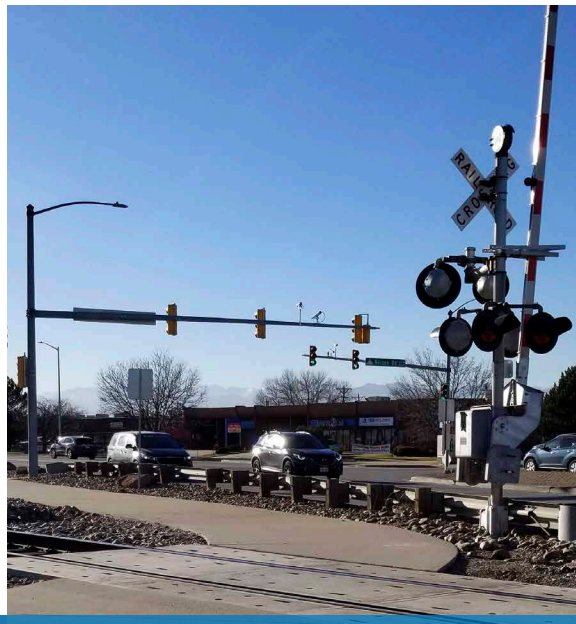

Final Report for

Existing Conditions & 2040 Baseline Analysis Report

Southwest Longmont Operations Study

Longmont, CO

June 2018

Prepared for:

CITY OF LONGMONT COLORADO

Prepared by:

SEH

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Prepared for City of Longmont

Introduction

The *Southwest Longmont Operations Study* has been initiated to advance planning that will address future demands on Longmont's multimodal transportation system in the southwest part of the City. Specifically, the study will examine the arterial roadway network formed by Ken Pratt Boulevard, Hover Street, and Nelson Road, including major intersections along these roadway corridors. The study area is depicted in **Figure 1**. The purpose of the study is to identify needed intersection and transportation system improvements and multimodal improvements, supported by concept-level designs and cost estimates that can be incorporated into the City's implementation plans for future construction.

This *Existing Conditions & 2040 Baseline Analysis Report* is a supporting document that will be foundational to the *Southwest Longmont Operations Study*. It includes an inventory of existing transportation features, analyses of current and future baseline vehicular traffic operations, study and interpretation of crash data, a summary and analysis of pedestrian and bicycle patterns, and inventory of bus ridership data. The information contained in this report will provide a basis for identifying future shortfalls in the transportation system, for developing alternative solutions, and for narrowing the focus to preferred methods of meeting future demands.

The City has long maintained a proactive stance in planning for growth and, in doing so, has recognized the critical role of transportation in its overall approach to setting and achieving community goals. In recent years, the August 2014, *Longmont Roadway Plan* was completed, providing a technical analysis of the City's street system in planning year 2035. It identified future roadway needs and improvements, including features within the limits of this new subarea study. Subsequently, planning efforts from across the City were brought under the overarching *Envision Longmont* plan, which integrates Longmont's Area Comprehensive Plan and Multimodal Transportation Plan into a single framework. Future transportation improvements, like those to be considered in the subarea study, can be incorporated into updates to the *Multimodal Transportation Implementation Plan*, an appendix to *Envision Longmont*.

Under *Envision Longmont*, transportation planning is carried out in recognition of Longmont's vision and guiding principles, with an eye on fulfilling *Envision's* enumerated strategies and related goals. Thus, in addition to updating the technical analysis previously performed for the *Longmont Roadway Plan*, the

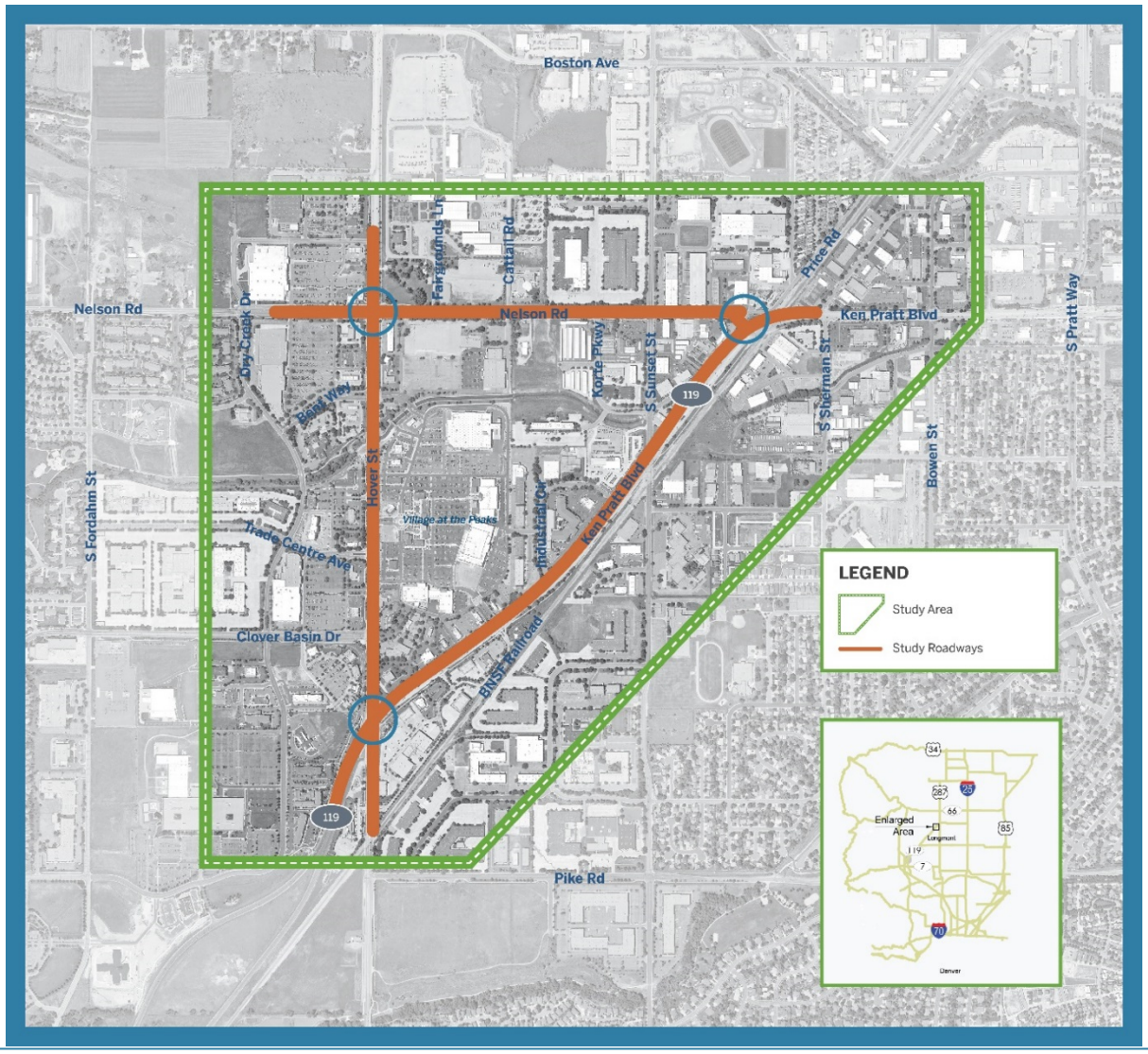
subarea study will consider a broad range of City concerns that are outlined in *Envision Longmont*. These concerns include

- Fulfilling transportation needs with neighborhood character,
- Preserving arterial streets as the backbone of multimodal travel, and
- Integrating safe and accessible bicycle and pedestrian features.

This broader view of the transportation system and its role in supporting the community's vision is reflected in this *Existing Conditions & 2040 Baseline Analysis Report*, which includes sections on the state of pedestrian, bicycle, and transit travel within the study area.

Next Steps. Building on the findings from the existing conditions, the project will enter the process of evaluating alternatives and potential solutions to address the deficiencies identified in this report.

Figure 1– Study Area



Roadway Network Conditions

Ken Pratt Boulevard

Ken Pratt Boulevard, also known as State Highway 119 (SH 119) and the Diagonal Highway, is a four-lane regional arterial between Hover Street and South Main Street that primarily runs northeast and southwest through the City of Longmont. SH 119 continues south of Hover Street through the Town of Niwot into the City of Boulder as a 4-lane expressway. Ken Pratt Boulevard/SH 119 also continues as an east-west, four-lane expressway east of South Main Street to Interstate 25, then continues further east as Firestone Boulevard and Weld County Road 24 through the Town of Firestone. SH 119 is a vital artery for daily commutes through the City of Longmont and the surrounding area. Heavy traffic flows occur in the westbound direction during the morning peak hour and in the eastbound direction during the evening peak hour.

Ken Pratt Boulevard and Hover Street intersection.

Within the study area, Ken Pratt Boulevard has two through lanes in both directions of travel, with designated right turn lanes at major intersections and business accesses along northbound Ken Pratt Boulevard. Continuous acceleration and deceleration lanes are provided along southbound Ken Pratt Boulevard, with the exception of a short segment between Sunset Street and Frontage Road. The median treatment alternates between raised medians with sections of landscaping and two-way left turn lanes, with designated left turn lanes provided at major intersections and business accesses. Sidepaths provide pedestrian and bicycle accommodations along Ken Pratt Boulevard. Multiple bus stops are also located along Ken Pratt Boulevard to provide local and regional connectivity. The speed limit from Hover Street to north of Sunset Street is posted at 45 mph, then is reduced to 35 mph north to Nelson Road.

Hover Street

Hover Street is a five-lane principal arterial that runs north-south through the City of Longmont. Hover Street continues to the north and south as North 95th Street throughout the rest of Boulder County, SH 42 and South 96th Street through the City of Louisville, and Via Varra Road through the City and County of Broomfield. Hover Street is also a major roadway used for commuting traffic in the morning and evening peak hours. Heavy traffic occurs in the southbound direction during the morning peak hour and in the northbound direction during the evening peak hour.

Hover Street between Village at the Peaks and Bent Way.

Within the study area, Hover Street has three northbound through lanes and two southbound through lanes. Continuous acceleration and deceleration lanes are provided along southbound Hover Street, except for between Nelson Road and the St. Vrain Centre access south of Bent Way. Designated left turn lanes are provided at each signalized intersection and at most major business accesses. Raised medians with sections of landscaping are provided between Ken

Pratt Boulevard and Nelson Road. Sidepaths and two recently constructed pedestrian underpasses, which are located south of Bent Way and south of Ken Pratt Boulevard, provide pedestrian and bicycle accommodations along Hover Street. The Dry Creek Greenway may also be accessed from Hover Street south of Bent Way. Multiple bus stops are also located along Hover Street to provide local and regional connectivity. The posted speed limit along Hover Street is 40 mph.

Nelson Road

Nelson Road is a four-lane principal arterial that runs east-west through the City of Longmont, beginning at US 36 and terminating at Ken Pratt Boulevard. Nelson Road transitions to a two-lane minor arterial west of Dry Creek Drive.

Nelson Road between Hover Street and Sunset Street.

Within the study area, Nelson Road has two through lanes, with a few designated right turn lanes in both directions. The median treatment is primarily two-way left turn lanes, with designated left turn lanes at major intersections and business accesses. On-street bicycle lanes are provided for both directions of travel along Nelson Road to accommodate bicyclists. Sidepaths are provided between Hover Street and Sunset Street, while attached sidewalks are provided east of Sunset Street to Ken Pratt Boulevard, to accommodate pedestrians. There is also a short sidewalk gap between Cattail Road and Korte Parkway on the south side of Nelson Road. Several bus stops are provided along Nelson Road to provide local and regional connectivity. The speed limit along Nelson Road is posted at 35 mph.

Surrounding Roadway Network

Sunset Street

Sunset Street is a four-lane minor arterial that runs north-south through the City of Longmont. Sunset Street begins at Plateau Road, transitions to a two-lane neighborhood collector north of Boston Avenue, then terminates at 11th Avenue near Loomiller Park. Short segments of Sunset Street continue north of Loomiller Park, but do not directly connect to the Sunset Street corridor. Sunset Street connects southern Longmont residential neighborhoods to central Longmont residential neighborhoods.

Clover Basin Drive

Clover Basin Drive is a four-lane minor arterial between South Fordham Street and Hover Street, and runs east-west through the City of Longmont. Clover Basin Drive begins at 75th Street as a two-lane neighborhood collector, transitions to a two-lane arterial east of Airport Road, then terminates at Hover Street. Clover Basin Drive provides access to the retail shopping centers near the study area, and a large residential neighborhood to the west.

Price Road

Price Road is a two-lane neighborhood collector that runs northeast and southwest, and terminates at Nelson Road near Ken Pratt Boulevard. Price Road serves as a primary access road that connects Ken Pratt Boulevard to the Twin Peaks Charter Academy and the St. Vrain Village mobile home park.

Industrial Circle

Industrial Circle is a two-lane local street, with on-street parking, that forms a loop off of Ken Pratt Boulevard, south of Sunset Street. Industrial Circle provides access to the Best Western hotel, Old Chicago restaurant, Subaru dealership, and surrounding businesses.

Bent Way

Bent Way is a two-lane local street that runs east-west, connecting Hover Street and Dry Creek Drive. Bent Way primarily serves as an access road to the St. Vrain Centre, which spans from Clover Basin Drive to Nelson Road on the west side of Hover Street.

Trade Centre Avenue

Trade Centre Avenue is a wide, two-lane local street that runs east-west, connecting South Fordham Street to Hover Street. Trade Centre Avenue primarily serves as an access road to the St. Vrain Centre and a large business park to the west.

Korte Parkway

Korte Parkway is a wide, two-lane local street, with on-street parking, that intersects with Nelson Road and Sunset Street, forming a short loop. Korte Parkway serves as an access road to the Nelson Road Self Storage facility, Sunset Plaza, and The Suites apartment building.

Cattail Road

Cattail Road is a two-lane local street, with on-street parking, that runs north-south on the north side of Nelson Road. Cattail Road provides access to the Longmont Humane Society, the Boulder County Fairground Campgrounds, and serves as the east entrance to the Boulder County Fairgrounds off of Nelson Road.

Fairgrounds Lane

Fairgrounds Lane is a two-lane local street that runs north-south on the north side of Nelson Road. Fairgrounds Lane serves as the west entrance to the Boulder County Fairgrounds off of Nelson Road.

BNSF Railroad

The BNSF Railroad runs parallel to Ken Pratt Boulevard on the east side of the study area, offset by approximately 50 feet from the back of sidewalk. There are two at-grade railroad crossings at Sunset Street and Ken Pratt Boulevard. According to the *Envision Longmont* report, six to twelve heavy rail trains travel through the study area per day.

Roadway Features

Field visits were completed in December 2017 and January 2018 to verify existing roadway configurations at each intersection, verify locations and type of control at business and driveway accesses, and document existing roadway characteristics and roadway conditions within the study area. This information was compiled and analyzed in order to identify potential roadway deficiencies, which are detailed in the following section.

Within the study area, there are a total of nine signalized intersections at the following locations:

- Ken Pratt Boulevard / Hover Street
- Ken Pratt Boulevard / Village at the Peaks
- Ken Pratt Boulevard / Sunset Street
- Ken Pratt Boulevard / Nelson Road
- Hover Street / Clover Basin Drive
- Hover Street / Village at the Peaks
- Hover Street / Bent Way
- Hover Street / Nelson Road
- Nelson Road / Sunset Street

Lane configurations of these signalized intersections are depicted in **Figure 2**.

Figure 2 also displays the locations of four unsignalized intersections within the study area, which operate as full-movement intersections. The locations of these unsignalized intersections are as follows:

- Ken Pratt Boulevard / Industrial Circle (West)
- Ken Pratt Boulevard / Industrial Circle (East)
- Nelson Road / Korte Parkway
- Nelson Road / Price Road

Business and driveway accesses are fairly limited along Ken Pratt Boulevard and Hover Street, with the majority operating with 3/4 movement, right-in/right-out restrictions, or right-in only restrictions. Additionally, there are a large number of business and driveway accesses along Nelson Road that currently operate with no movement restrictions. The majority of the accesses along Nelson Road are concentrated between Ken Pratt Boulevard and Sunset Street. **Figure 2** depicts the location and type of control used at each business and driveway access within the study area.

Along with verifying the roadway configurations and type of control, characteristics documented during field visits include:

- Roadway, median, and sidewalk widths
- Locations of major structures, such as pedestrian underpasses
- Locations and legends of signs
- Locations of lighting

- Locations of guardrail, retaining walls and fences, and major drainage features
- Pedestrian curb ramp conditions and slopes
- Locations of pedestrian push buttons at signalized intersections
- Pedestrian crossing distances at signalized intersections

A general overview of these roadway characteristics can be seen in **Figure 3**. More detailed information regarding medians, guardrail, walls and fences, drainage features, and roadway deficiencies may be found in the subsequent sections. Information relating to existing pedestrian, bicycle, and transit facilities may be found in the **Pedestrian and Bicycle Conditions** and **Transit Service** sections of this report.

Median

General locations and types of existing medians, which include raised median, painted median, and two-way left turn lanes, are outlined in **Table 1**. Roadway sections not listed below are typically designated left turns, with a solid double yellow stripe to separate the left turning traffic and the opposing through traffic.

Table 1 - Median Locations and Type along Study Roadways

Roadway	Approximate Locations	Type
SH 119	South of Hover Street	Painted Median
Ken Pratt Boulevard	230’ south of Hover Street to the Village at the Peaks	Raised Concrete Median with approximately 670’ of Landscaping
Ken Pratt Boulevard	Industrial Circle (West) to 250’ south of Industrial Circle (East)	Two-Way Left Turn Lane
Ken Pratt Boulevard	Industrial Circle (East) to 435’ north of Sunset Street	Raised Concrete Median with approximately 80’ of Landscaping
Ken Pratt Boulevard	435’ north of Sunset Street to Frontage Road	Two-Way Left Turn Lane
Ken Pratt Boulevard	Nelson Road to 270’ east of Nelson Road	Raised Concrete Median
Hover Street	The Village at Burlington access to 175’ south of Ken Pratt Boulevard	Two-Way Left Turn Lane
Hover Street	Ken Pratt Boulevard to 675’ north of Nelson Road	Raised Concrete Median with approximately 820’ total of Landscaping
Nelson Road	Dry Creek Drive to Fairground Lane	Raised Concrete Median
Nelson Road	Fairgrounds Lane to 250’ east of Korte Parkway	Two-Way Left Turn Lane
Nelson Road	Access to 1448 Nelson Rd	Two-Way Left Turn Lane
Nelson Road	Price Road to 80’ west of Ken Pratt Boulevard	Painted Median

Guardrail

General locations of guardrail in **Table 2**. All existing guardrail is located on Ken Pratt Boulevard.

Table 2 - Guardrail along Study Roadways

Roadway	Location	Approximate Length
Ken Pratt Boulevard	Hover Street Intersection	30’
Ken Pratt Boulevard	650’ SW of Nelson Road Intersection	175’
Ken Pratt Boulevard	South side of Nelson Road Intersection	105’
Ken Pratt Boulevard	300’ east of Nelson Road Intersection	90’

Fence/Wall

General locations and types of existing fence and walls are outlined in **Table 3**. A majority of walls and fences are located directly at the back of sidewalk and are mostly in place for pedestrian safety.

Table 3 - Fence and Walls along Study Roadways

Roadway	Location	Type
Ken Pratt Boulevard	East and West Side of Pedestrian Underpass near Hover Street	Tiered Stone Retaining Wall
Ken Pratt Boulevard	South Island of Hover Street Intersection	Concrete Retaining Wall
Ken Pratt Boulevard	Northeast of Industrial Circle (West)	Wrought Iron Fence
Ken Pratt Boulevard	Northeast of Industrial Circle (East)	Wrought Iron Fence
Ken Pratt Boulevard	650’ SW of Nelson Road Intersection	Wrought Iron Fence
Price Road	300’ East of Nelson Road Intersection	Wrought Iron Fence
Price Road	300’ East of Nelson Road Intersection	Concrete Retaining Wall
Hover Street	Nelson Road	Wood Fence
Hover Street	Clover Basin Drive	Stone Wall
Hover Street	350’ South of Bent Way	Wrought Iron Fence
Hover Street	350’ South Bent Way, east and west side of Hover Street	Concrete Retaining Wall
Hover Street	350’ South of Bent Way, east and west side of Hover Street	Handrail
Nelson Road	Sunset Street	White Plastic Fence

Lighting

General locations of existing street lighting are outlined in **Figure 3**. Lighting is consistently spaced along Ken Pratt Boulevard, Hover Street, and Nelson Road and at the study intersections along the three roadways.

Drainage Features

General locations and types of existing drainage features are outlined in **Figure 3**. The major drainage features that were noted were Dry Creek that runs perpendicular to Hover Street near Bent Way and several locations of concrete drainage ditches along Hover Street. The concrete drainage ditch on in the northwest part of the study area appears to run from Nelson Road along Hover Street to Dry Creek where an outfall spills into the river. There are additional areas to the north and south of the study area that appear to be retention areas for storm water drainage.

Concrete drainage ditch on west side of Hover Street.

Roadway Deficiencies

The existing roadway infrastructure along each study corridor was evaluated to determine potential issues relating to roadway alignment and driver behavior, signal equipment installations, auxiliary lane configuration at signalized intersections, and overall pavement condition. **Figure 4** summarizes all observed potential issues within the study area.

Roadway Alignment and Driver Behavior

Three notable potential issues relating to roadway alignment and driver behavior were identified during the field visits. The first observation was the heavy weaving maneuver that occurred along northbound Hover Street between Ken Pratt Boulevard and Clover Basin Drive. A significant amount of southwestbound right-turning vehicles from Ken Pratt Boulevard were observed weaving across two northbound lanes, over a distance of approximately 200 feet, to turn left at Clover Basin Drive. Ultimately, these vehicles may cause a queue to form in the channelized right turn lane and prohibit vehicles from continuing straight in the outside through lane, since drivers must wait for a break in northbound traffic to complete this maneuver.

Vehicles weaving across northbound lanes Hover Street to turn left at Clover Basin Drive.

The second potential issue is the limited sight distance from the southbound right turn lane along Hover Street at Ken Pratt Boulevard to the Pedestrian Crossing warning sign at the intersection. While the warning sign was fairly visible at the time of the field visits through the leafless trees, which line the west side of Hover Street, the sign may not be visible when leaves obstruct the sight path of drivers. With little advanced warning, drivers may not have adequate time to yield to pedestrian since vehicles travel at high speeds through the channelized right turn.

View from southbound right turn lane of pedestrian crossing warning sign at Ken Pratt Boulevard and Hover Street.

View from southbound right turn lane of pedestrian crossings at Ken Pratt Boulevard and Sunset Street.

Lastly, drivers turning from Sunset Street to Ken Pratt Boulevard may not recognize pedestrians crossing the northeast and southwest approaches due to the skewed intersection and perpendicular configuration of the associated crosswalks. Vehicles turning right from Sunset Street travel approximately 100 feet along Ken Pratt Boulevard before approaching the pedestrian crossing area. Drivers could accelerate before realizing the presence of pedestrians in the crosswalk. The driver would then have a limited amount of time to react in order to yield to the pedestrians. Additionally, drivers turning left from Sunset Street seemed to recognize pedestrians in the crosswalk after they were half way through the left turn. Drivers were observed quickly slowing down to yield to pedestrians.

Signal Equipment Installations

In general, MUTCD recommends backplates to be installed on each overhead signal head for roadways with a speed limit of 45 mph or higher, and for any roadway where backplates may increase the visibility of signal heads against bright skies or busy backgrounds. Almost all overhead signal heads within the study area are currently installed without backplates, except for a few along Hover Street.

Visibility of signal heads without backplates.

Auxiliary Lane Configuration at Signalized Intersections

Existing auxiliary lane lengths were compared to the standards outlined in the 2017 Public Improvement Design Standards and Construction Specifications for the City of Longmont, Colorado and the Colorado State Highway Access Code (2002). Due to potential physical constraints, only storage length and deceleration length were considered when calculating the required total length, assuming that the taper is included in the deceleration length. More specifically, storage length was determined by multiplying the largest right and left turn volumes during the peak hour by a factor of 1.1 for left turn lanes and a factor of 0.6 for right turn lanes, respectively. This storage length was then added to a deceleration length of 375 feet for arterial streets, 260 feet for collector streets, and 180 feet for local streets. Most auxiliary lane lengths within the study area were equal to or exceeded City or Access Code requirements with the exception of the following locations shown in **Table 4**.

Table 4 - Deficient Auxiliary Lane Locations

Roadway	Intersection	Movement	Approximate Total Length (ft)	Longmont Total Length Standard (ft)	Access Code Total Length Standard (ft)	Δ (ft)
Ken Pratt Boulevard	Village at the Peaks	NE-Bound Acceleration	50	-	550	500
Hover Street	Ken Pratt Boulevard / SH 119	SB Left Turn	350	530	-	180*
Hover Street	Bent Way	NB Left Turn	370	440	-	70
Nelson Road	Sunset Street	EB Right Turn Lane	0	350	-	350
* Due to competing left turn lanes along Hover Street between Ken Pratt Boulevard and Clover Basin Drive, the SB left turn lane at Ken Pratt Boulevard may only be extended by approximately 100'.						

Pavement Condition

Overall, the existing roadway pavement within the study area appears to be in fairly good condition, with some surface wear and minor cracking throughout. Several locations of moderate concrete spalling were observed during the field visits. Spalling was typically located along joints and at bus stops. There were also short sections of damaged raised curb within the median areas along Ken Pratt Boulevard. Additionally, asphalt rutting along the wheel path of vehicles was observed along Nelson Road at the intersections of Hover Street and Sunset Street.

Surface wear of concrete pavement along Ken Pratt Boulevard.

Spalling of concrete pavement along Hover Street.

Rutting of asphalt pavement along Nelson Road at the intersection of Hover Street.

Vehicular Traffic Operations

The *Southwest Longmont Operations Study* area identifies Ken Pratt Boulevard, Hover Street, and Nelson Road as urban arterial corridors. Typically, the capacity and operations of the intersections of an urban arterial corridor define the operations of the corridor as a whole. However, speed analysis and queuing along the corridor will provide further insight into the overall health of the corridor operations. Measures of effectiveness (MOE) such as average delay per vehicle, intersection Level of Service (LOS), arterial LOS, and average queue lengths were acquired from Synchro and SimTraffic (Version 9.1, build 904, revision 125) traffic analysis software. The Synchro/SimTraffic software package utilizes criteria described in the Highway Capacity Manual, 2010 Edition (HCM 2010). SimTraffic microsimulation was primarily used to analyze LOS, vehicle delay and average queue lengths.

LOS is a measure of effectiveness used to describe operation conditions at an intersection or along a corridor. LOS categories have a range from A to F and are based on the predicted delay in seconds per vehicle, with LOS A being very good operations and LOS F having poor, congested operations. Existing corridor lane configurations and balanced peak hour traffic volumes were used to analyze the intersection LOS for both existing and future year 2040 analysis. **Table 5** summarizes the signalized intersection LOS thresholds used in this analysis.

Table 5 - Intersection Level of Service (LOS) Criteria

LOS	Signalized Delay Range (seconds/vehicle)	Two-Way Stop Control Delay Range (seconds/vehicle)
A	0 - 10	0 - 10
B	10 - 20	10 - 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	25 – 35
F	80 and above	50 and above
Source: Highway Capacity Manual, 2010		

Additionally, SEH performed a travel time and delay study to observe and quantify average peak hour travel time and delay.

Existing Traffic Conditions

Traffic count data were collected within the study area during December 2017. The traffic count data is included in **Appendix A**.

Daily Traffic Volumes

Daily traffic volumes were collected on December 5 and 6, 2017 at mid-block segments, one at each of the three main corridors within the study area. Traffic data was collected on a Tuesday and Wednesday in order to represent an average weekday. The evening peak hour-to-daily volume ratio is consistent along the three corridors with 9% of the daily volume occurring during the evening peak period. The 9% peak hour-to-daily ratio was used to estimate daily volumes along the remaining roadways within the study area. The daily traffic volumes are summarized in **Figure 5**. Traffic volumes within the study area range from 19,000 to 32,300 vehicles per day along the study corridors, with the greatest volume occurring along Hover Street.

Peak Hour Traffic Volumes

Existing turning movement counts were collected on December 5 and 6, 2017 by All Traffic Data for the following fifteen locations:

- Ken Pratt Boulevard / Hover Street (Signalized)
- Ken Pratt Boulevard / Village at the Peaks (Signalized)
- Ken Pratt Boulevard / Industrial Circle (West) (Unsignalized)
- Ken Pratt Boulevard / Sunset Street (Signalized)
- Ken Pratt Boulevard / Nelson Road (Signalized)
- Ken Pratt Boulevard / Bowen St (Signalized)
- Hover Street / Pike Road (Signalized)
- Hover Street / Clover Basin Drive (Signalized)
- Hover Street / Village at the Peaks (Signalized)
- Hover Street / Bent Way (Signalized)
- Hover Street / Nelson Road (Signalized)
- Hover Street / Rogers Road (Signalized)
- Nelson Road / Dry Creek Drive (Signalized)
- Nelson Road / Sunset St (Signalized)
- Nelson Road / Price Road (Unsignalized)

Peak hour traffic was balanced along the corridor in order to analyze and simulate traffic operations with Synchro/SimTraffic traffic analysis software.

Travel Time and Delay Study

The travel time and delay runs were performed along Ken Pratt Boulevard and Hover Street on December 5 and 6, 2017 and along Nelson Road on January 11, 2018. The runs were conducted using the Manual Method using stopwatches with the driver adhering to the Average Car driving style as described in the Travel Time Data Collection Handbook[1]. Each roadway was driven three times in both directions during the

[1] Travel Time Data Collection Handbook. Federal Highway Administration. 1998.

morning peak period and three times in the evening peak period. Running time and delay was recorded at each signalized intersection during the travel run. **Appendix A** contains the field data.

The recorded field data was then compiled and tabulated to gather average total travel time (ATTT), average total travel speed (ATTS), average total travel delay (ATTD), average total running time (ATRT), and average total running speed (ATRS). **Table 6** displays the results of the travel time and delay study.

Table 6 - Travel Time and Delay Study Results

Location		Total Trip Length (Miles)	ATTT (s)	ATTS (mph)	ATTD (s)	ATRT (s)	ATRS (mph)
Ken Pratt Blvd EB	AM Peak	1.337	126.9	38	24.7	151.6	32
	PM Peak		161.9	30	84.7	246.6	20
Ken Pratt Blvd WB	AM Peak	1.105	120.9	33	24.7	145.6	27
	PM Peak		120.9	33	43.3	164.2	24
Hover Street NB	AM Peak	0.876	95.4	33	56.0	151.4	21
	PM Peak		103.8	30	150.7	254.4	12
Hover St SB	AM Peak	0.951	106.4	32	79.7	186.1	18
	PM Peak		124.0	28	127.7	251.6	14
Nelson Rd EB	AM Peak	0.897	107.4	30	90.0	197.4	16
	PM Peak		112.7	29	94.0	206.7	16
Nelson Rd WB	AM Peak	0.807	101.5	29	30.3	131.9	22
	PM Peak		105.3	28	112.7	218.0	13

Travel time and delay was greater in the evening peak hour compared to the morning peak hour. This is to be expected after observing the increased amount of traffic along the corridor during the evening peak hour. Travel delay was mostly due to congestion and stopping at traffic signals although other effects were observed, such as left-turning vehicles blocking southbound through movement traffic at the Ken Pratt Boulevard and Hover Street intersection. Traffic also backed up during the evening peak hour from Main Street through the Ken Pratt Boulevard and Nelson Road Intersection, blocking vehicles turning left from Nelson Road.

Existing Traffic Operations

The Synchro model for this study was developed in conjunction with signal timings provided by the City of Longmont. Currently, the signals along the Ken Pratt and Hover Street corridors run on an adaptive traffic control system do not adhere to set cycle length or splits. SEH made assumptions for the cycle length in order to calibrate the model to what we observed in the field. The following assumptions were made:

- Morning peak hour cycle length along Ken Pratt Boulevard and Hover Street – 115 seconds
- Morning peak hour cycle length along Nelson Road – 105 seconds
- Evening peak hour cycle length along Ken Pratt Boulevard and Hover Street – 133 seconds

- Evening peak hour cycle length along Nelson Road – 105 seconds

Intersection signal timings were then adjusted to convey the existing traffic conditions observed during field visits. **Table 7** and **Table 8,** included at the end of the report, display the morning and evening peak hour SimTraffic operations results including LOS and queuing information. The level of service worksheets and SimTraffic outputs are contained in **Appendix C** for reference.

An overview of the existing intersection level of service (LOS) results are displayed in **Figure 6** and **Table 9**. There may be some instances where individual movements operate poorly; however, intersections were evaluated based on the City of Longmont's benchmark for the quality of life for traffic operations. The City's benchmark sets the standard for intersection operations at LOS D. Additionally, the City's benchmark for any of the directional traffic movements comprising five percent or more of the total entering volume of a signalized intersection is LOS D. Movements at signalized intersections consisting of more than five percent of the total entering volume and LOS below "D" are displayed in **Table 10**.

Table 9 - Existing Intersection Level of Service (LOS) Results

Intersection	AM / PM Peak Hour	
	LOS	Delay (sec/veh)
Ken Pratt Boulevard / Hover Street	D / F	44.0 / 119.9
Ken Pratt Boulevard / Village at the Peaks	D / B	38.9 / 15.6
Ken Pratt Boulevard / Industrial Circle	A / A	4.4 / 4.2
Ken Pratt Boulevard / Sunset Street	D / E	48.3 / 59.4
Ken Pratt Boulevard / Nelson Road	B / B	14.7 / 15.7
Hover Street / Clover Basin Drive	B / C	19.2 / 28.1
Hover Street / Village at the Peaks	A / A	3.4 / 7.9
Hover Street / Bent Way	A / C	9.0 / 28.4
Hover Street / Nelson Road	C / E	26.9 / 74.1
Nelson Road / Sunset Street	C / C	22.6 / 30.9
Nelson Road / Price Road	A / A	5.0 / 6.9

Table 10 - High Volume Movement Level of Service (LOS)

Intersection	Movement	LOS	% Total Entering Vehicles
		AM / PM	AM / PM
Ken Pratt Boulevard / Hover Street	NBT	D / F	13.5% / 16.0%
	EBL	F / F	4.6% / 12.7%
	EBT	C / F	8.9% / 17.3%
	WBT	E / E	20.4% / 10.5%
Ken Pratt Boulevard / Village at the Peaks	SBL	E / D	2.7% / 9.2%
Ken Pratt Boulevard / Sunset Street	NBT	F / F	8.3% / 10.9%
	SBT	E / F	14.8% / 6.9%
	SBR	D / F	5.2% / 3.2%
Hover Street / Clover Basin Drive	EBL	D / E	2.6% / 6.7%
Hover Street / Nelson Road	NBT	C / E	14.9% / 27.5%
	SBL	C / E	7.2% / 4.7%
	EBL	E / F	2.9% / 10.2%
	EBT	D / E	9.0% / 10.3%
	WBT	D / F	9.2% / 7.6%

According to the results of the analysis, the signalized intersection of Ken Pratt Boulevard and Hover Street operates at a LOS F, Ken Pratt Boulevard and Sunset Street operates at a LOS E, and Hover Street and Nelson Road operates at a LOS E during the evening peak hour. All other intersections operate at a LOS D or better during both the morning and evening peak hour.

In addition to the intersection LOS evaluation, queues along Ken Pratt Boulevard, Hover Street and Nelson Road were reviewed to identify areas of congestion and confirm observations made during the travel time and delay study. SimTraffic traffic analysis software was used to determine average queue lengths for each movement along the three roadways. The average queue lengths for each intersection movement are tabulated in **Table 7** and **Table 8** at the end of the report.

Long queues along Ken Pratt Boulevard generally occur in the southwest-bound direction in the morning peak hour and the northeast-bound direction in the evening peak hour. Hover Street generally has larger queues in the southbound direction in the morning peak hour and northbound in the evening peak hour. Nelson Road experiences larger queues in evening peak hour in both directions of travel. The reported queues are consistent with the peak hour commuting travel direction of each roadway.

Queue along northbound Hover Street at the intersection of Ken Pratt Boulevard.

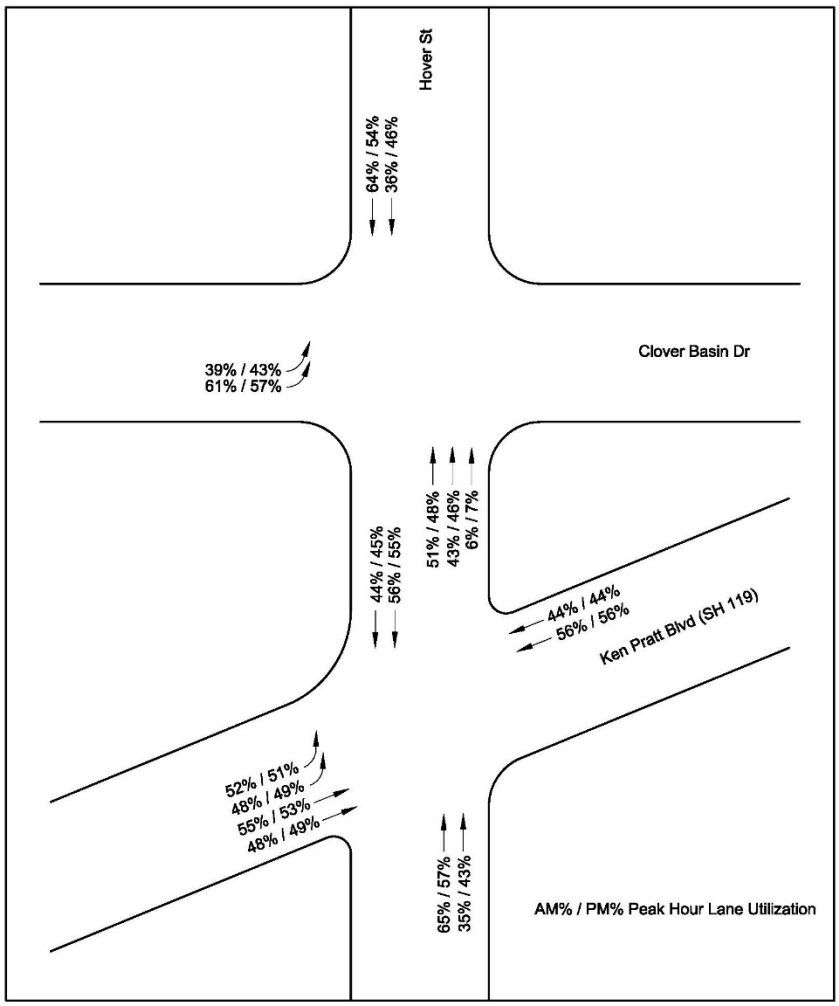
Lane Utilization

Lane utilization was collected on the same days the turning movement counts were collected, on December 5 and 6, 2017, at the following four locations:

- Ken Pratt Boulevard / Hover Street
- Hover Street / Clover Basin Drive
- Ken Pratt Boulevard / Nelson Road
- Nelson Road / Hover Street

Of the four intersections, the two that were the highest priority of this study were the intersections of Ken Pratt Boulevard and Hover Street, and Hover Street and Clover Basin Drive. **Figure 7** displays the existing lane utilization at each intersection by movement.

Figure 2– Existing Lane Utilization



As displayed, several movements encounter unbalanced lane distributions. Northbound traffic at the intersection of Hover Street and Clover Basin Drive tend to use the two inside through lanes instead of the recently assigned shared through plus right turn lane. Drivers seem to be weaving to the inside through lanes in order to turn left at Clover Basin Drive or in anticipation of the lane terminating at Nelson Road. In addition, drivers may be familiar with the old lane configuration where the outside lane terminated at Clover Basin Drive and may not realize that the lane continues as a through lane to Nelson Road. The southbound traffic at the intersection of Hover Street and Clover Basin Drive has a higher percentage of vehicles utilizing the far right through lane. Drivers may be making a decision to use that lane in order to make the lane change easier to turn right and merge onto SH 119.

Additionally, the northbound through movement at the intersection of Hover Street and Ken Pratt Boulevard experiences an imbalance in utilization with vehicles favoring the inside through lane. The imbalance may be occurring due to the lane addition further south on Hover Street where the roadway transitions from one to two northbound lanes. Drivers traveling north on Hover Street might tend to stay in the lane that they were already in if they do not anticipate making a movement.

Future Traffic Conditions

The future year for this study is 2040, consistent with the horizon year for the 2040 DRCOG travel demand Focus model developed for the City of Longmont.

2040 Traffic Forecasts

Traffic volume forecasts were developed for roadways within the project area in order to identify the roadway and intersection improvements needed to accommodate future traffic growth.

Socioeconomic data and traffic forecasts from the DRCOG regional travel demand Focus model and the 2040 travel demand model developed for the City of Longmont were reviewed to evaluate projected transportation trends along Hover Street, Nelson Road, Ken Pratt Boulevard, and the intersecting roadways. The roadway networks in the 2015 and 2040 models were checked for the reasonableness of the assumptions of facility types, connections, and laneage within the vicinity of the project area.

The socioeconomic data in the DRCOG and Longmont travel demand models were reviewed and compared for the Transportation Analysis Zones (TAZs) generally located immediately west of Hover Street, north of Nelson Road, south of Ken Pratt Boulevard, and west of Main Street. The TAZ system for the Longmont travel demand model varies from the DRCOG model because TAZs in the Longmont model were disaggregated to improve the distribution of the socioeconomic data and the access points to the roadway system. This was considered in the comparison and review of the models. The 2015 and 2040 land use values in the TAZs within the vicinity of the project area are shown in **Table 11**.

As shown in **Table 11**, the DRCOG socioeconomic data assumes little to no growth in employment and households within the TAZs in the project area. The Longmont model has growth in employment in the area surrounding the Hover Street and Nelson Road intersection and growth in households in the same area around that intersection, as well as southeast of Ken Pratt Boulevard. This growth within the Longmont model land use data generally created higher traffic volume growth along the Hover Street corridor.

Table 11 - DRCOG and Longmont Travel Demand Model's TAZ Socioeconomic Data

DRCOG Focus Model					Longmont Model								
TAZ	2015		2040		TAZ	2010				2040			
	TotEmp	TotHH	TotEmp	TotHH		TotEmp	TotHH	TotEmp	TotHH	TotEmp	TotHH	TotEmp	TotHH
28	196	48	88	48	**28**	20	37	73	37	20	37	156	38
					2833	53	0			136	1		
145	650	630	614	624	**145**	5	328	525	724	5	328	711	728
					2873	215	0			215	0		
					2874	300	0			486	0		
					2875	5	396			5	400		
180	619	94	613	94	**180**	10	17	320	33	406	20	964	51
					2918	10	0			105	15		
					2919	300	16			453	16		
181	972	147	944	138	**181**	100	0	1,300	135	100	0	1,407	135
					2920	20	0			20	0		
					2921	200	0			200	0		
					2922	480	0			480	0		
					2923	500	135			607	135		
187	1,933	104	1,858	101	**187**	500	104	1,600	104	500	104	1,600	104
					2926	600	0			600	0		
					2927	500	0			500	0		
188	551	531	449	517	**188**	200	206	340	568	203	270	343	632
					2928	100	167			100	167		
					2929	40	195			40	195		
190	1,187	384	1,154	359	**190**	700	1	850	402	723	156	873	557
					2931	150	401			150	401		
191	1,721	3	1,687	3	**191**	200	0	1,350	2	200	0	1,708	70
					2932	150	2			168	70		
					2933	250	0			250	0		
					2934	200	0			500	0		
					2935	300	0			340	0		
					2936	250	0			250	0		
192	2,234	3	2,220	3	**192**	400	0	1,800	0	450	0	1,950	0
					2937	300	0			300	0		
					2938	350	0			350	0		
					2939	400	0			400	0		
					2940	350	0			450	0		
193	1,439	507	1,373	468	**193**	500	0	1,340	436	500	0	1,620	816
					2941	500	0			500	0		
					2942	300	0			500	0		
					2943	40	436			120	816		
198	678	168	1,399	160	**198**	1,600	1	2,000	2	1,635	10	2,216	11
					2955	0	1			111	1		
					2956	400	0			470	0		
Total:	12,180	2,619	12,399	2,515				11,498	2,443			13,548	3,142

Due to the complexity of real-world travel behavior and individual roadway characteristics, travel demand forecasting models cannot be expected to result in precise representations of traffic volumes on each roadway. A post-processing adjustment uses comparisons of the base year model's predicted traffic volumes versus actual traffic counts. These comparisons provide estimations of the error associated with the model's representations of existing conditions. The model-produced forecasts are then adjusted to account for the errors found in the model to provide more reliable forecasts. This post-processing adjustment methodology, as prescribed in the National Cooperative Highway Research Program (NCHRP) Report 255 and NCHRP Report 765 (an update to 255), was applied to the DRCOG model output to develop initial traffic forecasts. These initial forecasts were compared to the adjusted traffic forecast outputs from the Longmont model to estimate daily 2040 traffic forecasts for use with this study.

The 2040 Baseline daily traffic forecasts developed for the study are summarized in **Table 12**.

Table 12 – 2040 Baseline Daily Traffic Forecasts

Road Segment		Existing Counts (2017)	2040 Forecast
Ken Pratt Boulevard	West of Hover Street	30,000	38,000
	East of Hover Street	23,000	31,000
	East of Village at the Peaks	28,000	35,000
	East of Industrial Circle	27,950	34,000
	East of Sunset Street	26,000	33,000
	East of Sherman Street	37,000	45,000
Hover Street	South of Ken Pratt Boulevard	25,650	30,000
	North of Ken Pratt Boulevard	36,400	46,000
	South of Nelson Road	32,300	42,000
	North of Nelson Road	27,980	37,000
Nelson Road	West of Hover Street	14,510	16,000
	West of Sunset Street	19,000	21,000
	East of Sunset Street	13,765	18,000
Sunset Street	South of Ken Pratt Boulevard	10,625	11,000
	North of Ken Pratt Boulevard	10,500	12,000
	North of Nelson Road	14,790	16,000
Clover Basin Drive	West of Hover Street	19,000	26,000
Bent Way	West of Hover Street	9,200	11,000
	East of Hover Street	16,200	17,500
Industrial Circle	North of Ken Pratt Boulevard	1,350	1,500
Village at the Peaks	North of Ken Pratt Boulevard	6,200	7,000
Village at the Peaks	East of Hover Street	3,990	4,500

2040 Traffic Operations

Traffic along each major arterial roadway, within the study area, is projected to increase significantly by the forecast year 2040 with approximately 25% more volume along Ken Pratt Boulevard, 30% along Hover Street and 10% along Nelson Road. Traffic along the minor roadways is also expected to increase. Projected peak hour turning movement counts and average daily volumes are displayed in **Figure 8**. The 2040 peak hour traffic overall operations by movement and intersection are displayed in **Figure 9** and summarized in **Table 13** and **Table 14,** attached at the end of the report. The level of service worksheets and SimTraffic outputs are contained in **Appendix C** for reference. As expected, intersection operations suffer greatly in the 2040 peak hour condition due to the increased traffic volume. The AM peak hour is expected to see several intersections fall below the desired LOS D, including: Ken Pratt Boulevard/Hover Street, Ken Pratt Boulevard/Village at the Peaks, Ken Pratt Boulevard/Sunset Street, and Hover Street/Clover Basin Drive. The PM peak hour is expected to see seven out of 11 of the intersections operate below LOS D, six of those with a LOS F. Travel time is also expected to be much greater in the 2040 condition with multiple intersections projected to see several minutes of additional delay. Hover Street is projected to see the largest increase in travel time delay due to increased congestion. **Table 15** displays a comparison between the existing and 2040 conditions.

Table 15 - 2040 Intersection Level of Service (LOS) Results

Intersection	AM / PM Existing Peak Hour		AM / PM 2040 Peak Hour		Difference (sec/veh)
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	
Ken Pratt Boulevard / Hover Street	D / F	44.0 / 119.9	F / F	164.8 / 332.4	120.8 / 212.5
Ken Pratt Boulevard / Village at the Peaks	D / B	38.9 / 15.6	F / B	85.8 / 12.5	46.9 / -3.1
Ken Pratt Boulevard / Industrial Circle	A / A	4.4 / 4.2	A / A	6.2 / 5.5	1.8 / 1.3
Ken Pratt Boulevard / Sunset Street	D / E	48.3 / 59.4	F / F	121.5 / 91.4	73.2 / 32.0
Ken Pratt Boulevard / Nelson Road	B / B	14.7 / 15.7	C / C	29.6 / 23.5	14.9 / 7.8
Hover Street / Clover Basin Drive	B / C	19.2 / 28.1	E / F	70.9 / 148.5	51.7 / 120.4
Hover Street / Village at the Peaks	A / A	3.4 / 7.9	A / F	5.1 / 120.3	1.7 / 112.4
Hover Street / Bent Way	A / C	9.0 / 28.4	B / F	15.4 / 151.7	6.4 / 123.3
Hover Street / Nelson Road	C / E	26.9 / 74.1	D / F	39.2 / 225.4	12.3 / 151.3
Nelson Road / Sunset Street	C / C	22.6 / 30.9	C / E	23.9 / 57.8	1.3 / 26.9
Nelson Road / Price Road	A / A	5.0 / 6.9	C / B	15.6 / 10.2	10.6 / 3.3

By 2040, increased queues are expected if no improvements are made to the existing roadways and intersections. Many left turning lanes are projected to back up into through movement traffic which will cause additional congestion along each roadway. Queues are also projected to extend beyond upstream intersections as well along Hover Street in several areas. Average queue lengths for the 2040 conditions are summarized by movement in **Table 13 and Table 14** at the end of the report.

Vehicular Crash History and Analysis

DiExSys, LLC compiled and analyzed crash history along Ken Pratt Boulevard, Hover Street, and Nelson Road for a five year period from January 1, 2012 to December 31, 2016. The crash data for the corridor was provided by CDOT, as collected from State Patrol and Boulder County Sheriff. A Baseline Safety Analysis report was submitted by DiExSys, dated January 2018. The report is referenced in **Appendix D**. The following provides a summary of the crash history analysis findings contained within the Baseline Safety Analysis report. The analysis utilized the five years of crash history to determine how the intersections compare with intersections in the state using Colorado-specific Safety Performance Functions.

The five year crash data was compiled an analyzed for the following locations:

- Ken Pratt Boulevard / Hover Street
- Ken Pratt Boulevard / Village at the Peaks
- Ken Pratt Boulevard / Industrial Circle (West)
- Ken Pratt Boulevard / Sunset Street
- Ken Pratt Boulevard / Frontage Road
- Ken Pratt Boulevard / Nelson Road
- Hover Street / Clover Basin Drive
- Hover Street / Trade Centre Avenue
- Hover Street / Village at the Peaks
- Hover Street / Bent Way
- Hover Street / Nelson Road
- Nelson Road / Fairgrounds Lane
- Nelson Road / Cattail Road
- Nelson Road / Korte Parkway
- Nelson Road / Sunset Street
- Nelson Road / Price Road

Crash data is displayed in **Figure 10**. Additionally, five-year crash data was compiled and analyzed for non-intersection related crashes along Ken Pratt Boulevard, Hover Street, and Nelson Road.

Safety Performance Functions and Level of Service of Safety

The assessment of the magnitude of safety problems on roadway segments and intersections was developed through the use of CDOT's most recent Safety Performance Functions (SPF). The SPF reflects the relationship between traffic exposure measured in Annual Average Daily Traffic (AADT), and crash count for a unit of road section measured in crashes per mile per year for segments, or crashes per year for intersections. The SPF models provide an estimate of the normal or expected crash frequency and severity for a range of AADT among similar facilities. Two kinds of Safety Performance Functions were developed. The first one addresses the total number of crashes and the second one looks only at crashes involving an

injury or fatality. Together they allow us to assess the magnitude of the safety problem from the frequency and severity standpoint.

Development of the SPF lends itself well to the conceptual formulation of the Level of Service of Safety (LOSS). The concept of level of service uses quantitative measures and qualitative description that characterize safety of a roadway segment in reference to its expected frequency and severity. If the level of safety predicted by the SPF represents a normal or expected number of crashes at a specific level of AADT, then the degree of deviation from the norm can be stratified to represent specific levels of safety. The four LOSS descriptions that correlate to the various degrees of deviation are as follows.

- LOSS I - Indicates low potential for crash reduction
- LOSS II - Indicates low to moderate potential for crash reduction
- LOSS III - Indicates moderate to high potential for crash reduction
- LOSS IV - Indicates high potential for crash reduction

Most recent Colorado-specific SPFs were used for the assessment of the magnitude of the safety problem on this project. Frequency and severity of crashes predicted by the SPF is compared with frequency and severity observed at a specific location. The subsequent sections provide an overview of the findings.

Intersection-Related Crashes

Ken Pratt Boulevard / Hover Street

During the study period, 132 crashes were reported at or related to the intersection with 44 of those crashes involving injuries and at total of 62 people reported as injured. There were no fatal crashes at the intersection during the study period.

Rear end was the most common type, followed by Approach Turn (Left turning vehicle collides with opposite direction vehicle). Rear end collisions may simply reflect congestion at this intersection but countermeasures including improved signal coordination or decision zone protection may be made.

The intersection performs at LOSS-IV from the crash frequency standpoint, reflecting **high potential for crash reduction**.

Ken Pratt Boulevard / Village at the Peaks

During the study period there were 11 crashes reported at the intersection with three involving injuries and a total of four people reported as injured. There were no fatal crashes at the intersection during the study period.

Rear end was the most common type of collision at the intersection. Direct diagnostic analysis does not find any patterns of crashes at this intersection during the study period.

The intersection performs at LOSS-I from the crash frequency standpoint, reflecting **low potential for crash reduction**.

Ken Pratt Boulevard / Industrial Circle

During the study period there were six crashes reported at the intersection with two involving injuries and a total of two people reported as injured. There were no fatal crashes at the intersection during the study period.

Broadside is the most common type of collision at the intersection. Although just short of the crash pattern definition threshold of 5 in 5 years, broadsides account for 66.7% of crashes at the intersection, against a norm of 25.8% at similar intersections statewide, suggesting that there may be a factor contributing to broadsides at the intersection such as limited sight distance from the landscaping in the area.

The intersection performs at LOSS-II from the crash frequency standpoint, reflecting **low to moderate potential for crash reduction**.

Ken Pratt Boulevard / Sunset Street

During the study period there were 36 crashes reported at the intersection with four involving injuries and a total of four people reported as injured. There were no fatal crashes at the intersection during the study period.

Direct diagnostic analysis shows overrepresentation of single vehicle and run off the road crashes in comparison with similar intersections statewide. Also, although short of the pattern criteria of five crashes in five years, even two crashes of a generally rare type such as bicycle is an unusual coincidence.

The intersection performs at LOSS-II from the crash frequency standpoint, reflecting **low to moderate potential for crash reduction**.

Ken Pratt Boulevard / Frontage Road

During the study period, there were zero crashes reported at the intersection.

Ken Pratt Boulevard / Nelson Road

During the study period there were 26 crashes reported at the intersection with eight involving injuries and a total of 13 people reported as injured. There were no fatal crashes at the intersection during the study period.

Rear End collisions represent the largest amount of reported crashes at the intersection. Direct diagnostics analysis shows that there are no abnormal crash patterns readily susceptible to correction.

The intersection performs at LOSS-II from the crash frequency standpoint, reflecting **low to moderate potential for crash reduction**.

Hover Street / Clover Basin Drive

During the study period 105 crashes were reported at this intersection with 40 involving injuries and a total of 62 people reported as injured. There were no fatal crashes at the intersection during the study period.

Direct diagnostics analysis shows that injury crashes, three or more vehicles crashes and broadsides are over-represented. Additionally, bicycle crashes have a relatively high prevalence.

This intersection performs at LOSS-III from the crash frequency standpoint reflecting **moderate to high potential for crash reduction**.

Hover Street / Trade Centre Ave

During the study period 11 crashes were reported at this intersection with two involving injuries and a total of four people reported as injured. There were no fatal crashes at the intersection during the study period.

Rear End collisions represent the largest amount of crashes at the intersection and direct diagnostic analysis shows that rear end crashes are overrepresented.

This intersection performs at LOSS-III from the crash frequency standpoint, reflecting **moderate to high potential for crash reduction**.

Hover Street / Village at the Peaks

Since the completed intersection did not exist during the study period, there is no crash history to report for the existing configuration. The reasonable (conservative) best estimate is that safety performance will be at the mean for similar intersections handling the same volumes. This is conservative since well-designed new facilities, tend to perform somewhat better than average from the safety standpoint. It is expected that the intersection will experience about 4.73 crashes per year with approximately 1.20 injury and fatal crashes per year.

Hover Street / Bent Way

During the study period there were 73 crashes reported at the intersection with 25 involving injuries and a total of 39 people reported as injured. There were no fatal crashes at the intersection during the study period.

Rear End collisions represent the largest amount of crashes at the intersection followed by Approach Turn and Broadside. Direct diagnostics analysis shows that no crash types quite meet the threshold to be identified as a pattern. Additionally, although not meeting the pattern identification criteria of 5 crashes in 5 years, the grouping of 3 crashes of rare types (pedestrian and bicycle) may be indicative of an issue at the intersection.

The intersection performs at LOSS-IV from the crash frequency standpoint, reflecting **high potential for crash reduction**.

Hover Street / Nelson Road

During the study period there were 114 crashes reported at the intersection with 34 involving injuries and a total of 45 people reported as injured. There were no fatal crashes at the intersection during the study period.

Direct diagnostics analysis shows that sideswipe same direction and crashes during rain are over-represented. Additionally, bicycle crashes fall just short of the crash pattern definition threshold; however, four crashes in five years is concerning due to the fact that bicycle crashes have a high probability of injuries.

The intersection performs at LOSS-IV from the crash frequency standpoint, reflecting **high potential for crash reduction**.

Nelson Road / Fairgrounds Lane

During the study period, there were zero crashes reported at the intersection.

Nelson Road / Cattail Road

During the study period, there were zero crashes reported at the intersection.

Nelson Road / Korte Parkway

During the study period there were two crashes reported at the intersection with one involving injuries and a total of 2 people reported as injured. There were no fatal crashes at the intersection during the study period.

Approach Turn collisions were the only reported crashes at the intersection. Direct diagnostics analysis shows that there are no abnormal crash patterns readily susceptible to correction.

The intersection performs at LOSS-II from the crash frequency standpoint, reflecting **low to moderate potential for crash reduction**.

Nelson Road / Sunset Street

During the study period there were 22 crashes reported at the intersection with seven involving injuries and a total of 14 people reported as injured. There were no fatal crashes at the intersection during the study period.

Rear End collisions represent the largest amount of reported crashes at the intersection. Direct diagnostics analysis shows that there are no abnormal crash patterns readily susceptible to correction.

The intersection performs at LOSS-I from the crash frequency standpoint, reflecting l**ow potential for crash reduction**.

Nelson Road / Price Road

During the study period there were three crashes reported at the intersection with zero involving injuries. There were no fatal crashes at the intersection during the study period.

Rear End collisions represent the largest amount of reported crashes at the intersection. Direct diagnostics analysis shows that there are no abnormal crash patterns readily susceptible to correction.

The intersection performs at LOSS-II from the crash frequency standpoint, reflecting **low to moderate potential for crash reduction**.

Non-Intersection Related Crashes on Segments

Ken Pratt Boulevard

During the study period, 48 non-intersection crashes were reported in the study area along Ken Pratt Boulevard between Hover Street and Nelson Road. 15 crashes involved injuries with a total of 21 people reported as injured. There were no fatal crashes along Ken Pratt Boulevard during the study period.

Rear End crashes represent the largest percentage of crash types along the corridor. Rear End crashes are typically associated with congestion and stopped traffic at intersections. Additionally, most crashes were recorded in the proximity of surrounding intersections which may indicate congestion or human error with recording the crash as non-intersection related.

The two head on collisions are a type rare enough to warrant closer investigation. Both occurred at night, in January and during icy road conditions. In the first event a westbound driver lost control on the curve approaching Hover Street, slid through the intersection and struck an eastbound bus that was the first vehicle waiting at the red arrow to turn left. Though reported as a non-intersection crash, the fact that there is no (and can be no) raised median within the intersection contributed to the crash. The second crash involved an eastbound, alcohol-impaired driver crossing the two way left turn lane striped median east of the west Industrial Circle intersection and colliding with a westbound vehicle. The officer noted that no pavement markings were visible through the ice and snowpack. Both drivers were injured. While this only occurred once in 5 years, it does bring light to the fact that the median is paved, and striped as a TWLTL, even though there are no opportunities to turn on either side of Ken Pratt Boulevard between the two Industrial Circle intersections.

Hover Street

There were 123 crashes listed as non-intersection related on Hover Street within the study limits. A majority of the crashes were Rear End (89 crashes) and Sideswipe Same Direction (23 crashes). These crash types usually indicate issues with congestion. Additionally, many of the crashes (69 total crashes) occurred within 150 feet of intersections and may have been wrongly coded as non-intersection related.

Nelson Road

There were 16 non-intersection crashes reported on Nelson Road within the study limits. Nine of the crashes were reported within 300 feet of Hover Street which may indicate that they were, in fact, intersection related. Also, of the 16 crashes, 10 were reported as “at driveway access” with five crashes located near Sunset Street, four near Ken Pratt Boulevard and one near Hover Street. The concentration of business accesses along Nelson Road between Ken Pratt Boulevard and Sunset Street may be an issue contributing to crashes along Nelson Road.

Pedestrian and Bicycle Conditions

The three principal arterials, which define the study area, include a range of bicycle and pedestrian facilities to serve non-motorized travel and provide access to transit. Generally, sidepaths, sidewalks, and off-street trails provide access along the corridors and within the study area. There are also on-street bicycle lanes along Nelson Road.


Sidepath along Ken Pratt Boulevard.

The condition of the bicycle and pedestrian facilities was field reviewed and documented for Ken Pratt Boulevard, Hover Street, and Nelson Road. The items measured during the field review were compared with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for Hover Street and Nelson Road. Due to the City's intergovernmental agreement with the Colorado Department of Transportation (CDOT), the pedestrian and bicycle facilities along Ken Pratt Boulevard/SH 119 were compared to the United States Access Board's Proposed Right-of-Way Accessibility Guidelines (PROWAG), since CDOT has adopted these new standards. The field review of the existing bicycle and pedestrian facilities was also utilized to conduct the analyses outlined below.

The pedestrian LOS for intersections along the three roadways was obtained from Synchro (Version 9.1, build 904, revision 125) traffic analysis software using the HCM 2010 methods (Highway Capacity Manual 2010, Transportation Research Board, Washington, DC, 2010.). Additionally, data was obtained to assess the Bicycle Level of Traffic Stress and the Bicycle LOS along Nelson Road, which includes on-street bicycle lanes.

Longmont Pedestrian and Bicycle Connectivity

The *Envision Longmont Multimodal & Comprehensive Plan* identifies implementing "*a complete balanced and connected transportation system*" as a guiding principle for the community. This is supported by policies and goals which address the need for multimodal connections between key destinations, to minimize barriers to active transportation, to provide accessible high quality pedestrian facilities in key areas of pedestrian activity, and to continue to upgrade and adapt street crossings for sidepaths and off-street trails.


Pedestrian crossing area at Hover Street and Nelson Road intersection.

Connectivity through the study area and to the greater community is reliant upon such goals and policies. **Figure 11** illustrates the existing and planned pedestrian and bicycle network in the immediate study area. The primary connections in the area are made up of existing sidewalks and sidepaths along the three corridors which shape the triangular Regional Center anchored by the Village at the Peaks. There are some short segments of attached sidewalks within the area and also sidewalk gaps identified.

Within the triangular area bounded by the study corridors, Sunset Street crosses the northeast corner and includes shared lanes and sidewalks. There is also a future planned trail connection across the triangle which will connect to the Dry Creek Greenway to Ken Pratt Boulevard, via the new Hover Street underpass.

Figure 11 also highlights the transit stops within the study area, as well as the nearby key land uses such as residential neighborhoods, the Downtown commercial area, schools, greenways, and recreational or natural areas. Sidepaths connect the area to Downtown Longmont and sidepaths and bike lanes connect to the west along Nelson Road. The new underpass located south of the SH 119 and Hover Street intersection facilitates safe east-west crossings, allowing users to avoid the large and complex skewed intersection.

Pedestrian and Bicycle Facility Conditions

As previously explained in the **Roadway Network Conditions** section of this report, field visits were completed in December 2017 and January 2018 to document existing roadway characteristics and conditions within the study area. This documentation included collecting data and noting general conditions of the existing pedestrian and bicycle facilities along each corridor. More specifically, the following information was collected:

- Pedestrian Curb Ramps:
  - General layout
  - Running slope of ramp
  - Cross slope and running slope of landing areas
  - Ramp lengths that appeared to be excessive
  - Installation of truncated domes
  - Location of utility structures
- Facilities at Signalized Intersections:
  - Approximate location of pedestrian push buttons in relation to the curb ramp landing area and crossing area
  - Pedestrian crossing distances
  - Type of pedestrian signal indication (i.e. countdown signal)
  - Timing of pedestrian signal indications (i.e. walk interval, change interval)
- Facilities along Pedestrian Access Route:
  - Width of pedestrian access route
  - Vertical surface discontinuities over 1/2”
  - Running slope of pedestrian access route that appeared to be excessive
  - Adverse slopes of adjacent planting area
  - Pedestrian facilities for adjacent at-grade rail crossings
  - Potential maintenance issues (i.e. cracking, spalling, and settlement of concrete facilities)

Figure 12 summarizes the information collected during the field visits. This information includes: type/location of pedestrian and bicycle facilities, potential compliance issues with ADAAG/PROWAG, and observed moderate/major maintenance issues. A detailed list of this information may be found in **Appendix B-1** of this report.

The existing pedestrian signal indication timing was also evaluated based on standards outlined in the Manual of Uniform Traffic Control Devices (MUTCD). Measured pedestrian crossing distances at signalized intersections were divided by 4 feet per second to determine the minimum required pedestrian

change intervals. A walking speed of 4 feet per second was assumed due to the low pedestrian volume and high congestion throughout the study area. These times were then compared to the actual pedestrian signal indication times observed to determine if the existing time provided to cross each intersection leg is sufficient.

Curb ramp with PROWAG compliance issues at Ken Pratt Boulevard and Sunset Street intersection.

Overall, the majority of ADAAG/PROWAG compliance issues observed within the study area were due to steep curb ramp slopes, lack of truncated domes, lack of level landing areas, and excessive vertical surface discontinuities. Additionally, approximately 55% of the existing curb ramps within the study area are diagonal curb ramps. Although diagonal curb ramps comply with ADAAG/PROWAG requirements in extreme circumstances, they are not a preferred installation.

Most of the maintenance issues identified in **Figure 12** relate to moderate/major concrete cracks, spalling, and settlement along the pedestrian access route. Although additional minor maintenance issues were observed, only issues that may impact pedestrian and bicycle travel along the corridor were identified for purpose of this report.

All of the existing pedestrian change interval times met minimum requirements. More detailed information regarding specific times may also be found in **Appendix B-1** for each signalized intersection.

Ken Pratt Boulevard

Ken Pratt Boulevard includes sidepaths along the study corridor for bicyclists and pedestrians to share. One missing sidewalk connection was identified at Industrial Circle (West), leading to the surrounding businesses. The four-lane divided roadway includes left and right turn lanes at every intersection. Crosswalks are only marked at signalized intersections. The percentage of curb ramps on the corridor that are oriented diagonally is 38%. The majority of the PROWAG compliance and maintenance issues are concentrated at the intersection with Sunset Street.

At-grade rail crossing and narrow sidewalks south of skewed Ken Pratt Boulevard and Sunset Street.

Several schools are located south of Ken Pratt Boulevard along Sunset Street which has narrow (4 foot) attached sidewalks that may be stressful for students walking to school and bus stops. Adding to this is the complexity of crossing the skewed intersection at Ken Pratt Boulevard and Sunset Street, which has channelized right turns and the BNSF railroad crossing east of Ken Pratt Boulevard.

The skewed intersection at Hover Street makes for an exceptionally long pedestrian crossing of 135 feet without a median refuge on the east leg. South of the Hover Street intersection, there is a new Bike Share station, covered bike shelter, and underpass providing a useful east-west connection in the area.

Newly constructed SH 119 underpass west of Hover Street.

Hover Street

Currently, there are sidepaths along Hover Street for bicyclists and pedestrians to share, including a new segment of sidepath on the east side adjacent to Village at the Peaks. The five-lane divided roadway includes left and right turn lanes at full access intersections. Crosswalks are only marked at signalized intersections. The percentage of curb ramps that are oriented diagonally on the corridor is 73%, many of which are newly constructed at Village at the Peaks.

Newly constructed Hover Street underpass south of Bent Way.

The Dry Creek Greenway trail connection is planned to provide connectivity via the new underpass of Hover Street south of Bent Way. The trail will allow for complete connectivity between the Hover Street and Ken Pratt Boulevard facilities for pedestrians and bicycles across the triangular area.

Nelson Road

There is a mixture of attached sidewalks, sidepaths, and on-street bicycle lanes along the Nelson Road study corridor. The four-lane undivided roadway includes marked crosswalks and left and right turn lanes at signalized intersections. The percentage of curb ramps along the corridor that are of diagonal orientation is 67%.

Pedestrian accommodations along the Nelson Road lack consistency and accessibility. Along the south side of Nelson Road there is no sidewalk for 450 feet between Cattail Road and Korte Parkway. East of Sunset Street there are narrow 4 foot attached sidewalks on north side, which appear to be in fair condition. On this segment of Nelson Road, there are also no accessible pedestrian access routes provided through the driveway accesses since the cross slopes exceed 2%.

Raised sidepath along Nelson Road in front of GE buildings.

Some sidepaths are raised above the roadway grade resulting in steep sidepath and curb ramp running slopes at driveways. This occurs in front of GE buildings on the north side between Cattail Road and Sunset Street and on the south side between Hover Street and Cattail Road.

Despite the presence of bicycle lanes on Nelson Road, it is a challenging corridor for bicyclists because the lanes terminate in advance of the intersections at Hover Street and Ken Pratt Boulevard. This requires bicyclists to either exit to a sidepath or share the lane with vehicular traffic in the most difficult areas to do so. Such conditions typically appeal to only the "strong and fearless" bicyclists.

Pedestrian and Bicycle Operations

Bicycle and pedestrian operations along the three corridors were analyzed to assist with the identification of system gaps and potential improvement options. Pedestrian and bicycle counts were taken during the same morning and evening peak hour as the vehicular traffic volumes. It is recognized that colder, winter months is expected to be an atypical representation of actual pedestrian and bicycle volumes for this study area. Past regional studies from DRCOG indicate that pedestrian and bicycle volumes can be potentially four times higher or more in the warmer, summer months. Additionally, peak pedestrian and bicycle volumes tend to occur during the middle of the day, on the weekend, whereas the data provided for this study was taken during the morning and evening peak hours for vehicular traffic volumes, during the middle of the week. Though there is a disconnect between peak vehicular traffic volume and peak pedestrian/bicycle volumes, this project will work to improve multi-modal facilities as it relates to facility deficiencies and safety throughout the study area. **Figure 13** displays the bicycle and pedestrian volumes collected in December 2017, and the analysis results of the operations.

Pedestrian Intersection LOS

The pedestrian intersection conditions analysis in this study uses the methodology for evaluating pedestrian level of service (LOS) at signalized intersections established in the *Highway Capacity Manual 2010*. All nine signalized intersections along the study corridors were analyzed. Unsignalized intersections were not included in the analysis. The analysis was based on the following traffic characteristics: vehicle demand flow rate based on weekday peak-hour volumes, right-turn-on-red flow rate, permitted left-turn flow rate, and posted speed limit. Signal control data was also analyzed, including the duration of the pedestrian walk setting, the pedestrian clearance interval (flash don't walk), the cycle length, phase duration, the yellow change interval, and the red clearance interval.

The Synchro model used these inputs to calculate LOS factors for vehicle counts, pedestrian delay, vehicle speed, vehicle volumes, and the cross-section characteristics. Using these factors, each crossing at the intersection was assigned a pedestrian LOS score and grade. **Table 16** summarizes the pedestrian LOS thresholds used in this analysis.

Table 16 - Pedestrian Level of Service (LOS) Criteria

LOS	Score
A	Less than 1.5
B	1.5 - 2.5
C	2.5 - 3.5
D	3.5 - 4.5
E	4.5 – 5.5
F	Greater than 5.5
Source: Highway Capacity Manual, 2010	

Figure 13 displays the results for the nine signalized intersections, reporting the Pedestrian LOS (PLOS) score for each street crossing. The lowest PLOS score of C was found at several crossings and the best PLOS score was A, found at the east leg of the intersection of Hover Street and Village at the Peaks and at the east leg of the intersection of Ken Pratt Boulevard and the Village at the Peaks.

Crossing treatments at the east leg of the intersection of Ken Pratt Boulevard and Village at the Peaks.

Bicycle Segment LOS

The Bicycle LOS (BLOS) along roadway segments is a function of the perceived separation between motor vehicle traffic and the bicyclist, parked vehicle interference, and the quality of the pavement. Perceived separation is affected by traffic volumes and speeds, the percentage of heavy vehicles, and the width of the outside lane or on–street pavement markings of bicycle lanes. **Table 17** outlines BLOS thresholds used in this analysis.

Table 17 - Bicycle Level of Service (BLOS) Criteria

BLOS	Score
A	Less than 2
B	2 - 2.75
C	2.75 - 3.5
D	3.5 - 4.25
E	4.25 - 5
F	Greater than 5

The BLOS was determined for Nelson Road as it is the only study corridor with on-street bicycle lanes. The BLOS score and letter grade during both the AM and PM peak hours in the eastbound and westbound directions are presented in **Figure 13**. The analysis utilized the following parameters: 35 mph roadway, width of the outside lane and the bike lane, no on-street parking, vehicular volume, and heavy vehicle percentage.

The results in **Table 18** show BLOS scores of C and D for the portion of the study corridor with on-street bicycle lanes. The BLOS scores are lower, as one might expect, in the areas without bicycle lanes east of Hover Street at BLOS E and BLOS F.

Table 18- Nelson Road Bicycle Level of Service (BLOS) Results

Direction	Time Period	Bicycle LOS Score	Bicycle Level of Service
Eastbound (Near Nelson Rd)	AM Peak	4.51	E
	PM Peak	4.63	E
Westbound (Near Nelson Rd)	AM Peak	5.17	F
	PM Peak	4.56	E
Eastbound (Near Sunset St)	AM Peak	2.81	C
	PM Peak	2.93	C
Westbound (Near Sunset St)	AM Peak	3.57	D
	PM Peak	2.96	C

Bicycle Level of Traffic Stress Analysis

The Bicycle Level of Traffic Stress methodology is based on research which has demonstrated that Americans have varying levels of tolerance for traffic stress when bicycling; thus the method is intended to gauge the ease or stressfulness of bicycling along a particular route or segment. The methodology was established by Mekuria, et al, in *Low- Stress Bicycling and Network Connectivity* for the Mineta Transportation Institute.

There are four categories of the Level of Traffic Stress measure (LTS), with LTS 1 being the least stressful and LTS 4 being the most stressful. **Table 19** describes the LTS categories used to analyze the bicycle facilities provides along Ken Pratt Boulevard, Hover Street, and Nelson Road.

Table 19 - Level of Traffic Stress (LTS) Categories

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.
Source: Low-Stress Bicycling and Network Connectivity, MTI Report 11-19, May 2012	

The criteria or factors that impact LTS are intended to be readily obtained without arduous data collection or calculation efforts. Factors include number of lanes, vehicular speed, width of bicycle lane, and presence of on-street parking. A key to this methodology is that several low-stress links along any corridor or route cannot compensate for a high-stress link along the same route. It operates on the weakest link principle; the worst score is the one assigned for the whole route. This is valuable in that it identifies the "weak links" or higher stress links in a bicycle network which keep people from using certain routes. If one's stress tolerance is LTS 2, one would be inclined to avoid routes with segments of LTS 4 regardless of the existence of LTS 2 segments, since it would still be required that they bicycle on the higher stress segments for a trip.

Typically the measure is used at the network planning level to identify gaps in low-stress connectivity that can be addressed through network plans and annual budgets or with special projects. Since the stress of a route is determined by its most stressful link, rather than the average, the tool is useful in the process of completing networks and increasing the mode share of bicyclists.

On-street bicycle lane along Nelson Road.

Nelson Road

Only one of the three arterials in the study area includes an on-street bicycle lane, which is Nelson Road. Review of the existing roadway and bicycle lane between Hover Street and Ken Pratt Boulevard resulted in a LTS 4. While there were segments of LTS 3, the LTS 4 segments, due to the absence of bicycle lanes at locations, supersede the lower stress segments in the overall rating. The details of the rating are displayed in **Appendix B-2**. LTS is also displayed on **Figure 13**.

Ken Pratt Boulevard and Hover Street

Ken Pratt Boulevard and Hover Street have sidepaths and trails for bicycle use which generally have a planting area between the path and roadway. This results in LTS 1, which is also shown on **Figure 13**.

Pedestrian/Bicycle Crash History and Analysis

Several intersections experienced pedestrian and bicycle related crashes. Pedestrian and bicycle related crashes are significant due to the higher probability of injury or fatality. **Figure 14** displays the location and direction of each pedestrian and bicycle related crash that was recorded during the five-year period from January 1, 2012 to December 31, 2016.

A majority of pedestrian and bicycle related crashes were recorded along Hover Street. Congestion and lack of driver awareness may be causes of the crashes. The three intersections that saw the largest amount of crashes were the intersection of Hover Street and Clover Basin Drive, the intersection of Hover Street and Bent Way, and the intersection of Hover Street and Nelson Road. Additionally, nearly all of the crashes resulted in an injury.

Transit Service Conditions

Four RTD routes and one TransFort route operate within the study area. Two operate within Longmont city limits and provide local service (routes 323 and 324). The remaining three routes provide regional service to Boulder. The TransFort route provides service between Fort Collins and Boulder. The following sections summarize the five transit service routes and provide detailed information about service days and frequency. Full details regarding each transit route can be found in **Table 20**.

Local Routes

The two local routes within the study area (in addition to the other local routes in Longmont) are funded by the City of Longmont to provide fare free service (known as Longmont Ride Free Fare Program). These two local routes are:

- 323: Skyline Crosstown
  - This local route provides service from the Ken Pratt Boulevard and Hover Street area to the northern extent of Pace Street. Service is provided during weekdays and Saturdays every 60 minutes.
- 324: Main Street Crosstown
  - This local route operates mostly along Main Street, providing a number of transfer opportunities at three Park & Rides (Longmont, which is located south of Ken Pratt Boulevard on Main Street, 8th & Coffman, and US 287 & 21st Ave). Service is provided every day of the week, with a frequency of every 30 minutes during the weekday and every 60 minutes on the weekends.

Newly constructed northbound transit stop located south of the Ken Pratt Boulevard and Hover Street intersection.

Regional Routes

Three regional routes provide service in this area, with the BOLT providing the most frequent service and longest service span. One route provides service between Fort Collins and Boulder. The three regional routes within the study area are as described below.

- J: Longmont/East Boulder/CU
  - This regional route provides a connection between Longmont and Boulder, with easy access to East Boulder and CU. Limited service is provided during directional peak periods on weekdays every 30 to 60 minutes.
- BOLT: Boulder/Longmont
  - This regional route provides regular service between Boulder and Longmont throughout weekdays, weekends, and holidays. Refer to **Table 20** for frequency and hours of operations for BOLT service.

- FLEX: Fort Collins/Loveland/Berthoud/Longmont/Boulder
  - This regional route is operated by TransFort, the transit agency in Fort Collins. Most routes provide service between Fort Collins and Longmont but a limited number of trips provide express service between Fort Collins and Boulder. The express service is provided during peak periods on weekdays—two morning and afternoon trips with one midday trip.

Table 20- Transit Route Service Summary

Route	Operator	Days of Service	Service Duration[1]	Trips[2]	Time of Operation[3]	Frequency
323	RTD	Weekday	12 hours	26 total	6 AM – 6 PM	60 min
		Saturday	9 hours	20 total	8 AM – 5 PM	60 min
324	RTD	Weekday	14.5 hours	60 total	5:15 AM – 8 PM	30 min
		Saturday	10 hours	22 total	8 AM – 6:15 PM	60 min
		Sunday				
J	RTD	Weekday	3 hours in AM 3 hours in PM	5 SB in AM and 4 NB in PM	5:30– 8:45 AM SB 3:15 – 5:30 PM NB	30 to 60 min
BOLT	RTD	Weekday	19.5 hours	38 at Miller Drive/Pike Road, 78 at all other stops	4:45 AM – 12:15 AM	15-60 min[4]
		Saturday	17 hours	36 total	6:30 AM – 11:45 PM	60 min
		Sunday	17 hours	35 total	6:30 AM – 11:45 PM	60 min
FLEX	TransFort	Weekday	3 hours in AM 6 hours in PM	10 total	5:15 – 8:15 AM 1:15 – 7:15 PM	60+ min

[1] Rounded to the nearest 30 minute interval.

[2] The total number of trips includes both directions.

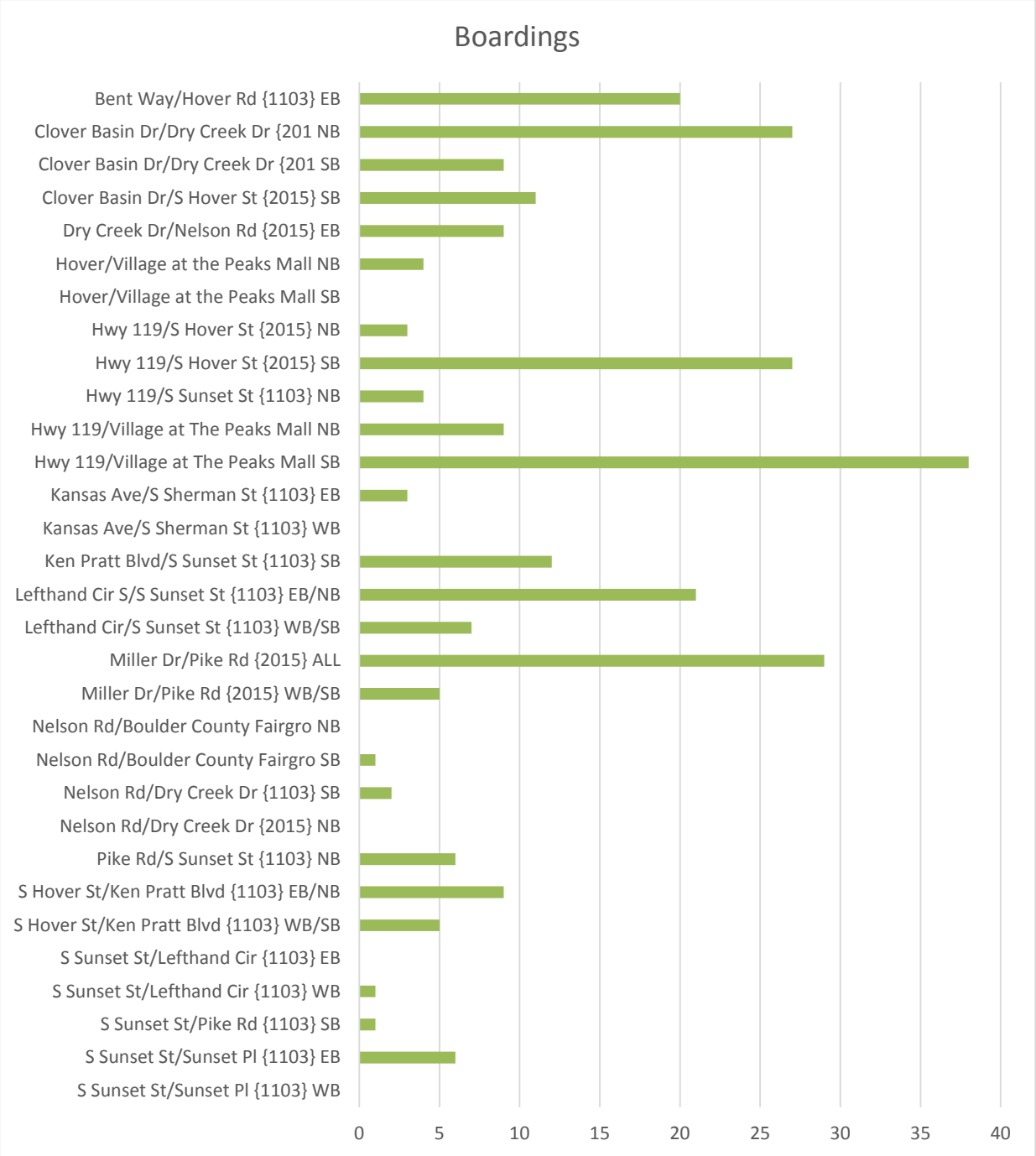
[3] The time of operation includes both directions rounded to the nearest 15 minute interval based on the first stop in the route.

[4] Service at Miller Drive/Pike Road is generally 30 minutes NB in the morning between 9 AM – 12 PM and SB between 12:30 – 4:30 PM. Service is every 15 minutes for a short span during the peak directions (in the morning SB and afternoon NB).

Transit Ridership

The **Figure 15** shows the total boardings (in both directions) for stops located within the study area. The southbound stop of Ken Pratt Boulevard and Village at the Peaks experiences the greatest boardings.

Figure 15 – Transit Boardings for Stops near the Study Area



Source: RTD Weekday Ridership at stops within the study area (Weekday), August -November 2017. Data does not include ridership information from December.

Tables

Southwest Longmont Operations Study

Table 7

2017 Existing Conditions

AM Peak Hour Operations

Intersection	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Ken Pratt / Hover Street (Signal)	NB	263	590	70	923	45.6	D	41.8	D	3.5	A	40.0	D			1252	159	270	920	151	309	0		
	SB	163	820	575	1,558	66.0	E	44.3	D	3.2	A	31.0	C	44.0	D	716	220	406	180	119	296	0		
	EB	200	390	131	721	131.2	F	34.6	C	6.4	A	56.9	E			6348	96	184	430	102	196	0		
	WB	145	894	142	1,181	100.7	F	57.2	E	1.7	A	56.2	E			1413	309	460	215	156	320	0		
Ken Pratt / Village at The Peaks (Signal)	NB	4	0	4	8	55.2	E	0.0	A	1.2	A	21.5	C			302	2	25	0		0	0		
	SB	54	0	28	82	55.8	E	0.0	A	6.4	A	38.1	D	38.9	D	304	41	111	0		0	0	14	45
	EB	35	582	6	623	28.7	C	4.9	A	3.7	A	6.2	A			1413	9	47	845	23	74	0		
	WB	50	1149	95	1,294	5.2	A	1.3	A	0.5	A	1.4	A			585	11	84	380	10	40	0	3	30
Ken Pratt / Industrial Circle	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	17	0	23	40	21.0	C	0.0	A	7.5	A	13.1	B	4.4	A	0			0	13	56	50	17	46
	EB	17	623	0	640	12.7	B	1.1	A	0.0	A	1.4	A			0			120	11	42	0		
	WB	0	1271	55	1,326	0.0	A	5.7	A	2.6	A	5.6	A			0			0		0	0		
Ken Pratt / Sunset Street (Signal)	NB	58	255	87	400	66.5	E	88.8	F	85.1	F	84.7	F			3858	192	367	0		0	0		
	SB	10	451	160	621	58.9	E	55.0	E	51.5	D	54.2	D	48.3	D	1235	195	364	0		0	0		
	EB	56	494	90	640	28.0	C	33.5	C	3.9	A	29.2	C			1291	129	221	90	16	75	320	2	36
	WB	265	1108	22	1,395	46.6	D	43.5	D	31.2	C	43.9	D			1391	342	540	260	179	370	80	6	101
Ken Pratt / Nelson Road (Signal)	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	466	0	45	511	45.9	D	9.2	A	23.2	C	43.5	D	14.7	B	0			0	150	191	50	35	75
	EB	10	581	0	591	23.9	C	6.0	A	0.0	A	6.2	A			1391	36	87	900	7	40	0		
	WB	0	1350	499	1,849	0.0	A	10.0	B	8.8	A	9.7	A			1631	114	216	0		0	165	22	106
Hover Street / Clover Basin Drive (Signal)	NB	314	593	25	932	27.8	C	12.1	B	6.3	A	17.2	B			716	77	154	220	123	277	0		
	SB	25	1213	205	1,443	15.7	B	18.5	B	5.4	A	16.5	B	19.2	B	1034	224	363	250	11	68	560	39	80
	EB	75	33	342	450	46.2	D	42.1	D	20.7	C	26.6	C			2660	24	73	155	42	107	0	129	273
	WB	3	55	7	65	50.3	D	58.7	E	28.2	C	55.0	E			455	57	124	0	2	24	0		
Hover Street / Village at The Peaks (Signal)	NB	0	650	25	675	0.0	A	3.2	A	2.1	A	3.2	A			1034	2	40	0		0	0		
	SB	35	1420	0	1,455	5.5	A	2.6	A	0.0	A	2.7	A	3.4	A	1074	19	114	230	14	56	0		
	EB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	WB	23	0	9	32	62.0	E	0.0	A	4.9	A	44.3	D			0			0	23	56	0	7	31
Hover Street / Bent Way (Signal)	NB	90	549	20	659	24.0	C	1.4	A	0.9	A	4.5	A			1074	5	36	190	58	151	0		
	SB	81	1306	105	1,492	11.8	B	5.2	A	4.9	A	5.5	A	9.0	A	662	23	116	275	32	92	430	6	28
	EB	60	19	141	220	78.0	E	57.5	E	24.6	C	41.8	D			1040	17	91	150	56	129	240	65	155
	WB	8	13	33	54	64.3	E	58.2	E	5.6	A	26.0	C			1148	9	49	50	7	40	150	12	57
Hover Street / Nelson Road (Signal)	NB	60	517	65	642	25.6	C	29.1	C	4.9	A	26.3	C			662	140	246	240	40	104	0	17	59
	SB	250	1301	196	1,747	20.0	C	21.1	C	7.9	A	19.4	B	26.9	C	2536	212	363	220	81	204	1000	30	80
	EB	101	312	73	486	59.6	E	42.1	D	20.3	C	42.5	D			740	95	169	290	53	106	600	34	98
	WB	118	319	150	587	55.6	E	44.2	D	9.9	A	37.8	D			2495	141	258	190	53	122	210	43	108
Nelson Road / Sunset Street (Signal)	NB	58	245	30	333	59.0	E	33.0	C	24.8	C	36.9	D			1235	127	253	0	50	114	0		
	SB	74	415	134	623	42.1	D	32.8	C	8.1	A	28.5	C	22.6	C	2096	208	386	150	73	174	150	51	275
	EB	120	361	146	627	20.3	C	15.8	B	13.0	B	16.0	B			2495	92	225	395	56	129	0		
	WB	60	395	135	590	23.2	C	16.9	B	6.6	A	15.1	B			746	79	153	515	32	98	105	41	88
Nelson Road / Price Road	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	80	0	180	260	25.7	D	0.0	A	5.1	A	11.4	B	5.0	A	0			0	48	115	0	45	88
	EB	34	431	0	465	6.5	A	6.0	A	0.0	A	6.0	A			746	22	112	50	12	52	0		
	WB	0	410	99	509	0.0	A	0.6	A	1.1	A	0.7	A			152	1	16	0		0	0		

Southwest Longmont Operations Study

Table 8

2017 Existing Conditions

PM Peak Hour Operations

Intersection	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Ken Pratt / Hover Street (Signal)	NB	156	843	96	1,095	48.2	D	90.9	F	11.9	B	77.4	E	119.9	F	1252	361	556	920	103	336	260	63	409
	SB	243	847	358	1,448	114.5	F	39.0	D	2.2	A	43.1	D			716	307	603	200	245	349	0		
	EB	670	911	252	1,833	463.5	F	145.2	F	102.3	F	246.7	F			6348	2011	3091	430	618	650	250	19	206
	WB	93	556	256	905	76.4	E	64.2	E	3.6	A	48.1	D			1414	221	380	215	70	264	0		
Ken Pratt / Village at The Peaks (Signal)	NB	7	4	31	42	38.6	D	39.7	D	1.5	A	12.2	B	15.6	B	635	6	33	0		0	0		
	SB	246	8	64	318	52.8	D	49.0	D	10.7	B	44.8	D			594	55	338	220	178	244	0		
	EB	63	1181	6	1,250	29.8	C	12.5	B	10.4	B	13.4	B			1414	95	216	845	34	91	350	1	20
	WB	35	834	185	1,054	28.3	C	9.8	A	3.1	A	9.3	A			580	117	254	380	19	71	0	39	89
Ken Pratt / Industrial Circle	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A	4.2	A	0			0		0	0		
	SB	45	0	31	76	33.9	D	0.0	A	9.6	A	23.7	C			0			0	32	90	50	24	73
	EB	13	1445	0	1,458	15.1	C	2.6	A	0.0	A	2.7	A			0			120	8	38	0		
	WB	0	1023	50	1,073	0.0	A	5.3	A	2.3	A	5.1	A			0			0		0	0		
Ken Pratt / Sunset Street (Signal)	NB	99	368	83	550	95.1	F	118.3	F	110.6	F	113.2	F	59.4	E	3858	317	710	0		0	0		
	SB	18	232	109	359	105.6	F	111.0	F	103.4	F	108.4	F			1235	188	415	0		0	0		
	EB	196	1202	92	1,490	61.2	E	40.2	D	6.5	A	40.7	D			1290	370	590	90	163	230	320	29	287
	WB	75	865	25	965	41.0	D	41.4	D	28.7	C	41.0	D			1391	253	437	260	27	176	80	11	102
Ken Pratt / Nelson Road (Signal)	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A	15.7	B	0			0		0	0		
	SB	593	0	32	625	42.1	D	0.0	A	20.7	C	40.9	D			0			0	167	204	50	13	75
	EB	18	1285	0	1,303	27.4	C	8.9	A	0.0	A	9.1	A			1391	72	311	900	13	65	0		
	WB	0	933	601	1,534	0.0	A	12.0	B	11.3	B	11.7	B			1631	106	218	0		0	165	33	150
Hover Street / Clover Basin Drive (Signal)	NB	392	1266	111	1,769	44.5	D	12.8	B	7.8	A	19.5	B	28.1	C	716	130	483	220	191	365	0		
	SB	105	902	184	1,191	42.9	D	23.8	C	4.3	A	22.4	C			1034	165	297	250	66	159	560	36	75
	EB	270	117	510	897	58.3	E	49.9	D	25.0	C	38.5	D			2660	97	235	155	115	232	0	192	412
	WB	36	110	29	175	85.4	F	105.0	F	91.0	F	99.0	F			455	155	330	0	36	110	0		
Hover Street / Village at The Peaks (Signal)	NB	0	1516	49	1,565	0.0	A	5.8	A	2.7	A	5.7	A	7.9	A	1034	68	144	0		0	0		
	SB	114	1094	0	1,208	24.3	C	2.9	A	0.0	A	4.8	A			1078	14	84	230	67	147	0		
	EB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	WB	97	0	105	202	72.2	E	0.0	A	16.7	B	44.0	D			0			0	92	180	0	47	127
Hover Street / Bent Way (Signal)	NB	230	1342	49	1,621	36.8	D	32.8	C	7.9	A	32.5	C	28.4	C	1078	270	568	190	146	341	0		
	SB	160	988	110	1,258	40.0	D	12.9	B	4.7	A	15.5	B			661	105	191	275	104	198	430	17	56
	EB	165	73	192	430	85.2	F	46.8	D	19.3	B	49.0	D			1398	125	396	150	134	199	240	84	220
	WB	28	74	165	267	48.9	D	46.1	D	24.1	C	32.6	C			1333	52	162	50	21	81	150	72	161
Hover Street / Nelson Road (Signal)	NB	196	1330	146	1,672	93.7	F	67.8	E	5.8	A	65.8	E	74.1	E	661	491	680	240	230	370	0	23	76
	SB	225	955	120	1,300	64.8	E	29.4	C	10.3	B	33.6	C			2536	189	347	220	159	294	1000	26	100
	EB	493	497	109	1,099	236.9	F	55.4	E	16.6	B	131.4	F			752	569	843	290	457	490	600	55	466
	WB	194	367	197	758	76.3	E	105.6	F	45.8	D	82.3	F			2495	284	632	190	120	244	210	127	302
Nelson Road / Sunset Street (Signal)	NB	104	420	45	569	50.2	D	42.2	D	40.0	D	43.5	D	30.9	C	1235	270	512	0	84	186	0		
	SB	76	264	101	441	98.3	F	35.4	D	11.0	B	39.9	D			2090	154	437	150	84	174	150	37	135
	EB	275	520	73	868	31.4	C	19.6	B	15.5	B	23.0	C			2495	109	245	395	134	272	0		
	WB	22	554	75	651	29.3	C	24.0	C	11.8	B	22.8	C			746	127	227	515	15	55	105	32	142
Nelson Road / Price Road	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A	6.9	A	0			0		0	0		
	SB	31	0	75	106	37.0	E	0.0	A	4.2	A	13.0	B			0			0	26	80	0	32	63
	EB	47	594	0	641	15.3	C	12.4	B	0.0	A	12.6	B			746	74	192	50	28	74	0		
	WB	0	576	43	619	0.0	A	0.5	A	0.6	A	0.5	A			155		4	0		0	0		

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Table 13

2040 Future Conditions

AM Peak Hour Operations

Intersection	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Ken Pratt / Hover Street (Signal)	NB	265	710	90	1,065	170.0	F	303.8	F	123.0	F	253.1	F			1252	825	**1203**	920	607	**903**	260	183	**410**
	SB	250	970	780	2,000	122.5	F	92.2	F	3.1	A	61.0	E	164.8	F	716	456	**680**	180	**282**	**350**	0		
	EB	250	470	125	845	1297.7	F	300.7	F	234.1	F	469.7	F			6348	2175	4474	430	**605**	**650**	250	9	156
	WB	185	1150	200	1,535	197.7	F	138.7	F	4.9	A	127.2	F			1413	748	**1180**	215	**273**	**320**	0	**67**	**780**
Ken Pratt / Village at The Peaks (Signal)	NB	15	0	10	25	54.0	D	0.0	A	1.6	A	31.3	C			302	14	67	0		0	0		
	SB	50	0	30	80	58.6	E	0.0	A	9.0	A	38.5	D	85.8	F	304	43	113	0		0	0	**16**	**47**
	EB	45	755	10	810	30.5	C	8.9	A	5.8	A	10.0	B			1413	44	166	845	23	90	350	1	20
	WB	90	1490	100	1,680	8.4	A	5.9	A	0.7	A	5.7	A			585	58	213	380	24	130	0	**7**	**32**
Ken Pratt / Industrial Circle	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	20	0	30	50	38.5	E	0.0	A	13.6	B	22.5	C	6.2	A	0			0	**16**	56	50	22	**61**
	EB	30	785	0	815	23.3	C	2.2	A	0.0	A	2.9	A			0			120	14	65	0		
	WB	0	1650	65	1,715	0.0	A	7.4	A	2.9	A	7.2	A			0			0		0	0		
Ken Pratt / Sunset Street (Signal)	NB	60	260	100	420	166.1	F	203.4	F	241.6	F	207.7	F			3858	394	586	0		0	0		
	SB	20	480	200	700	99.4	F	130.3	F	126.7	F	128.4	F	121.5	F	1235	408	612	0		0	0		
	EB	80	635	90	805	42.4	D	33.0	C	3.8	A	30.6	C			1291	138	314	90	33	**201**	0		
	WB	300	1455	45	1,800	126.9	F	137.5	F	123.2	F	135.4	F			1391	**1114**	**1383**	260	**308**	**370**	80	10	**102**
Ken Pratt / Nelson Road (Signal)	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	525	0	110	635	50.0	D	0.0	A	34.4	C	47.4	D	29.6	C	0			0	**163**	197	50	**47**	**75**
	EB	25	730	0	755	58.9	E	6.4	A	0.0	A	8.2	A			1391	24	96	900	24	72	0		
	WB	0	1690	635	2,325	0.0	A	32.8	C	27.1	C	31.2	C			1631	325	1103	0		0	165	118	**255**
Hover Street / Clover Basin Drive (Signal)	NB	335	790	35	1,160	341.2	F	35.5	D	18.1	B	116.1	F			716	**707**	**750**	220	**426**	**430**	0		
	SB	40	1640	240	1,920	19.9	B	13.4	B	5.9	A	12.6	B	70.9	E	1034	199	463	250	16	55	560	29	109
	EB	85	30	360	475	95.6	F	87.7	F	145.6	F	132.9	F			2660	85	467	155	62	**132**	0	**487**	**806**
	WB	0	65	15	80	0.0	A	772.4	F	698.8	F	760.3	F			455	**395**	**481**	0	**136**	284	0		
Hover Street / Village at The Peaks (Signal)	NB	0	855	35	890	0.0	A	2.3	A	1.4	A	2.3	A			1034	6	53	0		0	0		
	SB	45	1880	0	1,925	7.4	A	4.8	A	0.0	A	4.9	A	5.1	A	1074	39	151	230	16	44	0		
	EB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	WB	40	0	15	55	66.3	E	0.0	A	7.4	A	51.0	D			0			0	**39**	108	0	**10**	**40**
Hover Street / Bent Way (Signal)	NB	120	700	50	870	44.0	D	8.8	A	2.4	A	13.0	B			1074	69	161	190	64	**183**	0		
	SB	100	1710	125	1,935	17.4	B	12.3	B	7.7	A	12.3	B	15.4	B	662	141	292	275	41	99	430	21	78
	EB	90	20	190	300	53.1	D	37.3	D	32.4	C	38.8	D			1040	11	58	150	67	**141**	240	99	**204**
	WB	25	20	40	85	47.0	D	44.8	D	4.8	A	24.5	C			1148	10	50	50	18	**61**	150	12	34
Hover Street / Nelson Road (Signal)	NB	70	680	80	830	63.5	E	22.5	C	4.0	A	23.8	C			662	117	202	240	48	138	0	**13**	**53**
	SB	310	1720	240	2,270	46.8	D	45.2	D	14.1	B	42.2	D	39.2	D	2536	393	792	220	**201**	**380**	1000	37	91
	EB	125	325	80	530	66.1	E	43.4	D	26.2	C	46.0	D			740	101	196	290	59	124	600	41	118
	WB	135	340	190	665	57.2	E	48.9	D	12.9	B	39.8	D			2495	149	275	190	59	131	210	56	154
Nelson Road / Sunset Street (Signal)	NB	65	260	60	385	64.4	E	33.7	C	26.2	C	37.5	D			1235	142	288	0	**53**	130	0		
	SB	100	450	140	690	44.9	D	30.2	C	9.1	A	27.9	C	23.9	C	2096	217	422	150	94	**175**	150	51	**274**
	EB	140	425	150	715	25.5	C	19.3	B	16.0	B	19.8	B			2495	113	254	395	71	193	0		
	WB	100	460	190	750	26.4	C	19.6	B	7.9	A	17.5	B			746	98	168	515	54	136	105	51	**105**
Nelson Road / Price Road	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	90	0	200	290	149.0	F	0.0	A	7.3	A	49.8	E	15.6	C	0			0	**124**	339	0	**55**	**112**
	EB	40	545	0	585	12.5	B	14.8	B	0.0	A	14.6	B			746	80	238	50	23	**71**	0		
	WB	0	550	110	660	0.0	A	0.8	A	1.1	A	0.8	A			152	4	50	0		0	0		

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Table 14

2040 Future Conditions

PM Peak Hour Operations

Intersection	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Ken Pratt / Hover Street (Signal)	NB	190	1190	125	1,505	137.2	F	288.4	F	190.7	F	261.6	F			1252	1259	1288	920	882	945	260	289	410
	SB	360	1205	510	2,075	274.7	F	87.3	F	2.7	A	99.3	F	332.4	F	716	561	771	200	294	350	0		
	EB	850	1160	300	2,310	1172.3	F	653.8	F	632.0	F	840.3	F			6348	6264	6403	430	649	650	250	5	103
	WB	105	710	390	1,205	211.6	F	70.7	E	4.0	A	60.0	E			1414	301	481	215	153	292	0	2	58
Ken Pratt / Village at The Peaks (Signal)	NB	30	10	55	95	42.6	D	44.6	D	1.9	A	17.0	B			635	22	80	0		0	85	2	50
	SB	260	20	95	375	56.0	E	45.0	D	16.1	B	44.5	D	12.5	B	594	85	389	220	173	243	0		
	EB	95	1525	25	1,645	28.1	C	8.5	A	7.6	A	9.6	A			1414	6	58	845	36	100	350		5
	WB	70	1080	200	1,350	22.7	C	5.3	A	1.6	A	5.6	A			580	66	166	380	26	82	0	15	61
Ken Pratt / Industrial Circle	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	50	0	50	100	55.9	F	0.0	A	17.2	C	37.4	E	5.5	A	0			0	47	146	50	32	74
	EB	20	1820	0	1,840	12.3	B	2.1	A	0.0	A	2.2	A			0			120	7	34	0		
	WB	0	1300	60	1,360	0.0	A	6.5	A	2.5	A	6.3	A			1290	9	261	0		0	0		
Ken Pratt / Sunset Street (Signal)	NB	110	410	90	610	131.5	F	156.9	F	164.0	F	153.6	F			3858	450	868	0		0	0		
	SB	35	285	150	470	248.2	F	273.7	F	271.0	F	270.9	F	91.4	F	1235	496	930	0		0	0		
	EB	250	1525	95	1,870	69.4	E	22.3	C	4.1	A	27.6	C			1290	199	407	90	124	229	0		
	WB	90	1100	35	1,225	77.2	E	67.1	E	60.5	E	67.7	E			1391	396	703	260	88	310	80	7	101
Ken Pratt / Nelson Road (Signal)	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	730	0	65	795	36.4	D	0.0	A	19.1	B	34.9	C	23.5	C	0			0	160	196	50	27	75
	EB	50	1600	0	1,650	57.8	E	6.5	A	0.0	A	7.9	A			1391	47	165	900	31	87	0		
	WB	0	1160	850	2,010	0.0	A	23.9	C	36.3	D	29.1	C			1631	232	779	0		0	165	100	236
Hover Street / Clover Basin Drive (Signal)	NB	405	1885	140	2,430	59.7	E	13.0	B	9.3	A	20.7	C			716	146	555	220	177	342	0		
	SB	175	1455	235	1,865	724.4	F	202.0	F	62.3	E	237.9	F	148.5	F	1034	1038	1063	250	406	420	560	279	487
	EB	420	200	570	1,190	224.0	F	185.6	F	308.5	F	255.9	F			2660	1165	2319	155	213	330	0	1202	2178
	WB	50	120	60	230	588.9	F	270.3	F	274.9	F	329.0	F			455	352	464	0	291	442	0		
Hover Street / Village at The Peaks (Signal)	NB	0	2255	110	2,365	0.0	A	20.6	C	3.7	A	19.8	B			1034	178	555	0		0	0		
	SB	135	1685	0	1,820	284.2	F	219.2	F	0.0	A	224.2	F	120.3	F	1078	1038	1124	230	278	410	0		
	EB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	WB	180	0	140	320	1957.8	F	0.0	A	252.8	F	1064.7	F			0			0	1113	1150	0	1044	1151
Hover Street / Bent Way (Signal)	NB	350	1875	170	2,395	79.9	E	84.8	F	7.3	A	78.9	E			1078	658	1000	190	268	370	0		
	SB	170	1420	120	1,710	136.6	F	213.7	F	20.6	C	191.3	F	151.7	F	661	624	693	275	279	419	430	261	600
	EB	175	80	300	555	286.2	F	224.5	F	271.6	F	269.3	F			1398	927	1332	150	132	200	240	221	265
	WB	100	75	170	345	413.2	F	295.8	F	268.9	F	315.2	F			1333	697	1231	50	97	124	150	99	175
Hover Street / Nelson Road (Signal)	NB	230	1815	175	2,220	76.2	E	80.6	F	5.7	A	74.2	E			661	574	690	240	253	370	0	24	86
	SB	290	1365	150	1,805	659.4	F	751.2	F	405.8	F	707.7	F	225.4	F	2536	2284	2570	220	295	380	1000	545	1025
	EB	590	520	125	1,235	298.6	F	70.3	E	80.3	F	179.2	F			752	791	856	290	481	490	600	122	588
	WB	220	450	325	995	289.3	F	156.2	F	126.3	F	174.8	F			2495	598	1130	190	200	364	210	186	381
Nelson Road / Sunset Street (Signal)	NB	115	490	90	695	63.7	E	39.0	D	31.4	C	42.1	D			1235	264	480	0	85	205	0		
	SB	120	300	140	560	191.5	F	99.3	F	79.1	E	114.8	F	57.8	E	2090	544	1350	150	138	175	150	138	325
	EB	290	615	80	985	45.0	D	24.6	C	19.8	B	30.2	C			2495	105	247	395	125	275	0		
	WB	90	740	120	950	39.3	D	56.0	E	35.6	D	51.8	D			746	252	416	515	86	212	105	94	225
Nelson Road / Price Road	NB	0	0	0	0	0.0	A	0.0	A	0.0	A	0.0	A			0			0		0	0		
	SB	30	0	100	130	61.3	F	0.0	A	45.4	E	49.4	E	10.2	B	0			0	40	165	0	68	179
	EB	60	765	0	825	22.1	C	10.5	B	0.0	A	11.4	B			746	60	192	50	29	75	0		
	WB	0	850	50	900	0.0	A	2.8	A	0.9	A	2.7	A			155	16	66	0		0	0	6	41

Figures

Southwest Longmont
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FIGURE 2: Roadway Network

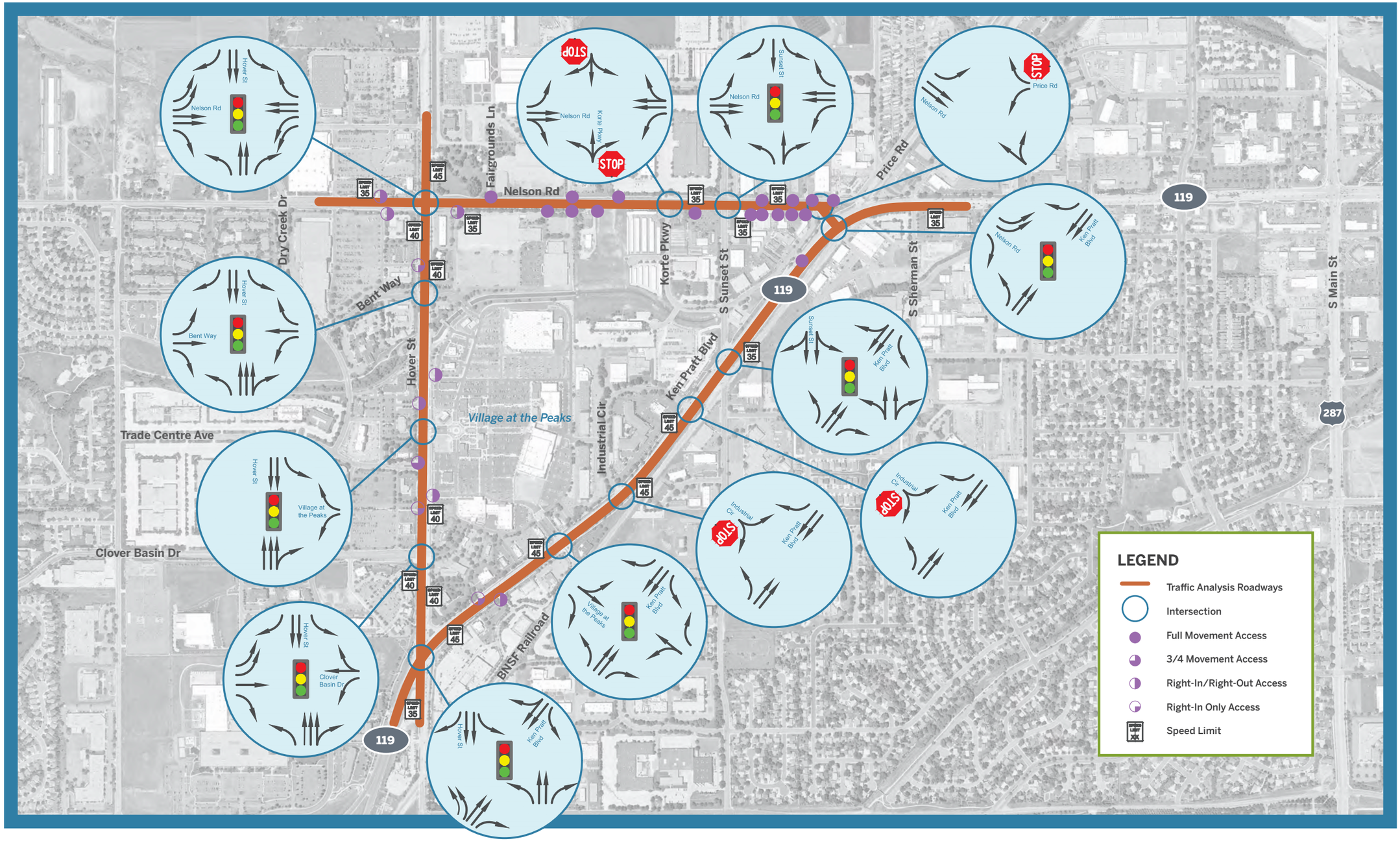

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FIGURE 3: Roadway Features

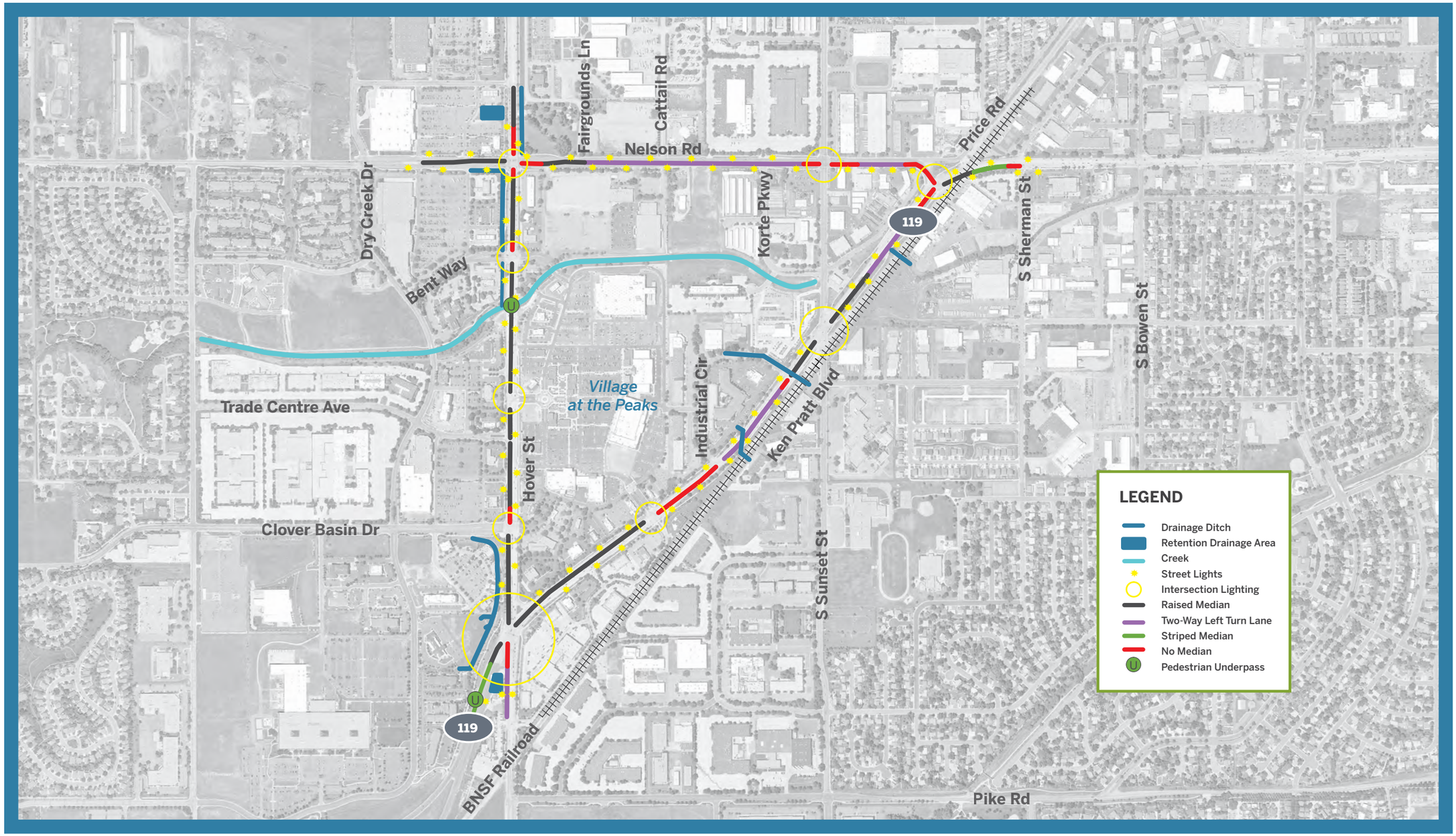

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FIGURE 4: Roadway Deficiencies

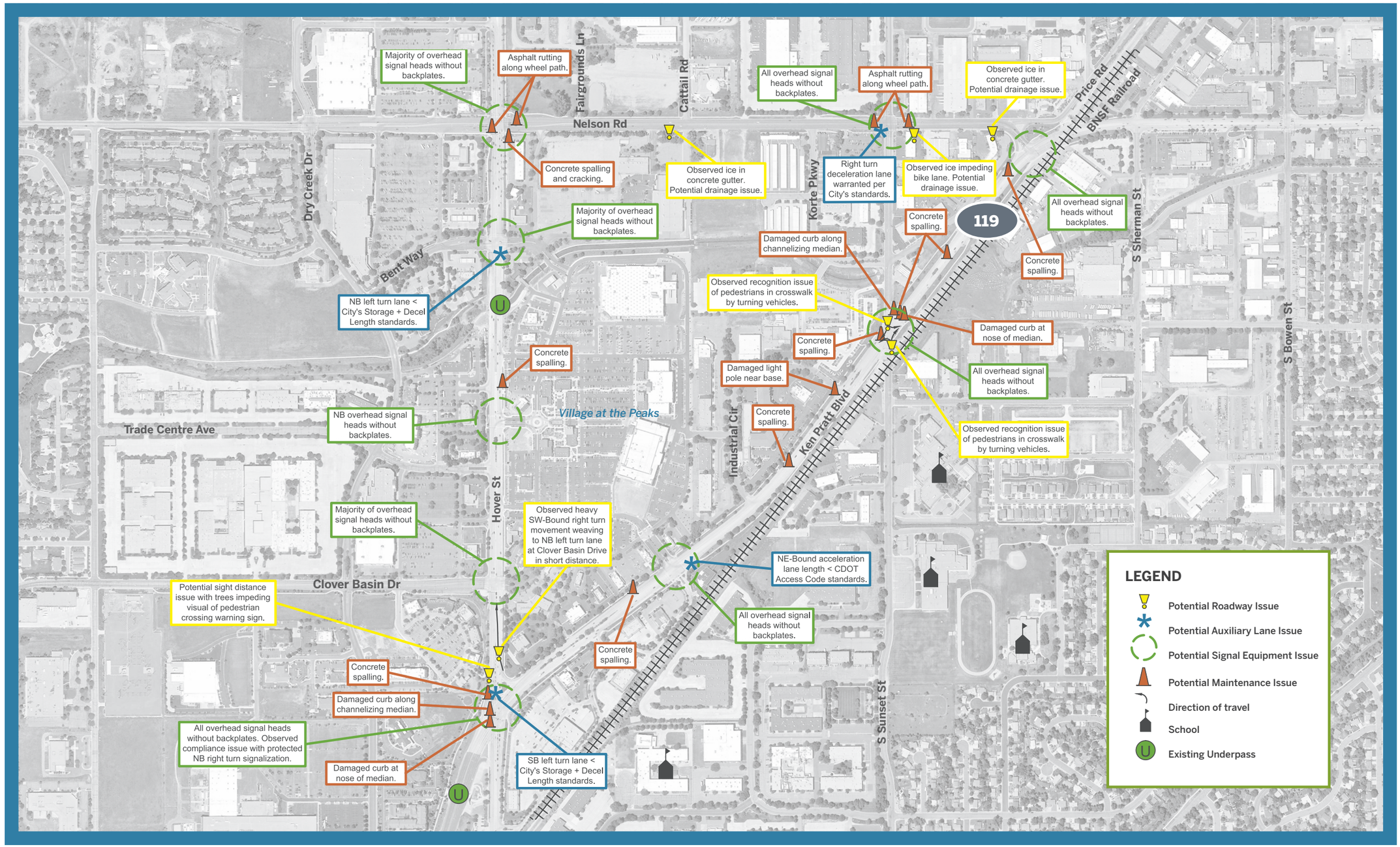

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FIGURE 5: Existing Traffic Volumes

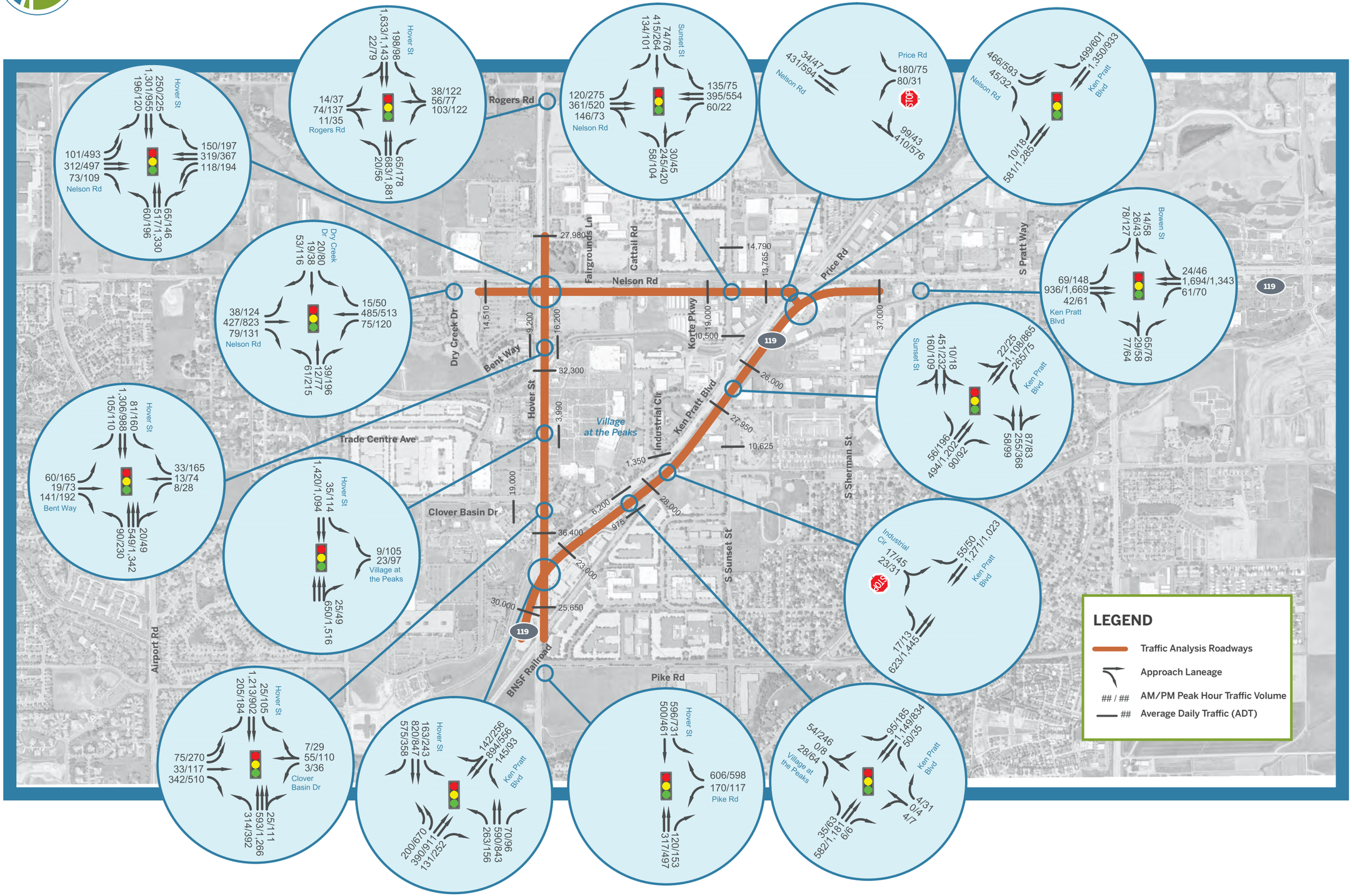

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FIGURE 6: Existing Intersection Level of Service

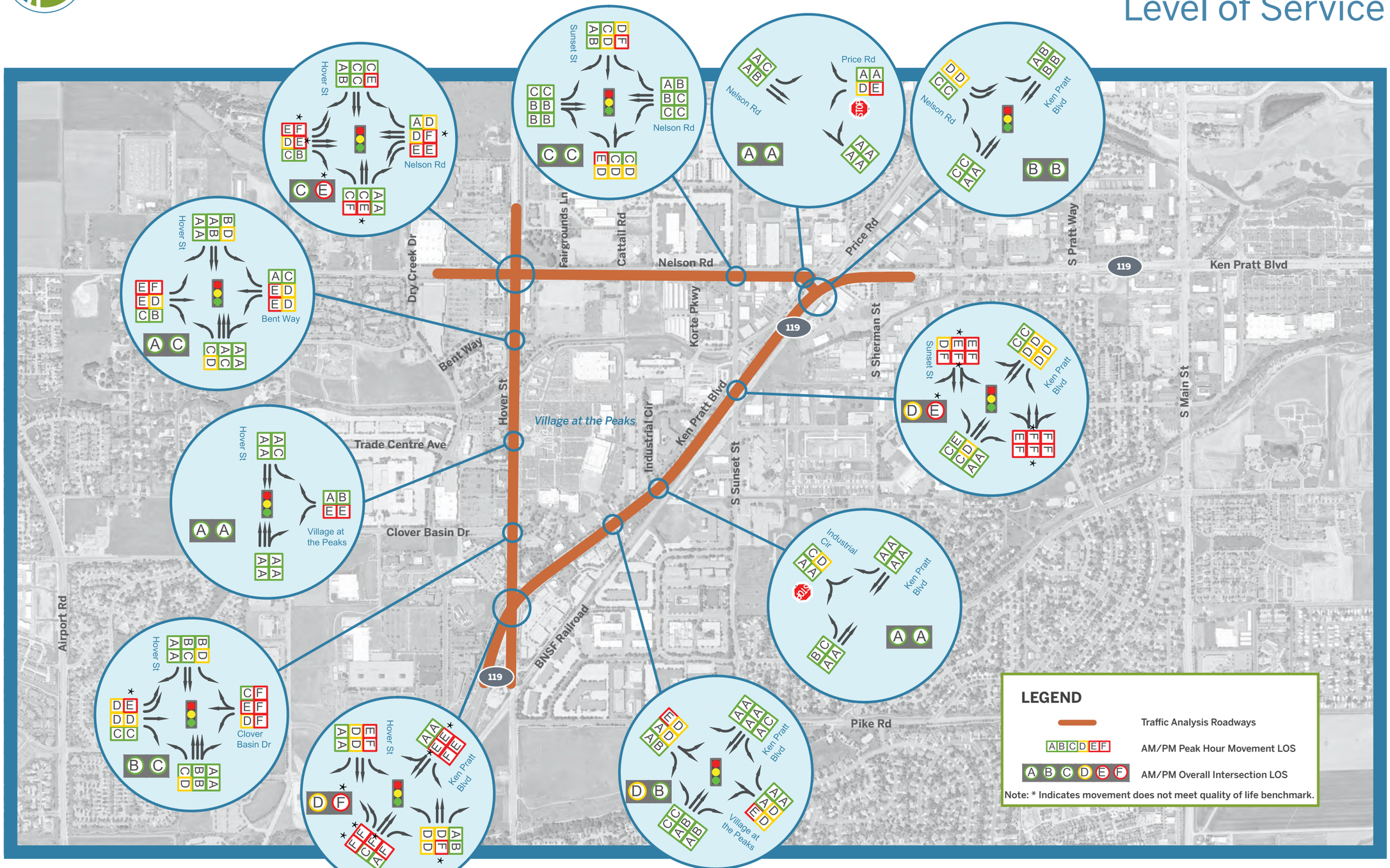

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FIGURE 8: 2040 Traffic Volumes

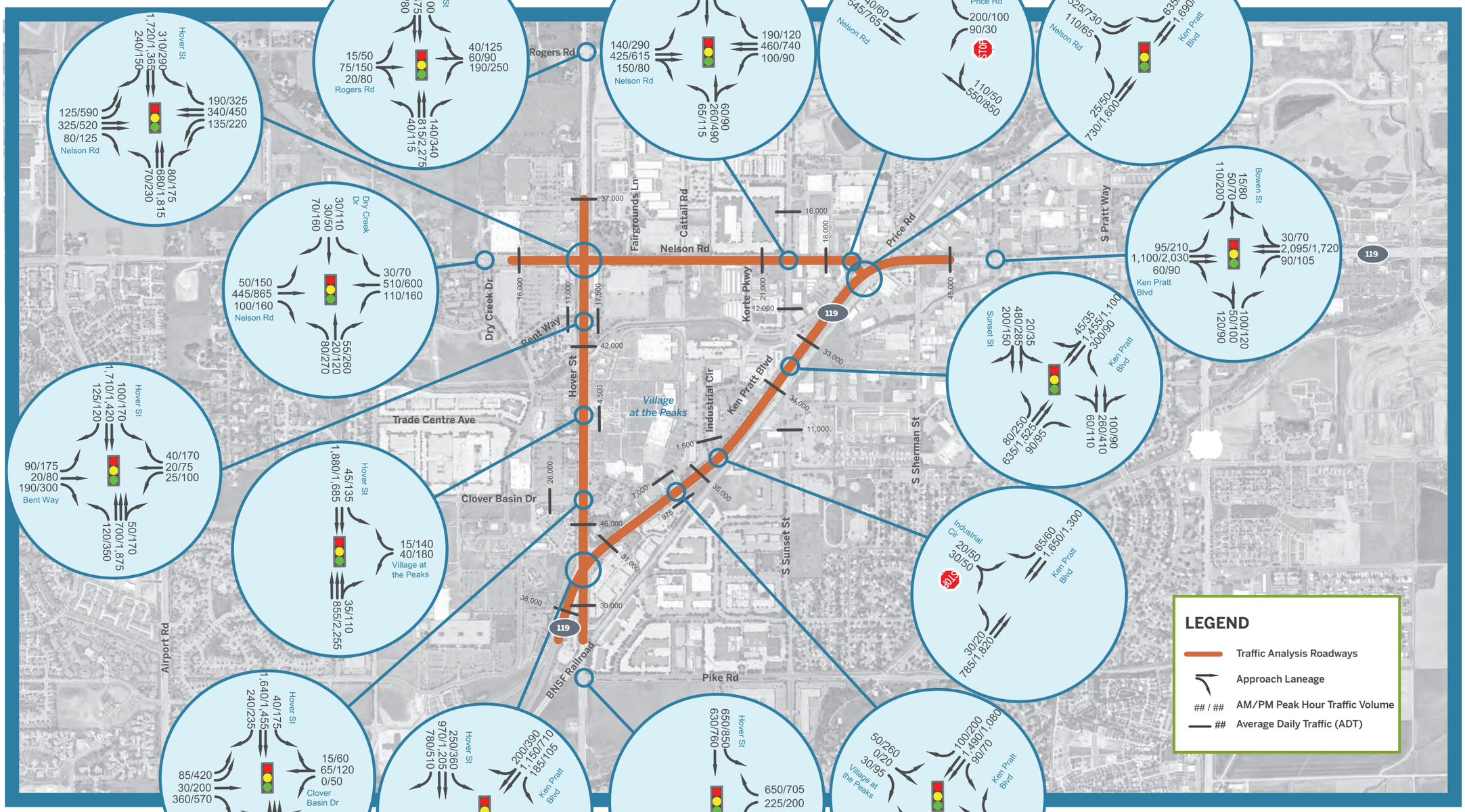

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FIGURE 9: 2040 Intersection LOS

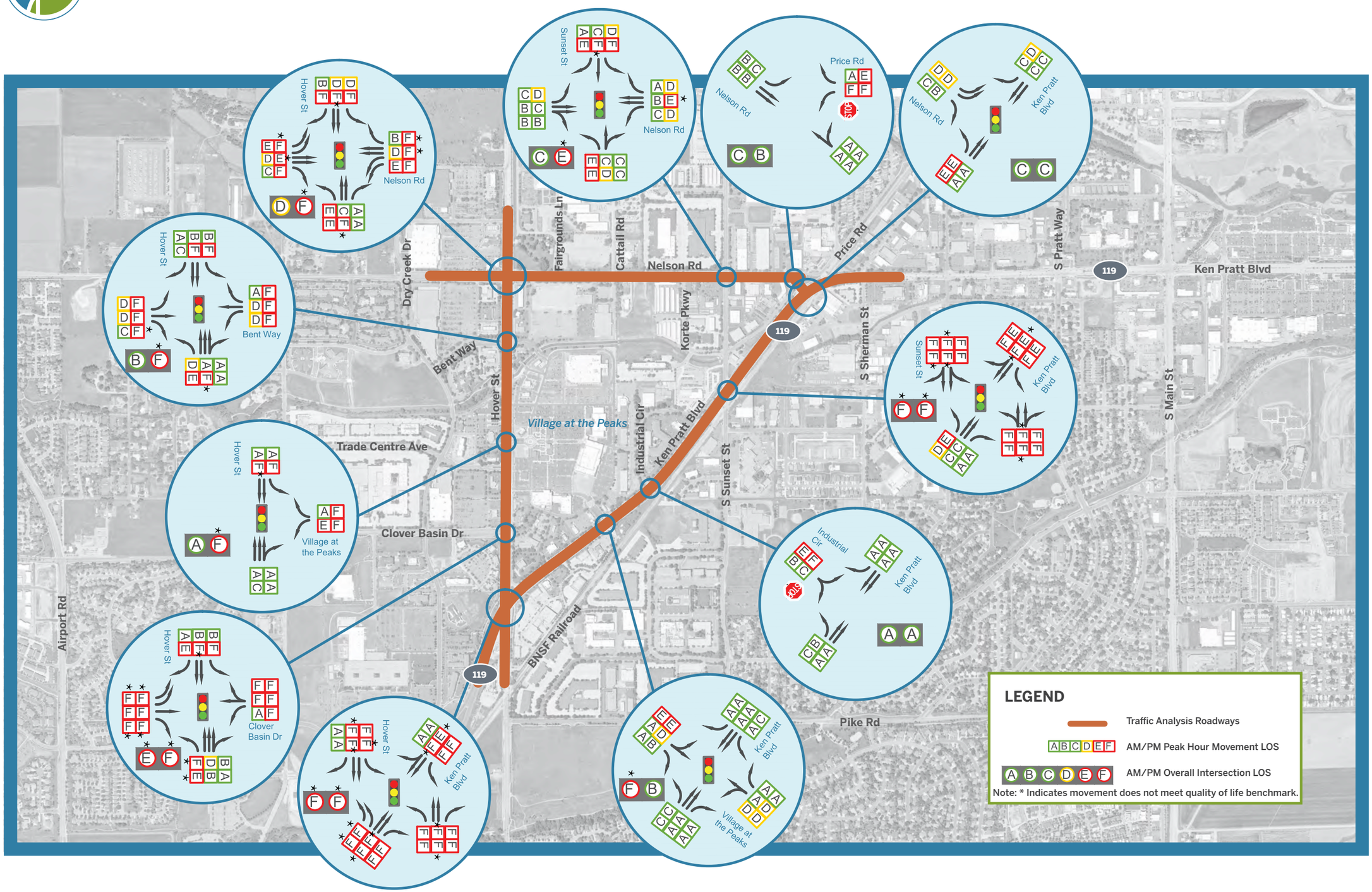

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FIGURE 10: 5-Year Crash History

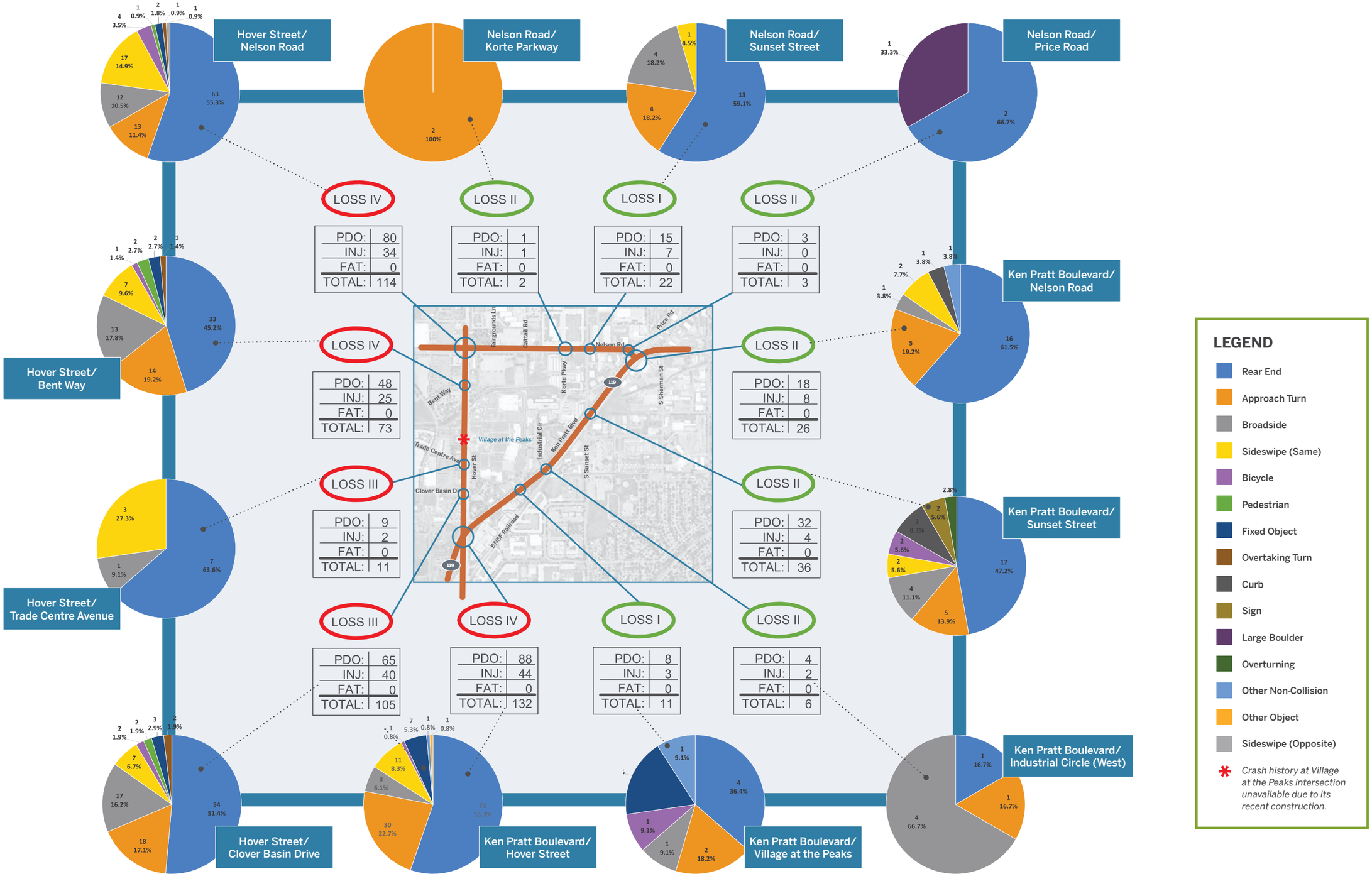

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FIGURE 11: SW Longmont Pedestrian/Bicycle Connectivity

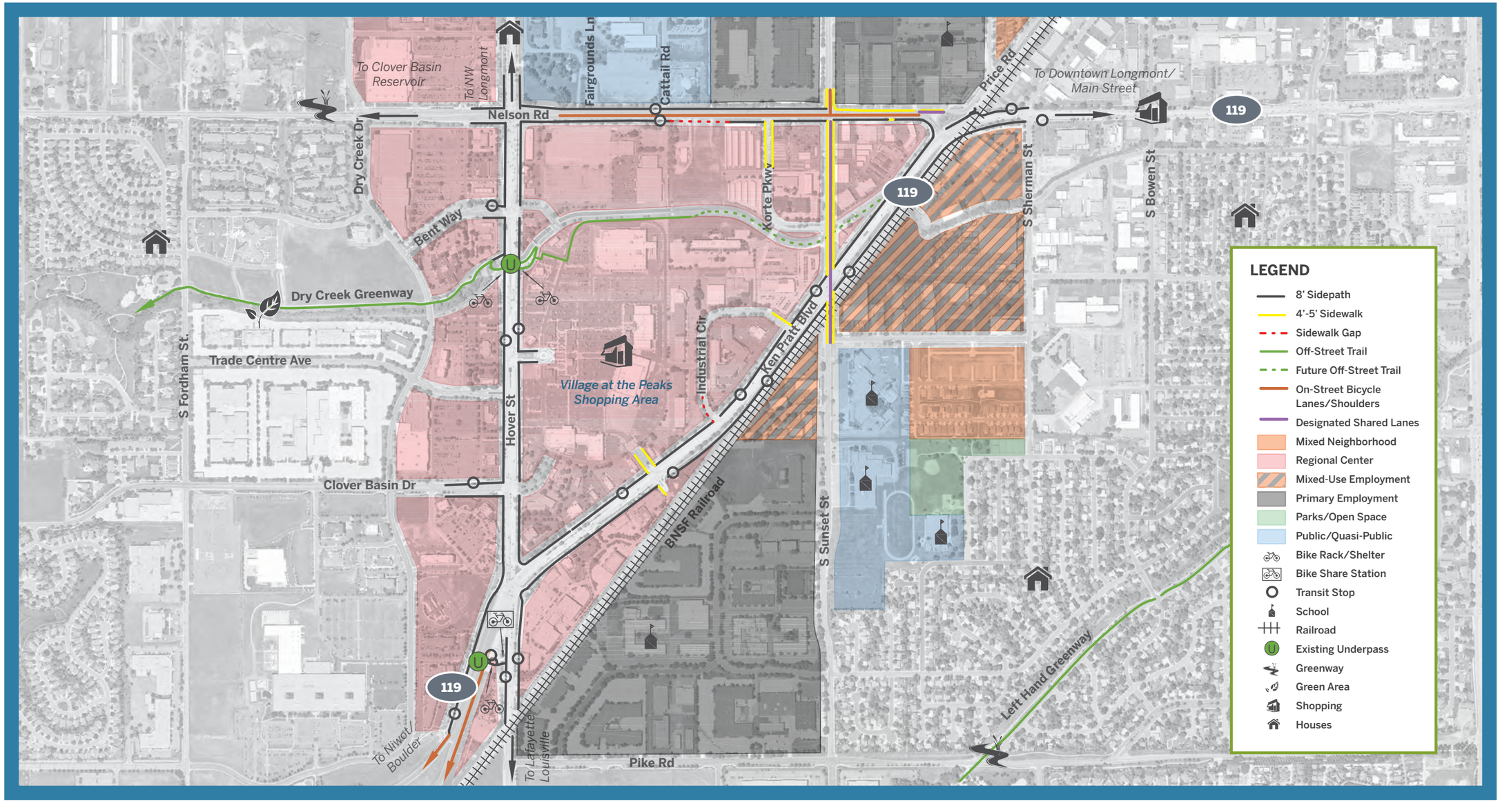

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FIGURE 12: Pedestrian/Bicycle Facilities and Deficiencies

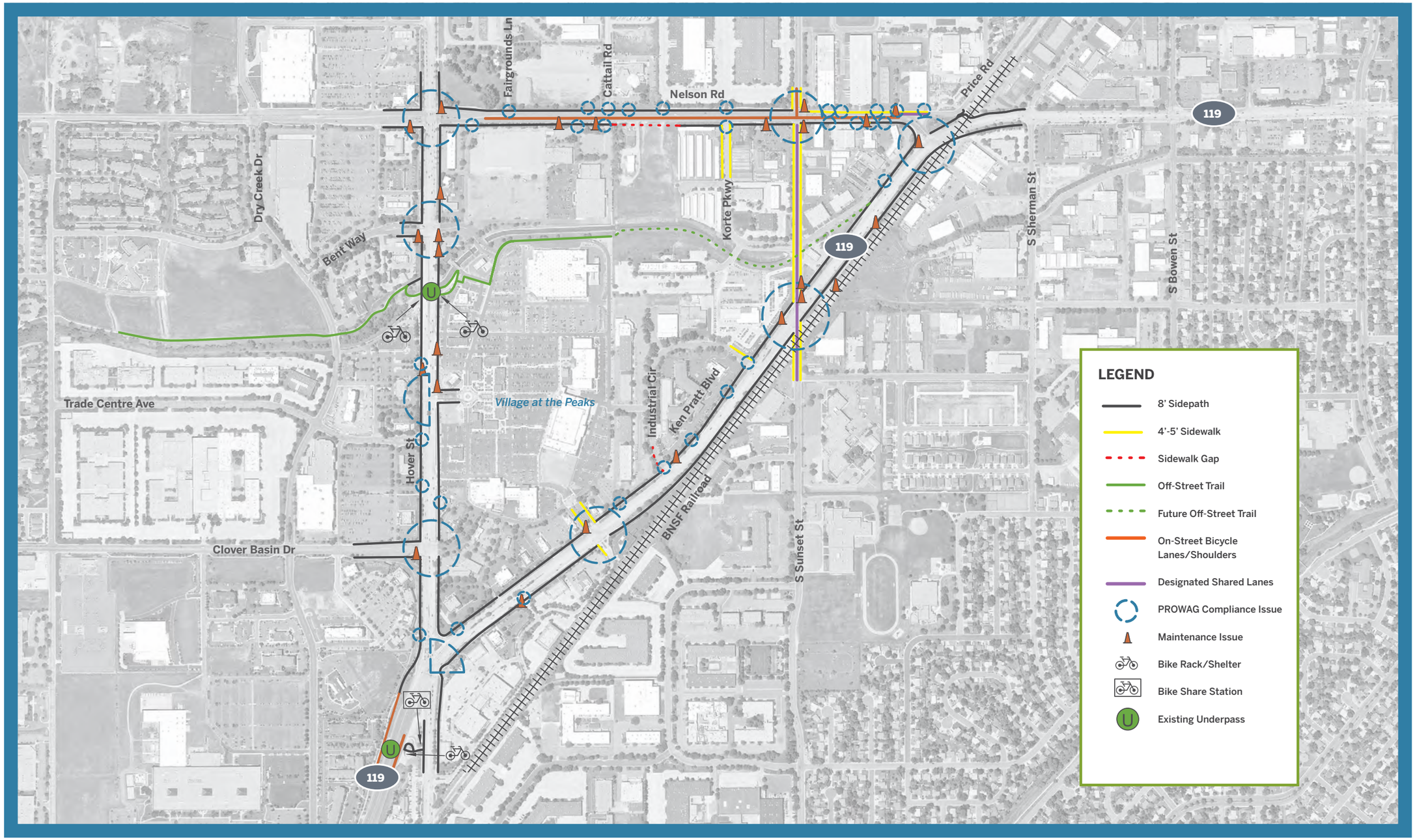

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FIGURE 13: Pedestrian/Bicycle Volume and Operations

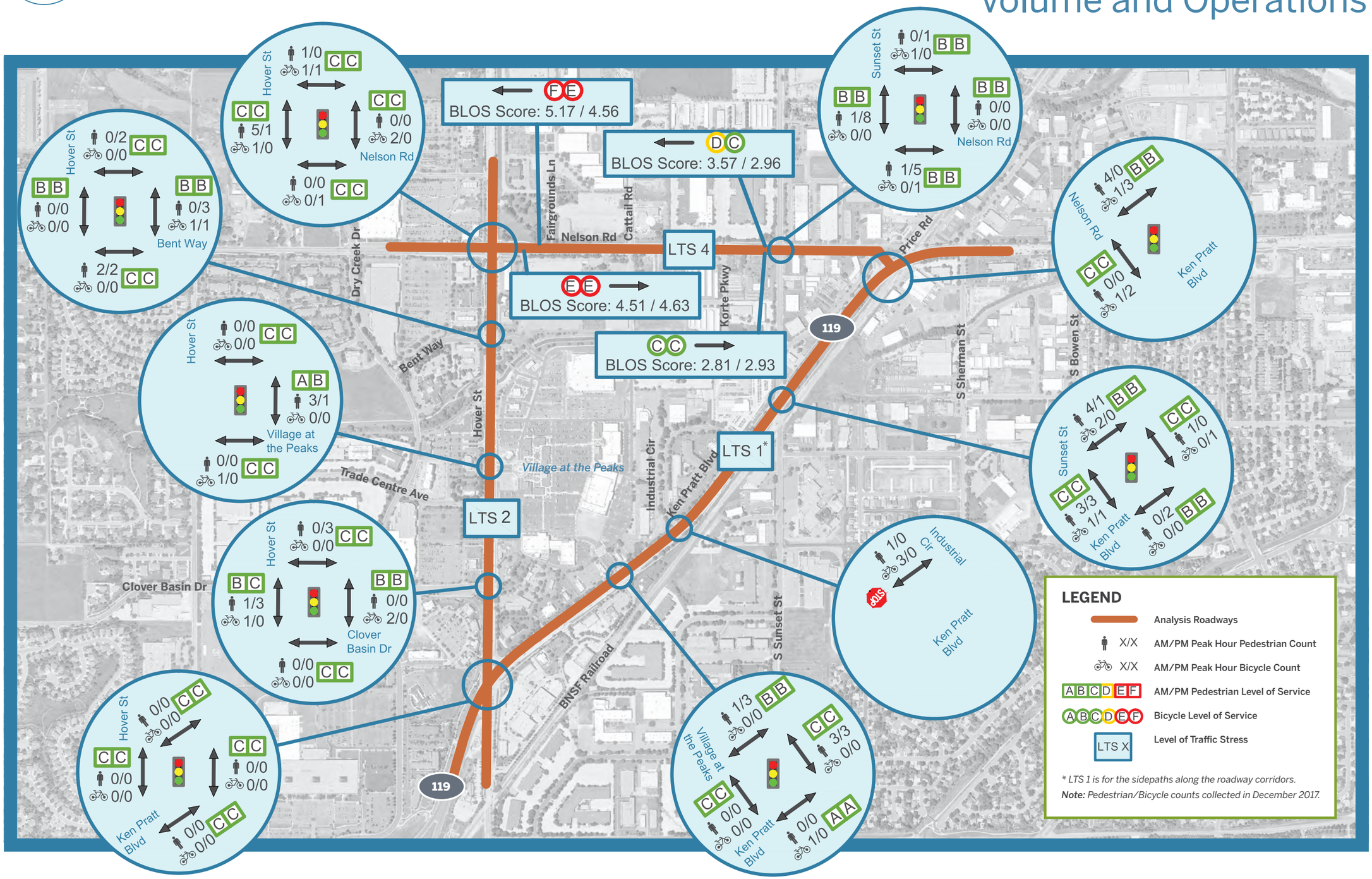

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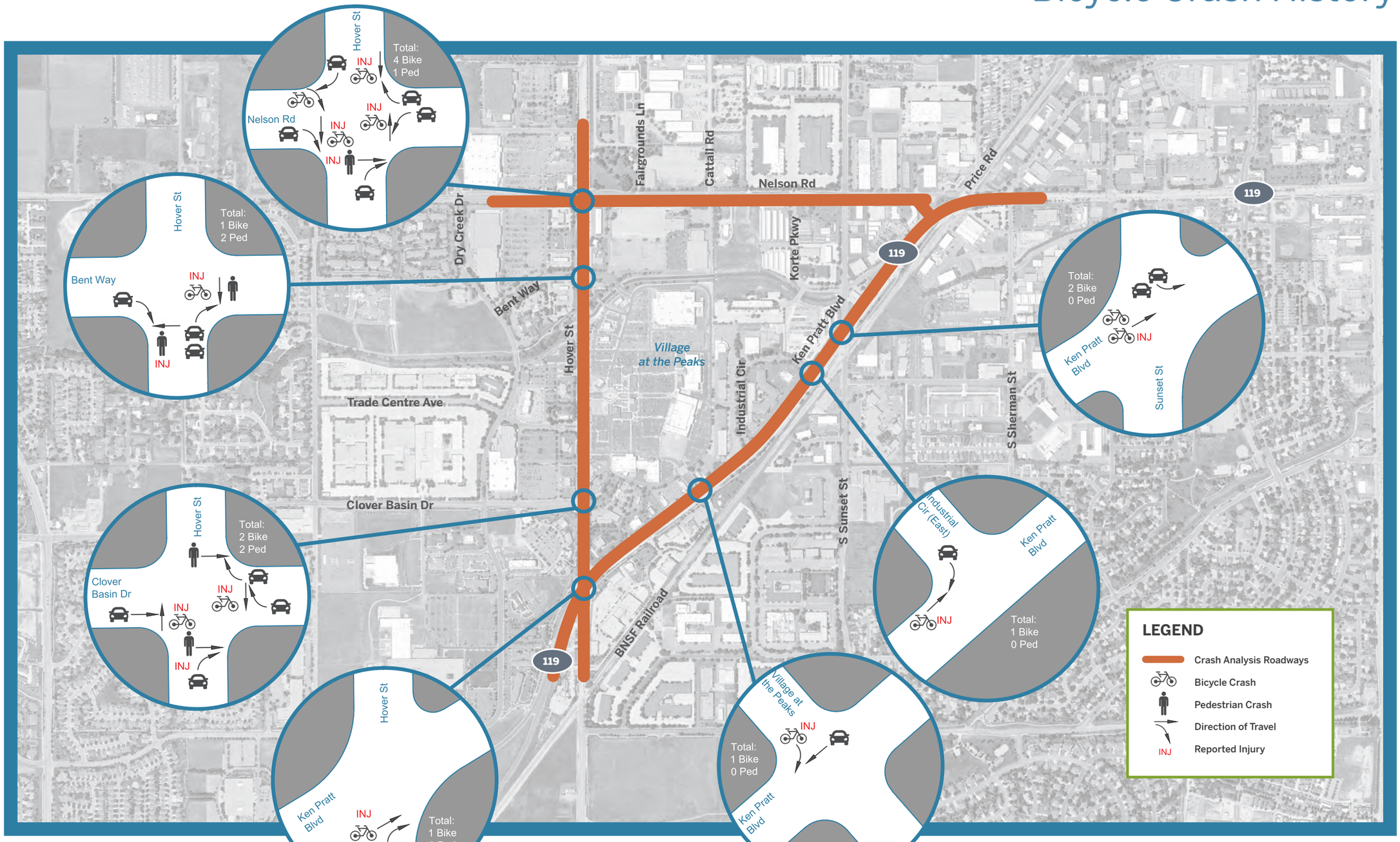
FIGURE 14: 5-Year Pedestrian/ Bicycle Crash History



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