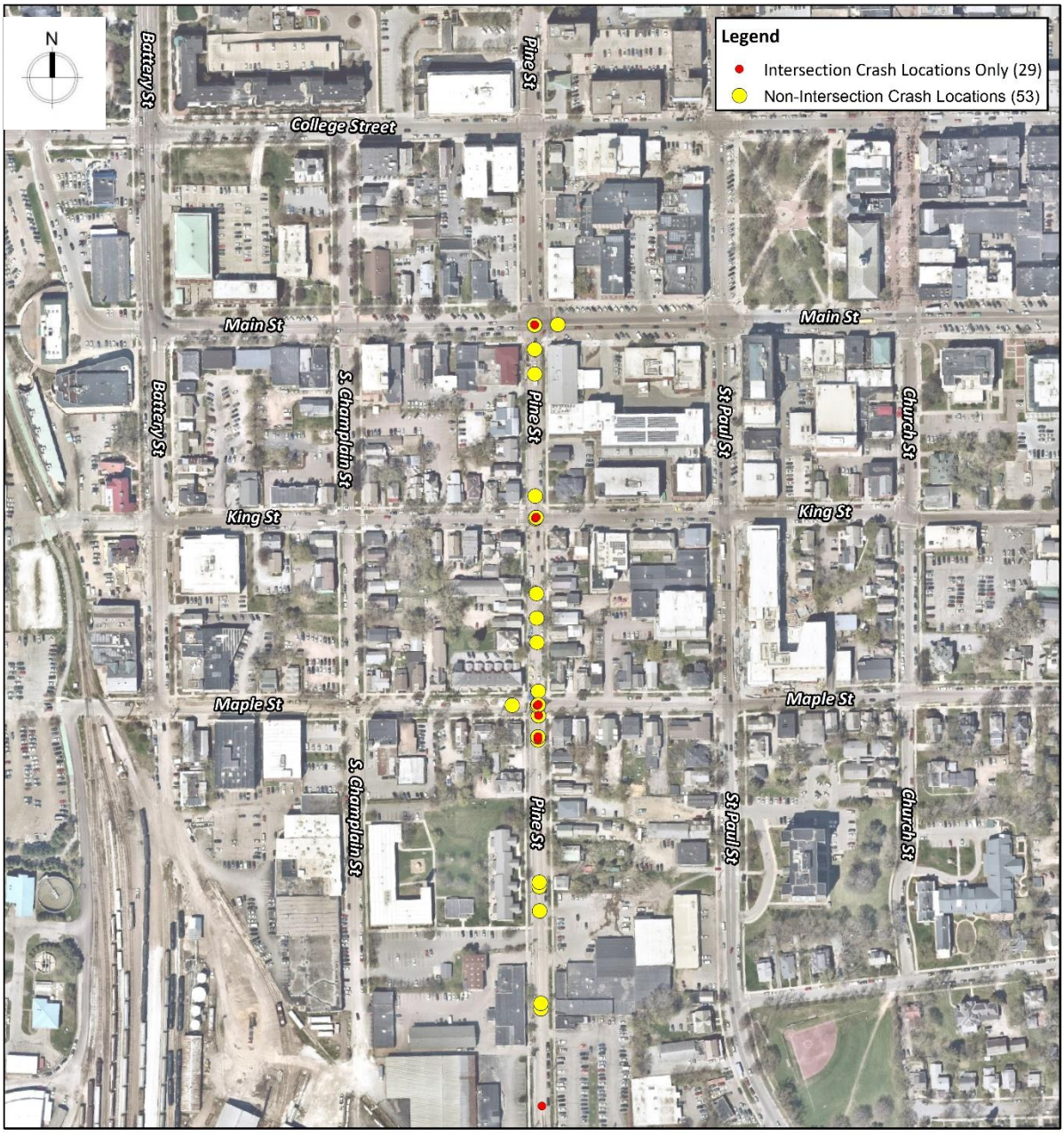
The segment of Pine Street in the Calahan (South) Park neighborhood between Lakeside Avenue and Kilburn Street has driveways providing access to a mix of commercial uses on both sides of the street and unsignalized intersections with local streets. The types of access management issues that exist in this area of the Project include closely spaced driveways, multiple driveways per parcel, wide and undefined driveways, driveways located too close to an intersection, and driveways and/or intersections on opposite sides of the streets that are not aligned. This section of Pine Street will be rehabilitated as part of the Project and will include new curbing and sidewalks that will provide better definition and alignment of existing driveways. The Project will also include curb extensions at intersections, raised crosswalks and other improved accommodations for pedestrians and bicyclists. This rehabilitation work and traffic calming will help improve the traffic safety for all users of the corridor.

The 2012-2016 crash data shows that the section of Pine Street within the Maple Street-King Street Neighborhood continues to be part an HCL Section (from Kilburn Street to Main Street). Because of this HCL designation, crash data was compiled for Pine Street for the period 2015-2019 from online data accessed from the VTrans' website. This data shows that 273 crashes occurred along Pine Street between Main Street and Queen City Park Road over this five-year period. These include crashes at intersections, along the links between intersections and at driveways. This count also includes crashes that occurred on the intersecting side streets at or near Pine Street. The three most common types of crashes were rear end, broadsides (no turns), and sideswipe (same direction). These types of crashes accounted for approximately 50% of all crashes. Crashes identified as 'Other' or that did not have a crash type specified comprised another 38% of all crashes. Most of the crashes along Pine Street were property damage only (89%). There were 31 crashes that resulted in personal injury (11% of total) and there were no fatalities associated with the crashes in the corridor.

There were 82 crashes that occurred on Pine Street between Kilburn Street and Main Street, which represents about 30% of all the crashes in the corridor (including crashes that occurred on the intersecting side streets at or near Pine Street). The locations of these crashes are shown on Figure 6-5. There were 29 total crashes at the three intersections along Pine Street in the Maple and King Street Neighborhood (Maple Street, King Street, and Main Street). The intersection of Pine Street and Maple Street had the most crashes in this area (14 over the five-year period). These intersection crashes were predominately rear-end, broadside and sideswipe crashes. These crash types are often associated with congested intersection operations such as what occurs at Pine Street and Maple Street.

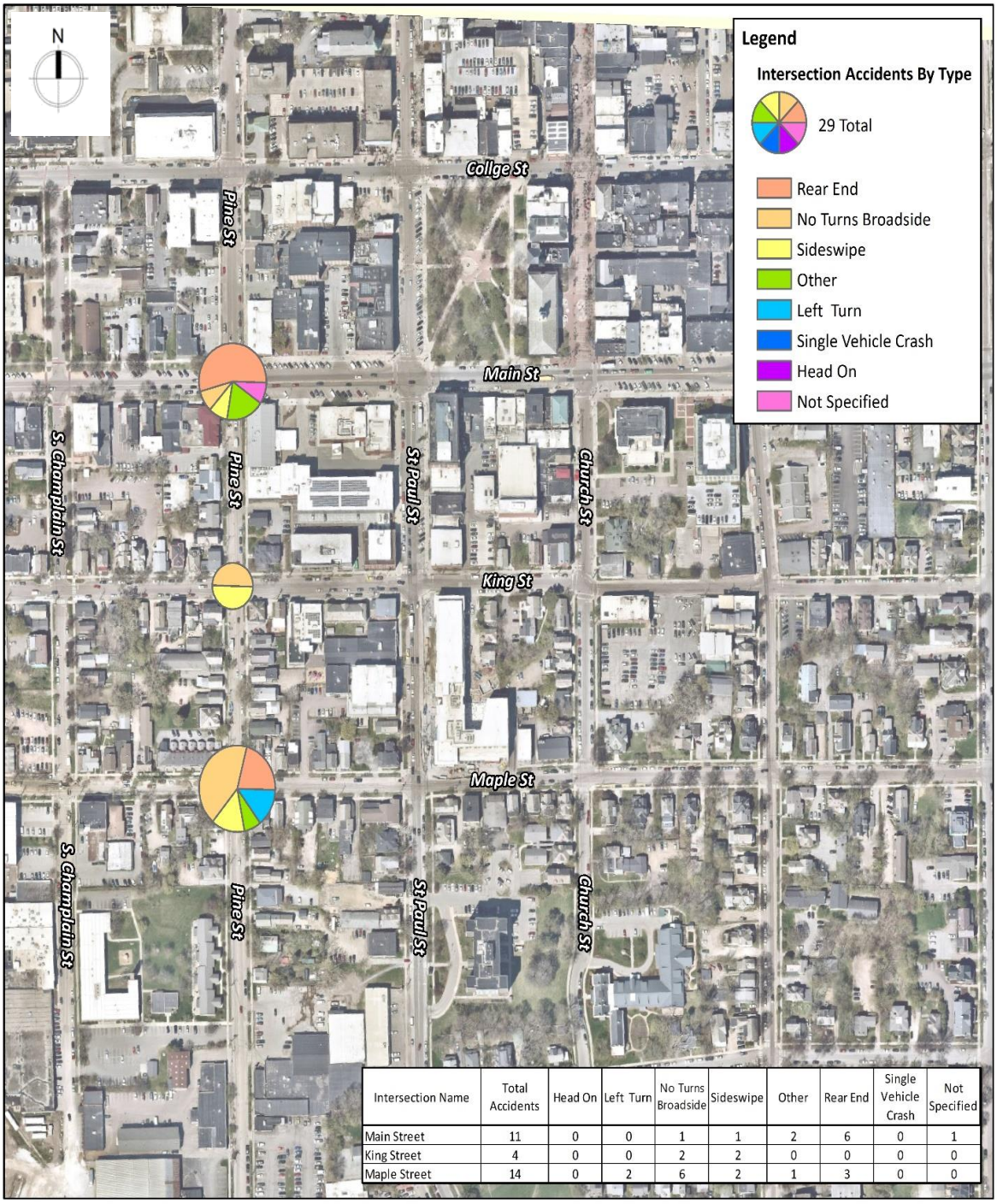
Figure 6-6 shows the intersection crash history and the distribution of crashes by type at each location.

Figure 6-5: Project Study Area Crashes (Five-year period)



source: http://apps.vtrans.vermont.gov/CrashPublicQueryTool/; January 17, 2020 query

Figure 6-6: Intersection Crashes

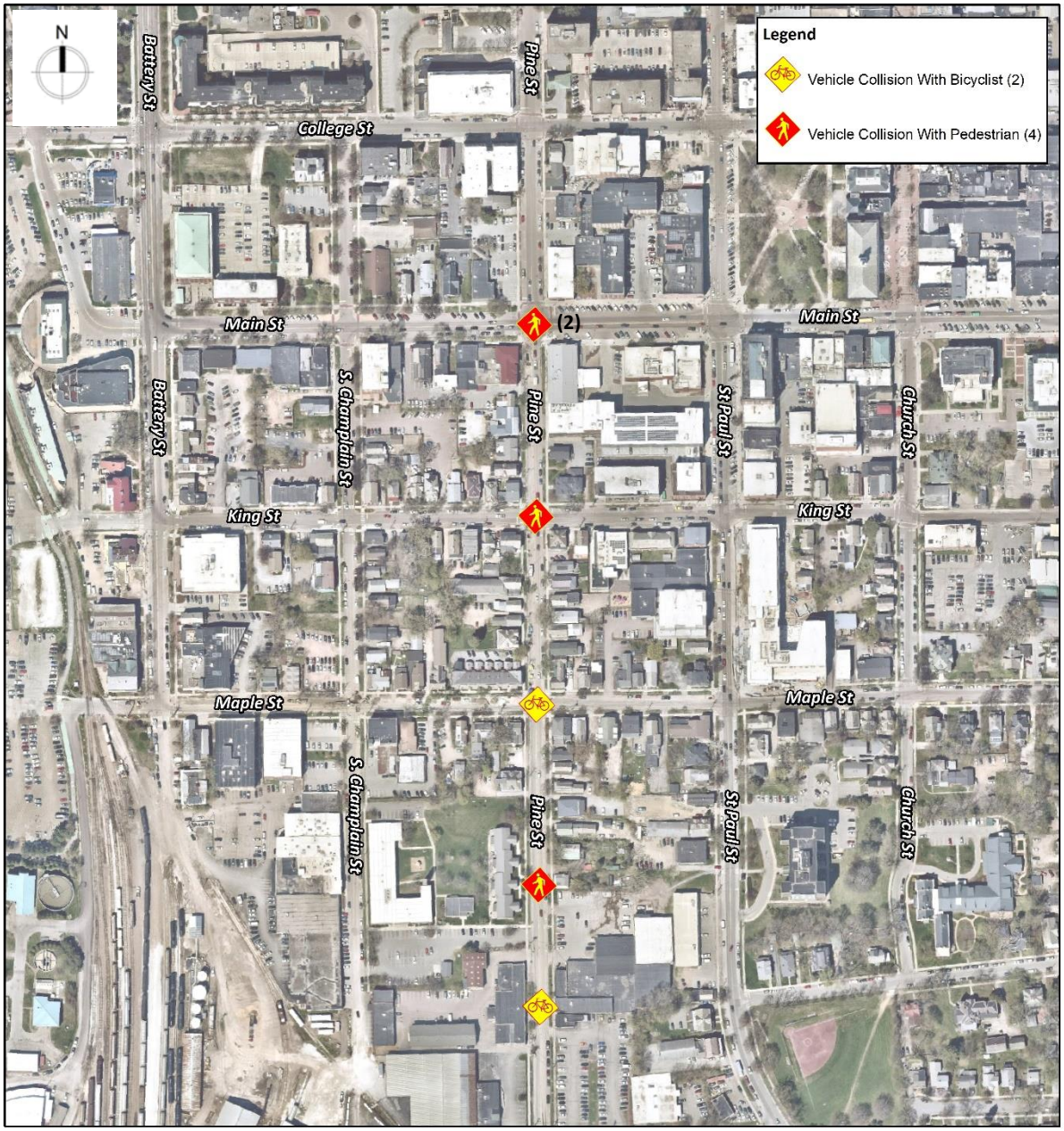


Intersection Name	Total Accidents	Head On	Left Turn	No Turns Broadside	Sideswipe	Other	Rear End	Single Vehicle Crash	Not Specified
Main Street	11	0	0	1	1	2	6	0	1
King Street	4	0	0	2	2	0	0	0	0
Maple Street	14	0	2	6	2	1	3	0	0

source: http://apps.vtrans.vermont.gov/CrashPublicQueryTool/; January 17, 2020 query

There was a total of fourteen crashes involving pedestrians or bicyclists over the five-year period throughout the Pine Street corridor. Six of these occurred on Pine Street in the Maple and King Street Neighborhood (four pedestrian and two bicyclist). This is more than what had been identified in the previous studies for the Project. The locations of these crashes are shown in Figure 6-7.

Figure 6-7: Pedestrian/Bicyclist Crashes (Five-year period)



source: http://apps.vtrans.vermont.gov/CrashPublicQueryTool/; January 17, 2020 query

Given the low number of reported incidents involving pedestrians or cyclists, it is not possible to identify HCL for these travel modes or to identify any patterns. The City has been making interim investments in the corridor to improve pedestrian and bicycle safety including upgrading crosswalks at intersections and midblock locations, installing Rectangular Rapid Flashing Begins (RRFBs), and signing/marking enhancements.

6.4 Air Quality

A detailed description of the Project's air quality environment was provided in the 2009 FSEIS and remains valid. The State of Vermont is categorized as an attainment area for all the United States Environmental Protection Agency (EPA) criteria pollutants (total suspended particulates, carbon monoxide, sulfur dioxide, nitrogen oxides, ozone and lead). This categorization has not changed since the 2009 FSEIS.

6.5 Noise Environment

The 2009 FSEIS characterized the existing noise environment in the Maple and King Street Neighborhood. This characterization of the existing noise conditions remains valid and no further detail is necessary.

6.6 Historic and Archaeological Resources

A detailed description of the Project's historic and archaeological resources was provided in the 2009 FSEIS. The Project's historic and archaeological resources as stated in the 2009 FSEIS remain valid. The Maple and King Street Neighborhood bisects the Battery Street Historic District as described in the 2009 FSEIS.

The 2009 FSEIS identified the Pine Street Historic District as a National Register Eligible Historic District. Subsequent to the 2009 FSEIS, the City nominated the Pine Street Historic District (now named Pine Street Industrial Historic District) (See Figure 6-8 below) for the National Register of Historic Places. On October 16, 2017, the United States Department of the Interior listed the Pine Street Industrial Historic District on the National Register of Historic Places. This district is located on Pine Street from Maple Street to the foot of the Pine Street Barge Canal, including parts of South Champlain Street, Battery Street, Kilburn Street, Marble Avenue, Pine Place and the shore of Lake Champlain. The historic district borders but does not overlap with the Maple and King Street Neighborhood. This information is only being provided to note this change from "Eligible" to "Listed".

Figure 6-8: Pine Street Industrial Historic District