

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

July 14, 2017

Mr. Pete Walter
City of Oregon City
PO Box 3040
Oregon City, OR 97045

**SUBJECT: REVIEW OF TRAFFIC IMPACT STUDY – ABERNETHY PLACE MIXED-
USE DEVELOPMENT – CP17-02**

Dear Mr. Walter:

In response to your request, I have reviewed the materials submitted in support of the proposed development of Abernethy Place. The relevant materials consisted of the Traffic Impact Study (TIS), dated April 26, 2017. It was prepared under the direction of Michael T. Ard, PE of Lancaster Engineering.

The proposed development is located on the northwest side of Washington Street between 17th Street and Oregon City's Amtrak Station. The site, located opposite the End of the Oregon Trail Interpretive Center, is approximately 4.1 acres in size. The development proposed consists of a 99-room hotel, 131 apartment units, 9,500 square-feet of retail space, and a 2,500 square-foot coffee shop. The hotel is proposed as the first phase with other uses to be constructed in a subsequent phase. The analysis was conducted for the entire development using a horizon year of 2022.

The TIS provides a basis upon which the development can be evaluated for the specific purposes described above.

Comments

1. Study Area. The study addresses the appropriate intersections. The engineer evaluated traffic patterns, traffic volumes, and operations at fourteen locations. The key intersections were:

1. Interstate 205 (I-205) southbound ramps at McLoughlin Boulevard (OR-99E);
2. I-205 northbound ramps at OR-99E;
3. 15th Street at OR-99E;
4. 14th Street at OR-99E;
5. 14th Street at Main Street;
6. 7th Street at Washington Street;
7. 14th Street at Washington Street;

8. 15th Street at Washington Street;
9. Abernethy Road at Washington Street;
10. Proposed site access at Washington Street;
11. Amtrak station access at Washington Street;
12. Prairie Schooner Way at Washington Street;
13. Clackamas River Drive at Washington Street; and
14. OR-213 at Clackamas River Drive.

These fourteen intersections were identified for the study in consultation with city staff and the Oregon Department of Transportation (ODOT).

2. **Traffic Counts.** The traffic counts were conducted in January 2017 at the intersections in #1, above. Traffic counts were conducted during the AM and PM peak periods. The base year traffic volumes appear reasonable.
3. **Trip Generation.** The TIS presents information on trip generation from the construction of 99-room hotel, 131 apartment units, 9,500 square-feet of retail space, and a 2,500 square-foot coffee shop. The trip generation rates were taken from the Institute of Transportation Engineers' *Trip Generation Manual – 9th Edition*. The engineer accounted for internal trips (those made within the development between different uses) and pass-by trips. After accounting for these adjustments, the development is calculated to produce 159 new AM peak hour trips; 151 new PM peak hour trips; and 1595 new total weekday trips. The trip generation appears reasonable.
4. **Trip Distribution.** The engineer's trip distribution shows 30 percent of traffic going to and from the north on OR 213; 12 percent to and from the north on OR-99E; 10 percent to and from the southeast on 7th Street; 9 percent to and from the southwest on Washington Street; and 39 percent utilizing other streets including I-205, Clackamas River Drive, Main Street, 15th Street, and OR-99E to the south. Pass-by trips and primary trips are accounted for separately. The engineer also provided information about the predicted use of the three site access points. The trip distribution seems reasonable.
5. **Traffic Growth.** The engineer calculated 2020 traffic volumes using several factors. ODOT's Future Volume Tables were used for OR 213 and for OR-99E. An annual growth rate of 0.7 percent on OR-99E and 1.2 percent on OR 213. For other facilities, the annual growth rate was assumed to be 2.0 percent annually. These values adequately account for regional growth.
6. **Analysis.** Traffic volumes were calculated for the intersections described in #1, above. At each location, the level of service (LOS), delay calculations, and the volume-to-capacity ratio (v/c) were provided to assess operations relative to the ODOT and city's operational standards. The analysis was undertaken for the AM and PM peak hours and

included year 2017 existing conditions, year 2022 background conditions, and year 2022 total traffic conditions.

The analysis shows a slight or modest degradation in the performance at the study area intersections with somewhat greater impact at the intersections nearest the site.

The engineer concludes:

“Based on the results of the operational analysis, all intersections are projected to operate acceptably per Oregon City standards through year 2022 either with or without the addition of site trips from the proposed development.

“The intersections operating under ODOT jurisdiction are also projected to meet ODOT’s respective performance standards, with the exception of OR 99-E at the I-205 ramp terminals. However, these intersections are specifically exempted from operational standards pursuant to OCMC 2.04.205(D).”

According to the analysis, the I-205/OR-99E ramp terminals currently do not meet ODOT’s ramp terminal operational standard (v/c of 0.85) under existing conditions nor are they expected to do so without mitigation.

The I-205/OR-99E southbound ramp terminal is calculated under existing conditions to operate at v/c of 0.95 during the AM peak hour and 0.91 during the PM peak hour. Under 2022 background conditions, it is expected to degrade to 1.02 during the AM peak hour and 0.98 during the PM peak hour. With the development, some additional degradation is predicted. The v/c is predicted to be 1.02 during the AM peak hour and 0.99 during the PM peak hour.

The I-205/OR-99E northbound ramp terminal is calculated under existing conditions to operate at v/c of 0.78 during the AM peak hour and 0.71 during the PM peak hour. Under 2022 background conditions, it is expected to degrade to 0.90 during the AM peak hour and 0.81 during the PM peak hour. With the development, some additional degradation is predicted. The v/c is predicted to be 0.91 during the AM peak hour and 0.81 during the PM peak hour.

Having identified these operational issues at the I-205/OR-99E ramp terminals, the engineer concludes:

“Although not recommended in conjunction with the proposed development, it should be noted that according to Oregon City’s Transportation System Plan (TSP), there is an identified project which would improve intersection operation at the intersection of OR-99E and the I-205 southbound ramps. The proposed improvement consists of installation of a second southbound left-turn lane, as well as providing a second eastbound receiving lane to accommodate the added turn lane. With installation of the additional turn lane, the

intersection would be projected to operate with v/c ratios below 0.85 during the morning and evening peak hours either with or without the addition of site trips from the proposed development.”

The Transportation System Plan includes I-205/OR-99E ramp terminal improvements for the southbound ramp terminal and northbound ramp terminal as projects as D75 and D76 respectively. The estimated price of each listed in TSP Table A1 is \$3 million. The projects are listed in the “not likely to be funded” category.

Asking or requiring the developer to contribute to these projects in proportion to his impact would be a method of starting to acquire funding in support of these projects. Using the total 2035 traffic volumes from the TSP for these intersections, the development would account for approximately 0.42 percent of the PM peak hour traffic at the southbound ramp terminal and 0.49 percent of the PM peak hour traffic at the northbound ramp terminal.

7. Crash Information. The TIS provides crash information for the five-year period from 2011 through 2015 for all of the existing intersections identified in #1, above.

All intersections experienced moderate or low crash rates with one exception. The intersection of Main Street and 14th Street experienced a crash rate of just under 1.5 reported crashes per million entering vehicles, exceeding the value of 1 crash per million that is generally indicative of need for more analysis and possible mitigation.

In the TIS, the engineer provides the following commentary:

“The intersection of 14th Street at Main Street had 30 reported crashes during the analysis period. The crashes consisted of 21 angle-type collisions, six turning-movement collisions, two collisions involving bicyclists, and one collision involving a pedestrian. Of the crashes reported, 15 were classified as PDO¹, 11 were classified as Injury C², and four were classified as Injury B³. The crash rate at the intersection was calculated to be 1.46 CMEV.⁴

“Based on the calculated crash rate being in excess of one crash per million entering vehicles, additional investigation regarding the safety of the intersection is appropriate. It was noted that Oregon City’s Transportation System Plan includes a recommendation to convert this intersection to all-way stop control as mitigation for the high incidence of crashes at the intersection. The intersection crash history shows five or more crashes per year that are susceptible to correction by installation of all-way stop control for each of the three most recent years analyzed (2013, 2014 and 2015). Accordingly, all-way stop control is both warranted and recommended based on the crash history. No other specific safety

¹ PDO is the abbreviation for “property damage only.”

² Injury C is for “possible injury – complaint of pain.”

³ Injury B is for “non-incapacitating injury.”

⁴ CMEV is the abbreviation for “crashes per million entering vehicles.”

mitigations are recommended based on the crash history. A more detailed discussion of this potential safety mitigation including operational and queuing impacts is provided on page 40."

I concur with the engineer's conclusion that the types of crashes prevalent at this intersection (including angle crashes and turning crashes) are among those that are susceptible to mitigation by conversion to all-way stop control. Though predicting the results of mitigation measures is somewhat speculative, it is likely that conversion to all-way stop control would produce significant reductions and could reduce the crash rate to less than 1.0 CMEV.

The proposed development will increase the intersection traffic volume by about two percent. Without mitigation it is unlikely that the number of crashes or crash rate would be changed significantly by the development. The existing crash rate and the slight increase in traffic caused by the proposed development are not justification for denial of the application nor would it be reasonable to require the applicant to fully fund or implement mitigation measures for the existing problem. Requiring the applicant to share in the project cost in proportion to his impact would help advance the implementation of appropriate crash mitigation and capacity-enhancing measures.

In his discussion of this crash mitigation measure, the engineer provides a detailed discussion about the implications associated with the conversion of this intersection to all-way stop control. The basic problem with all-way stop control is the potential for long queues that could back up to OR-99E. To avoid the problem of excessive queue lengths, the engineer recommends implementation of the following changes simultaneously:

- Convert Main Street/14th Street to all-way stop control;
- Convert the eastbound and westbound approaches on 14th Street at Main Street to each have a shared left/through lane and a shared through/right lane.
- Convert the westbound approach on 14th Street to OR-99E to have a shared left/right turn lane and a dedicated right turn lane.

The project described by the engineer is consistent with one of the options for TSP project D7, Main Street/14th Street Intersection Improvements.

As an alternative, the engineer discusses the other option from the TSP to address operations at this intersection. This option consists of converting 14th Street and 15th Street into a one-way couplet. Among other things, this option would require a new traffic signal at McLoughlin and 14th Street.

Note that both of these options for project D7 are discussed in the TSP as measures to reduce future congestion rather than as crash mitigation. Considerable detail including

the benefits and shortfalls of each option are included Volume 2 of the TSP (Section J – Performance Analysis of Planned and Constrained Transportation Systems).

Project D7 is listed in TSP Table 1: Likely to be Funded Transportation System as a short-term priority. The short-term priority projects are defined as projects recommended for implementation in one to five years. Requiring developments that put additional traffic through this intersection to participate in funding may help advance the implementation of this project.

- 8. Turn Lanes at Site Entrance(s).** The engineer performed a warrant analysis to assess whether a left turn lane was justified at the on northbound Washington Street at the site access. Based on volumes, a left turn lane is warranted at this location and should be constructed in connection with improvements of Washington Street in connection with the development.
- 9. Pedestrian and Bicycle Facilities.** The TIA provides information on the presence of facilities for bicyclists and pedestrians. Bike lanes are currently provided along Washington Street. Frontage improvements should retain these lanes and provide sidewalks consistent with the city's street standards.
- 10. Site Plan and Access.** The site is proposed to have three access points: access from 17th Street, a new access on Washington Street, and a shared access with the adjacent Amtrak Station. The driveway to Washington Street will either be a new access point or will be one currently serving an existing use. The access locations appear appropriate.
- 11. Intersection Spacing.** No new intersections are planned in connection with this proposal.
- 12. Sight Distance.** The engineer measured sight distance where access. Sight distance was found to be in excess of the sight distance required in both directions.
- 13. Consistency with the Transportation System Plan (TSP).** The frontage improvements appear to be consistent with the TSP and city standards. The crash mitigation measures discussed in connection with Main Street and 14th Street are also consistent with the TSP.
- 14. Conclusions and Recommendations.** As stated in the TIS, all intersections are calculated to operate consistent with the city's operational standards in 2022 with or without the development.

The development is predicted to contribute additional traffic to the ramp terminals at I-205 and OR-99E. The ramp terminals are exempt from the city's operational standards, but are currently failing to operate at ODOT's operational standards for ramp terminals. The

engineer notes that projects to improve the performance are included in the city's adopted TSP, though he does not recommended addressing the limitations in connection with this development.

The intersection of Main Street and 14th Street was shown to experience a high crash rate. The proposed development will contribute a modest amount of traffic to this intersection. The engineer recommends conversion of the intersection to all-way stop control as a crash mitigation measure. Because the conversion to all-way stop control will result in longer queues, he recommends other modifications including more lanes on 14th Street and a change in the configuration of 14th Street at McLoughlin Boulevard (OR-99E). The engineer's recommendation is consistent with one option for improvements to this intersection specified in the adopted TSP. He acknowledges that it would be appropriate for the developer to pay a proportionate share of the project cost.

Since the westbound 14th Street approach to Main Street currently meets left-turn lane warrants, the engineer recommends that a northwest-bound left-turn lane be provided even if the intersection is not converted to all-way stop control.

The engineer concludes that a left-turn lane on northbound Washington Street at the site access. He concludes that sight distance and spacing are adequate.

Conclusion and Recommendations

I find that the TIS provides an adequate basis upon which to assess the impacts of the proposed development. The engineer uses appropriate data and methods to analyze the operations and developed appropriate mitigation measures to address safety and operation issues.

With regard to the proposed development, I recommend the following conditions of approval relative to the off-site transportation impacts:

The developer shall construct Washington Street along the site frontage including a center turn lane to provide for left turns into the site. Applicant shall provide additional traffic engineering analysis relating to the location of the site access that shows the location of proposed access will not interfere with queuing or traffic operations at adjacent traffic signals through the TSP planning horizon.

The developer shall participate in the funding of improvements for the I-205/OR-99E ramp terminal projects (TSP Projects D75 and D76) in proportion to his development's traffic volumes as a percentage of total year 2035 intersection volumes from the TSP. Based on this methodology, the developer would be responsible for 0.42% of the \$3 million cost for Project D75 and for 0.49% of the

project cost for Project D76. This would result in a contribution from the applicant of \$12,600 + \$14,700.

The developer shall participate in the funding of improvements for the Main Street/14th Street improvements (TSP Projects D7 and D8) in proportion to his development's traffic volume as a percentage of the predicted 2035 traffic volume at the intersection calculated in the TSP. Based on the applicant's predicted site traffic, the applicant's responsibility would be 1.66% of the project's cost. The higher cost option in the TSP is listed at \$670,000. That would result in a contribution from the applicant of \$11,122.

Based on the existing high crash rate at the intersection of Main Street and 14th Street and continuing development in the city that will result in increased traffic volumes, the selection of a preferred option for TSP project D7 and a review of the implementation schedule for this project may be appropriate.

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

Sincerely,

A handwritten signature in dark ink that reads "John Replinger". The signature is written in a cursive, flowing style.

John Replinger, PE
Principal