



610 SW ALDER STREET, SUITE 700
PORTLAND, OR 97205
P 503.228.5230 F 503.273.8169

MEMORANDUM

Date: October 5, 2017 Project #: 21282

To: Curleigh Carothers, PE; City of Camas

cc: Jeff Barsness, Washington State Department of Transportation (WSDOT)
David Jardin, Clark County Public Works Department
John Schmidt, Metropolitan Land Group, LLC
Kurt Stonex, PE, Mike Odren & Stacey Hickman; Olson Engineering

From: Chris Brehmer, PE & Kelly Laustsen, PE; Kittelson & Associates, Inc.

Project: Green Mountain Phase 3

Subject: Transportation Compliance

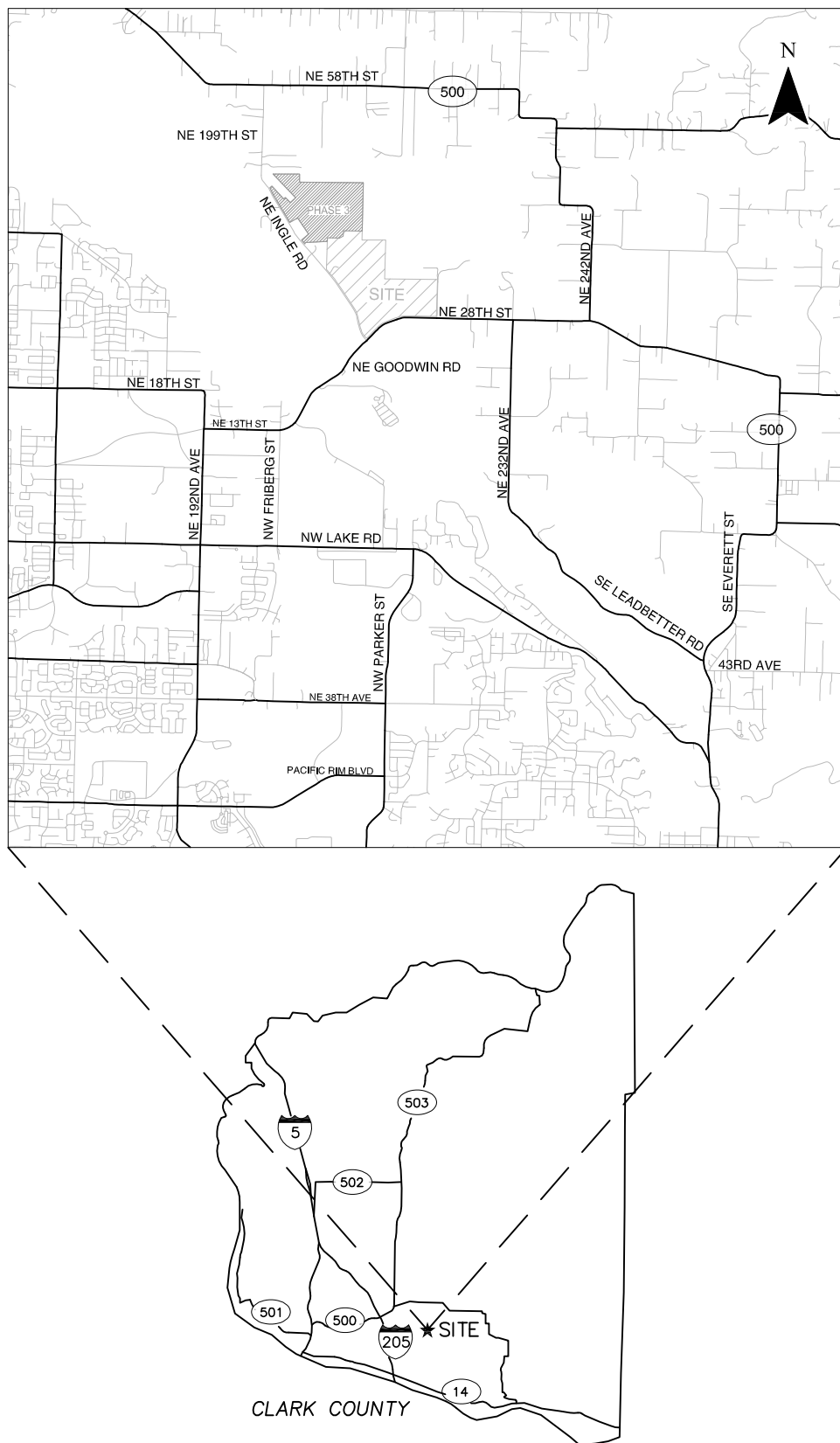
This memorandum provides transportation compliance documentation supporting Phase 3 of the proposed Green Mountain Master Plan development to be located immediately east of NE Ingle Road and north of NE Goodwin Road in Camas, Washington. The contents of this memorandum are based on the recommendations provided in the *Green Mountain Master Plan Transportation Impact Analysis* (TIA), prepared by Kittelson & Associates, Inc. and dated June 2014 (provided in *Appendix A*). The intent of this memorandum is to document Phase 3 trip generation and ensure that the mitigation measures provided in the Masterplan TIA are applied at the appropriate phase of development.

BACKGROUND

The TIA for the Green Mountain Master Plan developed in 2014 provided a near- and long-term analysis for full buildout of the Green Mountain site, including 283-acres of mixed-use development. The master plan assumed eight phases of the development, the first and second of which are currently underway. A Transportation Compliance Letter for Phase 2 was prepared by Kittelson & Associates, Inc. and dated November 2016 (provided in *Appendix B*).

Figure 1 illustrates the site vicinity and location of the Master Plan site, as well as Phase 3. A mix of residential and commercial uses is planned for the full site in accordance with the zoning.

Development of Phase 3 of the site is currently proposed, with the site plan shown in Figure 2. Phase 3 consists of 159 residential units with the majority of the site accessed via a new public roadway connection to NE Ingle Road and four units accessed via a shared driveway on NE Ingle Road.



Site Vicinity
Camas, Washington

Figure
1

SCOPE OF THE REPORT

This analysis identifies the transportation-related impacts associated with Phase 3 of the proposed Green Mountain Master Plan development and was prepared in accordance with the recommendations outlined in the Master Plan TIA. It documents the following:

- The number of site-generated trips (daily, weekday a.m. peak hour, weekday p.m. peak hour) estimated with Phase 3.
- The number of site-generated trips (daily, weekday a.m. peak hour, weekday p.m. peak hour) previously debited by approved site development applications on the master plan site.
- An accounting of the number of site-generated trips (daily, weekday a.m. peak hour, weekday p.m. peak hour) remaining assuming approval of the Phase 3 subdivision application.
- Evaluation of outstanding mitigation needs (as appropriate consistent with the Master Plan recommendations) involving:
 - Need for an eastbound right-turn lane at NE 199th Avenue/NE 58th Street (SR 500);
 - NE Ingle Road/NE Goodwin Road intersection operations; and
 - Assessment of proportionate share contribution at NE 192nd Avenue/NE 13th Street intersection.
- On-site access and circulation.
- Conclusions and recommendations.

ANALYSIS METHODOLOGY

As with the Master Plan TIA, all level of service analyses described in this report were performed in accordance with the procedures stated in the *2010 Highway Capacity Manual* (Reference 1).

To ensure that this analysis was based on a reasonable worst-case scenario, the peak 15 minute flow rate during the peak hour analysis periods was used in the evaluation of all intersection levels of service. For this reason, the analysis reflects conditions that are only likely to occur for 15 minutes out of each average peak hour. Traffic conditions during other weekday hours and throughout the weekend will likely be better than those described in this report.

CURRENT PROPOSED DEVELOPMENT PLAN

Phase 3 consists of 159 single-family detached homes and is expected to be completed by 2022. Phase 3 is primarily located in the northeast portion of the overall site, with access to the majority of the site anticipated on NE Ingle Road via a neighborhood circulator. A second access will be provided

to the south to serve four of the units. Phase 3 will not be connected to Phase 1 or 2 due to differences in elevations between the sites. In total, the proposed master plan anticipates two public street neighborhood circulator connections to NE Ingle Road serving the site in conjunction with two public street neighborhood circulator connections along NE 28th Street.

Trip Generation

Trip generation estimates for the proposed development were generated based on information provided in the standard reference manual *Trip Generation, 9th Edition* published by the Institute of Transportation Engineers (ITE – Reference 2). Table 1 summarizes the daily, weekday a.m., and weekday p.m. peak-hour trips for the Phase 3 assumed development. Peak hour trips in Table 1 have been rounded to the nearest five trips.

Table 1: Trip Generation Estimate – Phase 3

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	159 units	1,514	120	30	90	160	100	60

Table 2 summarizes the overall master plan trip generation and then deducts for the cumulative Phase 1¹, Phase 2¹ and Phase 3 trips to summarize the number of net new trips that will remain vested.

¹ While previous traffic analysis assumed 215 units in Phase 1, Phase 1 as platted consists of 201 units. While previous traffic analysis assumed 230 units in Phase 2, Phase 2 is now platted for 228 units. The updated trip totals are shown in Table 2.

Table 2: Master Plan Trip Generation and Build-out Debiting (Includes Phase 1, 2 and 3)

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Apartment	220	536 units	3,570	275	55	220	330	215	115
Single-Family Detached Housing	210	764 units	7,270	575	145	430	765	480	285
Total Residential (1,300 units)			10,840	850	200	650	1,095	695	400
Internalization (6% Daily,54% PM)			630	0	0	0	60	30	30
Shopping Center	820	90,000 square feet	6,340	145	90	55	560	270	290
Internalization (10% Daily, 11% PM)			630	0	0	0	60	30	30
Pass-By Trips (34%)			1,940	50	25	25	170	85	85
Total Vested Trips			17,180	995	290	705	1,655	965	690
Less Internalization			1,260	0	0	0	120	60	60
Less Pass-by trips			1,940	50	25	25	170	85	85
Vested Net New Trips for Full Build-out			13,980	945	265	680	1,365	820	545
Deduct for Net New Trips for Phase 1			1,914	150	40	110	200	125	75
Deduct for Net New Trips for Phase 2			2,170	170	40	130	230	145	85
Deduct for Net New Trips for Phase 3			1,514	120	30	90	160	100	60
Remaining Trips			8,382	505	155	350	775	450	325

As seen in Table 2, after accounting for Phase 1 through 3 development, a total of 8,382 daily; 505 weekday a.m. peak hour; and 775 weekday p.m. peak hour trips remain in the master plan approval.

Trip Distribution and Assignment

The distribution of site-generated trips onto the study area roadway system was estimated utilizing the trip distribution provided in the Master Plan TIA. *Appendix C* illustrates the trip assignment.

EVALUATION OF OUTSTANDING MITIGATION NEEDS

The Master Plan TIA included recommended mitigations for intersections not meeting standards under background and/or total traffic conditions. As part of each phase's transportation compliance letter, the TIA recommended evaluation of the following:

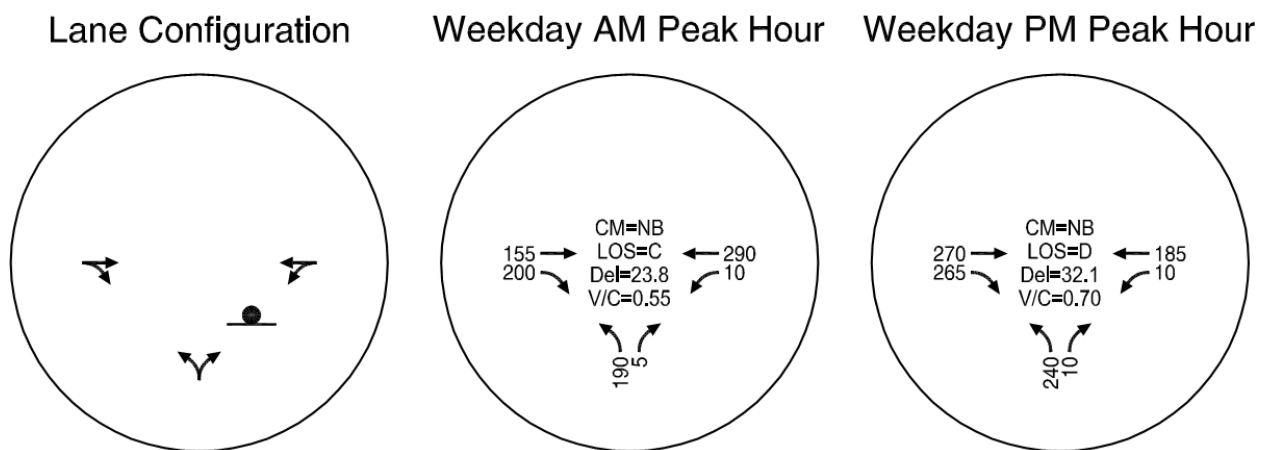
- Need for an eastbound right-turn lane at NE 199th Avenue/NE 58th Street (SR 500)
- NE Ingle Road/NE Goodwin Road operations (including traffic signal warrant analysis)
- Assessment of proportionate share contribution at NE 192nd Avenue/NE 13th Street

Given ongoing construction activity in the area, traffic counts previously collected in October 2016 for the Phase 2 TCL were used with a year of growth added² to inform an updated operations analysis. The count sheets are provided in *Appendix D*. The results are discussed below.

NE 199th Avenue/NE 58th Street (SR 500)

The Master Plan TIA recommended that future subdivision applications provide an updated assessment as to the potential need for providing a right-turn taper or lane at NE 199th Avenue/NE 58th Street (SR 500), considering both the need for a right-turn taper or lane and delay with the northbound left-turn. Year 2022 total traffic conditions were analyzed using the same approach from the Master Plan TIA, accounting for in-process developments (details are provided in *Appendix E*, and Green Mountain Phases 1, 2 and 3. The lane configuration and projected operations under 2022 total traffic conditions are shown in Exhibit 1. *Appendix F* contains the 2022 total traffic conditions traffic operations worksheets.

Exhibit 1: NE 199th Avenue/NE 58th Street (SR 500) Total Traffic Lane Configuration and Operations



As seen in the exhibit, the minor street northbound approach at the intersection of NE 199th Avenue/NE 58th Street (SR 500) is projected to operate at a volume-to-capacity (v/c) ratio of 0.55 and LOS C during the a.m. peak hour and v/c ratio of 0.70 and LOS D during the p.m. peak hour with Phase 3 site buildout. It therefore does not comply with WSDOT's LOS requirement (LOS C) for non-HSS facilities in rural areas, based on the weekday PM peak hour operations. This finding represents a LOS degradation relative to forecast Phase 2 site buildout conditions.

Roadways under Washington State jurisdiction are subject to the turn lane guidelines contained in the *WSDOT Design Manual* (Reference 3). Traffic volumes at the intersection of NE 199th Avenue/NE 58th Street (SR 500) meet WSDOT's guidelines for an eastbound right-turn lane on NE 58th Street

² Based on direction provided in the original traffic study, a 1% growth was applied to City of Camas roadways.

under existing conditions and future scenarios during both the weekday a.m. and p.m. peak hour (consistent with findings from the Master Plan TIA). The table below assesses volumes at the intersection for various horizon year scenarios and the impact of the proposed development.

Table 3: NE 199th Avenue/NE 58th Street (SR 500) Eastbound Right-Turn Lane Assessment

Scenario	Eastbound Right-Turn (EBRT) Volume	Meets Guideline?	Development-Added EBRT Trips	Impact of Development
2017 Existing Traffic – AM Peak	156	Yes	-	-
2017 Existing Traffic – PM Peak	161	Yes	-	-
2022 Background Traffic – AM Peak	196	Yes	17 (Phase 1,2)	9%
2022 Background Traffic – PM Peak	245	Yes	54 (Phase 1,2)	22%
2022 Total Traffic – AM Peak	202	Yes	6 (Phase 3)	3%
2022 Total Traffic – PM Peak	265	Yes	20 (Phase 3)	8%

Based on additional discussions with WSDOT and Clark County staff during the summer of 2017, WSDOT has identified a single-lane roundabout as the preferred mitigation at the intersection in lieu of installation of a westbound right-turn lane. Recognizing the cost of designing and constructing a roundabout exceeds the impacts associated with the Green Mountain Master Plan and represents an “ultimate” long-term improvement need, WSDOT and Clark County will coordinate to administer a proportionate share impact mitigation methodology.

Payment of proportionate share mitigation towards the future roundabout will allow Green Mountain Master Plan development (as well as other subsequent development) a basis to satisfy transportation concurrency while providing a funding mechanism to allow the public agencies to advance intersection improvements. The proportionate cost share of intersection improvements attributable to Green Mountain Phase 3 will be developed and documented in a separate letter, subject to WSDOT and County approvals. Table 4 summarizes Phase 3 site-generated trips projected to travel through the intersection (future roundabout).

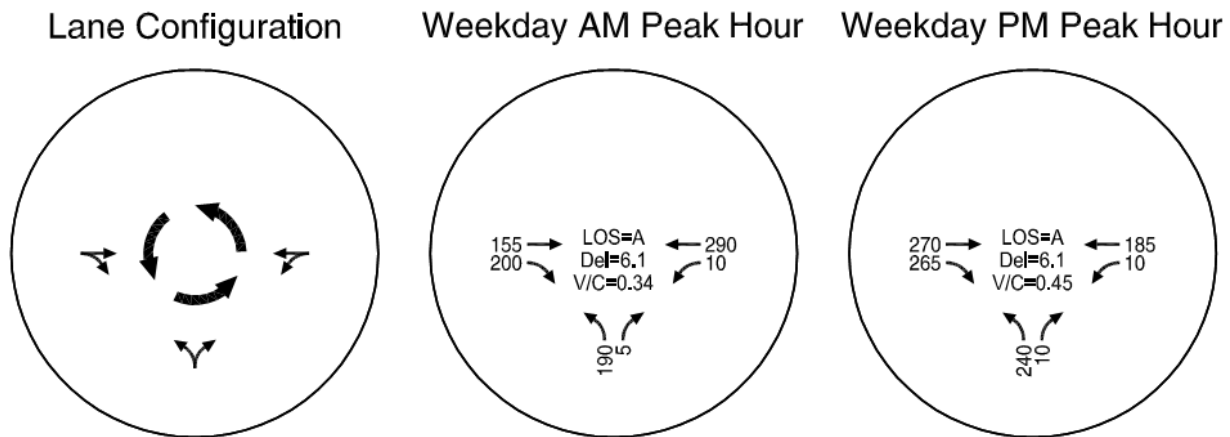
Table 4: NE 199th Avenue/NE 58th Street (SR 500) Site Impact

Scenario	Site-Generated Trip Impact
Phase 3 – Weekday AM Peak Hour	24
Phase 3 – Weekday PM Peak Hour	32

Mitigated Intersection Operations Analysis

As seen in Exhibit 4, the intersection is projected to meet WSDOT LOS standards with conversion to a single-lane roundabout.

Exhibit 4: NE 199th Avenue/NE 58th Street (SR 500) Total Traffic Lane Configuration and Operations – with Single-Lane Roundabout



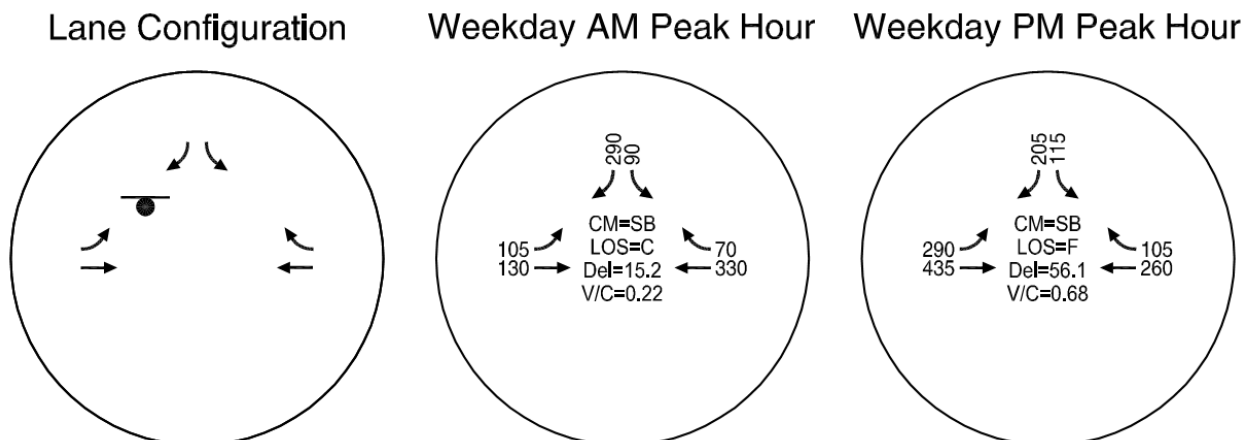
NE Ingle Road/NE Goodwin Road

In the Master Plan TIA, the intersection of NE Ingle Road/NE Goodwin Road was projected to not meet City of Camas intersection operating standards in the 2029 background conditions during the weekday p.m. peak hour and the 2029 total traffic conditions during both the weekday a.m. and p.m. peak hours. Therefore, the following series of mitigations were recommended in conjunction with the proposed development:

- Construct an eastbound left-turn lane on NE Goodwin Road at NE Ingle Road with the first Phase 1 trip (*currently under construction*).
- Construct a westbound right-turn lane on NE Goodwin Road at NE Ingle Road with the 203rd Phase 1 trip (prior to occupancy of 203rd single family home on site). The right-turn lane should provide at least 100 feet of storage (*was assumed to be constructed with Phase 2 development but may be reprioritized as discussed later in this report*).
- Construct a three-lane roadway section (with center two-way left-turn lane) on NE Goodwin Road along the site frontage in conjunction with standard frontage improvements as adjacent development occurs (*will be constructed with Phase 2 development*).
- Upon completion of Phase 1 site development (including construction of the eastbound left-turn lane on NE Goodwin Road at NE Ingle Road with Phase 1), the developer shall monitor the need for installation of a traffic signal with each future subdivision application at the intersection and construct a traffic signal when the intersection no longer satisfies City of Camas performance standard (LOS "D" and v/c of 0.90 or better) *and* the intersection volumes meet traffic signal warrants (subject to direction from the City of Camas) (*discussion provided below*).

Stop-controlled intersection operations are provided in Exhibit 5 assuming Phase 1 through 3 site development as well as approved background traffic. *Appendix F* contains the 2022 total traffic conditions traffic operations worksheets.

Exhibit 5: NE Ingle Road/NE Goodwin Road 2022 Total Traffic Lane Configuration and Operations



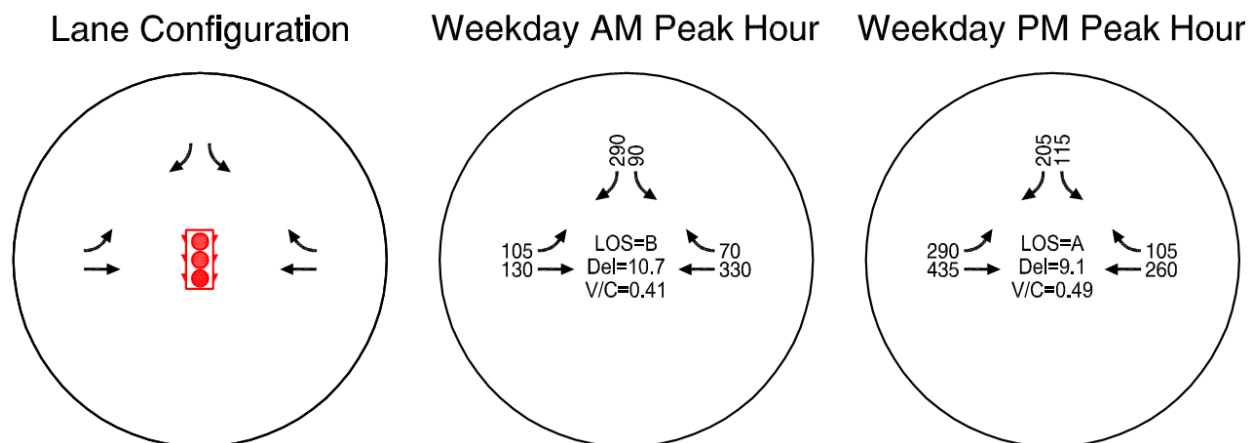
As seen in Exhibit 5, with buildout of Phase 3, the southbound left-turn at NE Ingle/NE Goodwin Road is projected to operate at a LOS C during the weekday a.m. peak hour with a v/c ratio of 0.22. During the weekday p.m. peak hour, the southbound left-turn operates at a LOS F but under capacity with a v/c ratio of 0.68. Therefore, the intersection no longer satisfies the City of Camas performance standard (LOS "D" and v/c of 0.90 or better) based on the weekday PM peak hour operations. This assessment assumes the two-way left-turn lane on NE Goodwin Road and westbound right-turn lane, both provided with Phase 2 (a second scenario without the westbound right-turn lane is also provided below). *Appendix F* contains the supporting traffic operations worksheets.

Based on the signal warrants provided in the Manual on Uniform Traffic Control Devices (MUTCD, Reference 4), the intersection is anticipated to meet the eight-hour (warrant #1) and four-hour (warrant #2). The warrant sheets are provided in *Appendix G*.

Mitigated Intersection Operations Analysis

With signalization, the intersection meets City performance standards, as shown in Exhibit 6.

Exhibit 6: NE Ingle Road/NE Goodwin Road 2022 Total Traffic Lane Configuration and Operations – with Signalization



Note: Synchro9 is unable to report v/c ratios for signalized intersections with the HCM 2010 methodology. Therefore, the v/c ratios shown are based on the HCM 2000 methodology as implemented by Synchro9.

Given the operational analysis and signal warrant assessment, signalization of the intersection of NE Ingle Road/NE Goodwin Road is recommended in conjunction with Phase 3.

Potential Westbound Right-Turn Lane Reprioritization

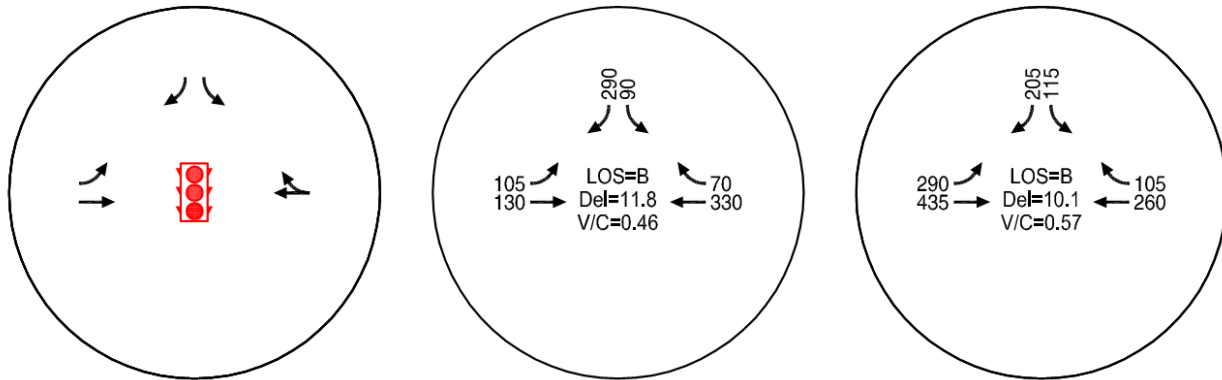
Based on the evolution of phased site development, the NE Ingle Road/NE Goodwin Road may be signalized prior to construction of the westbound right-turn lane on NE Goodwin Road at NE Ingle Road. From a capacity analysis perspective, the signalized intersection less the westbound right-turn lane would readily support site development through Phase 3 and beyond. Exhibit 7 illustrates peak hour intersection performance assuming signalization without provision of the westbound right-turn lane. Should signalization move ahead prior to construction of the westbound right-turn lane on NE Goodwin Road at NE Ingle Road, we recommend the traffic signal poles and equipment be located in a manner that accommodates the future westbound right-turn lane to the extent possible in order to minimize “throw away” construction costs. We currently anticipate that the right-turn lane will be constructed prior to or in-conjunction with completion of the phase that fronts Goodwin Road in the turn-lane area.

Exhibit 7: NE Ingle Road/NE Goodwin Road 2022 Total Traffic Lane Configuration and Operations – with Signalization Prior to Westbound Right-turn Lane Completion

Lane Configuration

Weekday AM Peak Hour

Weekday PM Peak Hour



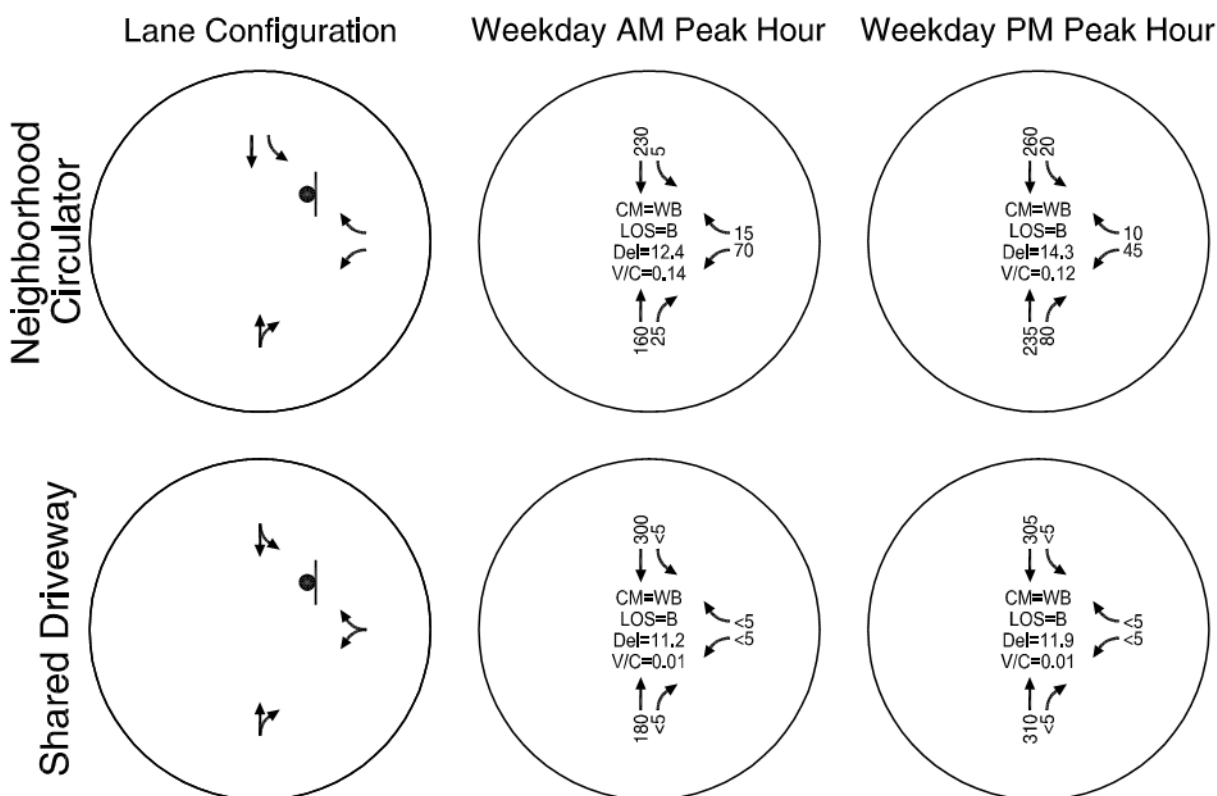
NE 192nd Avenue/NE 13th Street

The Master Plan TIA identified a proposed proportionate cost sharing methodology to fund future construction of a northbound right-turn lane and a westbound right-turn lane on NE 13th Avenue at NE 192nd Avenue, provided in *Appendix H*. Under this methodology, each weekday p.m. peak hour trip would be assessed a fee of \$319. Based on the Phase 3 trip assignment (refer to *Appendix C*), Phase 3 adds 72 trips to the intersection of NE 192nd Avenue/NE 13th Street and therefore should be responsible for contributing \$22,968 towards future improvements at the intersection.

ON-SITE CIRCULATION AND OPERATIONS

As seen in Figure 2, Phase 3 is located in the northwest portion of the overall site, with public street access anticipated on NE Ingle Road via a neighborhood circulator and a separate shared driveway serving four of the lots. Phase 3 will not be connected to Phase 1 or 2 due to differences in elevations between the sites. Therefore, all trips were assumed to utilize the neighborhood circulator access on NE Ingle Road developed with Phase 3, with the exception of the four lots access via a shared driveway. The proposed lane configuration for the new intersections and weekday a.m. and p.m. peak hour operations are shown in Exhibit 8. As shown in the exhibit, construction of a southbound left-turn lane at the neighborhood circulator access is proposed with development. *Appendix I* contains the traffic operations worksheets for the Phase 3 access operations.

Exhibit 8: Phase 3 Ingle Road Accesses – 2022 Total Traffic Lane Configuration and Operations



As seen in the exhibit, both accesses are projected to operate acceptably during both the weekday a.m. and p.m. peak hours. Anticipated queueing is provided in Table 5.

Table 5: Phase 3 Site Access Queueing – 2022 Total Traffic Conditions

Intersection	Movement	95 th Percentile Queue	
		Weekday AM Peak Hour	Weekday PM Peak Hour
Ingle Road/Neighborhood Circulator (Northern Access)	Westbound left-turn	25	25
	Westbound right-turn	25	25
	Northbound right-turn/through	<25	<25
	Southbound left-turn	<25	25
Ingle Road/Shared Driveway (Southern Access)	Westbound left-/right-turn	<25	<25
	Northbound right-turn/through	<25	<25
	Southbound though/left-turn	<25	<25

As seen in Table 5, 95th percentile queues are anticipated to be one vehicle or less during at both accesses during both the weekday a.m. and p.m. peak hours.

Given this analysis, acceptable operations can be maintained with the proposed site access arrangement. Delays during the peak periods are anticipated to be less than fifteen seconds for the critical movement at the neighborhood circulator access, which is the westbound left-turn. The access location shown on the site plan in Figure 3 is preferred in order to provide the required sight

distance. We recommend that on-site landscaping, signage and any above-ground utilities be provided appropriately to ensure that adequate sight distance is provided and maintained.

Neighborhood Circulator Considerations

The proposed neighborhood circulator serving 155 single family homes within Phase 3 will provide sufficient intersection capacity at Ingle Road and comply with Camas transportation concurrency requirements. Additional transportation considerations evaluated while locating and designing the neighborhood circulator are described below.

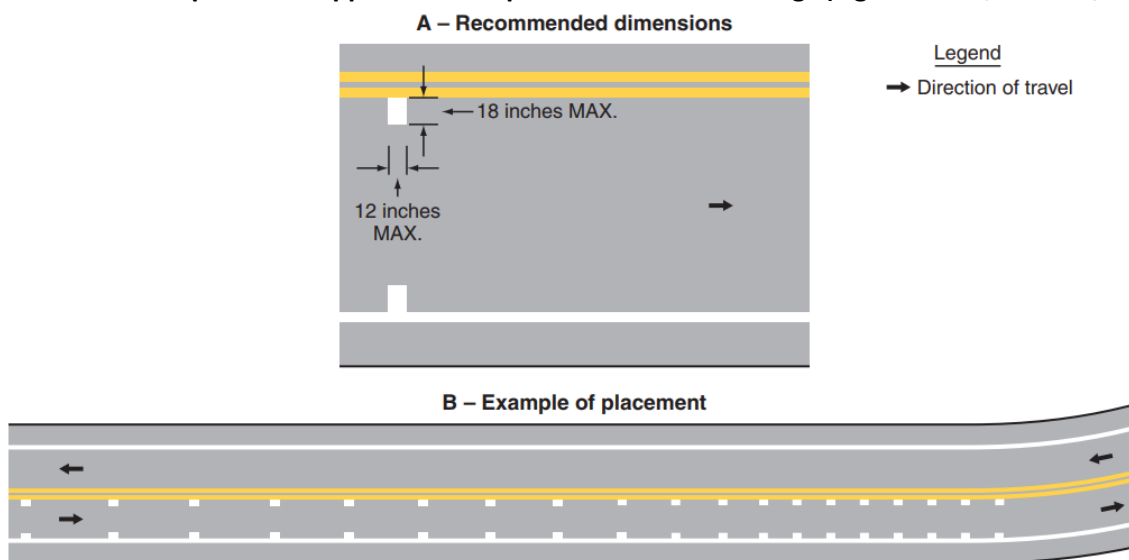
Turn Lanes

Construction of a southbound left-turn lane is proposed on Ingle Road approaching the neighborhood circulator in accordance with City of Camas design requirements. The new turn lane will reduce the potential delay incurred by southbound through traffic on Ingle Road related to southbound traffic turning left into the site (relative to the existing two-lane Ingle Road).

Sight Distance

The location of the proposed neighborhood circulator was selected to maximize available intersection sight distance at the Ingle Road connection point considering the horizontal curve along the south portion of the Ingle Road frontage as well as vertical curves along the roadway. The project civil engineering site plans prepared by Olson Engineering and included in *Appendix J* document the available intersection sight distance at the proposed access location on Ingle Road. Speed reduction markings could be installed along NW Ingle Road approaching the new roadway per MUTCD guidance in conjunction with site development, subject to City approval. Exhibit 9 provides the recommended marking dimensions and placement as provided in the MUTCD (Reference 4).

Exhibit 9: Example of the Application of Speed Reduction Markings (Figure 3B-28, MUTCD, Reference 4)



In addition, we understand the City of Camas will be posting a reduced speed limit along Ingle Road through the area of the proposed site frontage improvements, which is expected to reduce the sight distance requirements relative to the distances shown in the site plans included in *Appendix J*.

Daily Trip Considerations

From a daily trip perspective, the neighborhood circulator can be expected to carry on the order of 1,476 vehicle trips on a typical weekday day (based on the Phase 3 site trip estimate in Table 1 and accounting for 4 of the homes using a separate shared driveway) on-site. This level of traffic can be readily accommodated by a two-lane roadway. Traffic volumes along the new roadway will be highest closest to Ingle Road and will dissipate as home and local street connections within the Phase 3 development interface with the roadway east of Ingle Road.

The Applicant may consider coordinating with the City of Camas to incorporate traffic calming devices and/or design a roadway streetscape into the site design and construction in order to promote appropriate travel speeds along the neighborhood circulator, particularly where direct driveway access to the neighborhood circulator is proposed in proximity to Ingle Road.

FINDINGS AND RECOMMENDATIONS

Based on the results of the transportation compliance letter, Phase 3 of the Green Mountain Master Plan can be developed while maintaining acceptable levels of service and safety at the study intersections assuming provision of identified off-site mitigation measures. The primary findings and recommendations of this study are summarized below.

Trip Generation

- Phase 3 includes 159 single family homes and is estimated to generate 1,514 daily trips, 120 net new a.m. peak hour trips, and 160 net new p.m. peak hour trips.
- After accounting for Phases 1-3 site development; a total of 8,382 daily; 505 weekday a.m. peak hour; and 775 weekday p.m. peak hour trips remain vested in the master plan approval.

NE 199th Avenue/NE 58th Street (SR 500) Intersection

- The intersection does not meet WSDOT's level-of-service standard during the weekday p.m. peak hour with buildout of the Phase 3 site, with the northbound approach projected to operate at a LOS D.
- WSDOT has identified a single-lane roundabout as the preferred long-term improvement at the intersection.

- A proportionate share impact methodology will be developed in cooperation with Clark County and WSDOT to support future design and construction of a roundabout.
- Green Mountain Phase 3 and other subsequent developments adding trips to the intersection will be assessed a proportionate share mitigation payment based on the number of peak hour trips they add to the intersection.
- Phase 3 is projected to add 24 trips to the intersection during the weekday AM peak hour and 32 trips during the weekday PM peak hour.

NE Ingle Road/NE Goodwin Road Intersection

- The southbound left-turn at NE Ingle/NE Goodwin Road is projected to operate at a LOS F and warrant signalization with buildout of Phase 3.
 - From a capacity analysis perspective, the signalized intersection less the westbound right-turn lane would readily support site development through Phase 3 and beyond.

NE 192nd Avenue/NE 13th Street Intersection

- Phase 3 is projected to add 72 weekday p.m. peak hour trips to the intersection of NE 192nd Avenue/NE 13th Street. This trip impact triggers a proportionate cost share of \$22,968 (\$391 per trip) based on the mitigation methodology presented in the Master Plan TIA.

Recommendations

- The following should be provided in conjunction with Phase 3 site development:
 - Contribution of a proportionate share payment towards design and construction of a single-lane roundabout at the intersection of NE 199th Avenue/NE 58th Street (payment amount to be determined in coordination with WSDOT and Clark County).
 - Signalization of the NE Ingle Road/NE Goodwin Road intersection.
 - Contribution of \$22,968 towards future improvements at NE 192nd Avenue/NE 13th Street.
 - Signing and striping on NE Ingle Road at the new neighborhood circulator to accommodate the intersection and the proposed southbound left-turn lane in accordance with City of Camas design requirements.
 - On-site and off-site landscaping and any above ground utilities at the new neighborhood circulator connection to NE Ingle Road, shared driveway on NE Ingle

Road, and internal roadways should be provided appropriately to ensure that adequate sight-distance is maintained.

We trust this letter adequately addresses the traffic impacts associated with the proposed Green Mountain Master Plan Phase 3 site development. Please contact us if you have any questions or comments regarding the contents of this report or the analysis performed.

REFERENCES

1. Transportation Research Board 2010. Highway Capacity Manual. 2010.
2. Institute of Transportation Engineers. *Trip Generation Manual*, 9th Edition. 2012.
3. Washington State Department of Transportation. *Design Manual*. November 2015.
4. Federal Highway Administration. *Manual on Uniform Traffic Control Devices (MUTCD)*. 2009.

