

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

EXHIBIT P

August 30, 2021

Mr. Kelly O'Neill
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055

**SUBJECT: REVIEW OF TRANSPORTATION IMPACT STUDY – DEER MEADOWS
SUBDIVISION**

Dear Kelly:

In response to your request, I have reviewed materials submitted in support of the Deer Meadows on Dubarko Road in the east part of Sandy. The Transportation Impact Study (TIS), dated June 14, 2021, was prepared under the direction of Michael Ard, PE of Ard Engineering. A future street plan and preliminary plat, dated 7/26/2018, were also provided.

The site, with approximately 16 acres, is on the southwest side of US 26 and is bisected by Dubarko Road, a planned minor arterial road specified in the Sandy Transportation System Plan (TSP). TIS describes a proposal to subdivide the property; extend Dubarko Road from its present east terminus into the site; and create lots for low density dwellings and some apartments. A portion of the development is zoned for commercial uses but is not proposed to be developed at this time.

A significant feature of the development plan is that the applicant ignores the TSP and does not propose extending Dubarko Road, currently a stub street, to connect with US 26 opposite SE Vista Loop (West) as specified in the TSP. Instead, the TIS proposes "a new north/south collector roadway" as the eastern terminus of Dubarko Road.

It is also important to note that the analysis includes no development of the commercially zoned land, which is approximately 3 acres. The TIS indicates a need for further analysis when development of that commercial land is proposed.

Overall

TIS addresses some of the city's requirements but does not provide an adequate basis to evaluate impacts of the proposed development. Key deficiencies include a failure to provide for the extension of Dubarko Road to connect with US 26 as specified in the

TSP and a failure to account for development of or access to the commercially zone land (approximately 3 acres) that comprises a portion of "Lot 32" in the proposed development.

Comments

1. Study Area. The study includes analyses of:

- US 26 at SE Ten Eyck Road;
- US 26 at SE Langensand Road;
- Highway 211 at Dubarko Road; and
- Dubarko Road at SE Langensand Road.

Since the applicant assumes that Dubarko Road will not connect to US 26, the TIS does not include an analysis of this intersection.

2. Traffic Counts. The AM and PM peak hour traffic counts were conducted during March 2019. The engineer adjusted the traffic counts to account for seasonal variations. The engineer used a combination approach to account for seasonal variation of recreational traffic and separately for commuter traffic on US 26. Volumes on Highway 211 were adjusted by a straight 8 percent. The methodology appears consistent with the procedures defined by the Oregon Department of Transportation (ODOT).

The engineer's use of pre-COVID-19 counts is understandable, but new analyses needed to address the full impact of the development should be based on new traffic counts.

3. Trip Generation. The TIS uses trip generation for single-family dwellings and multi-family dwellings (land use code 210 and 220, respectively) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The engineer calculates that 32 single-family homes plus 120 apartments would produce 79 total AM peak hour trips; 99 total PM peak hour trips; and 1180 total daily trips. The calculation of trips generated by the residential development appears reasonable.

This calculation does not include potential trips associated with the future development of the commercially zoned land within the development area. The TIS states that "the nature of this future use has not yet been determined. Accordingly,

a future traffic study will be required as part of the design review application for the future commercial site use.”

By failing to any development of the commercially zoned land, the applicant has not shown the impact of the proposed removal of a key element of the TSP – namely Dubarko Road, which is shown connecting with US 26 at Vista Loop Drive (West).

- 4. Trip Distribution.** The TIS provided information about trip distribution from the site. The engineer assumed 65 percent of the traffic would travel to and from the northwest on US 26; 20 percent would travel to and from the southeast on US 26; and 15 percent would travel to and from the west on Dubarko Road. On a city-wide scale, the trip distribution seems reasonable. However, the proposed elimination of Dubarko Road results in localized impacts in the immediate vicinity that will result in different travel patterns than anticipated in the TSP.
- 5. Traffic Growth.** The TIS uses a 1.96 percent annual increase for Highway 26 based on projected volumes at the west boundary of Sandy. For Highway 211, the TIS uses an annual growth rate of 3.13 percent. For other facilities it uses a 2.0 percent annual growth rate to account for background traffic growth. The following in-process developments were included in the background traffic: the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and Bornstedt Views. These assumptions account for future traffic and appear reasonable.
- 6. Analysis.** Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. The intersection of US 26 with SE Ten Eyck Road is signalized; the other intersections are stop-controlled. The analyses were conducted for existing 2021 conditions, 2023 background conditions, and 2023 with the development.

The engineer calculates that the signalized intersection of US 26 with Ten Eyck meets the v/c standards specified by ODOT under all scenarios. At the intersection of US 26 with Langensand Road, the v/c for both the mainline and minor street approaches are calculated to meet ODOT's v/c standard. However, long delays (the basis for LOS) are calculated to occur on the minor street approaches under existing and future conditions.

The intersection of Dubarko Road and Langensand Road is predicted to operate acceptably under all scenarios. The intersection will operate at LOS "B" or better, meeting city operational standards.

The engineer makes the following statement about the intersection of Highway 211 with Dubarko Road:

The intersection of Oregon Highway 211 at Dubarko Road was previously under the jurisdiction of the Oregon Department of Transportation and subject to a volume-to-capacity ratio standard rather than level of service. The intersection would have met ODOT standards for operation, but with conversion to a city intersection it is projected to operate at level of service "E" either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control (as recommended in the safety analysis section of this report on page 20), the intersection is projected to operate at level of service D, thereby meeting the city's operational standard.

Since the TIS did not examine the impact of development of the commercially zoned portion of the site, it is not clear that LOS D would be achieved with full development of the subject property. It appears that only a little more development in Sandy would push the Dubarko Road Highway 211 intersection to LOS E and cause the need for mitigation.

The engineer concluded that "All other intersections are projected to operate acceptably per the appropriate jurisdictional standards."

7. Crash Information. The TIA provides information on crashes for the most recent available five-year period covering 2015 through 2019.

At the intersection of US 26 and SE Ten Eyck Road, there were eight reported and a relatively low crash rate. At the intersection of US 26 and Langensand Road, there were seven reported crashes and a low crash rate. At the intersection of Dubarko Road and Langensand Road, there was one reported crash.

The intersection of Highway 211 and Dubarko Road has been a safety concern for years and has undergone safety improvements. During the five-year period, 27 crashes were reported. The crash rate is substantially above the 90th percentile crash rate for similar intersections. Crashes remain a problem following

implementation of safety improvements that included realigning the Dubarko Road approaches and added striping on Highway 211. The engineer notes that the crash history indicates warrants are met for all-way stop control. He recommends consideration of the installation of all-way stop control to address safety issues. I concur.

- 8. *Site Plan and Access.*** The site plan provides for the extension of Dubarko Road, but only to a "new north/south collector roadway." Until such time as other development occurs to the south, Dubarko Road will serve as the principal access to the development. The only other access proposed at this time is Fawn Street, which would connect to Meadow Avenue just west of the subdivision.

The site plan makes no provision for access to the commercially zoned land (a portion of "Lot 32"). The site plan does not show a new subdivision street abutting the commercially zoned portion of "Lot 32." The applicant appears to be assuming that the commercially zone portion of "Lot 32" would have direct driveway access to US 26, though this appears to conflict with ODOT access control policies. Alternatively, the applicant may be assuming some type of cross-easements or shared driveway connections involving the residentially zoned portion of "Lot 32" would be acceptable. Neither option appears viable.

The engineer failed to explain how the site would be developed to serve all uses in the absence of the Dubarko Road extension identified in the TSP. I think this is a serious deficiency. I recommend delaying any approvals until issues of access are fully developed and justified.

- 9. *Sight Distance.*** The engineer did not analyze sight distance at the proposed intersections within the development. Given the terrain, sight distance is unlikely to be a problem and can be dealt with in subsequent proceeding.

- 10. *Traffic Signal Warrants.*** The engineer conducted a preliminary traffic signal warrant analysis at several locations based on ODOT procedures. He concluded that traffic signal warrants were not met at any location.

He concluded that all-way stop-control was warranted at the intersection of Highway 211 and Dubarko Road based on the intersection crash history.

- 11. *Left-Turn Lane Warrants.*** The TIS indicates that left-turn lanes are provided on eastbound US 26 at Langensand Road.

According to the engineer, the intersection of Highway 211 at Dubarko Road currently meets warrants for a northbound left-turn lane and a northbound right-turn lane. However, he states that the need for these turn lanes is not materially related to the proposed development. He further states that turn lane may not be needed if all-way stop control is installed at the intersection as recommended based on his safety analysis.

According to the TIS, turn lanes are not warranted at the intersection of Dubarko Road and Langensand Road.

12. Conclusions and Recommendations. The engineer concludes that the intersections will meet ODOT and city operational standards for the study area intersections either with or without the development. Note that no development is assumed for the commercially zoned portion of the development.

While most study area intersections are operating relatively safely, the intersection of Highway 211 and Dubarko Road suffers from a high number of crashes and a high crash rate. It is substantially higher than the 90th percentile crash rate for comparable intersections. Recent safety improvements do not appear to have altered this trend. The proposed development is among those that are expected to increase the traffic using the intersection of Highway 211 and Dubarko Road. The engineer recommends consideration be given to converting the intersection of Highway 211 and Dubarko Road to all-way stop control for safety reasons based on the historical data. He recommends no other mitigation to address safety issues.

Conclusion and Recommendations

As noted repeatedly above, the applicant is proposing to eliminate the planned connection of Dubarko Road with US 26 at Vista Loop Drive (West). Instead, he proposes to terminate Dubarko Road at a "new north/south collector roadway" near his property's west boundary. The TIS provides no justification for this change to the planned street system. There is no analysis showing the impacts on other portions of the street system caused by his proposed elimination of the minor arterial connection represented by Dubarko Road.

Another serious deficiency is the failure to account for development of the commercially zoned portion of "Lot 32." This land, totaling almost 3 acres, has the potential to generate substantial traffic. The traffic generated by this future commercial

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use cannot be ignored, especially considering the applicant's proposal to eliminate the planned connection of Dubarko Road to US 26.

The failure to explain site circulation and how all portions of the site will have access to the street network is another deficiency.

I recommend denial of the application based on the inadequacy of the TIS. I think the applicant has two paths to approval. The first involves submitting a new application that provides for the extension of Dubarko Road to US 26 as specified in the TSP. The second involves seeking a TSP amendment with an alternative arterial and collector street network that allows the regional needs to be met without the section of Dubarko Road he proposes to eliminate. Undertaking the necessary analysis to support this amendment and supporting the public process and adoption process would be an expensive and time-consuming undertaking.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,



John Replinger, PE
Principal

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