

Corvallis Safe Streets and Roads for All Project

DATE: February 12, 2026

TO: Project Team

FROM: John Bosket, PE; Kayla Fleskes-Lane, PE; Brianna Velasquez, EIT | DKS Associates
Perrin Falkner, PE, M.ASCE; Adrian Witte, PE; Anabel Jiang | Toole Design

SUBJECT: Corvallis Safe Streets and Roads for All Project

Walnut Boulevard Lane Reconfiguration Evaluation Revised
DRAFT

DKS Project #24899-000

INTRODUCTION

Walnut Boulevard is one of the widest streets within Corvallis under City-control and while it serves as a primary east-west route for auto travel across north Corvallis, its current form makes it challenging for people walking, biking, or using mobility devices to cross or travel along the street. This is especially true for children and older adults. Over time, residents have expressed safety concerns about Walnut Boulevard, including high driver speeds, unsafe conditions for people walking or biking, difficult and limited crossing opportunities, and increased wildlife collisions compared to other parts of the city.

Guided by a focus on safety and community feedback, the City has chosen to assess conditions along the corridor as part of the Corvallis Safe Streets and Roads for All (SS4A) project, although Walnut Boulevard was not identified as a high priority project location through the SS4A process. This assessment included completing a multi-disciplinary Road Safety Audit (RSA) which is documented in a separate report with suggested improvements ranging in implementation complexity. Overlapping with the Walnut RSA is an additional evaluation of reconfiguring lanes along the widest portion of Walnut Boulevard between NW Glenridge Drive/NW Witham Hill Drive and NE Jack London Street. The reason for this evaluation is because while there are numerous potential positive safety-related outcomes from a reallocation of road space, there is likely to be impacts to auto travel in the form of increased corridor travel time and changes to wait times for drivers for certain movements at specific intersections/traffic signals. Therefore, the City wants to understand these impacts to help inform a consideration of tradeoffs for any future proposals to reconfigure the street's layout.



In the area evaluated, the corridor varies between five-lane (two travel lanes in each direction and a center turn lane) and four-lane (two travel lanes in each direction with no center turn lane) cross-sections (see Figure 1). This evaluation considered different alternatives for reconfiguration that are described in later sections.

The information provided in this memorandum is organized into the following sections:

- **Alternative Evaluation Process** – this section presents the project’s leading objectives and criteria used to compare each alternative.
- **Alternatives & Transportation Elements Considered** – this section describes the alternatives and the various transportation elements that are being considered. Sub-sections provide detail on how the alternatives support each of the project goals.
- **Summary of Lane Reconfiguration Evaluation** – this section provides a summary of key findings from the evaluation process that will be used to help inform the selection of a preferred alternative.



STUDY CORRIDOR

- 4 LANES
- 5 LANES



SIGNALIZED STUDY INTERSECTION



TRANSIT STOP



SCHOOL



PLACE OF WORSHIP



PARK / GREEN AREA



LARGE EMPLOYMENT AREA

Study Corridor
NW Walnut Blvd

FIGURE 1: STUDY AREA



ALTERNATIVE EVALUATION PROCESS






A primary goal of the SS4A grant project is to prevent crashes resulting in deaths and serious injuries. The City's 2019 Transportation System Plan (TSP) Goals 1, 2, and 3 form the basis for this evaluation's objectives and evaluation criteria. The objectives are overarching principles that helped inform the range of possible transportation solutions. The evaluation criteria help assess how well those objectives would be met by the alternatives considered. These objectives and criteria (Table 1) have been used to help evaluate alternatives relative to each other, and in conjunction with a 2025 Road Safety Audit (RSA)¹, aided developing the recommended options for the City to consider in the future.

TABLE 1: WALNUT BOULEVARD LANE RECONFIGURATION EVALUATION CRITERIA

OBJECTIVE	EVALUATION CRITERIA	PERFORMANCE MEASURE
ENHANCE SAFETY AND HEALTH OF RESIDENTS	<ul style="list-style-type: none"> Reduces the potential severity and number of crashes Minimizes conflicts between modes (walking, bicycling, and driving) Increases the roadway's ability to self-enforce speeds 	<ul style="list-style-type: none"> Potential crash reduction percentage Estimated physical separation added between road users Number of traffic calming road design features added to match the operating speeds to the target speed
PROVIDE VIABLE ALTERNATIVES TO AUTOMOBILE TRAVEL	<ul style="list-style-type: none"> Increases access for people of all ages and abilities to get where they need to go, comfortably and safely, by all modes of travel Enhances bicycle and pedestrian facilities to encourage non-vehicular travel 	<ul style="list-style-type: none"> Pedestrian and bicycle Level of Traffic Stress (LTS) Number of crosswalks added Crossing distance reduced (feet)
PROVIDE AN EFFICIENT TRANSPORTATION SYSTEM (MOTOR VEHICLE-FOCUSED)	<ul style="list-style-type: none"> Maintains acceptable roadway and intersection operations where feasible. Minimizes changes to travel time. Minimizes potential for traffic diversion on local streets. 	<ul style="list-style-type: none"> Volume-to-capacity (v/c) ratio Estimated time and percentage change in corridor travel time Qualitative discussion of potential for traffic diversion

The project team conducted a technical evaluation of the alternatives based on the criteria outlined in Table 1 using the ratings shown in Table 2 below. Ratings are provided on a qualitative scale relative to criteria performance to provide a simple comparison between build alternatives and the no-build condition.

TABLE 2: SCORING SCALE

PERFORMANCE	EXCELLENT	GOOD	FAIR	POOR	VERY POOR
QUALITATIVE SCORE					

¹ Walnut Boulevard Road Safety Audit was conducted on Tuesday, April 15th, 2025. Report of findings in progress.

ALTERNATIVES & TRANSPORTATION ELEMENTS CONSIDERED

Various transportation elements are being considered as part of reallocating space along Walnut Boulevard in response to community feedback received² and the Walnut Boulevard RSA (report in progress), including:

- Lane conversion from a five-lane (or four-lane) cross section to a three-lane cross section
 - This could include right-turn lanes at high volume intersections to reduce congestion and provide the opportunity to better control the conflict between right turning vehicles and people biking in space and time
- Intersection signal timing upgrades to improve safety and flow for all users, including protected left-turn signal phasing
- Reallocation of the space between the existing curb lines to accommodate buffered or separated bicycle lanes
- Roadway design improvements that help to "self-enforce" speed limits (i.e., encourage drivers to select operating speeds consistent with the speed limit)³, including narrower vehicle travel lanes

Given these elements, the following alternatives were evaluated:

- **Five-lane (or four-lane) cross-section (Existing):** no-build scenario.
- **Three-lane cross-section (Three-lane):** provides one through lane in each direction with a center two-way left turn lane (TWLTL) and no exclusive right turn lanes at all.
- **Three-lane cross-section with added right turn lanes (Three-lane Plus):** provides one through lane in each direction with a center TWLTL and right turn lanes at intersections with high right turn volumes (discussed in more detail in the evaluation of the "Provide an Efficient Transportation System" objective).

It is important to note that each of the alternatives evaluated are limited to retrofits within the existing street footprint and do not include moving curb lines. This is because their implementation is considered the most realistic over the typical 20-year planning horizon for a variety of factors such as the length of the Walnut Boulevard corridor and construction cost.

The following sections describe the evaluation of each of the alternatives across the three objectives: Enhance Safety, Provide Viable Alternatives to Automobile Travel, and Provide an Efficient Transportation System.

² JLA Public Involvement, Corvallis SS4A Safety Comment Map Feedback Summary, May 2025.

³ Federal Highway Administration, Speed Limit Setting Handbook, January 2025.

ENHANCE SAFETY

Enhancing safety is one of the primary objectives of this analysis given the focus of the SS4A project. Three locations along the study corridor were part of the project's High Injury Network⁴, though no locations were ranked high enough to be included in the High Priority Project sites across the city.

Excessive speeds have also been a community concern along the corridor. The Corvallis Police Department has collected motor vehicle travel speeds on Walnut Boulevard, approximately 1,000-foot west of 29th Street, annually in October/November to analyze vehicle speeds and compliance with the posted speed limit (35 mph).

Figure 2 summarizes the observed percentage of drivers complying with the posted speed limit between 2021 and 2024 (data for year 2022 was not collected). The excessive speed threshold was considered as 46 mph, which was defined by the speed surveys collected by the Corvallis Police Department and is considered a Class C traffic violation as established under ORS.811.109.⁵

As shown in Figure 2, there are fewer high-speed violations, but there is also a lower percentage of drivers in both directions complying with the posted speed limit in 2024 than years before. While the majority of westbound drivers traveled below or at the posted speed limit, there is still a small percentage of drivers that excessively speed through the corridor. Also, there are notable speed spikes observed in each direction, up to 89 mph in the eastbound direction and 101 mph in the westbound direction. Speed survey reports are included in Appendix A.

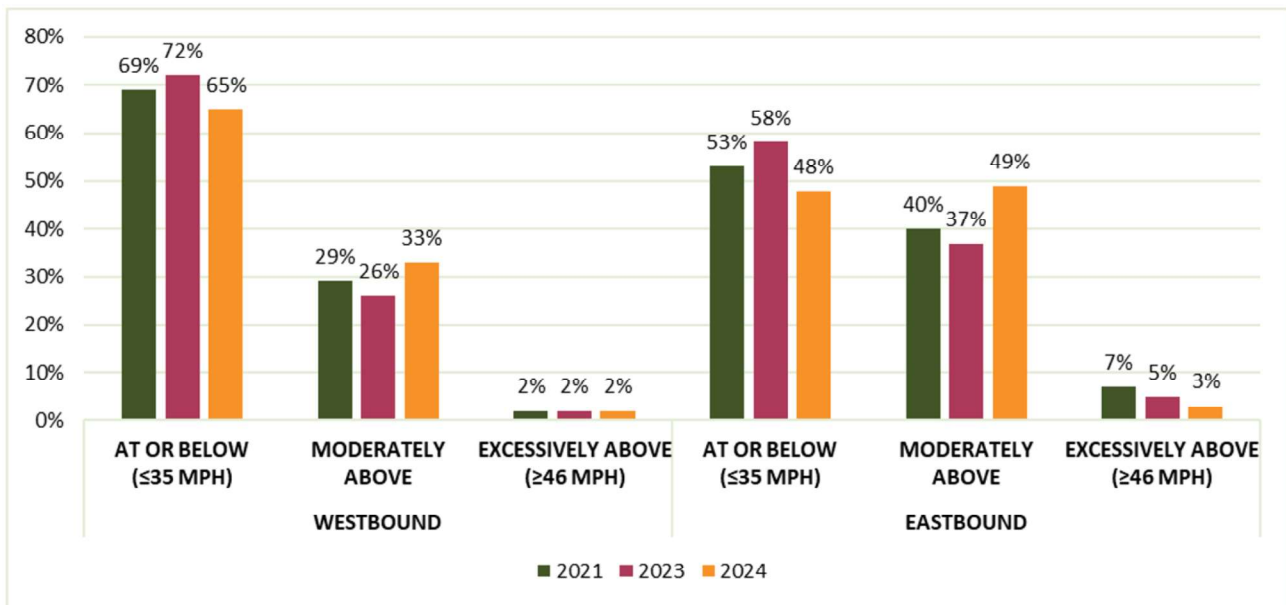
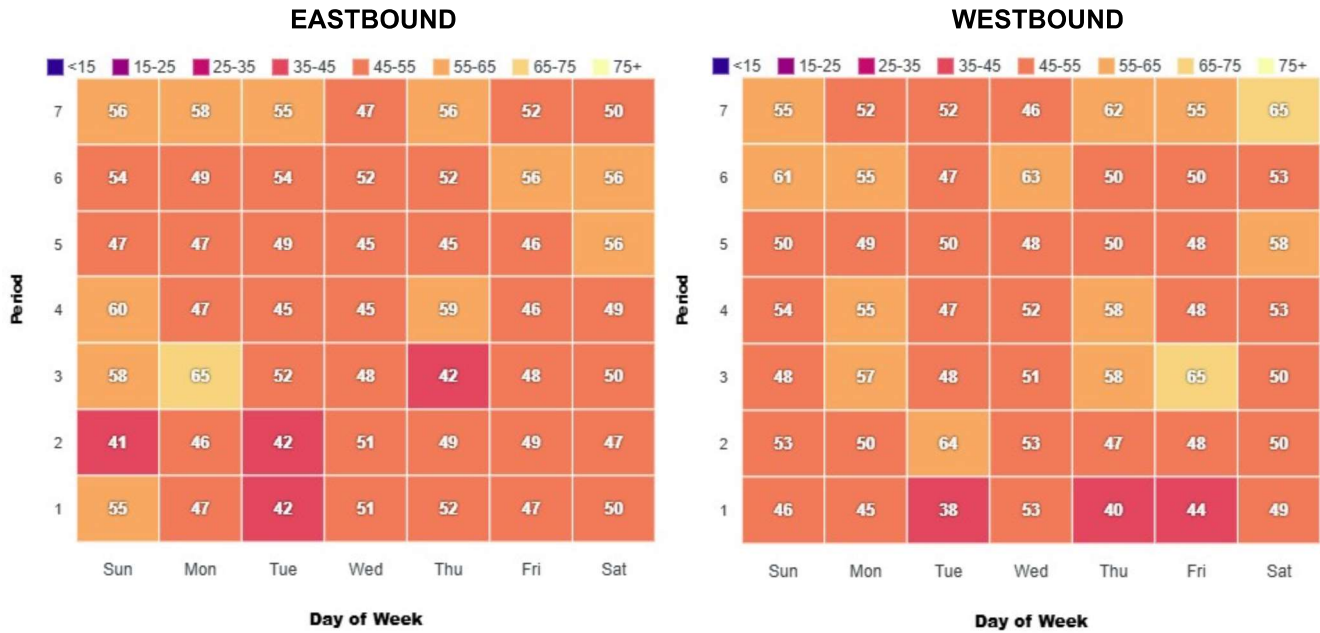


FIGURE 2: PERCENTAGES OF OBSERVED SPEED LIMIT COMPLIANCE ALONG WALNUT BOULEVARD JUST WEST OF NW 29TH STREET (2021, 2023, 2024)

⁴ Corvallis SS4A Existing Safety Conditions Preliminary Findings, March 2025.

⁵ Oregon Revised Statutes 811.109 - Penalties for Speed Violations, 2026.

To supplement the speed survey data collected by the Corvallis Police Department for the area west of NW 29th Street, more recent vehicle speed data was obtained from Urban SDK (September 21st to October 4th, 2025). This data shows that speed spikes are most common during the evenings (7:00 p.m. to 11:59 a.m.) in both directions, however the maximum speed of 65 mph also occurred during the morning peak period (7:00 a.m. to 9:59 a.m.) in both directions (Figure 3 below).



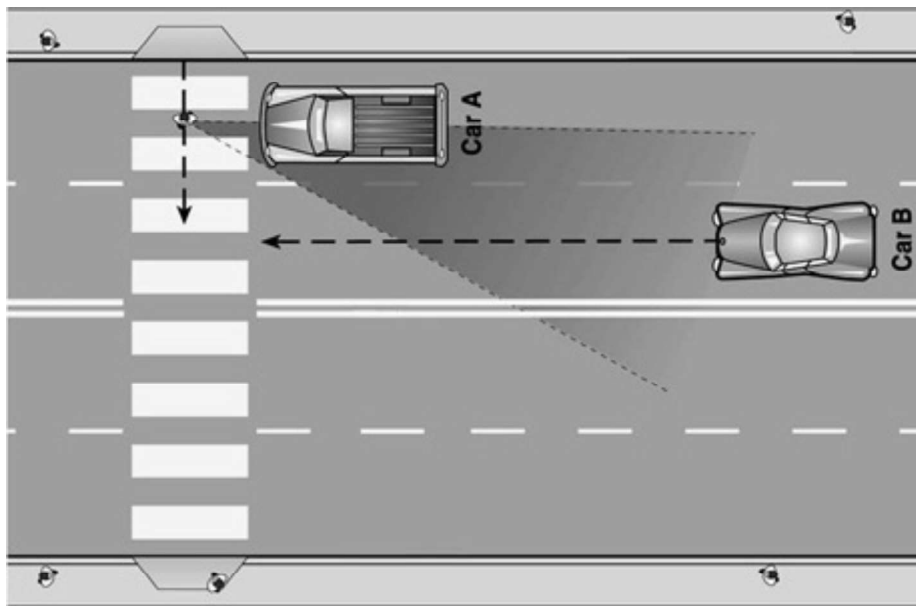
Period of Day:

- 1) Overnight: 12:00 a.m.– 3:59 a.m.
- 2) Early Morning: 4:00 a.m.– 6:59 a.m.
- 3) AM Peak: 7:00 a.m.– 9:59 a.m.
- 4) Midday: 10:00 a.m. – 12:59 p.m.
- 5) Early Afternoon: 1:00 p.m. – 3:59 p.m.
- 6) PM Peak: 4:00 p.m.– 6:59 p.m.
- 7) Evening: 7:00 p.m.– 11:59 p.m.

FIGURE 3: MAXIMUM VEHICLE SPEEDS ALONG WALNUT BOULEVARD JUST WEST OF NW 29TH STREET (SEPT/OCT. 2025)

There are numerous safety benefits in reducing the corridor from four or five lanes to a three-lane cross-section, including⁶:

- **Reduced vehicle speed differential** - On a multi-lane roadway, vehicle speeds can vary between travel lanes, and drivers frequently slow or change lanes due to slower vehicles. On three-lane roads, the vehicle speed differential is limited by the speed of the lead vehicle in the through lane. Reducing speeds, especially the higher speeds experienced, can decrease crash severity.
- **Reduced vehicle conflicts** – Additional lanes create more potential conflicts and contribute to rear-end, left-turn, and sideswipe crashes. Converting a four-lane roadway to a three-lane roadway with a center two-way left turn lane is proven to reduce all crash types in an urban area by 29 percent.⁷
- **Reduced pedestrian conflicts** – Additional lanes make crossing the roadway harder for pedestrians, as they have two more travel lanes to cross, and are exposed to moving traffic for a longer period of time. Figure 4 below demonstrates the multiple threats people face while walking across a mid-block crossing on multi-lane roadways. Car A is stopped to let the pedestrian cross, but it masks Car B, obstructing the pedestrian's and Car B's view of one another. Also, crosswalk treatments for a five-lane (or four-lane) cross section typically necessitate a higher treatment level (e.g., signal, overhead beacon, etc.) than for a three-lane cross section for a low stress crossing. A three-lane cross section also accommodates raised pedestrian refuge islands more easily than four lanes.



Source: [Guide for Safe Routes to School, Marking and Signing Crosswalks](#)

FIGURE 4: MULTIPLE THREATS FOR PEOPLE WALKING AT MID-BLOCK CROSSWALKS ON MULTI-LANE ROADWAYS

⁶ Federal Highway Administration, Road Diet Informational Guide, October 2022.

⁷ Oregon Department of Transportation. *Crash Reduction Factor List*, countermeasures #H53 & #BP20. 2023

- **Reduced bicycle conflicts** - Even without a buffered bicycle lane, a driver on a three-lane roadway is able to move over closer to the center lane when overtaking a bicycle. A driver on a five-lane roadway will have less opportunity to move over to the left as it is an active vehicle travel lane.
 - Reconfiguring roadway space may allow for providing exclusive right-turn lanes which allow for additional protected intersection phasing, reducing right turn permissive conflicts with a right turn signal. This has been proven to reduce pedestrian and bicyclist related crashes at signalized intersections by 20 percent.⁸

Table 3 summarizes the performance of each of the alternatives relative to existing cross section for the "Enhance Safety" objective.

TABLE 3: EXPECTED SAFETY PERFORMANCE OF ALTERNATIVES RELATIVE TO EXISTING CROSS SECTION

ALTERNATIVES	CRASH REDUCTION	SEPARATION BETWEEN ROAD USERS	TRAFFIC CALMING
THREE-LANE	<ul style="list-style-type: none"> • Conversion to a three-lane cross-section reduces risk of crashes by up to 29% (H53) • Buffered bicycle lanes reduce the risk of injury crashes involving bicyclists by 47% (BP24) 	Provides widest separation between road users	<ul style="list-style-type: none"> • Creates a sense of confinement, which encourages drivers to slow down and drive more cautiously • Narrower travel lanes, enhanced bicycle and pedestrian facilities, landscaping, and even signage can reinforce the perception of visual and physical restriction
THREE-LANE PLUS	<p>Similar crash reduction performance as Three-Lane alternative above, and...</p> <ul style="list-style-type: none"> • Addition of right turn lanes reduce the risk of crashes by 8% (H5) and reduce the risk of crashes involving people biking by 20% (BP20) • Urban green bicycle lanes can be installed at right turn lane merges to reduce the risk of intersection crashes involving people biking by 39% (BP6) 	Allows for some separation among road users for most of the corridor, but less at intersections than the Three-Lane alternative	<p>Similar traffic calming performance as Three-Lane alternative above, and...</p> <ul style="list-style-type: none"> • Proximity to other moving vehicles, such as in a turn lane, can help engage drivers to the surrounding environment

⁸ Oregon Department of Transportation. *Crash Reduction Factor List*, countermeasure #BP5. 2023

PROVIDE VIABLE ALTERNATIVES TO AUTOMOBILE TRAVEL

Based on the evaluation above, the following cross section concepts illustrate typical recommended widths of elements relative to the existing curblines (specific segment concepts included in the appendix). As shown in more detail in Figure 8 and Figure 9 on page 12, the three-lane cross-section would provide more space to reallocate towards buffered or physically separated bicycle facilities, including along constrained segments. The following sections discuss considerations for adding vertical protection to the cross section and considerations for enhancing crossings of Walnut Boulevard.

VERTICAL PROTECTION CONSIDERATIONS

Incorporating physical separation between road users enhances safety, comfort, and minimizes the level of traffic stress for people walking and cycling.⁹ For protected bicycle lanes, there are various considerations in choosing a vertical buffer element, including robustness, maintenance needs, installation cost, effectiveness, drainage, driveway spacing, and access to mailboxes or garbage pickup service. Three main types of vertical protection, ranging from lower to higher levels of upfront investment, include:

- **Permanent tubular markers** - For protected bicycle lane buffers of less than 3.5-feet in constrained cross sections, permanent tubular markers can be installed in the center of the buffer on the roadway surface. An example of this treatment appears in Figure 5 to the right. While permanent tubular markers alone provide less physical protection, their implementation in sequence can help visually narrow the roadway. Because the tubular markers are installed with gaps, drainage can flow directly to the existing flowline.

Permanent tubular markers are amongst the easiest and lowest cost to install; however, they typically require more maintenance and replacement in the long term than more substantial forms of vertical protection described on the

following page.



FIGURE 5: EXAMPLE OF PERMANENT TUBULAR MARKERS IMAGE SOURCE: [STREETSBLOG MASS](#))

⁹ Pedestrian and bicyclist stress levels are affected by facility availability and conditions, speed limits, presence of buffer space separating motor vehicle traffic, motor vehicle volume, and presence of street lighting.

- **Traffic separators** - A traffic separator is a modular (multiple pieces joined together) physical barrier that separates different types of traffic, such as lanes on a street. Traffic separators can be made of different materials and are typically surface applied to the street meaning they do not require excavation. They can cost more than tubular markers but typically require less maintenance. For an added level of visibility and safety, traffic separators may also include a vertical element, such as an integrated tubular marker. An example traffic separator-protected bike lane is shown in Figure 6.



FIGURE 6: EXAMPLE OF TRAFFIC SEPARATORS (IMAGE SOURCE: BEND BIKES)

While traffic separators can be joined together continuously for long stretches, they typically have breaks within them for drainage, driveway access, etc.

- **Concrete islands** - Concrete islands can be designed and installed in a variety of shapes and sizes and can be installed in buffers as narrow as 3.5-feet to allow for 1-foot minimum shy distance on either side. They can be doweled into existing pavement surfaces for retrofits or installed within an excavated footprint. For extra visibility, concrete islands can have reflective pavement markers, paint, and/or permanent tubular markers installed on top of the island at the beginning, end, and/or along the entire length. Concrete islands often have gaps at intervals for driveway access and drainage to allow water to flow through them to the gutter and inlets along the



FIGURE 7: EXAMPLE OF CONCRETE ISLANDS (IMAGE SOURCE: GOOGLE STREETVIEW)

existing roadway flowline. Concrete islands are typically more costly to install initially but have the best long-term performance and less maintenance needs than tubular markers alone or modular traffic separators. An example concrete island-protected bike lane is shown in Figure 7.

In general, the treatments shown in the typical sections for the protected bicycle lanes are preliminary and may be changed if implemented based on the City's ability to effectively maintain them in the future.

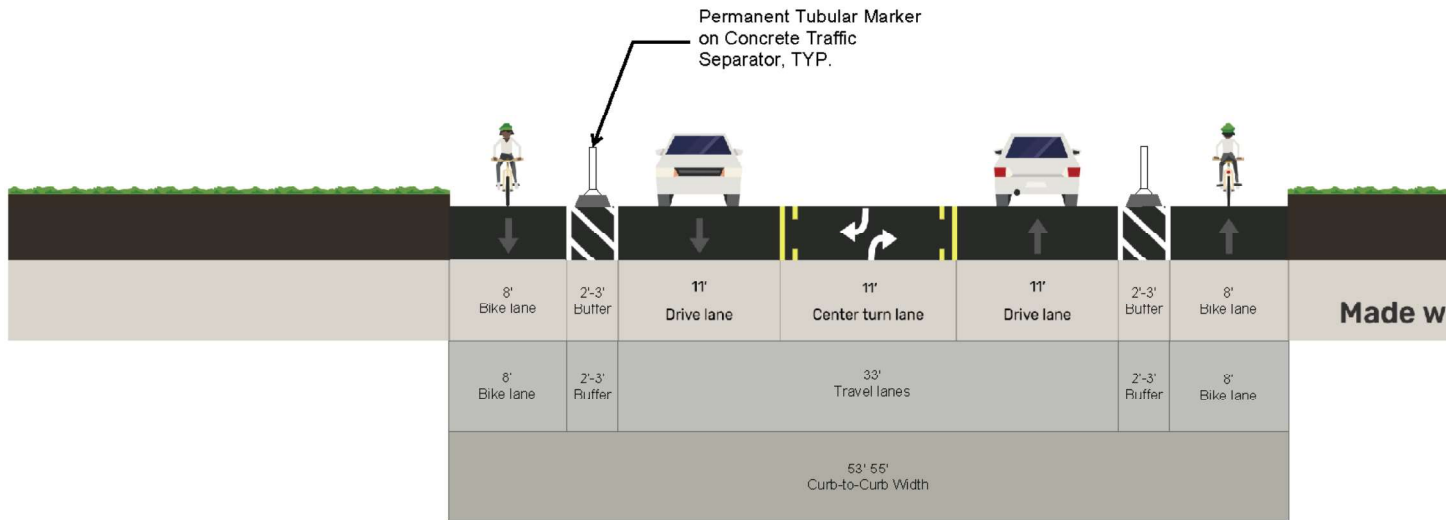


FIGURE 8: TYPICAL CONSTRAINED CROSS-SECTION OPTION, 53'-55' CURB-TO-CURB WIDTH (LOOKING EAST)

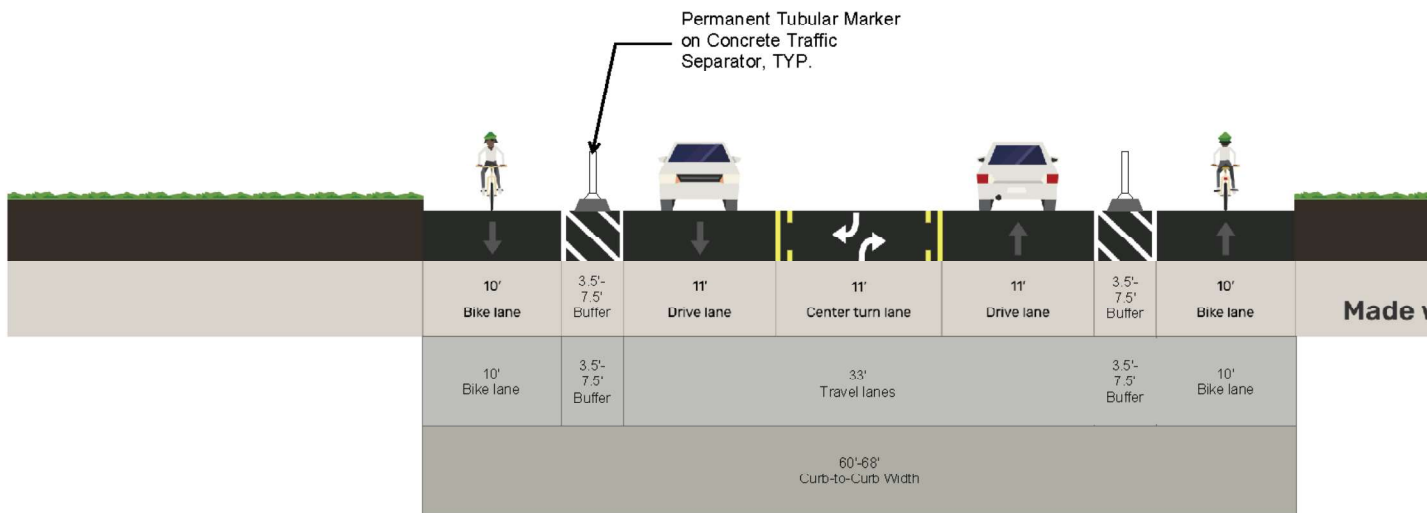


FIGURE 9: TYPICAL CROSS-SECTION OPTION, 60'-68' CURB-TO-CURB WIDTH (LOOKING EASTBOUND) WITH VERTICAL PROTECTION

CROSSINGS CONSIDERATIONS

With any build alternative, reducing the number of vehicle lanes also reduces exposure to vehicle traffic. Both build alternatives could accommodate raised pedestrian refuge islands to help reduce the crossing distance at minor street or midblock crossing locations. The Three-Lane build scenario would reduce exposure the most but the Three-Lane Plus scenario could more easily incorporate signal timing strategies that help minimize conflicts between people crossing and people turning right (e.g., leading pedestrian interval signal phasing, which allows a pedestrian a head start across the intersection).

Considering the surrounding land uses and key destinations (e.g., residential neighborhoods, schools, parks, places of worship, bus stops, etc.) on both sides of the roadway, there could be many opportunities for crossings of Walnut Boulevard, which are more easily accommodated in the Build alternatives (as discussed in the Enhance Safety section above). However, crossings should be avoided within 300-feet of a signal.¹⁰ Taking into account the surrounding land uses to determine logical crossing locations, the project team identified the following preliminary opportunities (pending further site-specific analysis) for additional crossings:

- One additional crossing between Satinwood Street and Highland Drive, ideally to better align with an eastbound bus stop
- One additional crossing between Kings Boulevard and NW 29th Street, ideally to improve connectivity to the future Neighborhood Bikeway along 27th Street (which crosses Walnut Boulevard at NW 25th Street) as well as with bus stops and surrounding parks/businesses
- Two additional crossings between NW 29th Street and Aspen Street, ideally to improve connectivity with an elementary school and bus stops
- One additional crossing between Aspen Street and Glenridge Drive/Witham Hill Drive, ideally to better align with bus stops
- The existing midblock crossing near Garyanna Street could be relocated to an intersection to minimize out of direction travel and utilize space created from the reconfiguration of lanes discussed in this evaluation

PROVIDE AN EFFICIENT TRANSPORTATION SYSTEM

To understand the feasibility of a lane reconfiguration along Walnut Boulevard and whether additional right turn lanes would be needed to address congestion bottlenecks, an initial screening of intersection operations was conducted to evaluate the most feasible lane configurations at each intersection. Based on that evaluation, a recommended lane configuration was identified for each alternative, and each alternative was then evaluated relative to each of the performance metrics under this objective.

¹⁰ ODOT Highway Design Manual, Section 830: Crosswalks and Crossings, pg. 800-133 (2025): https://www.oregon.gov/odot/Engineering/Documents_RoadwayEng/HDM-0300.pdf

Key assumptions used in the analysis include:

- **Study Intersections:** The study intersections are shown in Figure 10 on the following page, along with the traffic volumes used for analysis.
- **Existing Traffic Volumes:** Intersection turning movement count data was collected on Thursday, April 10th, 2025, on a typical weekday for the p.m. peak period (4:00-6:00 p.m.) conditions. Both the Corvallis School District and Oregon State University were in session. A seasonal adjustment was not applied to the OR 99W intersection counts since they were collected when traffic volumes aligned with the average weekday conditions consistent with the Corvallis TSP.¹¹ Existing p.m. peak hour traffic volumes are shown in Figure 10. The data is included in the appendix.
- **Future Traffic Volumes:** Future volumes were forecasted for the year 2045 at the study intersections using the most recent releases of the 2019 base year and the 2043 Regional Transportation Plan (RTP) update of the Corvallis Albany Lebanon Area Travel Demand Model (CALM). Additional local level network and connectivity refinements were made consistent with the Corvallis TSP. Raw link level volumes from the models were post-processed using methods consistent with methodologies outlined in the *National Cooperative Highway Research Program (NCHRP) Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design*. Figure 11 shows the future (year 2045) no-build p.m. peak hour traffic volumes.
 - Following completion of the initial analysis, the project team became aware of planned school consolidations that will shift student travel from Letitia Carson Elementary School on Satinwood Street to Bessie Coleman Elementary School on Walnut Boulevard, west of 29th Street. A preliminary estimate of the additional trips to and from Bessie Coleman Elementary, based on projected post-consolidation enrollment, indicated that the increase would not be significant enough to affect the conclusions of this analysis.
- **Analysis Tools:** Existing and future (year 2045) intersection operations were analyzed using Synchro, which employs the Highway Capacity Manual 7th Edition (HCM 7) methodologies, and SimTraffic software to assess the level of congestion experienced. This analysis helps evaluate the relative operational impacts of reducing the number of vehicle lanes from two in each direction to one in each direction and the addition of a center TWLTL along the entire corridor. Software analysis reports are included in the Appendix.
- **Mobility Targets:** The City of Corvallis allows for intersections to operate at a maximum volume-to-capacity (v/c) ratio of 0.85 during the p.m. peak hour. For signalized intersections, the combined intersection v/c ratio (not individual legs) must comply with the standard.¹² The OR 99W intersection under ODOT jurisdiction must operate at a maximum v/c ratio of 0.90 as a freight route on a regional highway inside the urban growth boundary and within the metropolitan area.¹³

¹¹ Corvallis Transportation System Plan, Volume 2, Figure 4: Typical Seasonal Traffic Volume Profile for Highways in Corvallis, (2019)

¹² Corvallis Transportation System Plan, Volume 1, Chapter 6: Standards, pg. 98 (2019)

¹³ 1999 Oregon Highway Plan – Amendment, Oregon Department of Transportation, December 2015

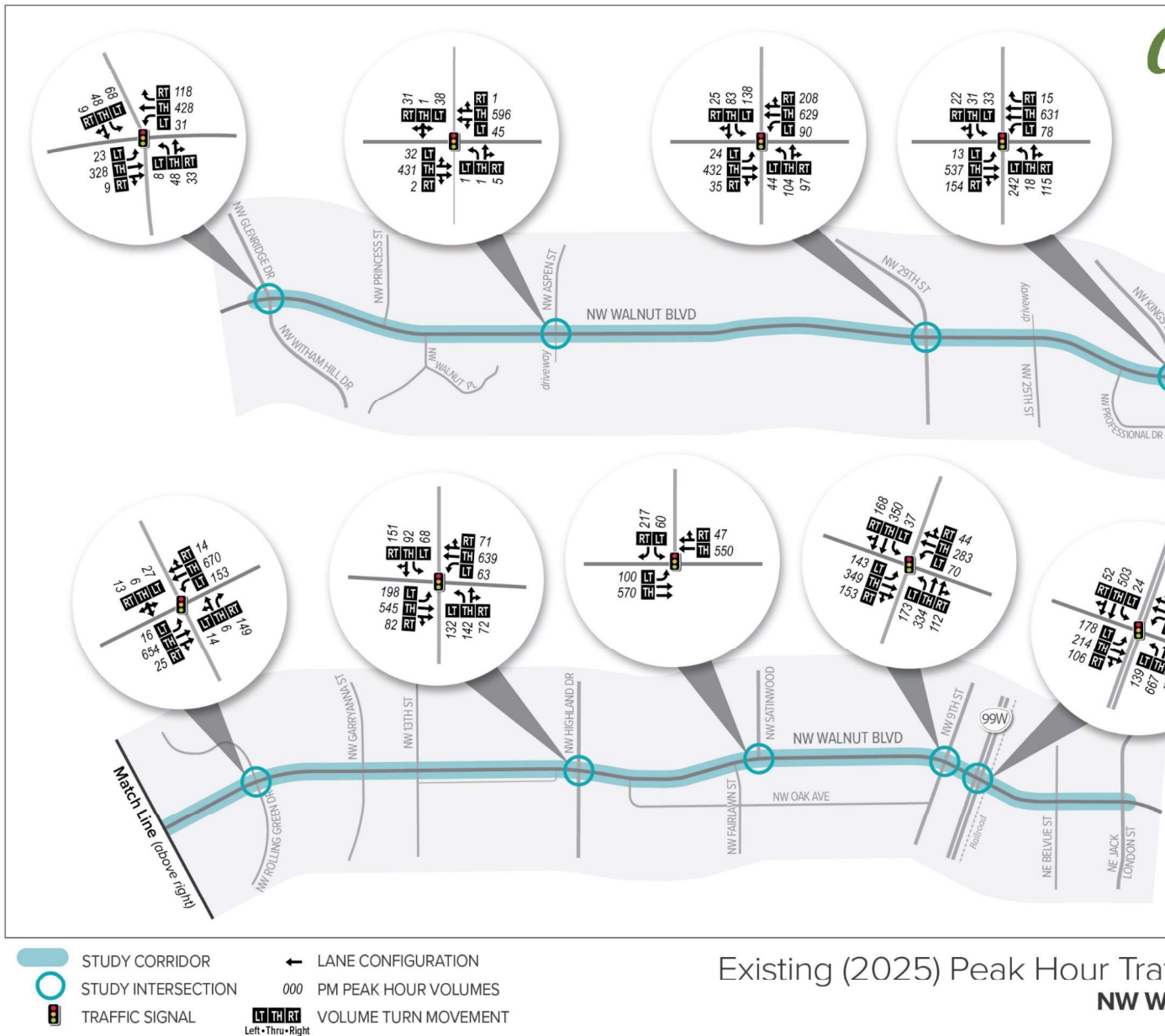


FIGURE 10: EXISTING (2025) PM PEAK HOUR TRAFFIC VOLUMES



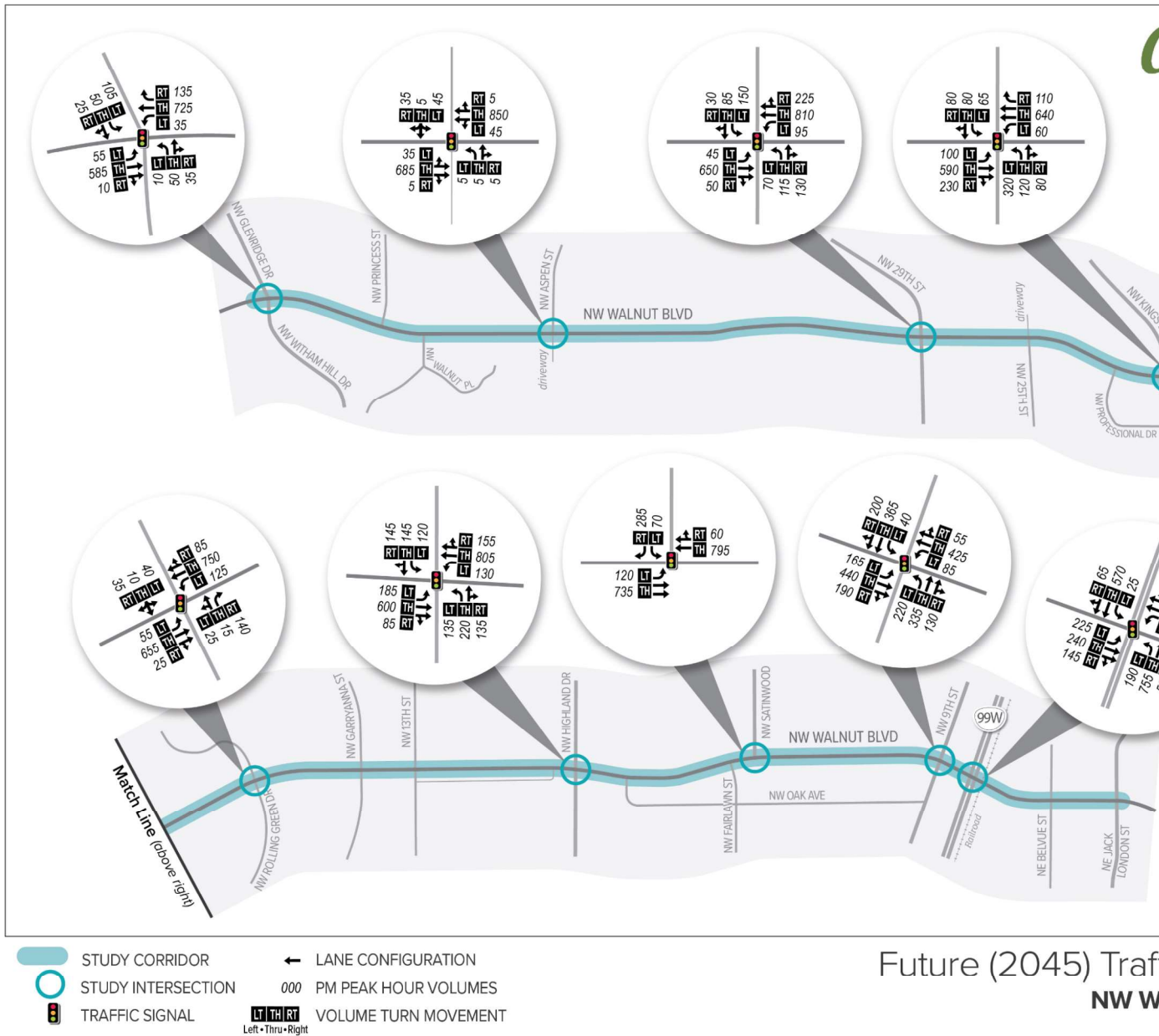


FIGURE 11: FUTURE (2045) NO-BUILD PM PEAK HOUR TRAFFIC VOLUMES

INITIAL SCREENING

To understand lane configuration options at each study intersection, the following scenarios were evaluated:

- **Five-lane cross-section (Existing/No-Build):** maintains existing lane configuration at intersections
- **Three-lane cross-section (Three-Lane):** provides one through lane in each direction with a center TWLTL
- **Three-lane cross-section with added right turn lane pockets (Three-Lane Plus):** provides one through lane in each direction with a center TWLTL and right turn lanes at all intersections with high right turn volumes from Walnut Boulevard, including:
 - Eastbound right turn at OR 99W
 - Eastbound and westbound right turns at NW 9th Street
 - Eastbound and westbound right turns at NW Highland Drive
 - Eastbound and westbound right turns at NW Kings Boulevard
 - Westbound right turn at NW 29th Street
 - Westbound right turn at NW Glenridge Drive / Witham Hill Drive

Table 4 below summarizes intersection operations with existing (year 2025) traffic volumes under the No-Build, Three-Lane, and Three-Lane Plus scenarios. Table 5 below reports intersection operations with future (year 2045) conditions.

The majority of study intersections are expected to meet applicable mobility targets under the existing and future no-build lane configurations, but reconfiguring travel lanes could increase congestion at up to two intersections beyond the City's mobility target. Adding right turn lanes at intersections when converting to a three-lane cross section could help meet the City's mobility targets at one additional intersection, with only the intersection at Highland Drive continuing to exceed the City's targets under the Three-Lane Plus scenario.

TABLE 4: 2025 STUDY INTERSECTION OPERATIONS

STUDY INTERSECTION	MOBILITY STANDARD	EXISTING (5-LANE)			THREE-LANE			THREE-LANE PLUS		
		V/C	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY
OR 99W	$v/c \leq 0.90$	0.56	D	42	0.67	D	45	0.59	D	44
NW 9TH ST	$v/c \leq 0.85$	0.58	D	41	0.78	D	43	0.65	D	42
SATINWOOD ST^A	$v/c \leq 0.85$	0.44	B	13	0.67	B	18	N/A	N/A	N/A
HIGHLAND DR	$v/c \leq 0.85$	0.70	B	17	0.95	D	46	0.89	D	37
ROLLING GREEN DR	$v/c \leq 0.85$	0.33	A	7	0.56	B	11	N/A	N/A	N/A
KINGS BLVD	$v/c \leq 0.85$	0.56	B	13	0.81	C	25	0.70	B	18
NW 29TH ST	$v/c \leq 0.85$	0.60	B	16	0.92	D	46	0.74	C	23

STUDY INTERSECTION	MOBILITY STANDARD	EXISTING (5-LANE)			THREE-LANE			THREE-LANE PLUS		
		V/C	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY
ASPEN ST	v/c ≤ 0.85	0.30	A	4	0.47	A	9	N/A	N/A	N/A
GLENRIDGE DR/WITHAM HILL DR	v/c ≤ 0.85	0.46	B	16	0.57	C	29	0.47	C	21

BOLD AND RED indicates mobility target/standard is not met.

^A Operations for this intersection are reported based on HCM 2000 methodologies since HCM 7 does not support non-NEMA phasing elements (e.g., exclusive pedestrian phases).

TABLE 5: 2045 STUDY INTERSECTION OPERATIONS

STUDY INTERSECTION	MOBILITY STANDARD	FUTURE NO-BUILD (5-LANE)			THREE-LANE			THREE-LANE PLUS		
		V/C	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY
OR 99W	v/c ≤ 0.90	0.46	A	9	0.46	A	9	0.46	A	59
NW 9 TH ST	v/c ≤ 0.85	0.69	D	43	0.80	D	48	0.65	D	45
SATINWOOD ST ^A	v/c ≤ 0.85	0.55	B	14	0.67	B	15	N/A	N/A	N/A
HIGHLAND DR	v/c ≤ 0.85	0.87	D	39	1.02	F	82	0.91	D	51
ROLLING GREEN DR	v/c ≤ 0.85	0.40	B	10	0.53	B	12	N/A	N/A	N/A
KINGS BLVD	v/c ≤ 0.85	0.71	C	22	0.85	C	33	0.72	C	23
NW 29 TH ST	v/c ≤ 0.85	0.73	C	24	0.99	E	64	0.82	C	35
ASPEN ST	v/c ≤ 0.85	0.37	A	4	0.60	B	12	N/A	N/A	N/A
GLENRIDGE DR/WITHAM HILL DR	v/c ≤ 0.85	0.76	E	75	0.80	D	37	0.69	E	58

BOLD AND RED indicates mobility target/standard is not met.

^A Operations for this intersection are reported based on HCM 2000 methodologies since HCM 7 does not support non-NEMA phasing elements (e.g., exclusive pedestrian phases).

Given the results listed above, the following summarizes key considerations at each intersection that led to the recommended lane configuration at each study intersection used for the alternative evaluation:

- **OR 99W** - This intersection is expected to meet ODOT mobility targets under all time periods. The signal timing at this intersection was recently updated (July 2025) to implement signal coordination with the NW 9th Street intersection. While the overall intersection operates within mobility targets, even with signal coordination there is high delay (LOS D) during existing conditions, and an initial queueing evaluation identified a risk of queue spillback between OR

99W and NW 9th Street if a lane reconfiguration occurs. Queue spillback from NW 9th Street into the highway poses a significant crash risk given the high posted speed limit along the highway (50 mph). Given these conditions, it is recommended to maintain the existing lane configuration at this location.

- **NW 9th Street** – While this intersection will meet mobility targets under future traffic conditions with a three-lane reconfiguration, as noted above, there is risk of queue spillback from NW 9th Street to OR 99W with any lane reconfiguration. If a lane reconfiguration is advanced, an eastbound right turn lane should be considered at this intersection (rather than a 3-lane cross section only) given the higher right turn volume today (approximately 150 vehicles).
- **NW Satinwood Street** – This intersection is expected to meet City mobility targets under all time periods. However, to reduce southbound queues under future conditions, the exclusive pedestrian phase was assumed to overlap with the southbound right-turn and eastbound left-turn movements, which would require updating signal heads.
- **NW Highland Drive** – This intersection will fail to meet mobility targets under existing traffic conditions with a reconfiguration to three-lanes only. Eastbound and westbound right turn lanes can provide some additional needed capacity and prevent westbound queues from spilling back into the Satinwood Street intersection, however, mobility targets will still not be met. Maintaining the existing four-lane cross-section east of this intersection to NW 9th Street could resolve capacity issues but that would restrict width for separated or protected bicycle lanes within the existing curb lines.
 - Northbound and southbound right-turn lanes could be considered given the higher right turn volumes today, which account for at least 50 percent of the volumes in the shared lane. Right-turn lanes on all intersection legs would allow the intersection to meet City mobility targets. This would align with a project listed in the City's TSP under auto and freight project solutions¹⁴, however these were not included in the analysis as this would require widening and additional right-of-way.
 - Converting this intersection to roundabout traffic control could also be considered. A sensitivity analysis was performed to determine feasible lane configurations. For a roundabout to meet mobility standards, Walnut Boulevard must have a four-lane cross section (two lanes in each direction) approaching NW Highland Drive as well as a northbound right turn from NW Highland Drive onto Walnut Boulevard (an example concept is illustrated in Figure 12). While roundabouts provide additional safety benefits compared to traffic signals and are generally cheaper to operate over the long-term, this improvement was not included in the analysis as replacing the existing signal with a roundabout would require a larger capital investment.
- **NW Rolling Green Drive** – This intersection is expected to meet City mobility targets under all time periods.
- **NW Kings Boulevard** – This intersection is expected to meet City mobility targets under all time periods. Eastbound and westbound right turn lanes should be considered at this intersection to provide additional capacity for the higher projected right turn volume (approximately 110

¹⁴ City of Corvallis, Transportation System Plan, Table 16: Auto & Freight Solutions, Project ID: A31, .

vehicles) given planned future land use growth and connectivity along Kings Boulevard north of Walnut Boulevard. The added right turn lanes would allow for protected signal phasing to prevent conflicts between high right turning volumes and people walking and biking.

- **NW 29th Street** – This intersection will fail to meet mobility targets under existing and future traffic volumes with a reconfiguration to a three-lane cross section only. A westbound right turn lane should be considered at this intersection given the higher right turn volume today (approximately 210 vehicles), which would allow the intersection to meet City mobility targets.
- **NW Aspen Street** – This intersection is expected to meet City mobility targets under all time periods. However, the south approach serves as a driveway to the Bessie Coleman Elementary School. This analysis focuses on only a p.m. peak period, so traffic volumes during school drop-off and pick-up hours should also be considered in the future at this intersection before a lane reconfiguration occurs, particularly if school traffic patterns change in Corvallis.
- **NW Glenridge Drive/Witham Hill Drive** – This intersection is expected to meet City mobility targets under all time periods. However, a westbound right turn lane should be considered at this intersection given the higher right turn volume today (approximately 120 vehicles).

As noted above, a roundabout was identified as a possible improvement at Walnut Boulevard/NW Highland Drive. An example concept is illustrated in Figure 12 below. Although outside the scope of this evaluation, if the City further considers a lane reconfiguration along Walnut Boulevard, it may be worth evaluating roundabouts at other intersections to address safety and performance concerns with a longer term capital investment.

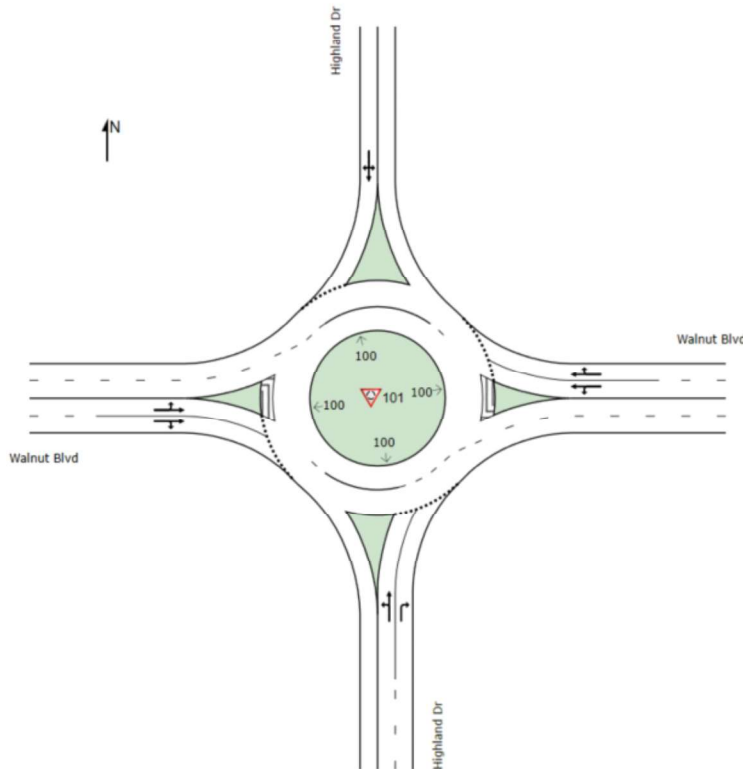


FIGURE 12: EXAMPLE ROUNDABOUT CONCEPT AT WALNUT BOULEVARD/NW HIGHLAND DRIVE

Given these findings, Table 6 lists the recommended turn lane configuration at each intersection that was included in the alternative evaluation below. Modification A improves capacity at some intersections while maintaining a higher priority on use of available roadway width for more comfortable bicycle facilities, while Modification B includes additional right turn lanes at intersections to support the use of protected signal phases for people walking and biking and additional capacity for motor vehicles. Note that both Modification A and Modification B were considered to have similar benefits as Three-Lane Plus alternatives for evaluation criteria that were not related to motor vehicle operations.

TABLE 6: SUMMARY OF TURN LANE CONFIGURATION RECOMMENDATIONS

INTERSECTION	MODIFICATION A	MODIFICATION B
OR 99W	Existing lane configuration	Existing lane configuration
9TH ST	Existing lane configuration	Existing lane configuration
SATINWOOD ST	3-lane	3-lane
HIGHLAND DR	3-lane plus EB/WB RT	3-lane plus EB/WB RT ^A
ROLLING GREEN DR	3-lane	3-lane
KINGS BLVD	3-lane	3-lane plus EB/WB RT
29TH ST	3-lane	3-lane plus WB RT
ASPEN ST	3-lane	3-lane
GLENRIDGE DR/WITHAM HILL DR	3-lane	3-lane plus WB RT

^A To meet mobility targets at all intersections under the Modification B scenario, the existing lane configuration could be considered at Highland Drive.

VOLUME-TO-CAPACITY RATIO EVALUATION

Based on the recommended lane configurations, Table 7 summarizes the number of intersections that are expected to fail to meet City or ODOT v/c ratio mobility targets. Under the Modification B build scenario, there will be one intersection (NW Highland Drive) that fails to meet the City's v/c ratio mobility targets now and in the future. However, it would still operate without excessive queues spilling back into the adjacent intersections and relatively acceptable levels of congestion (future delay of 57 seconds, or LOS E).

TABLE 7: MOBILITY TARGETS PERFORMANCE OF ALTERNATIVES

ALTERNATIVES	NUMBER OF INTERSECTIONS IN 2025:		NUMBER OF INTERSECTIONS IN 2045:	
	MEETING CITY/ ODOT MOBILITY TARGETS	FAILING TO MEET CITY/ ODOT MOBILITY TARGETS	MEETING CITY/ ODOT MOBILITY TARGETS	FAILING TO MEET CITY/ ODOT MOBILITY TARGETS
NO-BUILD	9	0	8	1
THREE-LANE	7	2	7	2
MOD. A	7	2	7	2
MOD. B ^A	8	1	8	1

^A To meet mobility targets at all intersections under the Modification B scenario, the existing lane configuration could be considered at Highland Drive. Roundabouts could also be considered, although that could require a larger capital investment.

TRAVEL TIME EVALUATION

Travel time was also assessed along the study corridor to ensure minimal changes with a potential lane reconfiguration. Table 8 below summarizes travel time under existing (year 2025) conditions with either a four- or five-lane cross-section (existing/no-build) or the recommended lane configurations described in Table 6 above. Overall, right turn lanes at more intersections with high right turn volumes (Modification B) help minimize the impact on travel times through the study corridor, with approximately a one-minute increase in each direction on average compared to existing conditions. It should also be noted that unsignalized side-street traffic delay is expected to reduce with either build alternative given vehicles can more comfortably enter the mainline roadway or center TWLTL since there are fewer lanes to cross, resulting in shorter wait times.

TABLE 8: TRAVEL TIMES ASSOCIATED WITH EXISTING VS. RECOMMENDED LANE CONFIGURATION MODIFICATIONS (2025)

DIRECTION	2025 EXISTING TRAVEL TIME (MM:SS)	MOD. A TRAVEL TIME (MM:SS)	CHANGE IN TRAVEL TIME (MM:SS)	MOD. B ^A TRAVEL TIME (MM:SS)	CHANGE IN TRAVEL TIME (MM:SS)
WB	7:30	10:00	+2:30 (33%)	8:50	+1:20 (18%)
EB	6:50	7:50	+1:00 (14%)	7:40	+0:50 (12%)

DIVERSION EVALUATION

Given future congestion at the Highland Drive intersection (Table 5), there is risk for possible traffic diversion to the surrounding street network. However, there are limited parallel routes in this area and few streets that connect to parallel routes, limiting the spread of potential diversion. Based on

an initial screening of future p.m. peak hour volumes in the CALM models, around 150 vehicles could shift to Circle Boulevard on average, a parallel arterial/collector corridor (approximately a 20-25 percent increase from projected no-build volumes), although volume shifts would be expected to be lower during other times of the day. Adding capacity via additional right turn lanes (or maintaining the five-lane cross section at key bottlenecks) could help reduce the amount of peak diversion estimated.

While most north-south streets that connect Walnut Boulevard and Circle Boulevard are collector or arterial roadways, NW 13th Street and NW Garyanna Drive are both local roads bisecting residential land use in the area, with a portion of 13th Street identified as a Neighborhood Bikeway. The model indicates both streets could be affected by an increase of up to 45 vehicles in total, compared to projected no-build volumes, between both streets during the future p.m. peak hour given their proximity to Highland Drive and uninterrupted traffic flow. Speed humps or other traffic calming devices could be considered along both streets to limit cut through traffic between the two east-west corridors.

SUMMARY OF EFFICIENT TRANSPORTATION SYSTEM PERFORMANCE

Table 9 summarizes the performance of each of the alternatives relative to the "Provide an Efficient Transportation System" objective.

TABLE 9: EFFICIENT TRANSPORTATION SYSTEM PERFORMANCE OF ALTERNATIVES

ALTERNATIVES	V/C RATIO (MOBILITY STANDARDS)	CORRIDOR TRAVEL TIME	TRAFFIC DIVERSION
THREE-LANE	Two study intersections fail to meet the City's mobility targets during the p.m. peak hour with existing volumes	More than three minutes of travel time added in each direction	This alternative would experience the most potential diversion of traffic to other surrounding streets
MODIFICATION A	Two study intersections fail to meet the City's mobility targets during the p.m. peak hour with existing volumes	On average, one to two minutes of travel time is added in each direction	This alternative would have less potential for traffic diversion compared to the Three-Lane alternative (similar to Modification B)
MODIFICATION B	One study intersection fails to meet the City's mobility targets during the p.m. peak hour with existing volumes	On average, approximately one minute of travel time is added in each direction	This alternative would have less potential for traffic diversion compared to the Three-Lane alternative (similar to Modification A)

SUMMARY OF LANE RECONFIGURATION EVALUATION

Based on the scoring criteria established for this project, this section summarizes key considerations for how the Walnut Boulevard lane reconfiguration alternatives perform relative to the project goals. Table 10 below presents the summary results for alternatives.

The Modification B (Three-Lane Plus) build alternative, which features a three-lane cross-section with a center TWLTL and right turn lanes at high right-turn volume intersections (a Three Lane Plus alternative), supports all project objectives best. This alternative is expected to provide enhanced safety for all road users while minimizing impacts to traffic operations and increasing accessibility and comfort for those walking, cycling, or rolling through Walnut Boulevard now and into the future.

SAFETY

- **All build alternatives** align substantially with this criterion given they implement proven countermeasures that reduce the potential severity and number of crashes as well as minimize conflicts between road users and increase the roadway's ability to self-enforce speeds.
- The **Three-Lane Plus** build alternatives (Modification A or Modification B) provide more opportunities to reduce permissive turning conflicts than existing conditions.















VIABLE ALTERNATIVES TO AUTOMOBILE TRAVEL

- **All build alternatives** align substantially with this criterion considering they minimize the level of traffic stress for people walking and biking by accommodating enhanced facilities with greater separation from motor vehicle traffic.
- The **Three-Lane** build alternative accommodates the greatest separation between modes of travel.

TRANSPORTATION SYSTEM EFFICIENCY FOR MOTOR VEHICLES

- The **Modification B (Three-Lane Plus) build alternative** outperforms the Modification A (Three-Lane Plus) build alternative and the Three-Lane build alternative under this criteria, considering it minimizes changes to traffic operations, including congestion and travel time along the corridor.

TABLE 10: WALNUT BOULEVARD LANE RECONFIGURATION ALTERNATIVES EVALUATION

OBJECTIVE	NO-BUILD	THREE-LANE	THREE-LANE PLUS ^A	
ENHANCE SAFETY				
VIALE ALTERNATIVES TO AUTOMOBILE TRAVEL				
PROVIDE AN EFFICIENT TRANSPORTATION SYSTEM FOR MOTOR VEHICLES				
KEY:				
EXCELLENT	GOOD	FAIR	POOR	VERY POOR
				

^A Overall evaluation performance was assumed similar for both three-lane plus alternatives (Modification A and B), although Modification B would **perform slightly better for providing an efficient transportation system for motor vehicles and slightly worse for a viable alternative to automobile travel than** Modification A.