

MEMORANDUM

Date: February 10, 2021 Project #: 20567

To: Dan Grimberg, West Hills Land Development
Mike Peebles, Otak

From: Julia Kuhn & Wade Scarbrough

Project: Scholls Heights at South Cooper Mountain

Subject: Timing of Improvements to SW Tile Flat Road and SW Scholls Ferry Road

This memorandum has been prepared to support West Hill's Land Development Modification Application to request changes to three conditions of approval associated with the 2017 land use decision¹ for Scholls Heights at South Cooper Mountain. Specifically, the conditions desired for modification are summarized below.

- Condition of Approval #5 – currently this condition requires right-of-way dedication and widening of SW Scholls Ferry Road along the site frontage to a modified five-lane cross-section. Although not specified in the condition, all of the traffic analyses conducted to date have assumed that the second westbound through lane on SW Scholls Ferry Road would be converted to a right-turn lane at the intersection with SW Tile Flat Road.
- Condition of Approval #6 – currently this condition requires right-of-way dedication and widening of SW Tile Flat Road to a modified three-lane cross-section along the site frontage.
- Condition of Approval #7 – this condition requires construction of the SW Tile Flat Road improvements from SW Scholls Ferry Road to Street K as part of the first phase of site development.

West Hills desires to modify these conditions by defining when improvements are required to be constructed based on a threshold of number of units being developed by phase. Given that the requirement for these conditions is, in part, directly tied to the need for future changes to the lane geometry at the SW Tile Flat Road/SW Scholls Ferry Road intersection, we have re-evaluated intersection operations to determine if the existing lane configuration on each roadway can facilitate the initial phases of development.

¹ Staff Report dated November 8, 2017 for the Scholls Heights at South Cooper Mountain PUD

As will be discussed in this memo, our analyses revealed that the initial phases (i.e., up to 325 single family units and 275 multi-family units) could be developed while maintaining acceptable intersection operations through the year 2022 without any intersection modifications and/or site frontage widening.

Background

In May 2017, we submitted a Traffic Impact Analysis as part of the land use application for Scholls Heights at South Cooper Mountain. This study recommended the following improvements along SW Tile Flat Road and SW Scholls Ferry Road as part of site development:

- Widen SW Scholls Ferry Road to provide two westbound through lanes from the eastern property boundary of The Ridge at South Cooper Mountain to SW Tile Flat Road. At the SW Tile Flat Road intersection, the northern-most through lane should be striped as a westbound right-turn lane. As part of this improvement, a westbound right-turn traffic signal overlap should be provided at the signalized intersection.
- Widen SW Scholls Ferry Road to provide two eastbound through lanes from SW Tile Flat Road through the SW Strobel Road intersection. To the east of SW Strobel Road, the eastbound direction could taper to one through lane.
- Widen SW Tile Flat Road to provide a 3-lane cross-section from the northern boundary of the Scholls Heights property to the SW Scholls Ferry Road intersection. The southbound approach at SW Scholls Ferry Road should be striped to include a left-turn lane and a shared left/through/right lane.

In August 2017, we submitted a *Phasing Analysis* memorandum to accompany the City's review of Scholls Heights at South Cooper Mountain. The August 2017 memo considered the development of up to 682 single family homes and 275 multifamily homes on the properties located northeast of the SW Tile Flat Road/SW Scholls Ferry Road intersection. As part of the August 2017 memo, seven phases of residential development and associated on-site infrastructure were anticipated to occur by the year 2022. At the SW Tile Flat Road/SW Scholls Ferry Road intersection, the phasing analyses were conducted assuming the changes to the intersection recommended as part of the May 2017 TIA were in-place as part of the first phase of development.

Since submittal of the August 2017 memo and the issuance of the associated Conditions of Approval from the City of Beaverton, West Hills has modified their intended phasing schedule West Hills. Per the current plans, the initial phase of development could include up to 325 single family units and up to 275 multifamily units.

For reference purposes, the estimated trip generation of the initial phase of development is provided in Table 1. These estimates were calculated using the rates contained in the *Trip Generation Manual* (10th Edition, as published by the Institute of Transportation Engineers). Further, we separated out the single family homes into two sub-phases: one of 129 homes and one of 196 homes.

Table 1. Trip Generation Estimate for Initial Phase of Development

Land Use	ITE Code	Size (Units)	Total Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total Trips	In	Out	Total Trips	In	Out
Single Family	210	129	1,218	95	24	71	128	81	47
Single Family	210	196	1,850	145	36	109	194	122	72
Mid-Rise Apartments	221	275	1,496	99	26	73	121	74	47
Total Initial Phases			4,564	339	86	253	443	277	166

As part of the analyses described herein, the trips shown in Table 1 were assigned to the transportation network using the distribution assumptions applied in the previous reports for the site (i.e., 10 percent to/from the northwest via SW Tile Flat Road and 5 percent to/from the southwest via SW Scholls Ferry Road, and 85 percent to the east/north via SW Scholls Ferry Road).

Given West Hill’s desire to define when improvements are required based on a threshold number of units being developed, the rest of the memorandum outlines an updated analysis of intersection operations assuming the existing signal and lane geometry at the SW Tile Flat Road/SW Scholls Ferry Road intersection remains in place. The timing of needed geometric changes at the intersection can clarify when the roadway frontage improvements are required.

Updated Traffic Volume Development

As part of the original TIA, turning movement volumes were recorded at the SW Tile Flat Road/SW Scholls Ferry Road intersection during the weekday AM and PM peak hours in the year 2015. Given the ongoing COVID-19 pandemic and the inability to collect any new data reflective of “typical” travel behavior, we used these historical counts to develop a proxy for existing year conditions in accordance with the methodology used in the recently approved *South Cooper Mountain Main Street*² traffic study. Consistent with the *Main Street* study, we adjusted the year 2015 intersection volumes collected for the May 2017 TIA as follows:

- A background growth rate of two percent per year was applied to the volumes on all approaches. This growth rate was applied over the 5-year period to represent year 2020 traffic conditions.

²As submitted by Global Transportation Engineering in November 2020.

- The percentage of heavy trucks was assumed to be up to two percent of the traffic volumes on each movement (the prior counts included a significant amount of construction-based traffic on some of the movements).
- The estimated trips generated by the Mountainside High School were added assuming the school is fully operational.

The adjusted “existing” 2020 volumes were then grown to year 2022 background conditions assuming:

- The background growth rate estimated to be 0.5 percent per year between 2020 and 2022; and,
- The development of new neighborhoods within South Cooper Mountain has occurred at a much slower pace than previously anticipated (i.e., a very minor number of new homes have been constructed whereas many of the traffic studies conducted to date assumed the South Cooper Mountain area would build out fully by the year 2022). Based on information compiled by Otak, only the “Ridge” development is anticipated to have occupied units affecting this intersection (in addition to Scholls Heights) prior to the year 2022. We added the traffic volumes associated with full buildout of the Ridge using the information included in our previous TIAs to account for background conditions.

Year 2022 “total traffic” volumes were then developed for the initial development phasing scenario based on the trip generation shown in Table 1 above as well as the distribution assumptions applied in the TIS and the August 2017 memo. The resultant traffic volumes assume that only the SW Scholls Ferry Road/SW Strobel Road/SW Vandermost Road intersection is available for ingress and egress into the new neighborhoods. No access to SW Tile Flat Road is proposed as part of the initial phase.

The estimated traffic volumes at the SW Scholls Ferry Road/SW Tile Flat Road intersection are shown in Figure 1 for the “existing” 2020 and the year 2022 scenarios.

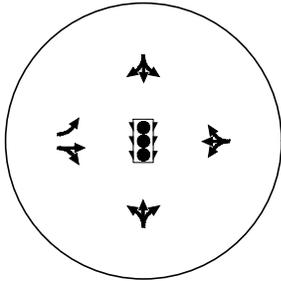
Resulting Intersection Operations

Existing and year 2022 intersection operations were evaluated based on the methodologies included in the *Highway Capacity Manual, 6th Edition* using the Synchro software analysis tool. Washington County considers the intersection to be operating acceptably over the course of either peak hour if a volume-to-capacity ratio of less than or equal to 0.99 is maintained. This threshold was used to determine if the initial phases could be constructed prior to the need for geometric improvements at the SW Tile Flat Road/SW Scholls Ferry Road intersection.

Assuming the existing intersection geometry remains in-place between now and the year 2022, the resultant intersection operations for each of the scenarios analyzed are reflected in Figure 1 and summarized in Table 2.

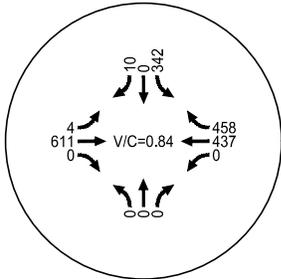


Existing Lane Configurations and Traffic Control Devices

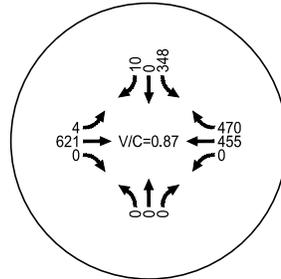


AM PEAK HOUR

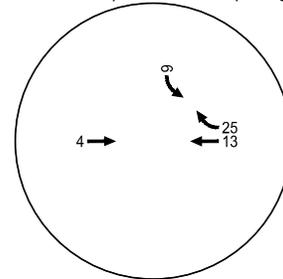
2020 Existing Conditions



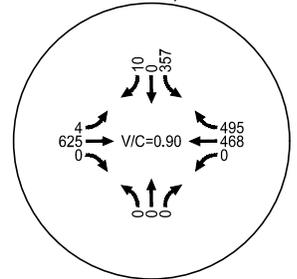
2022 Background Conditions



Initial Development Phase Trip Assignment

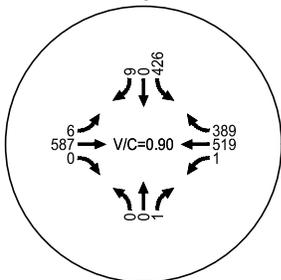


2022 Initial Development Phase

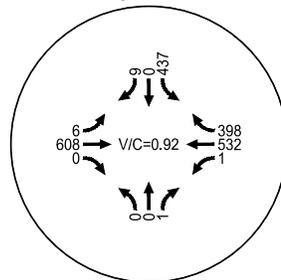


PM PEAK HOUR

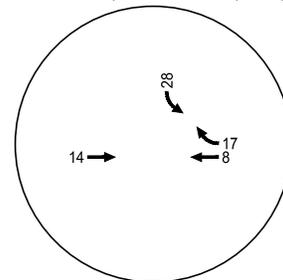
2020 Existing Conditions



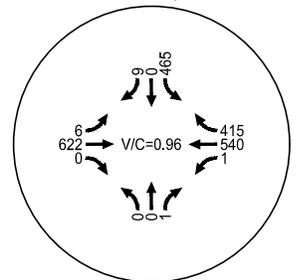
2022 Background Conditions



Initial Development Phase Trip Assignment



2022 Initial Development Phase



- STUDY INTERSECTION

- TRAFFIC SIGNAL

V/C = INTERSECTION VOLUME-TO-CAPACITY RATIO

Weekday Traffic Operations
AM and PM Peak Hour
Beaverton, Oregon

Figure
1

Table 2. Anticipated Intersection Operations

Scenario	Number of Scholls Heights Units	Weekday AM Peak Hour V/C	Weekday PM Peak Hour V/C
Existing Conditions	N/A	0.84	0.90
Year 2022 Background	N/A	0.87	0.92
Year 2022 Initial Phases of Development	129 Single Family Units + 196 single family units + 275 multi-family	0.90	0.96

As shown in Table 1, the initial phase(s) could be constructed while maintaining acceptable intersection performance, based on the updated traffic growth projections and phasing plan, prior to any geometric changes being needed at the SW Tile Flat Road/SW Scholls Ferry Road intersection. Given that no intersection widening is needed, we conclude that the conditions of approval could be modified to indicate that the frontage improvements along SW Tile Flat Road and SW Scholls Ferry Road near the intersection are not needed prior to the construction of the initial phases contemplated as part of this analysis.

Conclusions

Based on the information presented herein, the initial phase within Scholls Heights (i.e., up to 325 single family homes and 275 multi-family units) could be developed while maintaining acceptable intersection operations through the year 2022 without any intersection and/or roadway widening. Following the construction of this initial phase within Scholls Heights, we recommend that the intersection operations be reassessed to account for updated development phasing schedules associated with both Scholls Heights as well as other previously approved developments in the area and then current traffic volumes to determine when the previously anticipated intersection changes (and associated widening along the site frontages) would be required.

Please let us know if you need any additional information as part of your review.

Appendix 1 Intersection Operations
Analyses