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TECHNICAL MEMORANDUM

DATE:	March 31, 2020
TO:	Lisa Key, City of Liberty Lake
FROM:	KJ Hanley, PE, Parametrix Charles Allen, PE, PTOE Parametrix
SUBJECT:	Country Vista Drive Corridor Analysis DRAFT
CC:	
PROJECT NUMBER:	377-7878-004
PROJECT NAME:	Liberty Lake Network Analysis Update and Country Vista Corridor Study

INTRODUCTION

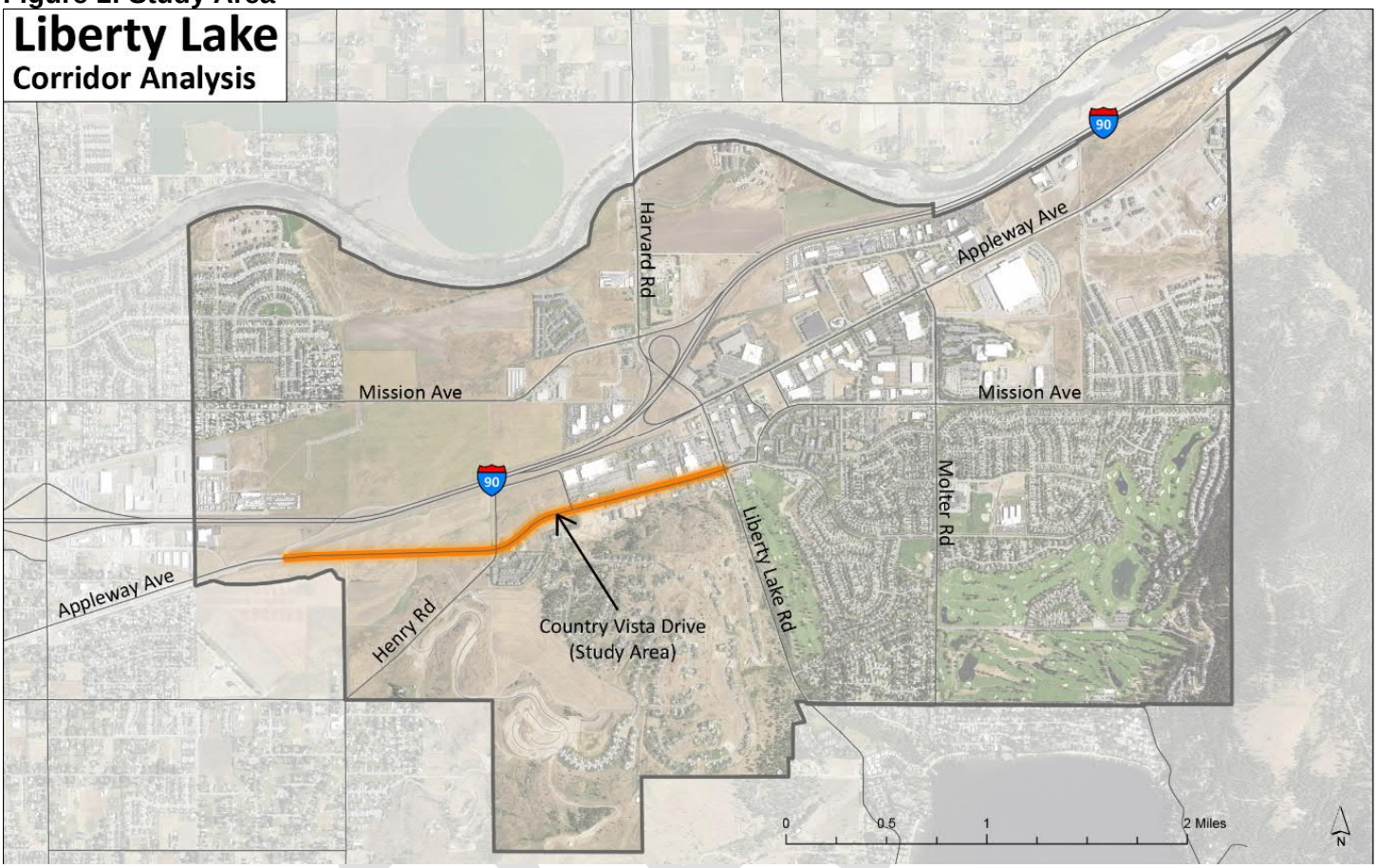
The City of Liberty Lake has requested Parametrix to conduct an update to the 2017 Network Analysis Transportation Study including a focused corridor analysis of Country Vista Drive to investigate short-term issues and improvements. The purpose of this memo is to summarize the results of the Country Vista Drive analysis. Additionally, to provide support to the ongoing design of the Henry Road bridge over I-90, long-term intersection configuration recommendations are provided for the Henry Road/Country Vista Drive intersection and the Mission Avenue/Henry Road intersection at either end of the future bridge.

Given the current and future importance of the roadway, the City desires to analyze potential improvements to accommodate vehicular, bicycle, and pedestrian traffic. Considerations include current zoning ordinances, land use classifications as found in the Comprehensive Plan, trail plans, pending and near-term developments, traffic counts and Level of Service (LOS) analysis, and projected future growth. Where intersection improvements are warranted, an analysis is also conducted to determine whether roundabouts or traffic signals are the appropriate improvement strategy. Additional recommendations for crosswalks and bicycle connections are outlined, as well as best practices in placing future transit stops. The application of these principles will help the City of Liberty Lake maintain a comfortable effective route for multiple modes of transportation and that as new development occurs, it will meet both current and future demand.

BACKGROUND

Country Vista Drive is a five-lane roadway that parallels I-90 in the City of Liberty Lake. The study area includes a 1.5 mile stretch of Country Vista Drive from the I-90 on/off ramps (also known as the Appleway flyover) on the west to the intersection with Liberty Lake Road to the east. A significant portion of the land that surrounds Country Vista Drive is currently vacant, although a high school is being constructed on the west end of the corridor. Figure 1 shows the portion of Country Vista Drive that is included in this study. The study area has a generally linear form, with a slight bend around Henry Road.

Figure 1: Study Area



Zoning

Figure 2 shows the current zoning around Country Vista Drive as of March 2020. The three zones that are adjacent to the study area include the M2 Community Center Mixed-Use District, the M3 Central Business Mixed-Use District, and the C2 Freeway Commercial District zones. Though each of these zones has specific requirements, all three are generally commercial in nature.

Most of the study area falls within the M2 Community Center Mixed-Use District zone (shown in blue on Figure 2). The M2 zone is intended to "promote the livability, stability, and improvement of the City's community center mixed use areas" (Liberty Lake City Code, 10-2F-1). Both vertical and horizontal mixed use is permitted in this zone. This mixture of land uses is intended to "encourage walking, as an alternative to driving, and provide more employment and housing options" (Liberty Lake City Code, 10-2F-1). This zone helps connect neighborhoods and employment areas. Development in this zone should be "transit-oriented" to the greatest extent possible to reduce the reliance on the automobile and parking needs.

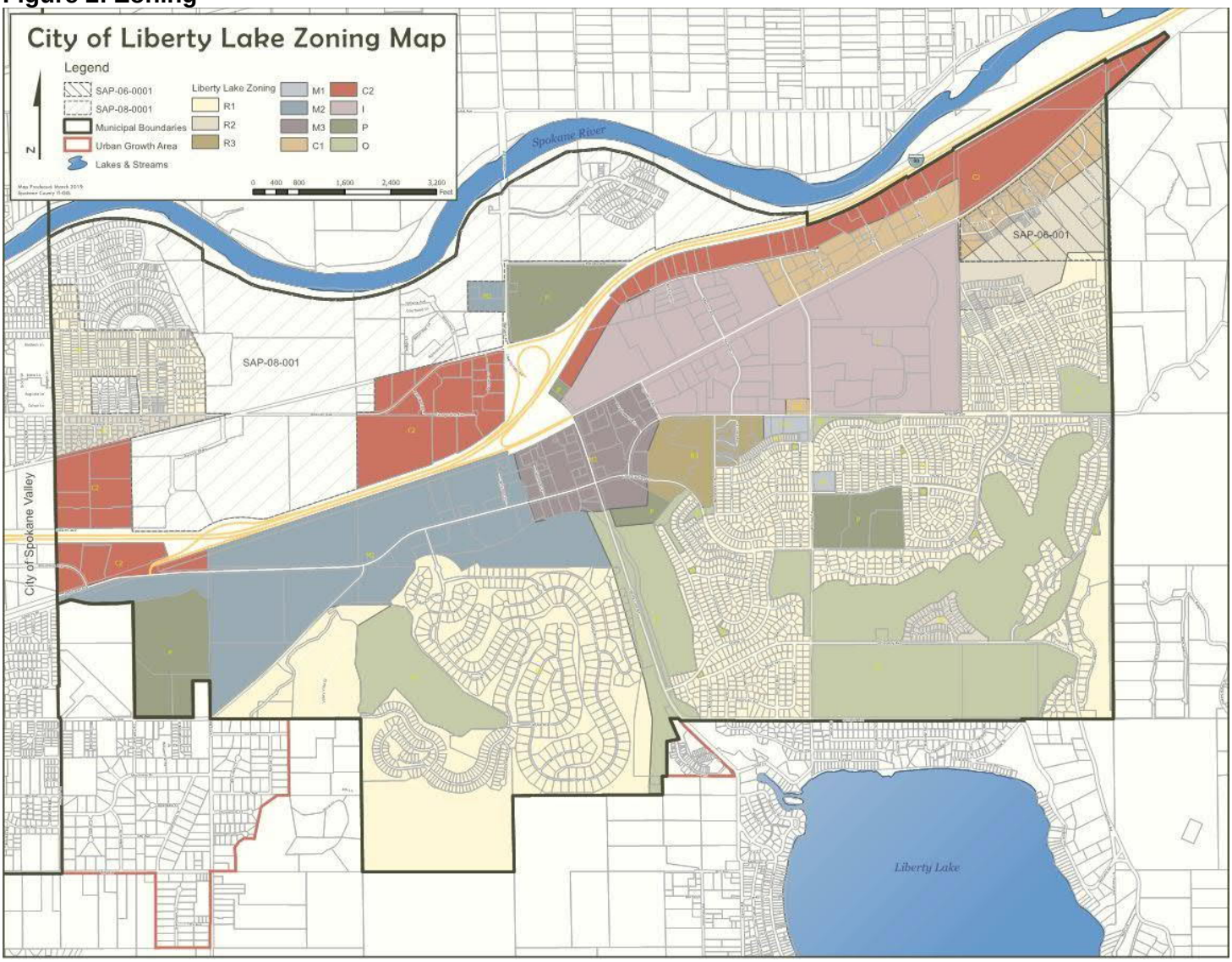
The eastern portion of the corridor falls within the M3 Central Business Mixed-Use District zone. This zone makes up the core of Liberty Lake's central business district. The City has a goal to strengthen the M3 zone as the "heart" of the community and as the logical place for people to gather and create a business center. This zone also has the same principles as the M2 zone regarding the encouragement of walking and transit-oriented developments.

A small portion (roughly 1,000 feet) of the study area falls within the "C2 Freeway Commercial District" zone. This zone provides for a range of light manufacturing, office uses, automobile-oriented uses, and similar uses which may not be

appropriate in mixed-use zones. This small portion of C2 zone is located around the I-90 on/off ramps. While this zone allows for business services, including automobile-oriented uses, it does prevent strip commercial development on arterial and collector streets.

Overall, existing development along the corridor is compliant with current zoning. Most development is commercial in nature, with big-box, pad, and commercial strip development patterns. There is some medium-density housing south of the street at the intersection of Henry Road. Based on current zoning, Country Vista Drive has potential to become an even more vital commercial and mixed-use thoroughfare with future development.

Figure 2: Zoning



Source: City of Liberty Lake

Comprehensive Plan

In 2015 the City of Liberty Lake adopted a 20-year comprehensive plan. Comprehensive plans are meant to offer a long-range vision for decision makers to refer to as development proposals and zoning requests are considered. An important part of the comprehensive plan is the land use classification map. This map shows what land uses the city has determined to be appropriate in each area of the city. A portion of Liberty Lake's land use classification map is shown in Figure 3. The land use classifications match the current zoning for the city, with most of the corridor designated Community Center

Mixed-Use, a portion to the east designated Central Business District Mixed-Use, and a small portion to the west designated Freeway Commercial.

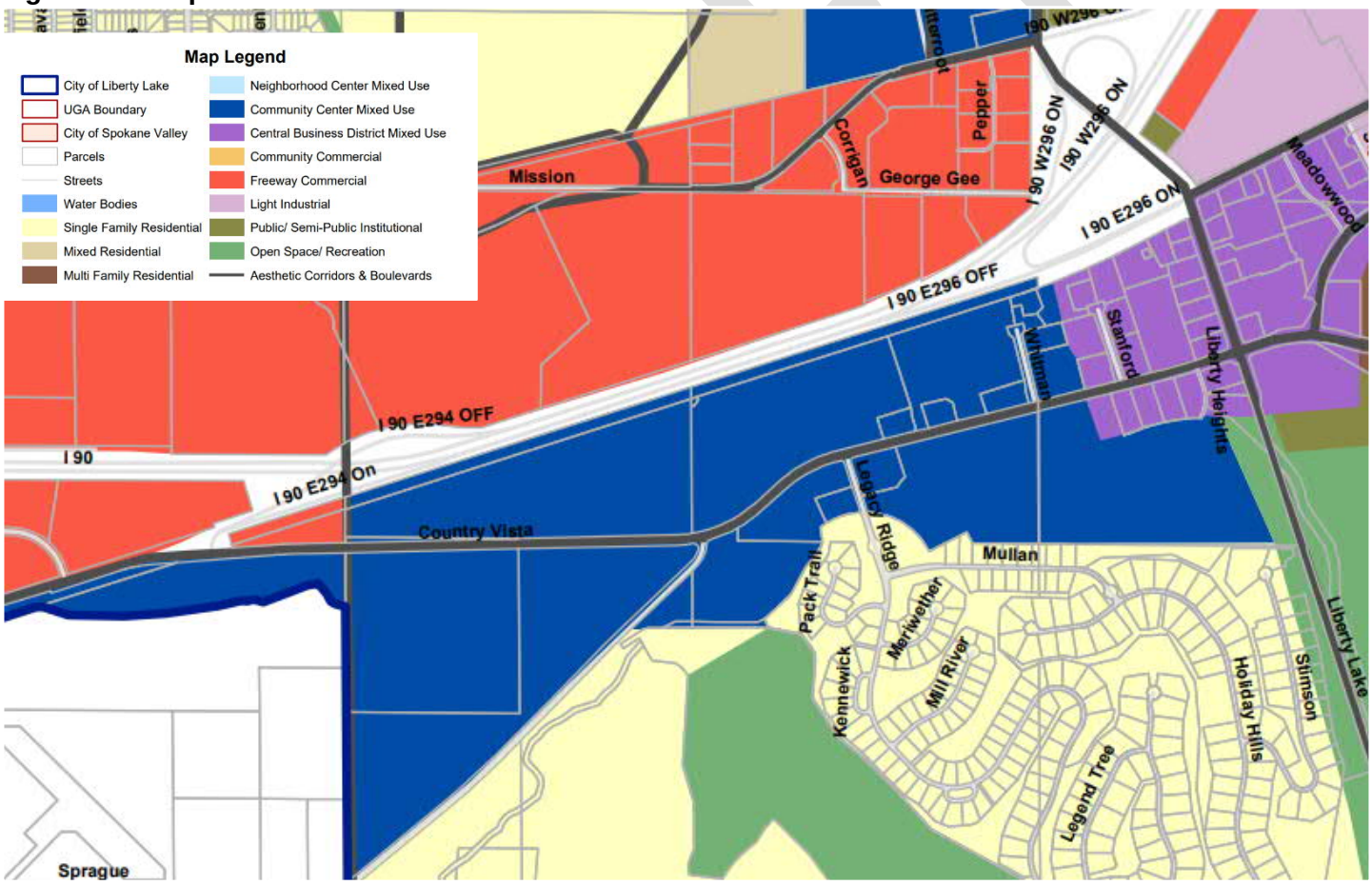
Community Centers, as described in the comprehensive plan, are "higher-intensity mixed-use areas designed to serve two or more neighborhoods. Community centers may have a mix of uses, including commercial, civic, light manufacturing or industrial, office, recreational uses, and residential when associated with the other permitted uses" (Liberty Lake Comprehensive Plan, pg. 49).

The Central Business District has more a regional focus, which is evident in its urban intensity and composition of uses within the district. It is also intended to "attract significant numbers of additional office and retail jobs as well as opportunities for new higher density housing" (Liberty Lake Comprehensive Plan, pg. 49).

The Freeway Commercial designation is meant for land uses that draw in customers from outlying areas. Specific guidelines in this area are meant to improve the aesthetics of the I-90 corridor. Residential uses are not permitted within this designation.

Overall, the community has envisioned an attractive corridor, with a mixture of uses, pedestrian-friendly design, opportunities for office and retail, and connections with surrounding neighborhoods.

Figure 3: Comprehensive Plan

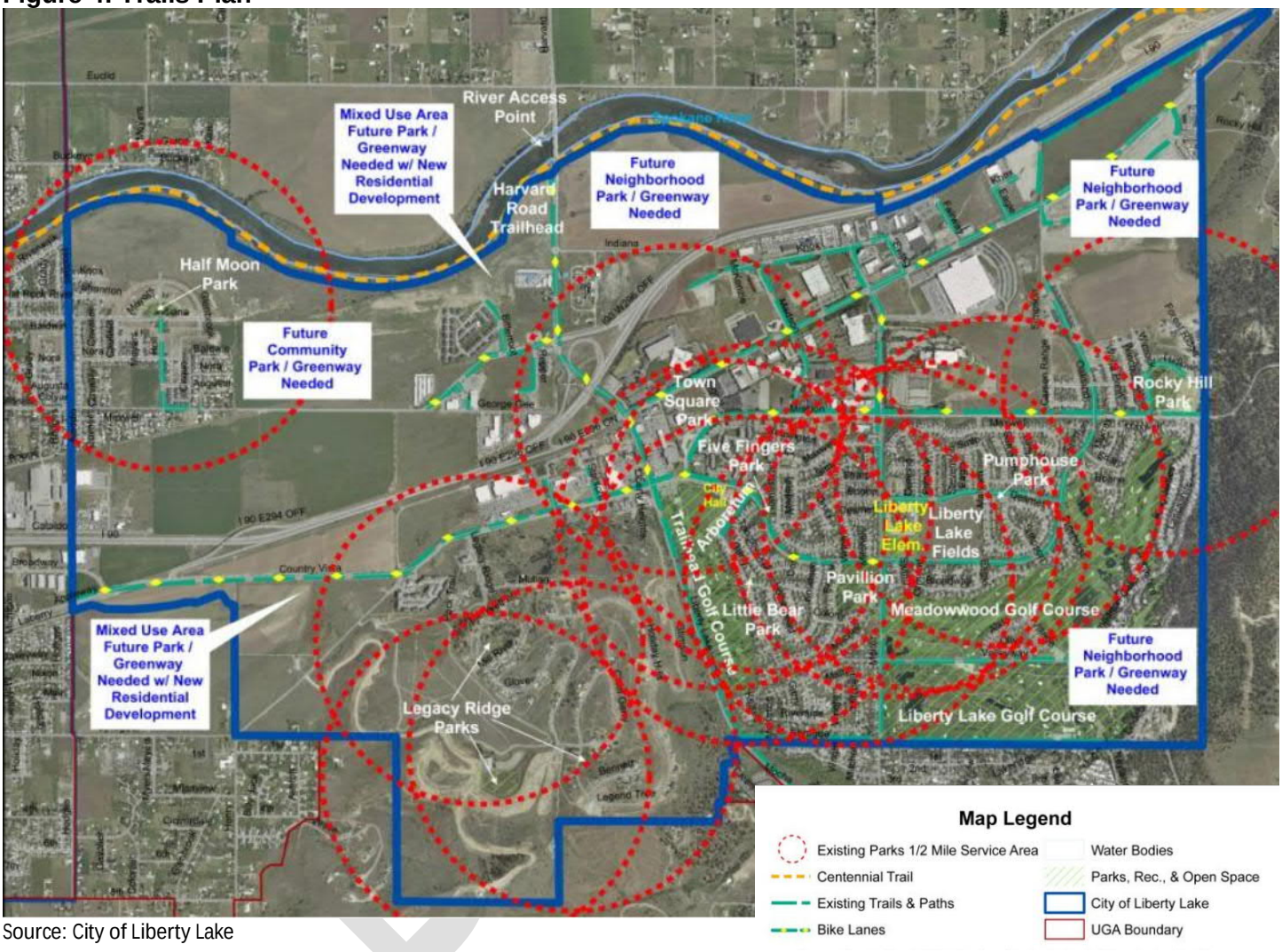


Source: City of Liberty Lake

Trails Plan

In 2015, Liberty Lake also adopted the Parks, Recreation, Open Space, and Trails Plan. This plan highlights the priority the City has placed in ensuring adequate active transportation infrastructure throughout the area. Country Vista Drive is identified in this plan as an important bicycle corridor, with bike lanes shown on both sides of the street along its entire length. This portion of the plan has already been implemented as bike lanes are currently present. Figure 4 is a map from this plan, which specially calls out the need for a future "Park/Greenway" with new residential development.

Figure 4: Trails Plan



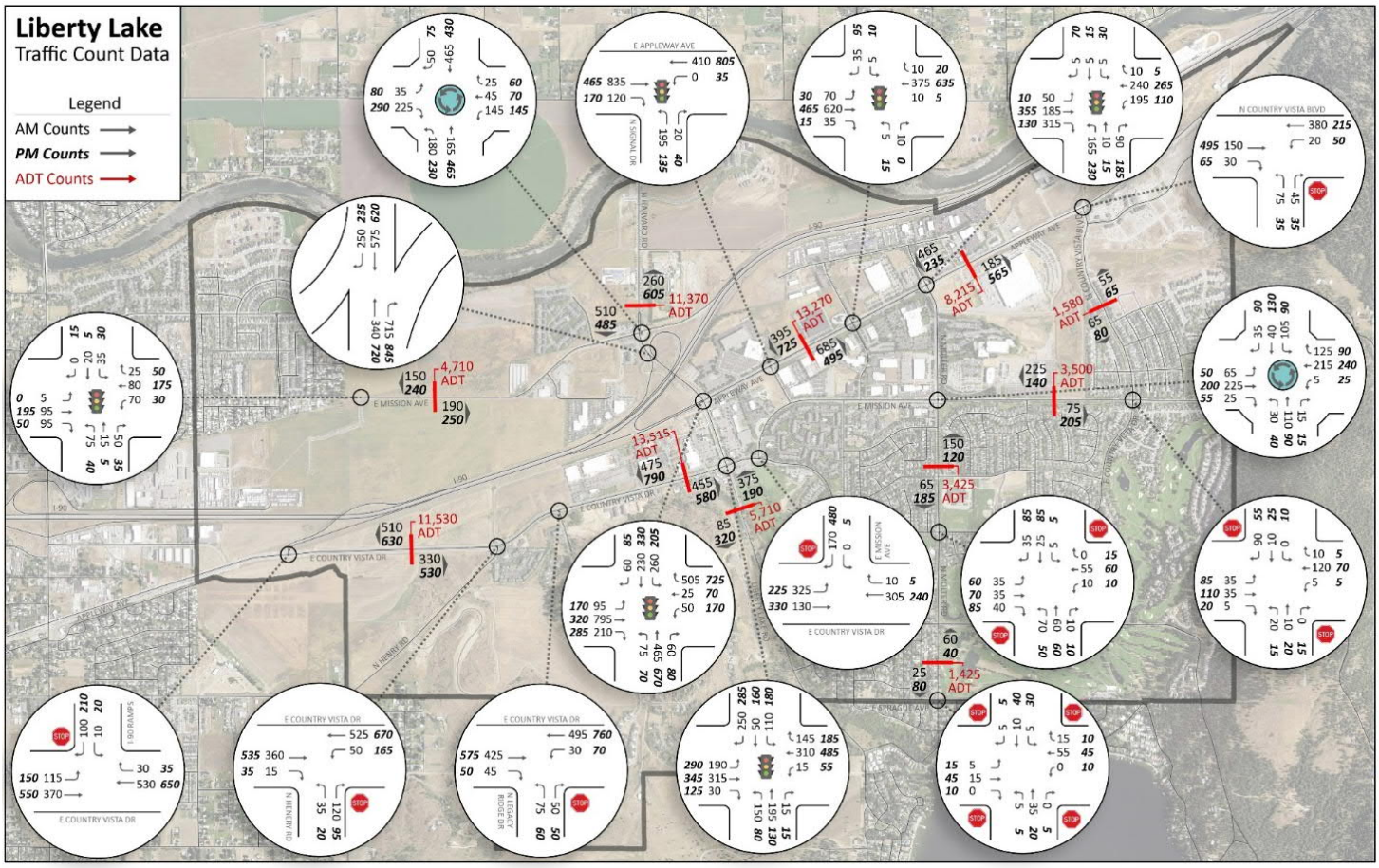
Source: City of Liberty Lake

EXISTING CONDITIONS

Traffic Counts

To help determine existing conditions, Parametrix conducted city-wide traffic counts the week of November 4, 2019 including AM and PM peak period turning movement counts at 17 intersections and 72-hour tube counts at 11 locations. Four intersections on Country Vista Drive were counted in addition to two tube count locations. Figure 5 summarizes the city-wide traffic count results. At the time of the data collection, daily traffic volumes on Country Vista Drive corridor ranged from about 11,500 to 13,500 vehicles per day with slightly higher volumes on the east end.

Figure 5: Traffic Counts

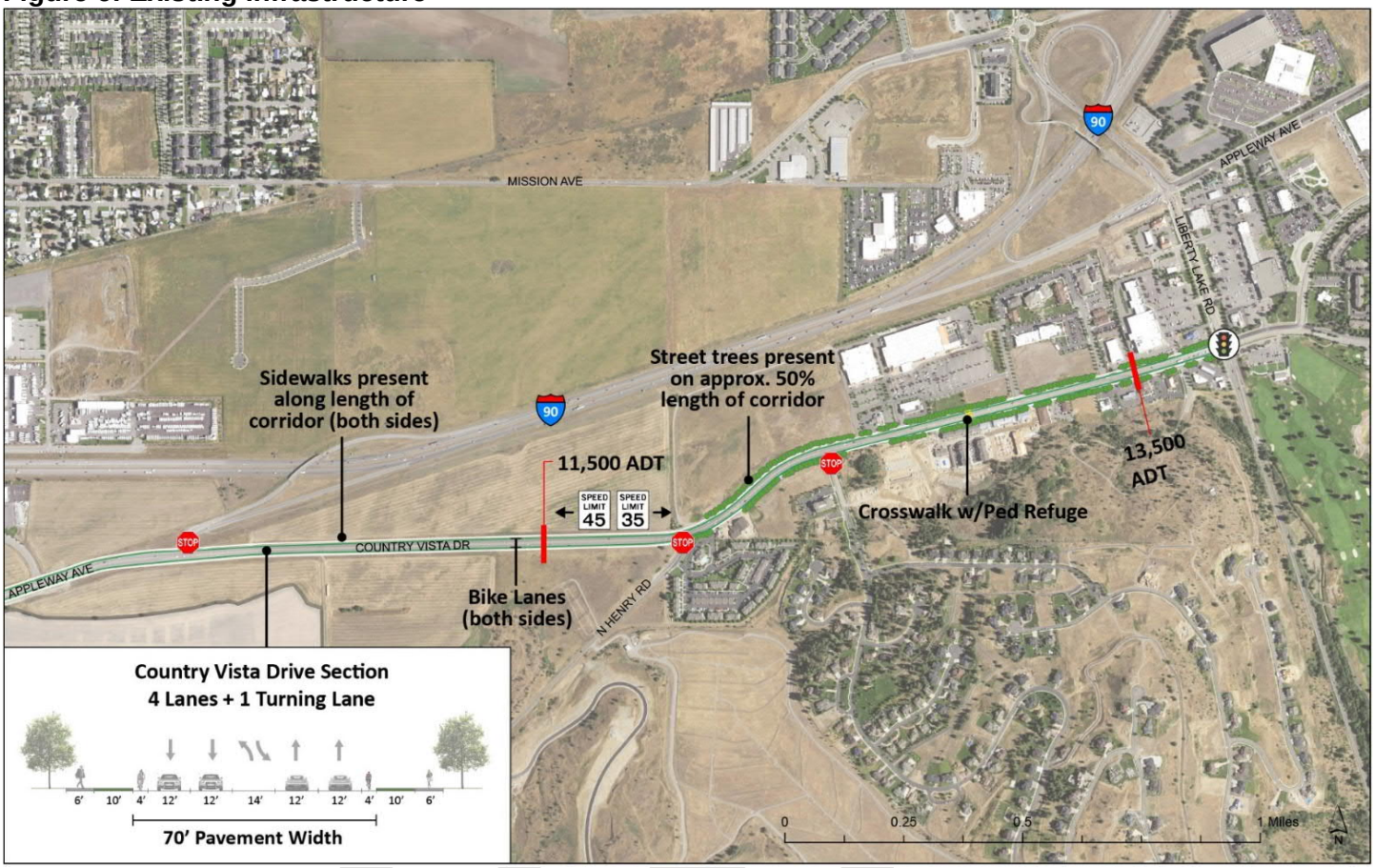


Infrastructure

The entire portion of Country Vista within the study area currently has two travel lanes in each direction, and a center turn lane. There are four-foot bike lanes on both sides of the street, a 10-foot grass buffer, six-foot sidewalks, and landscaping. Street trees are present for approximately 50 percent of the length of the study area (found on the eastern half of the corridor where most development has already occurred).

The vehicle speed limit changes at roughly the halfway point of the study area, with the western half being 45 mph, and the eastern half closer to the city center being 35 mph. Very few pedestrian crosswalks span the street, with one at the Liberty Lake Drive signalized intersection to the east, and a midblock crosswalk with a refuge island near the Home Depot (see Figure 6). Other than the signal at Liberty Lake Drive, all intersecting streets are stop-controlled for the minor streets and free-flow movements on Country Vista Drive.

Figure 6: Existing Infrastructure



FUTURE CONDITIONS

Development

There are a few pending developments that will significantly impact the future of the corridor. Most notable is the plan for a future high school at the west end of the corridor. The high school will add multiple access points and a new traffic signal to the corridor (see Figure 7). Accompanying the high school are plans for more multi-family development just to the east of the school, sharing access to Country Vista Drive with the high school. Most vacant land along the corridor is anticipated to develop as commercial use soon after the high school is in place.

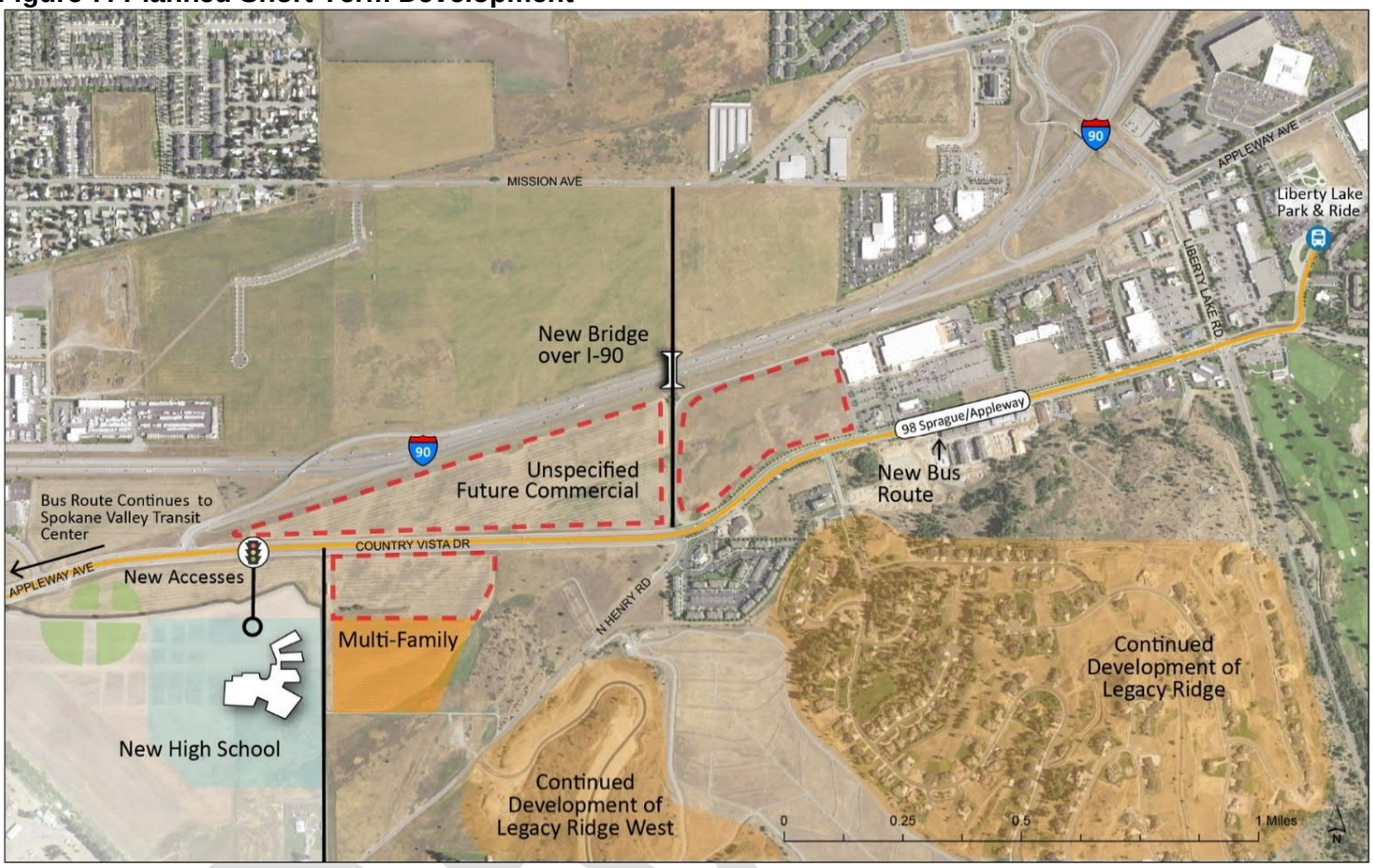
Infrastructure

A new bridge over I-90 connecting Country Vista Drive and Mission Avenue is planned at the current Henry Road alignment. The bridge will provide an alternate route for vehicles from the northern portion of the city to access the southern portion without using Liberty Lake Road (which is currently one of very few routes that crosses the freeway in the city). Designs for the bridge are underway and it is expected to be constructed in within the next few years.

The Spokane Transit Authority (STA) plans to modify Route 98 which connects the Spokane Valley Transit Center to the west to the Liberty Lake Park & Ride in the city center to the east. In the vicinity of Liberty Lake, the route currently runs along Mission Avenue north of I-90. STA plans to move the route to the Country Vista Drive corridor in 2021. The realigned route will provide new transit service to the Country Vista Drive corridor.

The City of Liberty Lake plans to construct raised medians along the Country Vista Drive corridor. The raised medians will include landscaping elements and will help to control and consolidate access on the corridor. The project to add the medians is scheduled for 2024.

Figure 7: Planned Short-Term Development



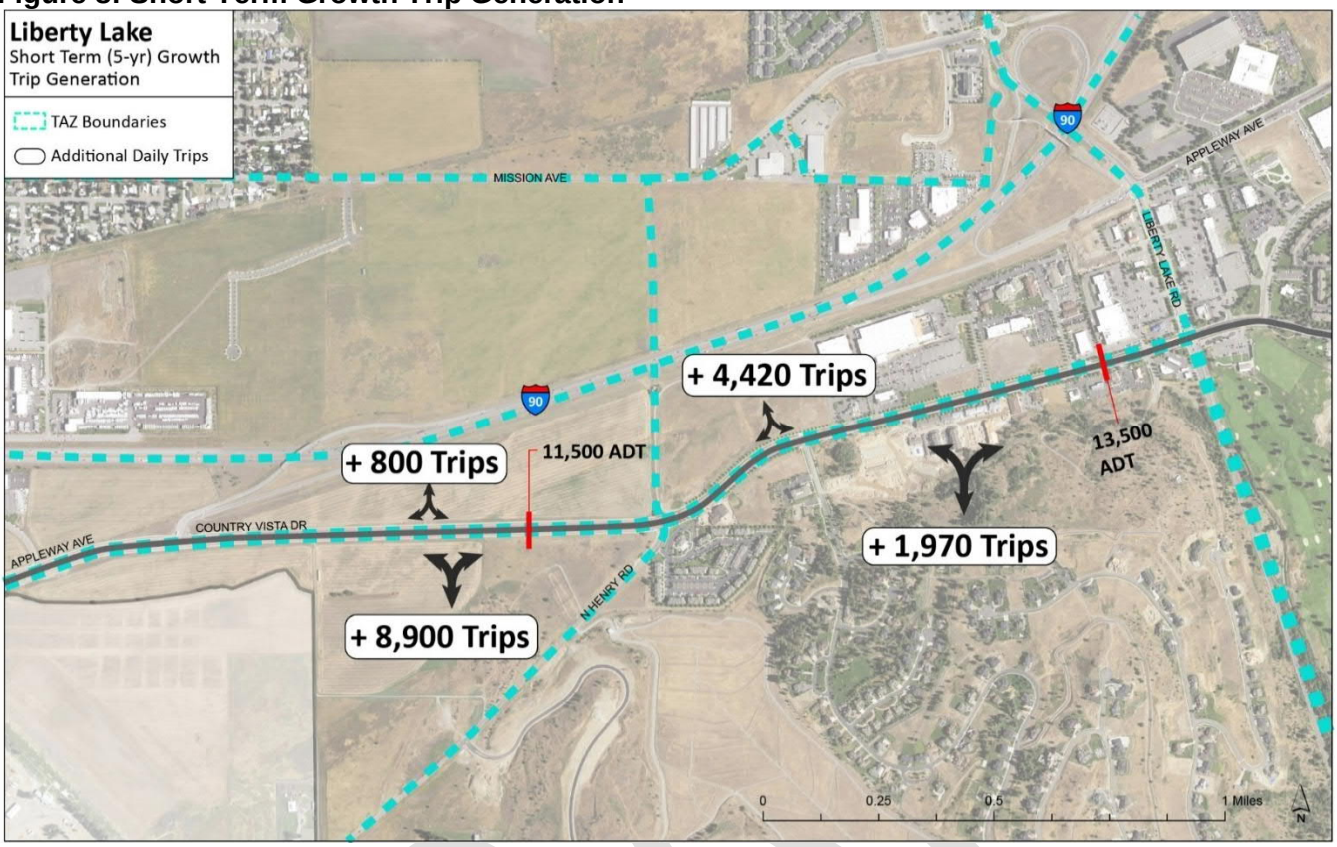
Short-term Traffic Demand

To estimate the travel demand expected from short-term growth, Parametrix worked closely with City staff to develop assumptions about pending or likely development within the next five years. Development areas were identified city-wide and included known or ongoing development such as the new high school and adjacent multi-family residential units on the Country Vista corridor. Parametrix and city staff also identified more generic land use growth assumptions for areas likely to develop but where specific plans are unclear or not available at this time.

With the assessment of short-term growth areas, Parametrix conducted a trip generation exercise to estimate the number of trips new development would incur on the roadway. The Institute of Transportation Engineers (ITE) compiles trip generation rates for various land uses in the Trip Generation 10th Edition. The trip generation rates are based on studies conducted nationwide. Parametrix selected and applied trip generation rates from ITE's Trip Generation 10th Edition for assumed development. Figure 8 summarizes the daily trips estimated to be generated by the short-term development adjacent to the Country Vista Drive corridor.

Parametrix then distributed the peak hour trips throughout the road network based on logical origin and destination pairs, land use patterns, and existing traffic volume directional splits. Finally, combing the distributed short-term growth trips with existing traffic counts, Parametrix developed the short-term traffic demand estimate to use for intersection analysis.

Figure 8: Short-Term Growth Trip Generation



CORRIDOR RECOMMENDATIONS

Intersection Performance

Vehicular performance at intersections is often defined by the concept of intersection LOS. LOS is defined by average vehicle delay (sec/vehicle and is associated with a letter grade on a scale from A (free flowing traffic), to F (intersection failure, major delays). Typically, LOS D service flow rates are used as minimally acceptable standards for traffic operations.

- A – free flow operation
- B – reasonably unimpeded operation
- C – stable operation
- D – small increases in flow may cause substantial delay
- E – operates with significant delays
- F – operates with extremely slow speeds and/or intersection failures

Parametrix calculates LOS using Synchro, a traffic engineering software program published by Trafficware. Synchro methods are comparable with the methods and procedures of the Highway Capacity Manual (HCM) 6th Edition to calculate vehicle delay on the roadway network. Table 1 illustrates the LOS definitions for unsignalized intersections (stop-controlled or roundabout) and signalized intersections. It should be noted that Highway Capacity Manual definitions for LOS do not apply to uncontrolled movements.

Table 1: Level of Service

Level of Service	Unsignalized Intersection Average Delay (sec/veh)[1]	Signalized Intersection Average Delay (sec/veh)
A	0 -10	0 - 10
B	10 - 15	10 – 20
C	15 – 25	20 – 35
D	25 - 35	35 – 55
E	35 - 50	55 – 80
F	> 50	> 80

1. Reported for the worst stop or yield-controlled approach
Source: HCM 6th Edition

In coordination with City staff, two intersections were identified as potential concerns for the near future. These include the Henry Road/Country Vista Drive intersection and the Legacy Ridge Road/Country Vista Drive intersection. Both intersections are currently stop-controlled for the minor street. With existing traffic, both the Henry Road intersection and the Legacy Ridge Drive intersection operate at LOS C during the PM peak hour. When short-term growth is taken into consideration, both intersections reach LOS F.

Table 2: Intersection LOS Summary

Intersection	LOS (Avg Delay)	
	Existing	With Short-term Growth
Henry Road	C (17)	F (>50)
Legacy Ridge Drive	C (21)	F (>50)

Because both the Henry Road intersection and the Legacy Ridge Drive intersection are projected to operate at LOS F under short-term growth conditions, Parametrix further analyzed potential mitigations to convert the intersections to roundabouts or signals.

Roundabout Option

Parametrix utilized the traffic analysis program SIDRA 8 to evaluate the roundabout designs. SIDRA supports several methodologies for roundabout analysis including the SIDRA standard roundabout model as well as the roundabout methodologies contained in the HCM. For this analysis, Parametrix reports results using the SIDRA methodology which is the methodology supported by the Washington Department of Transportation.

To estimate the number of roundabout entry lanes needed for each approach of each study intersection. Parametrix examined planning-level roundabout sizing criteria from NCHRP Report 672 Roundabouts: An Informational Guide 2nd Edition published by the Transportation Research Board (TRB) to offer further context to the analysis.

Parametrix applied the roundabout sizing criteria documented in the NCHRP Report 672 to short-term PM peak hour volumes for both the Legacy Ridge Drive/Country Vista Drive and Henry Road/Country Vista Drive intersections. According to NCHRP Report 672, the number of lanes likely needed for a roundabout approach can be estimated from the sum of the entering volume and conflicting circulating volume. The higher the combined volumes, the more likely the approach requires additional lanes to function adequately (see Table 3). As shown in Figures 9 and 10, short-term PM peak hour forecast volumes reveal that all roundabout approaches exceed the combined 1,000 vehicles per hour threshold for the Henry Road intersection and for the westbound approach of the Legacy Ridge Drive intersection. Thus, both potential roundabout locations merit consideration for two entry lanes.

Because both intersections were above thresholds needing two lane approaches, both intersections were analyzed in SIDRA as two-lane roundabouts. Figures 11 and 12 show the recommended roundabout lane configuration. Table 4 summarizes the LOS results. As shown in Table 4, the Henry Road intersection is expected to operate at LOS C as a two-lane roundabout configuration with two-lane approaches eastbound and westbound on Country Vista Drive, and one-lane approaches north and south on Henry Road. The Legacy Ridge intersection is expected to operate at LOS B as a two-lane roundabout with two-lane approaches eastbound and westbound on Country Vista Drive, and a one-lane approach northbound on Legacy Ridge Drive.

Table 3: Planning-level Roundabout Sizing Criteria

Volume Range (Sum of Entering and Conflicting Volumes)	Number of Lanes Required
0 to 1,000 vehicles per hour	• Single-lane entry likely to be sufficient
1,000 to 1,300 vehicles per hour	• Two-lane entry may be needed • Single-lane may be sufficient based on more detailed analysis
1,300 to 1,800 vehicles per hour	• Two-lane entry likely to be sufficient
Above 1,800 vehicles per hour	• More than two entering lanes may be required • A more detailed capacity evaluation should be conducted to verify lane numbers and arrangements

Source: NCHRP Report 672

Figure 9: Henry Rd Roundabout Option

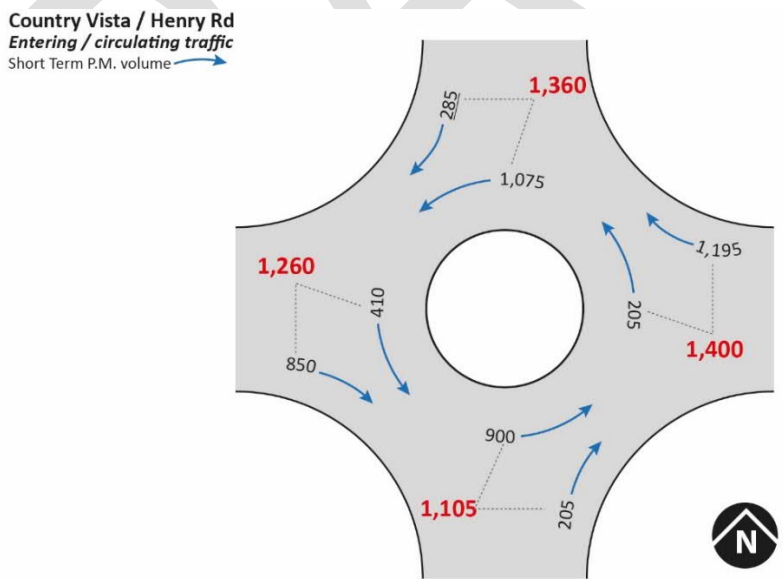


Figure 10: Legacy Ridge Drive Roundabout Option

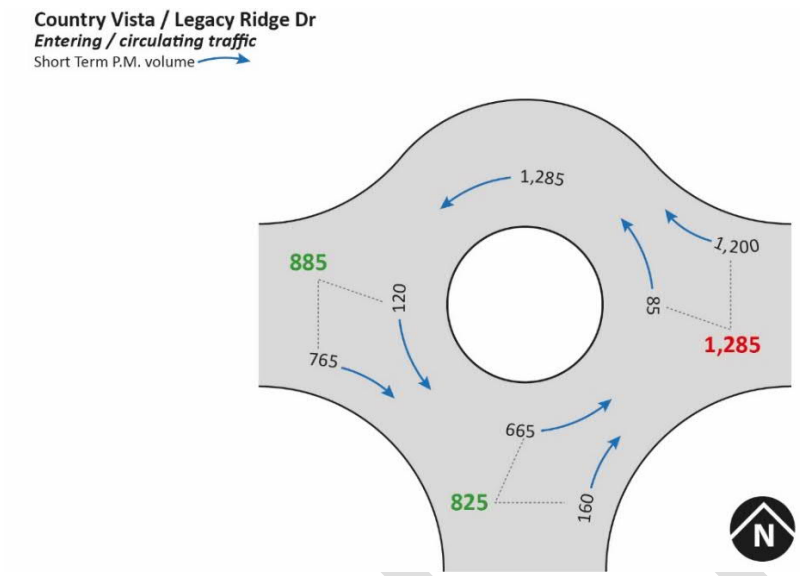


Figure 11: Two-Lane Henry Road Roundabout Option

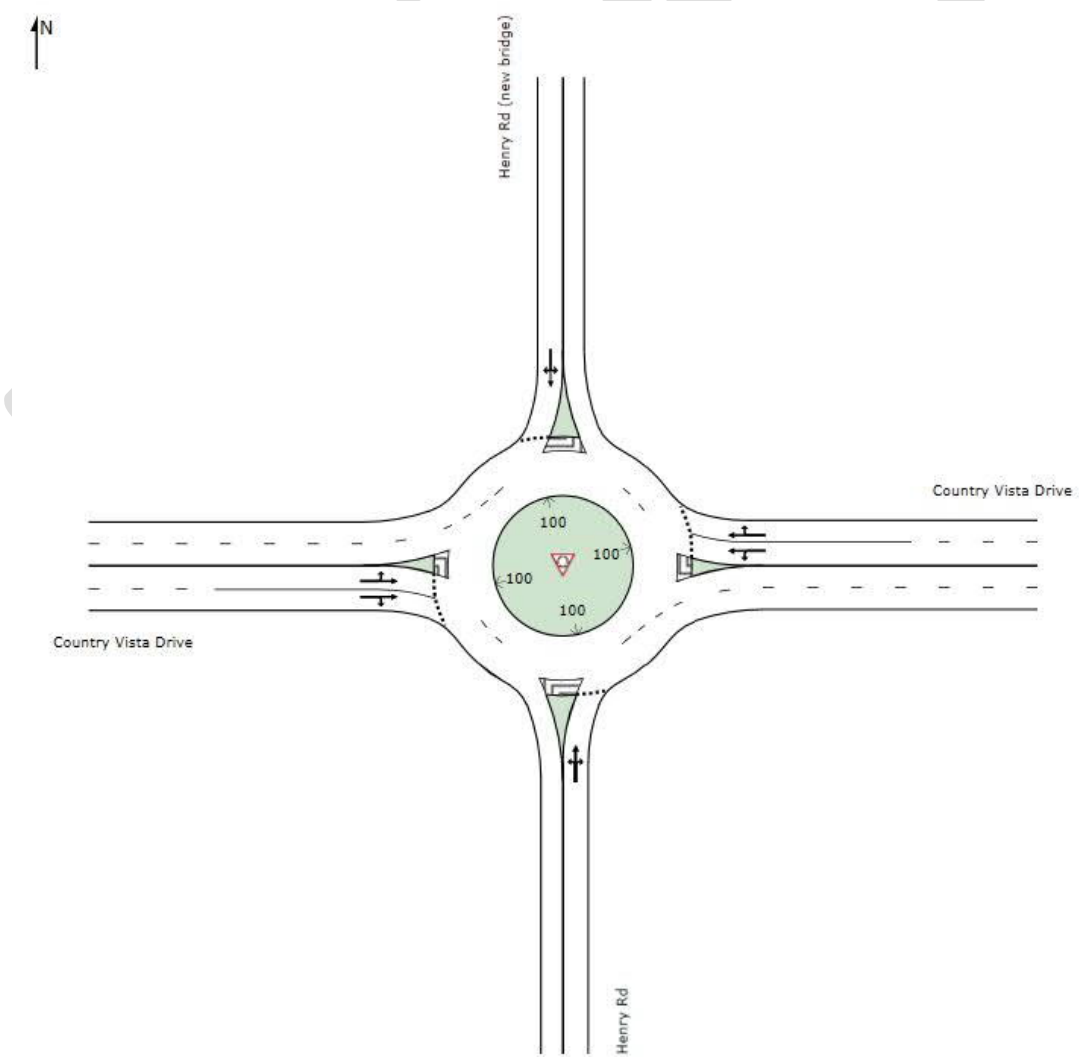


Figure 12: Two-Lane Legacy Ridge Drive Roundabout Option

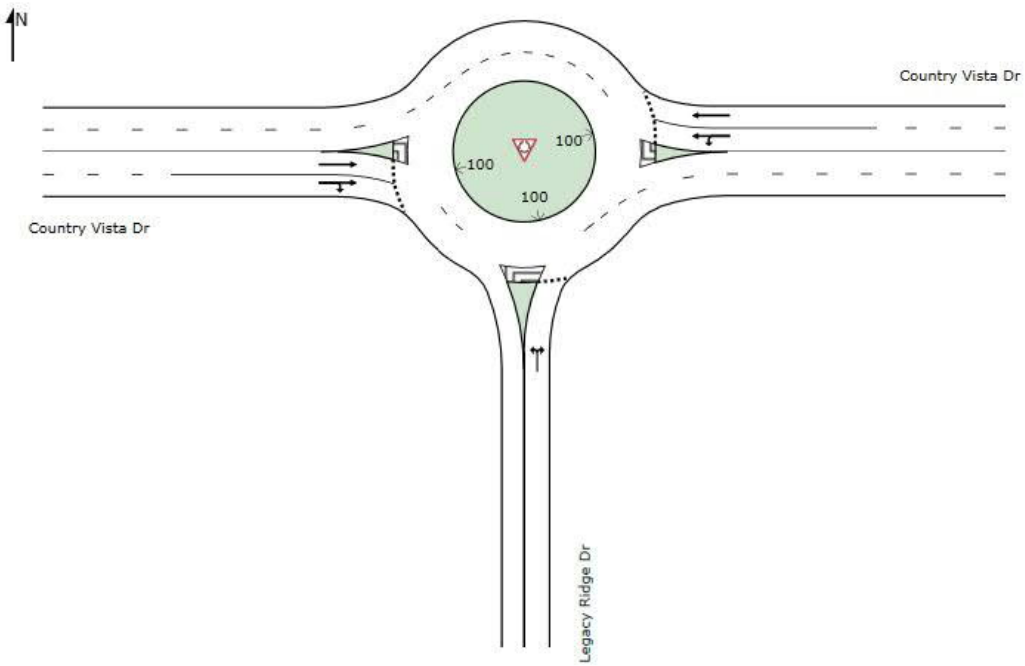


Table 4: Intersection LOS Summary with Roundabouts

Intersection	LOS (Avg Delay)		
	Existing	With Short-term Growth	
	Unsignalized	Unsignalized	Roundabout
Henry Road	C (17)	F (>50)	C (30)
Legacy Ridge Drive	C (21)	F (>50)	B (11)

Signalization Option

The Henry Road and Legacy Ridge Drive intersections were also evaluated as signalized intersections. A partial signal warrant analysis of the Legacy Ridge Drive intersection was completed to provide guidance and context for the need for a signal at Legacy Ridge Drive. Signal warrant guidelines are set forth by the Manual of Uniform Traffic Control Devices (MUTCD) which is the national standard for all traffic control devices on all public roads open to public travel. The MUTCD identifies nine signal warrants based on traffic volumes, pedestrians, school crossings, and crash history, among others. According to the MUTCD, at least one of the nine warrants must be met for a signal to be considered at a location. However, meeting one of the warrants does not in and of itself require the installation of a signal. A signal warrant is just one part of an overall engineering study of the suitability of a signal.

The Legacy Ridge Drive intersection was analyzed under Warrant 1, the eight-hour traffic volumes warrant to determine if volumes on the major street (Country Vista Drive) and minor street (Legacy Ridge Drive) exceeded the necessary thresholds for any eight hours of the day to warrant a signal at the intersection. Table 5 shows the results of Warrant 1B. While the intersection did not meet Warrant 1B under existing volumes (6 of 8 hours needed were met), the Legacy Ridge Drive intersection is projected to meet signal Warrant 1B under the Short-Term Volumes. (12 hours of 8 hours needed).

Table 5: MUTCD Signal Warrant 1B Projections for Legacy Ridge Road/Country Vista Drive

Existing Volumes		Short-term Growth Volumes	
Warrant 1B		Warrant 1B	
Major	Minor	Major	Minor
>900	>75	>900	>75
420	56	707	86
929	125	1565	190
880	118	1483	180
802	108	1351	164
779	63	1313	159
892	72	1290	105
976	79	1411	115
903	73	1306	106
1058	86	1530	125
1282	104	1855	151
1358	110	1965	160
1190	96	1721	140
669	54	967	79
6 of 8 hours met		12 of 8 hours met	

Synchro analysis was performed for the Henry Road and Legacy Ridge Drive intersections as signalized intersections. Table 6 shows the LOS and vehicle delay for each of the intersections under the Short-Term volume scenario. As seen in Table 6, both the Henry Road and Legacy Ridge Drive intersections will perform at LOS B as signalized intersections under the Short-Term growth scenario.

Table 6: Intersection LOS Summary with Roundabouts or Signals

Intersection	LOS (Avg Delay)			
	Existing	With Short-term Growth		
	Unsignalized	Unsignalized	Roundabout	Signalized
Henry Road	C (17)	F (>50)	C (30)	B (13)
Legacy Ridge Drive	C (21)	F (>50)	B (11)	B (17)

Intersection Recommendation

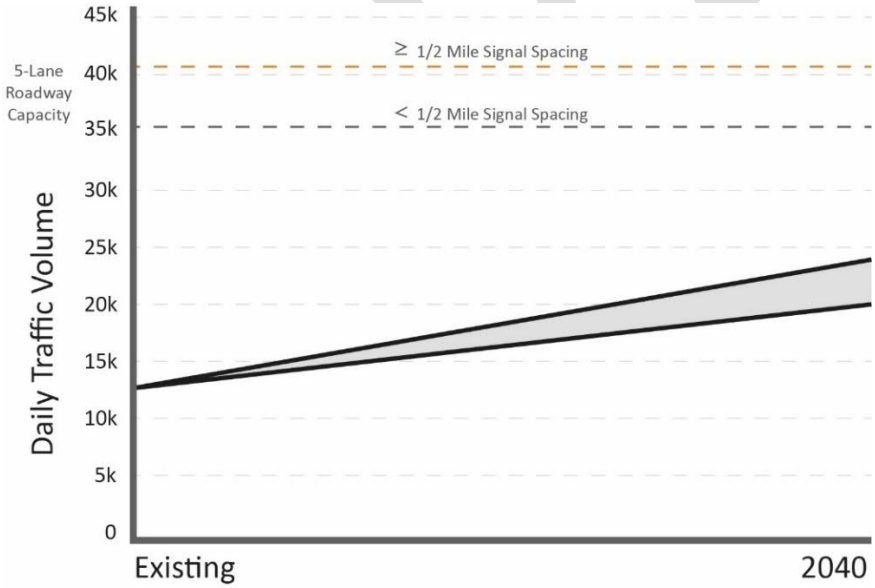
Parametrix recommends traffic signalization for both intersections. Traffic signals will be more consistent with other treatments on the corridor, namely the signal at Liberty Lake Drive and the proposed signal at the new high school entrance. Additionally, the signals will offer a more controlled experience for pedestrians and bicyclists traveling along Country Vista Drive and crossing the roadway. Roundabouts can be intimidating to pedestrians and bicyclists who are unsure if vehicles will yield as required by law and a two-lane roundabout design increases the pedestrian crossing distance without additional traffic control. Also, left-turns for bicyclist in a two-lane roundabout can be difficult due to the need to change lanes inside the circle among faster-traveling vehicles. Furthermore, there have been past concerns about dual-lane roundabouts at other locations on the corridor with number of young drivers to travel to and from the planned high school. Finally, roundabouts require a larger footprint and there are concerns about environmentally sensitive land near the intersection.

Figure 13: Existing Signals and Recommended Future Signals

Roadway Cross-section

Parametrix compared existing traffic volumes with preliminary long-term forecasts for the Country Vista Drive corridor to provide a high-level outlook on roadway cross-section needs. Figure 14 compares existing ADT, a forecasted range for 2040 ADT, and planning-level capacities for roadways with a five-lane cross-section. Signal spacing has a significant effect on roadway capacity, so capacities are presented for roadways with less than ½ mile signal spacing and greater than ½ mile signal spacing. Results illustrate that volumes are not expected to approach five-lane capacity thresholds through 2040 and the existing five-lane cross section is likely sufficient for the long term. A full long-term traffic analysis will be documented in the second phase of this study.

Figure 14: Lanes/Street Capacity



Transit

The planned realignment of Route 98 onto Country Vista Drive by STA will add a new dynamic to the corridor. STA prefers bus stops placed every ½ mile on the corridor. Parametrix recommends general ½ mile bus stop spacing with flexibility to best compliment actual development patterns as they occur. A balance between pedestrian accessibility and speed should be considered and infrastructure should be built to maximize potential ridership. Also, any future development should link building entrances to bus stops via walkways. Because STA plans to build bus shelters at stops, future development should accommodate concrete pads to fit future shelters. With proper frequency, bus stop spacing, and access to destinations, this bus route can significantly enhance the pedestrian and bike-friendly nature of the street.

Bicycle/Pedestrian Treatments

Linear Elements

Country Vista Drive already has bicycle and pedestrian amenities along the length of the street (both sides). Parametrix recommends preserving these existing amenities and to move forward with adding ped/bike amenities on the new bridge at Henry Road. As development occurs, the city should continue to extend back of sidewalk landscaping and street trees as required per city code and to preserve a walkable and aesthetically pleasing environment.

Crossings

In order to meet the established desire to have a walkable, transit-oriented corridor with connections to surrounding neighborhoods, mid-block crosswalks will be needed at various locations on the corridor. There are numerous types of mid-block crossing treatments and amenities and it is important to find the right treatment for the right location in order to maximize vehicle and pedestrian compliance. Multiple research documents indicate that in the wrong settings, marked crosswalk alone are insufficient and should not be used. Specifically, the Federal Highway Administration (FHWA) publication FHWA-HRT-04-100: Safety Effects of Marked vs Unmarked Crosswalks an Uncontrolled Locations (2005) states that marked crosswalks should not be used for the following conditions:

- Speed limit greater than 40 mph
- Four or more lanes with ADT greater than 12,000 vehicles per day (no refuge island)
- Four or more lanes with ADT greater than 15,000 vehicles per day (with a refuge island)

The Country Vista Drive corridor has portions of the roadway with a speed limit greater than 40 mph. Additionally, ADT currently exceeds 12,000 vehicles per day on the east end of the corridor and the roadway is expected to exceed 15,000 vehicles per day in the future. Thus, additional amenities beyond a marked crosswalk – even with a refuge island – is preferred.

Finding the right combination of crossing treatments is critical to making a crossing effective. Data documented in National Cooperative Highway Research Program (NCHRP) Report 562: Improving Pedestrian Safety at Signalized Crossings (2006) provides thresholds to identify appropriate pedestrian treatments based on criteria, including pedestrian volumes, road volume, road width and speed limit. NCHRP Report 562 defines four categories of treatments:

- Enhanced: High-Visibly Signs and Markings, Median Refuge Islands, In-Street Pedestrian Crossing Signs
- Active: flashing Amber Beacons, Pedestrian Crossing Flags, In-Roadway Warning Lights
- Red: Pedestrian Crosswalk Signal, Half Signal, HAWK, Pedestrian Beacon
- Signal

“Enhanced” treatments include devices that are active in the crossing at all times, such as static signage, and pavement markings. “Active” treatments are devices that activate a warning when pedestrians are present or crossing a street, such

as flashers or pedestrian flags. The "Red" category includes signals or beacons that display a circular red signal to motorists when activated by pedestrians. This includes HAWK, PELICAN, or TOUCAN signals. The "Signal" category includes conventional traffic signals which are administered by guidelines in the MUTCD. Finally, each category can be further sub-divided as being "HC" High Compliance, or "LC" Low Compliance.

NCHRP Report 562 provides guideline plots to aid in identifying the appropriate pedestrian treatment for various roadway scenarios. Parametrix applied the roadway and traffic parameters for the Country Vista Drive corridor to the plots best representing corridor conditions. Plots with and without a pedestrian refuge island are provided to compare the types of amenities recommended under each condition.

Figures 15 and 16 illustrate the recommendations absent a refuge island and with a refuge island, respectively. The plots are annotated by yellow boxes according to existing volumes and forecasted short-term volumes on Country Vista Drive. Because future pedestrian volumes are unknown, a peak hour pedestrian flow range of 20 to 100 crossings per hour was assumed. Figure 15 shows that without a refuge island, the conditions on Country Vista Drive are such that a "Red" category treatment is recommended. Essentially, the roadway width, speeds, and volumes dictate that a device with a red indication is critical to aid in driver and pedestrian compliance.

Figure 15: Pedestrian Amenity Guideline Plot – No Refuge Island

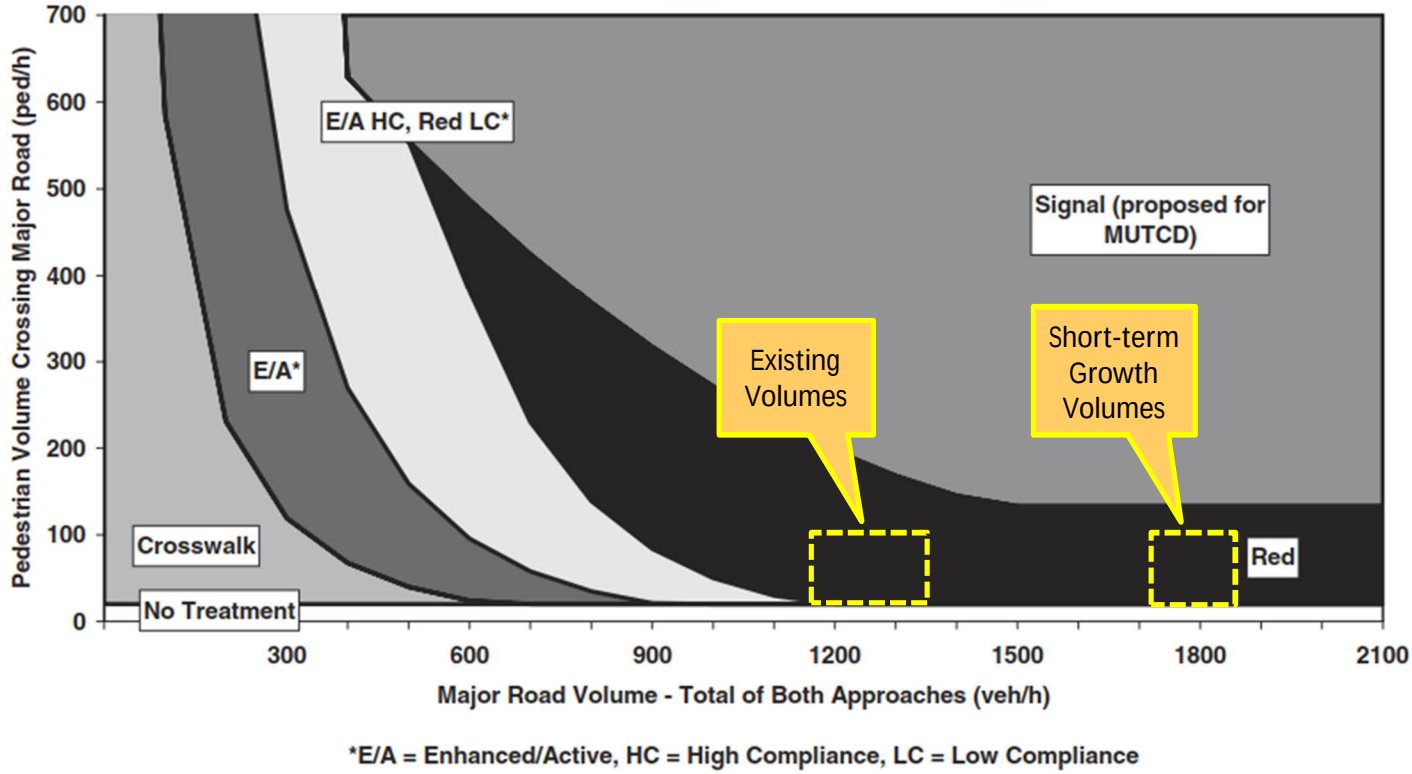


Figure A-14. Guidelines Plot, 66 ft (20 m) Pavement, ≤35 mph (55 km/h), 3.5 ft/s (1.1 m/s) Walking Speed.

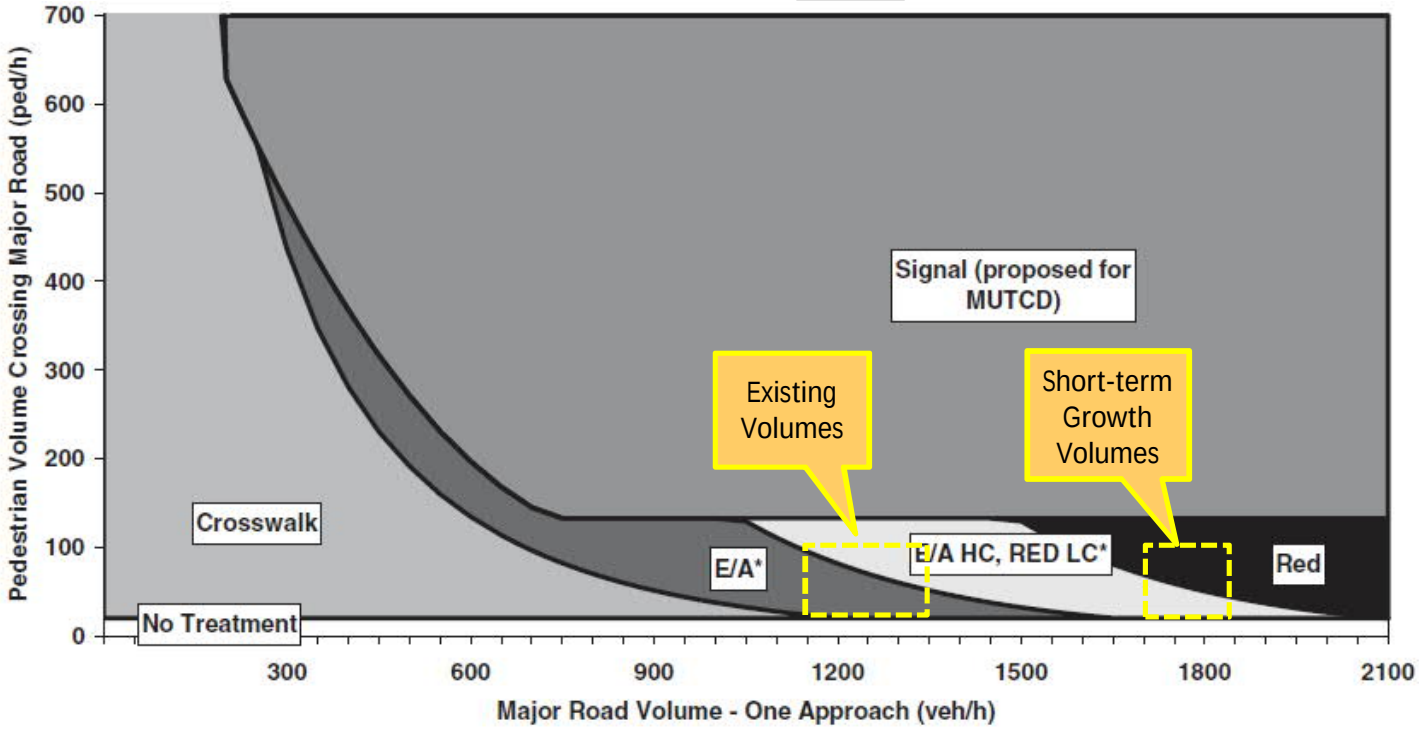
Figure 16 shows the impact of a pedestrian refuge island. With the refuge island, the crossing environment changes. Pedestrians can cross the road in two stages and enhanced/active amenities are the recommended treatment. Rapid Rectangular Flashing Beacon (RRFB) signs, such as those used for the existing crossing on Country Vista Drive (see Figure 17), fit within this amenity category.

Considering the NCHRP analysis and the configuration of the existing crossing on the east end of the corridor, it is recommended that future crossings also feature refuge islands and RRFB signs. This configuration will provide consistency for drivers and pedestrians and will be compatible with the future project to add raised medians on the corridor.

Actual locations of future pedestrian crossings are not recommended at this time since the value of a crossing is highly correlated with development patterns. As development unfolds, the City should seek to locate crossings that support pedestrian desire lines and fit the context of land use patterns. Additionally, crossings should be spaced at least 300 feet. from traffic signals and other crossings.

Figure 18 summarizes the bicycle/pedestrian recommendations and general locations where future crosswalks may need to be implemented. The crosswalks should be spaced away from other signals/crossings, support pedestrian desire lines, and fit the context of actual development patterns.

Figure 16: Pedestrian Amenity Guideline Plot – With Refuge Island



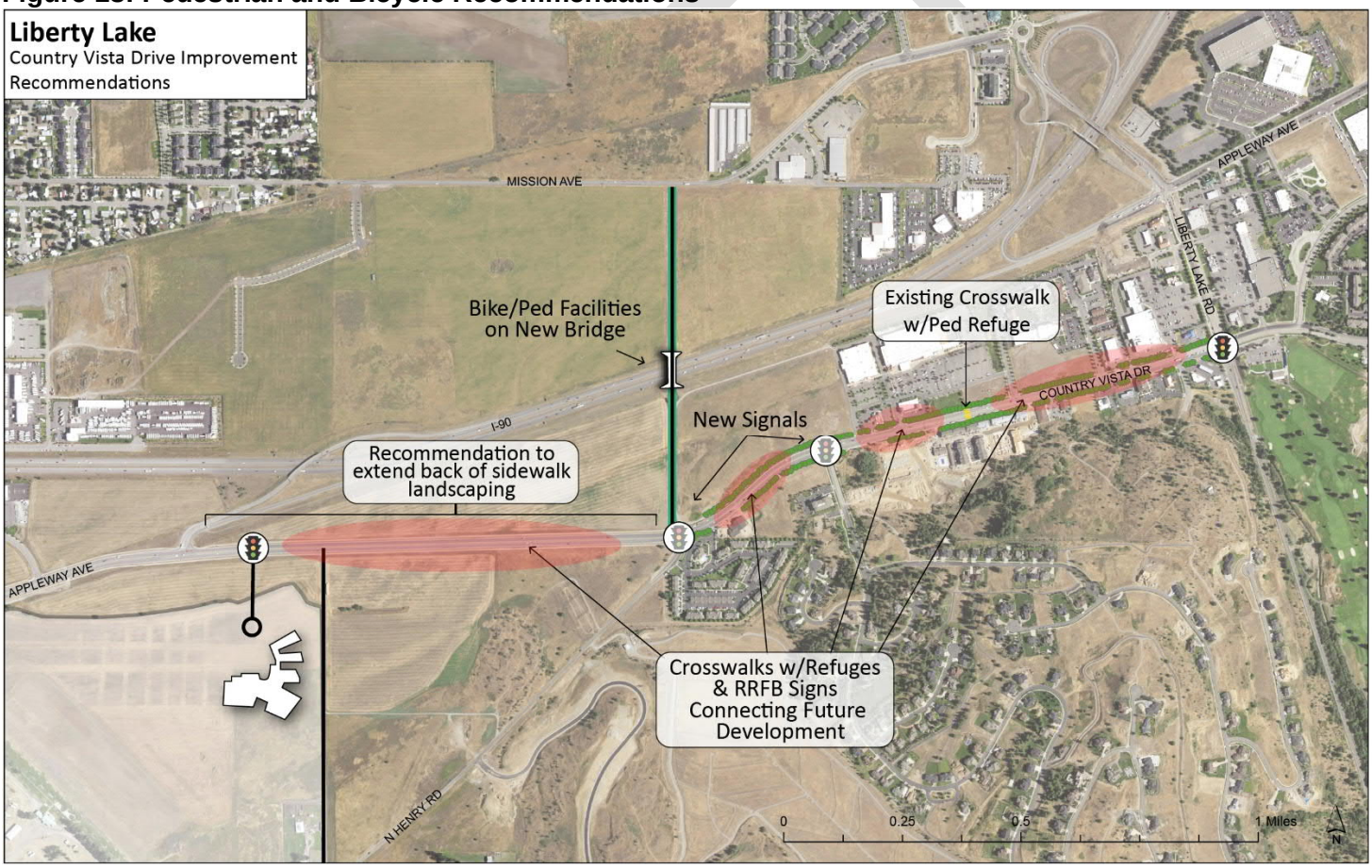
*E/A = Enhanced/Active, HC = High Compliance, LC = Low Compliance

Figure A-15. Guidelines Plot, Divided Roadway with Pedestrian Refuge Island, Crossing 36 ft (11 m) Pavement, ≤35 mph (55 km/h), 3.5 ft/s (1.1 m/s) Walking Speed (Plot Assumed 50/50 Volume Split for Signal Curve).

Figure 17: Existing Pedestrian Crossing on Country Vista Drive with Refuge Island and RRFB Signs

Source: Google Street View

Figure 18: Pedestrian and Bicycle Recommendations



HENRY ROAD BRIDGE INTERSECTION RECOMMENDATIONS

To aid in the ongoing design of the Henry Road bridge over I-90, Parametrix conducted analysis of the Henry Road/Country Vista Drive and Mission Avenue/Henry Road intersections. The purpose of the analysis is to provide guidance on intersection sizing and configurations for the two major intersections at either end of the bridge.

To develop the long-term traffic forecasts, Parametrix utilized the Spokane Regional Transportation Council (SRTC) travel demand model which provides an outlook for 2040 conditions based on regional growth and transportation network assumptions. Working closely with City staff to refine model assumptions for City of Liberty Lake land uses, Parametrix generated 2040 PM peak hour turning movement forecasts for each intersection and then analyzed intersection performance for future scenarios. Full documentation of the use and refinement of the SRTC travel demand model will be provided in the long-term analysis memo.

Given the recommendation for a signalized intersection at Henry Road/Country Vista Drive to address short-term traffic growth, Parametrix carried forward the signalized intersection configuration to 2040 analysis. At Mission Avenue/Henry Road, Parametrix explored both signalized intersection and roundabout configurations. Table 7 presents the results of the analysis.

As shown in Table 7, the assumed signalized configuration for the Henry Road/Country Vista Drive would be able to accommodate 2040 traffic volumes and no further adjustments would be needed. At the Mission Avenue/Henry Road intersection, because volumes are supportive of a one-lane roundabout and because there is already a roundabout on the corridor, Parametrix recommends the roundabout configuration. Parametrix also conducted a brief sensitivity test assuming a fourth leg on the north side of the roundabout providing a connection to unspecified future residential development. Results indicate the roundabout will be able to accommodate a future fourth leg. Figures 19 and 20 illustrate the recommended configurations at both intersections.

Table 7: 2040 Intersection LOS Summary for Henry Road Bridge Intersections

Intersection	LOS (Avg Delay)		
	Signalized	Roundabout	
		3-leg	4-leg
Henry Road/Country Vista Drive	B (16)	--	--
Mission Avenue/Henry Road	A (8)	A (8)	B (12)

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Figure 19: Legacy Ridge Drive/Country Vista Drive Roundabout

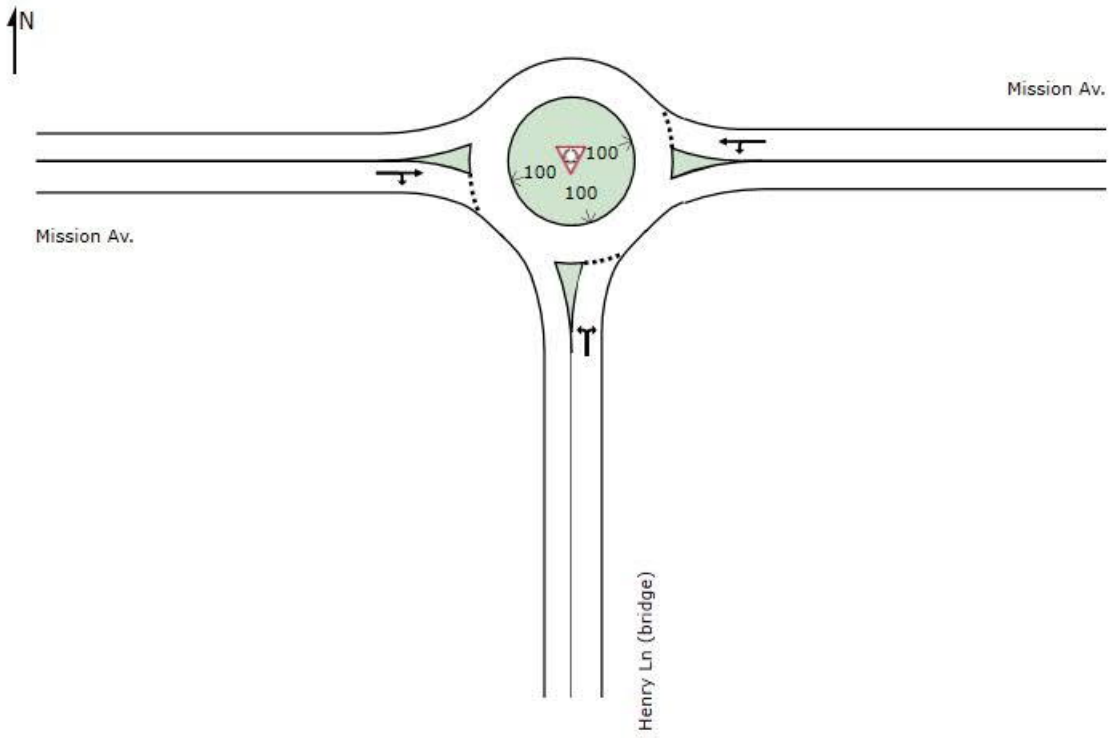
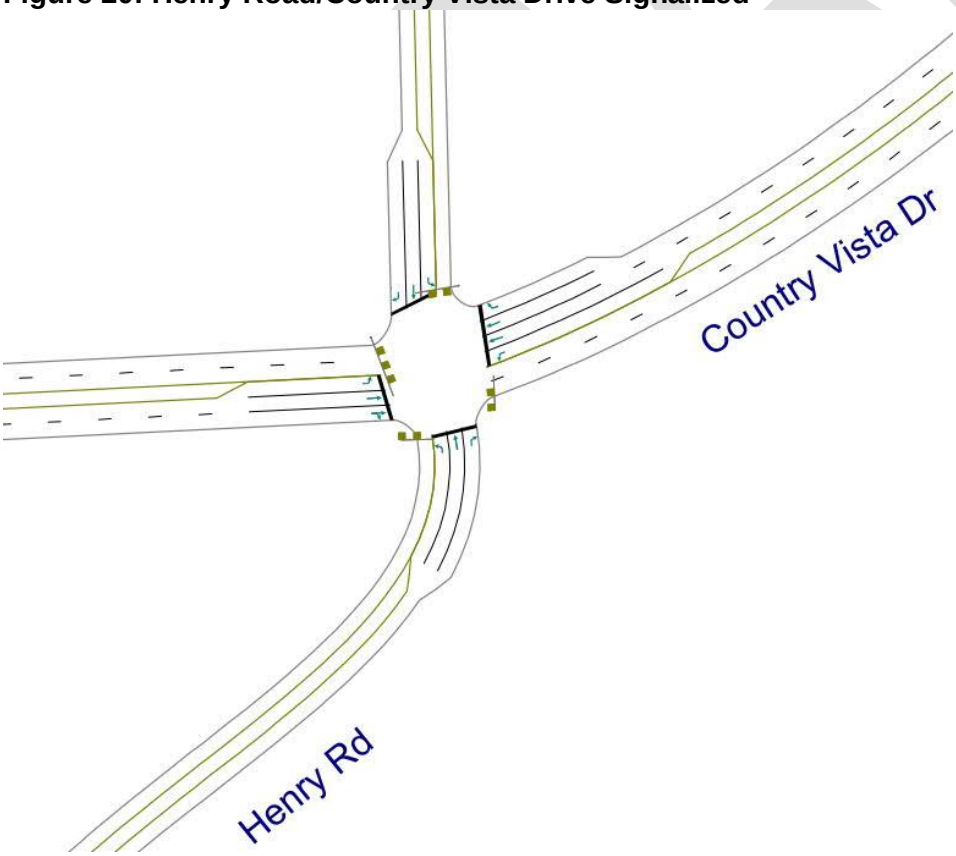


Figure 20: Henry Road/Country Vista Drive Signalized



SUMMARY/CONCLUSION

Country Vista Drive is poised to become an even more important corridor to the City in both the near- and long-term future. It's current layout and connection between I-90 and the city center solidifies this role. The City has already begun to implement some of its vision for the street by building bike lanes, separated sidewalks, landscaping, and some street trees. Still, much of the land surrounding the street is currently vacant, so as more development occurs, improvements to the street and its intersections will be warranted to accommodate increased traffic.

The City's Comprehensive Plan and current zoning ordinances identify commercial and mixed-use development along the entire length of the study area. There are also plans for a new high school with access to the street. There are preliminary plans for a new bridge that connects Country Vista Drive to Mission Avenue on the north end of town spanning I-90.

Based on this anticipated development and projected trip generation data, two intersections will reach a failing LOS under short-term growth assumptions. These include the intersections at Henry Road and at Legacy Ridge Drive. Parametrix recommends traffic signals eventually be implemented at both intersections. Roundabouts were also considered, but two-lane roundabouts would be required to handle the traffic volume and there have been past concerns about two-lane roundabouts on the Country Vista Drive corridor.

Parametrix also recommends the City continue to implement improvements to the pedestrian and bicycle network, as outlined in its plans. Due to the street width and traffic speed, new crosswalks that span the Country Vista Drive should include RRFB signals and pedestrian refuge islands. The crosswalks should be located to best support pedestrian desire lines and actual development patterns. The refuge islands will be compatible with the future plans to add landscaped medians to the corridor.

It is also recommended that when STA realigns Route 98 onto the corridor that bus stops be planned for generally every ½ mile with flexibility to support actual development patterns as they occur. Additionally, future development should accommodate walkways between buildings and bus stops and also provide concrete pads for future shelters to be constructed by the STA. Active transportation amenities should also be included on Henry Road bridge over I-90 as already planned.

A long-term review of intersections on either side of the I-90 bridge indicates the signal recommendation at the Henry Road/Country Vista Drive intersection would be sufficient to accommodate 2040 traffic volumes. Additionally, Parametrix recommends a single-lane roundabout configuration at the Mission Avenue/Henry Road intersection on the opposite side of the bridge. A single-lane roundabout is expected to be able to accommodate 2040 traffic demand and fits with the character of Mission Avenue and the existing roundabout at Mission Avenue/Harvard Road.

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