

**REPLINGER & ASSOCIATES LLC**  
TRANSPORTATION ENGINEERING

February 16, 2017

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

**SUBJECT: REVIEW OF TRAFFIC IMPACT STUDY – SERRES FARM ANNEXATION  
– AN16-04**

Dear Mr. Walter:

In response to your request, I have reviewed the materials submitted in support of the proposed annexation of the Serres Farm to the city. The relevant materials consisted of the Traffic Impact Study (TIS), dated February 13, 2017. It was prepared under the direction of Michael T. Ard, PE of Lancaster Engineering.

The proposed annexation is for 35.65 acres located to the north of Holcomb Boulevard between S Oak Tree Terrace and S Winston Drive. No specific development proposal is proposed at this time. The TIS is confined to the analysis of the annexation and rezoning on specific intersections to provide a basis for assessing compliance with the Transportation Planning Rule and help identify future planning requirements and possible mitigation measures that will be needed to allow a specific development to proceed at a later date.

The TIS provides a basis upon which the annexation and rezoning proposal can be evaluated for the specific purposes described above.

**Comments**

**1. Study Area.** The study addresses the appropriate intersections. The engineer evaluated traffic patterns and traffic volumes and evaluated three locations. The key intersections were:

- Highway 213/Beavercreek Road
- Highway 213/Redland Road
- Redland Road/Holcomb Boulevard/Abernethy Road

These three intersections were identified for the study in consultation with city staff and the Oregon Department of Transportation (ODOT). A new study area will be established when a specific development proposal is brought forward at a later date. It will include additional intersections, such as the site access points along Holcomb Boulevard, not

addressed in this TIS. A new TIS undertaken for a specific development will need to address all requirements of the city's *Guidelines for Transportation Impact Analyses*.

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 121 new single-family dwellings. This estimate is based on the increase in the number of homes under the assumed R-10 zoning. The trip generation rates were taken from the Institute of Transportation Engineers' *Trip Generation Manual – 9<sup>th</sup> Edition*. The engineer calculated that this number of houses would produce 91 new AM peak hour trips; 121 new PM peak hour trips; and 1152 new total weekday trips.
4. **Trip Distribution.** The engineer's trip distribution shows 85 percent of traffic going to and from the west on Holcomb Boulevard through the intersection of Redland/Holcomb/Abernethy. From this point, 16 percent of site trips are projected to travel to and from the south along Redland Road, 25 percent of site trips are projected to travel to and from the west along Abernethy Road, 40 percent of site trips are projected to travel to and from the north along Highway 213, and 4 percent of site trips are projected to travel to and from the south other roads. The engineer also accounts for a small percentage of trips that will be in the local area and may use Holly Lane and its extension. The trip distribution seems reasonable.

The trip distribution assumptions result in the proposal having an insignificant traffic impact on the intersection of Highway 213 and Beavercreek Road.

5. **Traffic Growth.** The engineer calculated 2035 traffic volumes using several factors. The predicted increase in total peak hour trips specified in the Transportation System Plan (TSP) were used to develop an annual traffic volume increase applicable to local streets. ODOT's Future Volume Tables were used to calculate increases in traffic on Highway 213. Finally, predicted volumes at the Highway 213/Redland Road and Highway 213/Beavercreek Road intersections were balanced to be consistent between them. This methodology is likely to produce somewhat different future year volumes than those developed from a regional transportation model, as used in the TSP, for example, but the methodology does allow a good assessment of the impact of the proposed zone change with assumed development of the Serres Farm property. It is worth noting that transportation analysis zone (TAZ) 725, which includes the Serres Farm property, is predicted in the TSP to experience an increase of 593 dwelling units prior to 2035. The development of the Serres Farm property and the amount of residential development assumed in the TSP for TAZ 725 appear consistent.

- 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, 2035 background conditions, and year 2035 total traffic conditions.

According to the analysis, the impact of the zone change and development of the Serres Farm property has virtually no effect on the intersection of Highway 213/Beaver Creek Road. The predicted increase in traffic volumes from a potential Serres Farm development is only 4 trips during the AM peak hour and 5 trips during the PM peak hour. These volume changes are insignificant in comparison to the current volumes – over 4500 during the AM peak hour and over 6000 during the PM peak hour. The calculated v/c for the 2035 background condition and the 2035 total traffic condition with the Serres Farm development is the same using the standard level of precision of calculating the v/c to two decimal points, which is the customary approach. Since the city's *Guidelines for Transportation Impact Analyses* specify a threshold value of 20 peak hour trips to trigger analysis of an intersection, the low traffic volumes calculated from residential development of the Serres Farm property will not require any further analysis of the Highway 213/Beaver Creek Road intersection.

Under current conditions, the intersection of Highway 213/Redland Road is calculated to operate at a v/c of 0.87 during the AM peak hour and 1.01 during the PM peak hour. With growth in the region, the performance of the intersection is predicted to degrade. The TIS predicts that the v/c would degrade to 1.04 during the AM peak hour and 1.23 during the PM peak hour with background growth. Adding potential development of the Serres Farm property would cause slight additional degradation to v/c of 1.05 during the AM peak hour and 1.24 during the PM peak hour.

The TSP proposed a solution for the predicted failure to achieve operational standards at the intersection of Highway 213/Redland Road, but this improvement, identified as project D79 was listed among the “not likely to be funded” category. The principal capacity-increasing feature of this project was increasing the number of through lanes on Highway 213 in both the northbound and southbound directions. The engineer did not analyze this potential solution for improving the operations of this intersection, but did analyze another potential concept to improve the intersection's performance and mitigate for the traffic impacts of the potential development of Serres Farm at the R-10 density. The engineer's mitigation concept would involve converting the westbound Redland Road approach to allow left turns from three lanes and provide for a third receiving lane on Highway 213 north of Redland Road. This concept does not “solve” the predicted failure to achieve adopted v/c standards, but would improve the intersection's performance. Using this conceptual mitigation measure is predicted to improve the performance with the potential Serres Farm development to better than that

predicted using the existing intersection configuration with 2035 background traffic conditions. This concept has some operational difficulties and would require additional analysis and approvals by ODOT before implementation. This concept does represent a possible mitigation measure to improve the performance of the Highway 213/Redland Road intersection.

Under current conditions, the intersection of Redland Road/Holcomb Boulevard/Abernethy Road is calculated to operate at a v/c of 0.76 during the AM peak hour and 0.78 during the PM peak hour. With growth in the region, the performance of the intersection is predicted to degrade. The TIS predicts that the v/c would degrade to 0.88 during the AM peak hour and 1.07 during the PM peak hour with background growth. Adding potential development of the Serres Farm property would cause slight additional degradation to v/c of 0.90 during the AM peak hour and 1.11 during the PM peak hour.

The TSP did not specify a project at this intersection to increase capacity, though two projects indicate this intersection as a terminus – project D79, discussed above, and D91, the proposed upgrading of Redland Road from Holcomb Boulevard to Holly Lane. Like project D79, D91 was included in the TSP's "not likely to be funded" category.

In the TIS, the engineer explored mitigation concepts that could be used to improve the performance of the Redland Road/Holcomb Boulevard/Abernethy Road intersection. He concludes that adding an eastbound right turn lane to the Abernethy Road approach would improve the intersection's performance to a v/c of 0.95 during the PM peak hour. This offers a feasible, potential solution that would allow the intersection to meet adopted performance standards.

As the engineer notes, development is not being proposed at this time. He suggests that the mitigation measures discussed in the TIS be subject to additional study. They do appear to offer the opportunity to avoid further degradation in performance that might reasonably be expected with development of the Serres Farm property under R-10 zoning. I concur with his conclusions.

- 7. Crash Information.** The TIS provides crash information for the three-year period from 2013 through 2015. The crash history at the intersection of Highway 213/Beavercreek Road puts it in the top ten percent of high crash locations in the state. The engineer summarizes the crash history. Rear-end crashes are the most common type. The engineer recommended installation of a queue warning system and notes that the TSP includes a project (D14) that would involve a queue warning system. This project is in the likely to be funded category. The very few numbers of vehicles added to the intersection from the potential development of Serres Farm have no measurable effect on the need for implementation of this project or any other safety mitigation measures at the Highway 213/Beavercreek Road intersection.

The intersection of Highway 213/Redland Road and the intersection of Redland Road/Holcomb Boulevard/Abernethy Road experienced moderate crash rates. Both fell below the 90<sup>th</sup> percentile of crash rates for their respective intersection types. The engineer does not recommend any safety mitigation measures for these intersections. I think that additional safety analyses, including the potential for specific safety mitigation measures will need to be explored during future, comprehensive analyses of potential mitigation measures to enhance the capacity of these two intersections. The absence of definitive safety mitigation measures, however, is not something that is needed to assess the ability of the transportation system to act on the proposed annexation and rezoning.

**8. *Transportation Planning Rule Analysis.*** Because the proposed annexation also involves rezoning of the property to R-10, a TPR analysis is also included. The analysis is predicated on the development of the land at a density that would allow 121 additional single-family dwellings. The engineer states that the proposal does not change the functional classification of any existing or planned transportation facility and does not alter the standards for implementing the functional classification system. As discussed in #6, above, the development of the Serres Farm property is predicted to degrade the performance of the transportation system such that it would not meet applicable performance standards. Two specific intersections were identified: Highway 213/Redland Road and Redland Road/Holcomb Boulevard/Abernethy Road. Further action will be required before development can undertaken.

**9. *Conclusions and Recommendations.*** As stated in the TIS, no development is proposed at this time. Because the impact of development would cause key intersections to fail to meet applicable performance standards, the engineer recognizes that conditions may be necessary to limit development until a refinement plan is adopted that provides for projects to accommodate predicted traffic or that adopts different performance standards.

## **Conclusion and Recommendations**

I find that the TIS provides an adequate basis upon which to assess the impacts of the proposed annexation and rezoning. I agree that the proposal does not cause the need for change in the functional classification of any existing or planned facility. I concur with the engineer's analysis concluding that key intersections will fail to meet adopted performance standards at the intersections of Highway 213/Redland Road and Redland Road/Holcomb Boulevard/Abernethy Road.

Since development is not proposed at this time, I remind the applicant that at such time as a development is proposed, a transportation analysis will need to be prepared that

addresses the requirements outlined in the city's *Guidelines for Transportation Impact Analyses*.

With regard to the proposed annexation and zone change, I recommend that as a condition of approval the following be included:

No development, except that permitted under the County's Future Urban FU-10 zoning designation, in effect as of the date of this application's submittal, shall be allowed until the following occurs and the Applicant demonstrates compliance with these requirements:

a. Highway 213 at Redland Road intersection (an Oregon Highway intersection) is forecasted to fall below adopted performance standards prior to year 2035. As a result, a new Refinement Plan, including elements such as financially constrained projects and alternative mobility standards, and amendments to OCMC Chapter 12.04 implementing the new Refinement Plan, shall be adopted and acknowledged.

b. Redland Road at Holcomb Boulevard/Abernethy Road (a non-Oregon Highway intersection) is forecasted to fall below adopted performance standards prior to year 2035. As a result, the City must do one of the following:

(1) Adopt amendments to the City's Transportation System Plan and OCMC Chapter 12.04 to include projects that satisfy the then-applicable performance standards and these standards must be acknowledged; or

(2) Condition the Approval of a land division application that satisfies then-applicable OCMC Chapter 12.04 by including proportional mitigation of the application's impacts on that intersection, or such other mitigation measure(s) as may be approved which assure(s) that the intersection will either meet, or perform no worse than, the then-applicable performance standards.

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

Sincerely,



John Replinger, PE  
Principal