

Banks Transportation System Plan Alternatives Evaluation Report

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CC: Banks UGB/TSP Technical Advisory Committee

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A. Introduction / Purpose

This report describes transportation solution alternatives that consider the needs, opportunities, constraints, and potential solutions identified in *Technical Memorandum 5.1: Banks Transportation Needs, Opportunities, and Constraints Report*. Proposed solution alternatives are compared against the “decision criteria” that were presented in Appendix D of the aforementioned memorandum. This report provides a recommended list of projects to be implemented over the 20-year planning horizon (to 2030). This report is intended for adoption into the transportation element of the Banks Comprehensive Plan. The recommended project list presented in this report will be utilized in the City of Banks transportation capital improvement program (CIP).

The alternatives examined in this report, and the projects recommended for inclusion on the City’s CIP list, have been assessed at a planning level of detail and would need to be analyzed at a further advanced level at such time as the City were to propose a particular project to receive funding to construct.

This report addresses Task 5.2 of the *Urban Growth Boundary/Transportation Systems Plan Update* contract between the Oregon Department of Transportation (ODOT) and CH2MHILL.

B. Transportation System Improvement Alternatives – Physical Improvements

This section describes physical transportation system improvement alternatives to address needs identified in the Banks area (as previously described in Technical Memorandum 5.1). Each alternative presented in this section is compared against the following evaluation criteria:

- **Traffic Operations.** *Does the alternative mitigate existing and anticipated (2029) traffic congestion?* This criterion measures the extent to which alternatives alleviate existing and anticipated future traffic congestion.
- **Safety.** *Does the alternative mitigate existing or anticipated safety issues?* This criterion measures the extent to which alternatives ensure safety for all users (drivers, transit, pedestrians, and bicyclists).
- **Mobility.** *Does the alternative enhance mobility for all users?* This criterion measures the extent to which alternatives enhance mobility for transportation users (freight, nonmotorized, transit, transportation disadvantaged, etc.).
- **Land Use.** *Does the alternative minimize land use impacts? Is the alternative consistent with state and local land use planning goals?* This criterion measures the extent to which alternatives minimize property impacts and impacts on existing residential and business access. This criterion relates to economic development because it also evaluates the extent to which alternatives impact future business development through property takes. It also relates to consistency with local, regional and statewide land use plans.
- **Environmental & Social Impacts.** *Does the alternative minimize environmental and social impacts, including impacts on existing and future development and low-income/minority populations?* Most alternatives will have some built and natural environmental impacts. This criterion measures the extent to which alternatives minimize impacts on the social and environmental considerations for the interchange management area. This criterion includes environmental justice considerations.
- **Support for Implementation.** *Can the alternative be supported by both the state and local community?* This criterion measures the extent to which alternatives can be agreed upon that meet the needs and interests of stakeholders within acceptable timelines.
- **Cost-Effectiveness.** *Is the scale of the alternative consistent with the benefits it provides? Is it a practical, affordable solution?* All alternatives will have costs associated with development and implementation. This criterion evaluates how effective the alternative is at relieving congestion compared to the cost.

Need

Remove future volume from the intersection of Wilkesboro Road and OR 47.

Upon urbanization of the Wilkesboro Road corridor (in the UGB expansion area south of OR 6) there would be significant increase vehicles on a road that currently experiences very little volume. This increase in vehicles would potentially pose an operational and safety problem at the existing Wilkesboro Road/OR 47 intersection, due to the close proximity of this intersection to the OR 6 ramp terminal.

Alternative #1: Realign Wilkesboro Road

This alternative entails realigning Wilkesboro Road southward to flow into existing Lippert Lane so that Wilkesboro Road intersects with OR 47 further south from the OR 6 ramp terminal (see Figure 1 below); the existing intersection of Wilkesboro Road and OR 47 would be closed to vehicular traffic (i.e. dead-ended). This alternative would necessitate the construction of approximately 0.27-mile of new road and the purchase of approximately 48,000 square feet of privately owned land for right-of-way.

The rationale for why the location of this proposed alternative is optimal is described in the responses to the evaluation criteria below.

This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area south of OR 6. The anticipated increase in trips associated with a prospective development (as revealed through a traffic impact assessment) would trigger the need to close the aforementioned intersection and subsequently prompt the need to construct the realigned Wilkesboro Road.

Because the safety problem is exacerbated by urbanization, and the adjacent area would become industrial (i.e. generate more large truck movements with relatively slower speeds and wide turns) a project to correct this problem should be a high priority for inclusion in the CIP.

The realigned Wilkesboro Road corridor shown on Figure 1 is conceptual and would be defined through the land development process as it is funded, designed, and built.

Figure 1: Alternative #1 - Realignment of Wilkesboro Road



Criteria Evaluation

Traffic Operations

The intersection of Wilkesboro Road and OR 47 was not a study intersection in the current analysis that was performed in June-July, 2010. The intersection of OR 47 and the OR 6 Interchange Ramp was evaluated, however, and did not result in either poor vehicle-to-capacity (v/c ratio) or poor queuing conditions.

Per applicable ODOT interchange area access management spacing standards¹, there should be a minimum spacing distance of 1,320 feet between the OR 6 ramp terminal and the nearest major intersection. The purpose of these spacing standards is to protect the function of the interchange and, consequently, the state's investment in the facility. Moving towards compliance with applicable standards greatly improves the likelihood that an interchange (and its associated local street system connector roads) operates efficiently and safely. This alternative would increase the spacing (on the east side of OR 47) between the OR 6 ramp terminal and Wilkesboro Road intersection from 80 feet (existing) to 890 feet (after realignment). The result of this realignment would therefore be an increase in future operational efficiency, safety, and mobility.

¹ Appendix C: Access Management Standards" from the Oregon Department of Transportation (ODOT). See Table 18.

Safety

See discussion under traffic operations regarding increased access spacing.

Mobility

See discussion under traffic operations regarding increased access spacing.

Land Use

This alternative may necessitate an exception to Statewide Planning Goal 3 (Agricultural Lands) because it would entail utilizing Washington County land zoned exclusive farm use (EFU). The Washington County Community Development Code (CDC) Article III (Land Use Districts) Section 340 does not reference roadways as either a permitted, conditional, or prohibited use. However, CDC Article VII (Public Transportation Facilities) Section 705.2.1 notes that a realigned public road is a Category C Project that is permitted outside an urban growth boundary. This alternative would not eliminate any residential or business access points. This alternative would be subject to applicable standards of CDC Section 610 (Land Divisions Outside the UGB).

In summary, this alternative would entail a slight land use impact because of its location on land currently zoned EFU; however, this impact would not be inconsistent with state law governing the use of EFU, as it would be permitted (subject to design standards and conditions) under Washington County's CDC, which implements Goal 3 in Washington County.

Environmental & Social Impacts

As noted under the Land Use discussion, this alternative would entail the incorporation of approximately 48,000 square feet of farmland. No other significant natural resources are impacted by this alternative. The conceptual layout of the realigned Wilkesboro Road does minimize potential impacts, however, by being located as closely adjacent to OR 47 as possible so as to leave as much contiguous farmland is possible while not impacting any residences or structures of any kind.

Support for Implementation

This alternative has also been concurred on by ODOT and Washington County Land Use and Transportation Division staff and has been discussed with City of Banks staff, City of Banks Council members, and City of Banks Planning Commission members. There has been no expression of disapproval from any of the aforementioned agencies; therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$853,650. This estimate includes the design and construction of new Washington County Minor Collector roadway, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Interchange Reconfiguration Option

During the TSP analysis process an idea was raised by a Banks landowner to reconfigure the OR 6/OR 47 interchange as a way to address the future anticipated operational and safety issues associated with the forecasted increase of volume at the Wilkesboro Road/OR 47 intersection (discussed earlier) without realigning Wilkesboro Road. However, ODOT staff discarded the idea because the existing interchange does not experience, nor is forecasted to experience, operational or safety issues, and therefore it would be unreasonable to pursue the reconfiguration of the interchange as a way to address this local need associated with UGB expansion.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed. This alternative would become warranted based on future conditions related to urbanization along Wilkesboro Road and the associated increase in traffic volume utilizing the intersection of Wilkesboro Road/OR 47. It is likely that the timing of realignment will coincide with impending development - that is, the anticipated increase in trips associated with a prospective development (as revealed through a traffic impact assessment) would trigger the need to close the aforementioned intersection and subsequently prompt the need to construct the realigned Wilkesboro Road.

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

Remove future volume from the current intersection of Washington Avenue and Aerts Road.

Upon urbanization of the UGB expansion area east of the railroad tracks (north of OR 6) there would be significant increase vehicles on Washington Avenue, a road that currently experiences very little volume. This increase in vehicles would pose an operational and safety problem at the existing Washington Avenue/Aerts Road intersection, which creates a fifth leg at the Aerts Road/OR 6 intersection. This fifth intersection approach is confusing to drivers, and is at an angle that invites high-speed entering traffic to Washington from eastbound OR 6, and involves sharp-angle right turns onto OR 6.

Alternative #2: Realign Washington Avenue

This alternative entails realigning Washington Avenue northward to intersect with Aerts Road further north from the Aerts Road/OR 6 intersection (see Figure 2 below) at a location approximately 100 feet north of the existing entrance to the Quail Valley Golf Course. This alternative addresses the future need to provide greater spacing between the Washington Avenue/Aerts Road intersection for safety and operational purposes (and provide subsequent potential room for a southbound left-turn storage lane that could be warranted based on future conditions). This alternative also addresses the future need to close the existing Washington Avenue intersection with Aerts Road, which is currently located immediately north of the intersection with OR 6. This alternative would be constructed only

when warranted based on future traffic conditions associated with future development of the UGB expansion area east of the railroad tracks.

The realigned Washington Avenue corridor shown on Figure 2 is conceptual and would be defined through the land development process as it is funded, designed, and built.

The rationale for why the location of this proposed alternative is optimal is described in the responses to the evaluation criteria below.

Criteria Evaluation

Traffic Operations

This alternative would increase the spacing between the Aerts Road/OR 6 intersection and the Aerts Road/Washington Avenue intersection an extra 420 feet. Under future conditions modeling, the southbound queue on Aerts Road is expected to back up significantly from the Aerts Road/OR 6 intersection. It should be noted, however, that the traffic forecast model likely overstates the degree of queuing impact. Nonetheless, having a greater distance between the two aforementioned intersections will increase the likelihood that the queue will end before the new intersection, thereby allowing turning movements in and out of Washington Avenue to occur more efficiently. Upon assessment of this alternative, Washington County staff noted that the proposed realignment of Washington Avenue would improve the safety and operations of the OR 6/OR 47 intersection. County staff also noted that, to relieve OR 47, Aerts Road should be utilized as a collector or minor arterial upon UGB expansion; a recommendation related to this County assessment is provided later in this memorandum.

Figure 2: Alternative #2 - Realignment of Washington Avenue



Safety

Conditions at the existing intersection of Washington Avenue at Aerts Road (immediately north of the Aerts Road/OR 6 intersection) could be potentially operationally inefficient and pose a potential safety problem upon the addition of vehicles that will accompany growth into the expanded UGB area east of the existing city. This alternative would close off the existing Washington Avenue intersection with Aerts Road, which would greatly improve safety conditions at the Aerts Road/OR 6 intersection.

Mobility

Mobility for non-motorized users would be enhanced by this alternative. Bicyclists traveling eastward on Washington Avenue out of the east Banks area would be able to access Aerts Road at a location that is safer than the existing intersection, which is immediately adjacent to OR 6, where vehicles are moving at a consistently high rate of speed.

Land Use

The realigned Washington Avenue roadway would be within the expanded UGB and would be an allowed use under City zoning. This alternative would entail the use of private land to construct (owned by the Quail Valley Golf Course) and would relocate the existing entry point to the Quail Valley Golf Course; however, the realignment of this road is anticipated to have a beneficial economic impact on the properties to be developed by the golf course, given that no development could occur without an access point to Aerts Road, and no significant percentage increase in traffic volume would be permitted to use the existing Washington Avenue intersection at Aerts Road because of previously noted operational and safety concerns. This alternative would not eliminate any existing residential access points.

Environmental & Social Impacts

This alternative would not impact any significant natural resources nor would it impact any existing residences or businesses.

Support for Implementation

This alternative has also been concurred on by ODOT and Washington County Land Use and Transportation Division staff and has been discussed with City of Banks staff, City of Banks Council members, and City of Banks Planning Commission members. There has been no expression of disapproval from any of the aforementioned agencies; therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$1,198,600. This estimate includes the design and construction of new City of Banks Collector roadway, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed. This alternative would become warranted based on future conditions related to urbanization in the UGB expansion

areas west and south of the Quail Valley Golf and the associated increase in traffic volume utilizing the intersection of Washington Avenue/Aerts Road. It is likely that the timing of realignment will coincide with impending development – that is, the anticipated increase in trips associated with a prospective development (as revealed through a traffic impact assessment) would trigger the need to close the aforementioned intersection and subsequently prompt the need to construct the realigned Washington Avenue. Because the safety and operational problem is exacerbated by urbanization, and the adjacent area would be substantially developed (i.e. generate a significant number of commuter) a project to correct this problem should be a high priority for inclusion in the CIP.

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

Provide collector-level east-west internal circulation in Banks to accommodate expanded urban area and reduce reliance on state highways for intra-city circulation.

Alternative #3: Install vehicular crossing of railroad from west to east sides of Banks

Making provisions for east-west travel is critical to maintaining adequate citywide circulation as the City expands east of the railroad tracks. This alternative addresses the need to provide an east-west collector road for the City of Banks with respect to the UGB expansion area east of the existing city. Such an east-west collector road system, which integrates the proposed new eastside collector road (see Alternative 10), is not possible without a railroad crossing. This alternative also addresses the City's transportation objective of having a secondary route from the existing City of Banks to the Aerts Road access point to OR 6 and the desire to provide internal west-east circulation in Banks (again, assuming build-out of the UGB expansion area on the east side of the railroad tracks).

A proposed over-crossing should be treated as local parallel route to OR6 and Banks Road. To gain a better investment for the structure, this parallel route should be classified at least as a collector and allow cut-through traffic. Local traffic should use this over-crossing instead of using OR6 to access different sides of the City.

Several alternative versions of this alternative were assessed and are discussed in turn below.

Alternative #3a: Install vehicular overcrossing of railroad from area south of Arbor Village to Rose Avenue

This alternative would entail constructing a vehicular bridge over the railroad tracks connecting the existing street network on the west side of Banks (south of the Arbor Village neighborhood) to the future street network on the east side of Banks (at Rose Avenue) (see Figure 3 below). This crossing would include bicycle/pedestrian accommodations. This alternative is a long-term one which assumes the full build-out of the UGB expansion area on the east side of Banks as a prerequisite for consideration of construction.

As noted, this alternative would provide a secondary route from the existing City of Banks to the Aerts Road access point to OR 6 and the desire to provide internal west-east circulation in Banks (again, assuming build-out of the UGB expansion area on the east side of the railroad tracks).

This alternative is conceived as a low-speed collector road that would include bicycle and pedestrian accommodations which met City street standards.

This alternative is an alternative for addressing the needs described above. Alternatives 3b through 3f also describe projects considered to address this need.

This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area east of the railroad tracks.

The proposed railroad crossing corridor shown on Figure 3 is conceptual and would be defined through the land development process as it is funded, designed, and built.

Figure 3: Alternative #3a – Location of Vehicular Overcrossing of RR Tracks from Arbor Village to Rose Avenue



Criteria Evaluation

Traffic Operations

Constructing this alternative would improve traffic circulation on a system-wide basis for the City at such time when the UGB expansion area is built-out. Based on anticipated road congestion conditions, commuters on the west side of the railroad tracks wishing to travel to points east (Hillsboro; Beaverton; Portland) would be able to utilize the bridge to either access OR 6 at Aerts Road or use the eastside street system to access Banks Road, and proceed east to US 26, whereas without a railroad crossing such drivers would, by necessity, utilize OR 47 (Main Street) to access OR 6 or proceed north through town to Banks Road, from which point they could then travel to a connection with US 26. Conversely, drivers on the east side of Banks would have the option, based on anticipated road congestion conditions, of utilizing the bridge to access OR 6 from Main Street rather than from Aerts Road (or using Banks Road to connect to US26).

This alternative would remove local in-town trips from OR 6. Drivers on either side of the railroad tracks wishing to travel to in-town destinations could utilize the bridge to do so without needing to travel on OR 6 or traveling along OR 47 (Main Street) and Banks Road (on the west side) or Aerts Road and Banks Road (on the east side) to perform in-town trips.

Safety

This alternative was not conceived to address an existing or anticipated safety issue. However, it will be necessary to include safety precaution measures to ensure that no safety issue arises with regard to the introduction of cut-through traffic into the Arbor Village neighborhood. Potential safety issues associated with neighborhood cut-through traffic could be addressed through the imposition of a low posted speed (prominently signed), consistent police monitoring of the speed limit, and the installation of traffic calming measures such as speed bumps and/or landscaped intersection islands.

Mobility

As described under the discussion of traffic operations, traffic circulation would be improved by this alternative (under an assumed east side build-out scenario). Mobility would be improved for bicyclists and pedestrians, as this alternative would include bicycle and pedestrian accommodations. City of Banks, ODOT, and Washington County staff concurs with this proposed alternative in concept. However, both Washington County and ODOT staff noted that, in a comparison between Alternative 3a and 3b, Alternative 3b is preferable because Alternative 3a appears too far south to be the sole east-west railroad crossing and would result in out of direction travel for significant portions of intra-city traffic in the future (if it were the sole crossing).

Land Use

This alternative would be permitted under City of Banks Zoning regulations. This alternative would not eliminate any existing residential or business access points.

Environmental & Social Impacts

This alternative is not anticipated to have an impact on any significant natural resources. The potential for a social impact related to cut-through traffic in the Arbor Village neighborhood is addressed under the Safety discussion for this alternative.

Support for Implementation

The need for a secondary route to access OR 6 at Aerts Road is supported by the Banks Comprehensive Plan Transportation Element (1988 Update; pp. 73-74) and the Banks Transportation Network Plan (1999), which provides a discussion regarding the need for providing secondary route to access OR 6 from the existing city (pp 38-43). A secondary route to the Aerts Road access point at OR 6, which would entail a railroad overcrossing at the south end of Arbor Village (connecting to Rose Avenue/Washington Street on the east side of the track) is an approval criterion for the development for the undeveloped land at the south end of Arbor Village. By virtue of the Banks City Council, in 2008, requiring a covenant (stipulating the installation of a railroad crossing at the previously described location) on the deed to the aforementioned property, the Council reiterated the need for the City to have such a secondary route to access OR 6 at Aerts Road.

ODOT Rail staff has expressed initial concerns about the feasibility of this alternative. The companies operating active operations on the rail lines which would be crossed under this alternative have expressed initial opposition to the alternative based on concerns related to trespassing/liability issues associated with people crossing over the railroad tracks.

This alternative would require early planning close coordination with both the ODOT Rail Division and with the railroad companies actively operating on the rail lines at the time the project was being considered for implementation.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$8,650,000. This estimate includes the design and construction of new City of Banks Collector roadway, new single span cast-in-place concrete girder bridge, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Alternative #3b: Install vehicular overcrossing of railroad from Sunset Avenue to new collector road on east side of railroad

Alternative 3b is intended to address the same needs described for Alternative 3a. Alternative 3b would construct a vehicular bridge crossing of the railroad tracks at a point further north than 3a, from Sunset Avenue on the west to a future circulator road on the east (see Figure 4 below). This new crossing would include bicycle/pedestrian accommodations. There is currently an at-grade crossing at this location that is utilized by the Banks Lumber Mill under an agreement with the existing rail companies.

The proposed railroad crossing corridor shown on Figure 4 is conceptual and would be defined through the land development process as it is funded, designed, and built.

Figure 4: Alternative #3b - Location of Vehicular Overcrossing of RR Tracks from Sunset Avenue to east side



Criteria Evaluation

Traffic Operations

Same evaluation rationale as for Alternative 3a.

Safety

As with Alternative 3a, Alternative 3b was not conceived to address an existing or anticipated safety issue. However, it will be necessary to include safety precaution measures to ensure that no safety issue arises with regard to the introduction of cut-through traffic into the neighborhood located between the railroad tracks (on the east) and Main Street (on the west). Potential safety issues associated with neighborhood cut-through traffic could be addressed through the imposition of a low posted speed (prominently signed), consistent police monitoring of the speed limit, and the installation of traffic calming measures such as speed bumps and/or landscaped intersection islands.

Mobility

Same evaluation rationale as for Alternative 3a.

Land Use

This alternative would be permitted under City of Banks Zoning regulations.

Environmental & Social Impacts

This alternative is not anticipated to have an impact on any significant natural resources.

Support for Implementation

City of Banks, ODOT, and Washington County staff concurs with this proposed alternative in concept.

ODOT Rail staff has expressed initial concerns about the feasibility of this alternative. The companies operating active operations on the rail lines which would be crossed under this alternative have expressed initial opposition to the alternative based on concerns related to trespassing/liability issues associated with people crossing over the railroad tracks.

This alternative would require early planning close coordination with both the ODOT Rail Division and with the railroad companies actively operating on the rail lines at the time the project was being considered for implementation.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$7,083,000. This estimate includes the design and construction of new City of Banks Collector roadway, new single span cast-in-place concrete girder bridge, new right-of-way, contingency, and engineering costs. No escalation factors or costs for acquisition of adjacent properties are included. See Appendix A for further detail on the cost estimate for this alternative.

Alternative #3c: Install undercrossing of railroad from area south of Arbor Village to Rose Avenue

This alternative was assessed at a cursory level and has been discarded currently. Costs would be at an order-of-magnitude higher than an overcrossing due to the required extreme depth and linear distance that such an alternative would entail coupled with the complexity of installing such an underground structure beneath an active rail line.

Alternative #3d: Install at-grade crossing of railroad from area south of Arbor Village to Rose Avenue

This alternative was discussed with ODOT Rail and has been discarded currently. An at-grade crossing of an active double-track at this location would not be permitted. This would be the preferred option for a collector road between the east and west sides of Banks because the cost to do so would be significantly less than an overcrossing. However, at-grade crossings of the railroad under existing conditions is infeasible because the tracks that would need to be crossed are currently used for track-switching - an activity that is highly incompatible with at-grade crossings; this is also the reason that at-grade crossings along this segment of tracks is not permitted under ODOT Rail Division Policy.

Based on the above circumstances, at-grade crossings are not a feasible option for recommendation at this time. However, as noted, at-grade crossings are the City's preferred option for east-west railroad crossings, and would be pursued for implementation at such time in the future that at-grade crossings become feasible due to changing conditions.

Alternative #3e: Install at-grade crossing of railroad from Sunset Avenue to new collector road on east side of railroad

This alternative was discussed with ODOT Rail and has been discarded currently. An at-grade crossing of an active double-track at this location would not be permitted. This would be the preferred option for a collector road between the east and west sides of Banks because the cost to do so would be significantly less than an overcrossing. However, at-grade crossings of the railroad under existing conditions is infeasible because the tracks that would need to be crossed are currently used for track-switching – an activity that is highly incompatible with at-grade crossings; this is also the reason that at-grade crossings along this segment of tracks is not permitted under ODOT Rail Division Policy.

Based on the above circumstances, at-grade crossings are not a feasible option for recommendation at this time. However, as noted, at-grade crossings are the City’s preferred option for east-west railroad crossings, and would be pursued for implementation at such time in the future that at-grade crossings become feasible due to changing conditions.

Alternative #3f: Install vehicular overcrossing of railroad adjacent to OR 6 bridge

Alternative 3f is intended to address the same needs described for Alternative 3a. This alternative would entail constructing a vehicular bridge adjacent to the OR 6 bridge over the railroad tracks, thereby connecting the existing street network on the west side of Banks (south of the Arbor Village neighborhood) to the future street network on the east side of Banks (at Washington Avenue) (see Figure 5 below). This alternative is a long-term one which assumes the full build-out of the UGB expansion area on the east side of Banks as a prerequisite for consideration of construction.

This alternative was discussed with ODOT Rail and has been discarded currently. ODOT Bridge staff did a review of this alternative and found it to not be a viable alternative – the existing OR 6 bridge is structurally in good condition and would not need to be replaced in the next 20 years and that the proposed alternative creates difficulties for ODOT if the agency decided to widen OR 6 in the future. ODOT Bridge staff also noted that there would not be significant cost-savings building this alternative versus building a separate local-route bridge (as discussed in Alternative 3a).

Conclusion for Alternative 3 alternatives

Based on the above assessment, Alternative 3a and 3b are recommended as projects to be placed on the City’s transportation CIP list for consideration to be constructed (when warranted based on future conditions). However, both Washington County and ODOT staff noted that, in a comparison between Alternative 3a and 3b, Alternative 3b is preferable because Alternative 3a appears too far south to be the sole east-west railroad crossing and would result in out of direction travel for significant portions of intra-city traffic in the future (if it were the sole crossing).

It is important to reiterate that, as noted previously, an at-grade crossing would be the preferred option for a collector road between the east and west sides of Banks because the cost to do so would be significantly less than an overcrossing. However, at-grade crossings of the railroad under existing conditions is infeasible because the tracks that would need to be crossed are currently used for track-switching – an activity that is highly incompatible with at-grade crossings; this is also the reason that at-grade crossings along this segment of

tracks is not permitted under ODOT Rail Division Policy. Based on the above circumstances, at-grade crossings are not a feasible option for recommendation at this time. However, as noted, at-grade crossings are the City's preferred option for east-west railroad crossings, and would be pursued for implementation at such time in the future that at-grade crossings become feasible due to changing conditions.

Alternatives 3c and 3f are NOT recommended for further consideration.

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

Provide viable travel alternative to OR 6 for traffic between Banks and the Portland metropolitan area.

Alternative #4: Sight distance improvements at intersection of Banks Road/Aerts Road

This alternative addresses the need to provide an alternate route that could be used by Banks residents and visitors if congestion issues occur at the intersection of Aerts Road and Highway 6; the alternate route would be Banks Road-to-US 26. To address this need, this alternative subsequently needs to address existing geometric/safety issues on Banks Road. There are existing sight distance issues associated with the existing steep vertical grade conditions in the vicinity of the intersection of Banks Road and Aerts Road; although sight distance issues exist currently, the risk these issues pose to user safety would increase significantly in correlation with the number of new vehicles that would be utilizing this intersection upon development build-out of the UGB expansion areas. The existing Banks Road/Aerts Road intersection is shown in Figure 5 below.

This alternative could be done at varying degrees of complexity and cost, as warranted under future conditions. Alternative 4a through 4c could be viewed as alternatives to one another or as phases of the same project, as will be discussed in turn below. Alternative 4d would be a standalone alternative to Alternatives 4a, 4b, and 4c; a decision to program Alternative 4d for implementation would negate the need to construct Alternatives 4a through 4c.

This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area east of the railroad tracks.

Figure 5: Alternative #4's - Intersection of Banks Road and Aerts Road (looking west)



Alternative 4a: Install advanced warning signage

Alternative 4a is intended to increase safety for motorists, pedestrians, and cyclists traveling on Banks Road and those turning onto Banks Road from Aerts Road who do not have adequate sight distance based upon assumed design speed and existing conditions. The installation of advanced signing on all three legs would improve safety conditions at the intersection. In addition to advanced signing, rumble strips for westbound Banks Road traffic just east of the crest vertical curve may be considered, and are included in the cost estimate.

Criteria Evaluation

Traffic Operations

Traffic operations would not be adversely affected by this alternative.

Safety

Advanced signing and rumble strips on Banks Road in the vicinity of the intersection with Aerts Road will improve the safety of this intersection by providing warning to motorists who may be unfamiliar with the area of the relatively blind intersection at Aerts Road.

Mobility

Mobility conditions would not be adversely affected by this alternative.

Land Use

There would be no land use impacts associated with this alternative.

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative.

Support for Implementation

As Banks Road is owned and maintained by Washington County, this alternative would need to be coordinated closely with staff from the Washington County Land Use and Transportation Department to determine when this alternative would be warranted and to plan for implementation. It is anticipated that the Banks community would support this alternative given its overall benefits and lack of impacts to any parties.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$14,000. This estimate includes the evaluation of existing signing at the site, design and construction of new advanced signing, and construction of rumble strips on Banks Road east of intersection, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list (with the exclusion of the proposed posted speed element and the inclusion of speed advisory plaques) for consideration to be constructed (when warranted based on future conditions related to an increase in road volumes associated with development of the UGB expansion area).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Alternative 4b: Install advanced warning signage

As with Alternative 4a, Alternative 4b is intended to increase safety for motorists, pedestrians, and cyclists traveling on Banks Road and those turning onto Banks Road from Aerts Road who do not have adequate sight distance based upon assumed design speed and existing conditions. The installation of advanced signing on all three legs that would reduce posted speed and warn oncoming vehicle traffic of reduced sight distance on the crest vertical curve, in combination with a flashing yellow light at the intersection, would improve safety. In addition to the installation of advanced signing and flashing light, rumble strips for westbound Banks Road traffic just east of crest vertical curve may be considered, and are included in the cost estimate.

Criteria Evaluation

Traffic Operations

Based on the discussion provided with regard to Alternative 4a, the proposed speed limit element of this alternative is discarded.

Safety

A flashing yellow beacon would not be an effective tool with regard to mitigating safety issues at Aerts Road and Banks Road associated with poor sight distance; therefore the flashing yellow beacon element of this alternative is disregarded.

Mobility

Mobility will not be affected by this alternative.

Land Use

There would be no land use impacts associated with this alternative.

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative.

Support for Implementation

As Banks Road is owned and maintained by Washington County, this alternative would need to be coordinated closely with staff from the Washington County Land Use and Transportation Department to determine when this alternative would be warranted and to plan for implementation. It is anticipated that the Banks community would support this alternative given its overall benefits and lack of impacts to any parties.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$83,700. This estimate includes the evaluation of existing signing at the site, design and construction of new advanced signing, yellow flashing light, rumble strips on Banks Road east of intersection, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment with regard to ODOT review comments on this alternative, it is not recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed.

Alternative 4c: Install advanced warning signage and install traffic signal at intersection of Aerts Road/Banks Road

As with Alternatives 4a and 4b, Alternative 4c is intended to increase safety for motorists, pedestrians, and cyclists traveling on Banks Road and those turning onto Banks Road from Aerts Road who do not have adequate sight distance based upon assumed design speed and existing conditions. Advanced signing on all three legs that warns vehicle traffic of traffic signal in combination with a proposed traffic signal at the intersection will improve safety. Because of the crest vertical curve just to the east of the intersection, advanced warning lights, in addition to advanced warning signs, may be required. In addition to signing and signal improvements, the three approach legs would be widened to the Washington County Collector standard of 36 feet.

Conclusion

ODOT staff directed that this alternative be discarded because this intersection would not meet signal warrants.

Alternative 4d: Correct vertical grade issues on Banks Road at Banks Road/Aerts Road intersection area

Alternative 4d is intended to increase safety for motorists, pedestrians, and cyclists traveling on Banks Road in the vicinity of Aerts Road and those turning onto Banks Road from Aerts Road who do not have adequate sight distance based upon assumed design speed and existing conditions. The existing crest vertical curve at Banks Road and Aerts Rd, and the sag curve 500 feet to the west (see Figure 5 for photo), would be regarded to meet 60mph vertical design speed sight distance requirements at a minimum. This would allow drivers approaching Aerts Road from Banks Road, and drivers attempting to turn from Aerts Road, adequate sight distance and would therefore not require a speed reduction (currently posted as “Basic Rule”). Approximately 3,800 feet of Banks Road and 100 feet of Aerts Road would be reconstructed to Washington County Collector standard width of 36 feet. The golf course to the south of Banks Road would have retaining walls on fill. Some signs would need to be removed and replaced.

Criteria Evaluation

Traffic Operations

This alternative would likely increase speeds because two vertical curves were “flattened” and upgraded to standards, but traffic analysis based upon existing speeds and future estimated volumes should be performed to get a more thorough understanding of the impact on operations. Washington County staff noted that modifying the vertical curve and sag to conform to County road improvement standards would be the best long-term solution to the sight distance/safety issues on Banks Road, but that the appropriate strategy would best be determined by County engineering staff, which generally prefers to introduce improvement measures in a stepped approach (starting with relatively modest treatments and moving to more aggressive measures).

Safety

This alternative would improve sight distance on all three legs of the Banks Road/ Aerts Road intersection and would therefore remove the previously described sight distance issue altogether. In addition to the vertical curve upgrades, the reconstructed roadway would be constructed to meet the Washington County Collector standard of 36 feet, providing adequate lane and shoulder spacing for vehicles, bicycles, and pedestrians attempting to travel through the intersection. ODOT staff noted that modifying the vertical profile of Banks Road would be the best tool to improve sight distance. ODOT staff also advised clearing vegetation at the corners of the Banks Road/ Aerts Road intersection to improve sight distance conditions. Safety conditions would be upgraded to an even higher degree if this project were done in concurrence with Alternative 5 (the widening of Banks Road – discussed later in this memorandum).

This alternative does not address the other substandard vertical curves on the Banks Road corridor, so consideration must be made to the consistency of roadway design speeds if only this segment of Banks Road is upgraded.

Mobility

Mobility will be improved for vehicles turning on to or off of Aerts Road as the intersection will be safer for all users. The wider roadway width associated with the 3,800 feet of reconstructed roadway will provide increased mobility for larger vehicles and those vehicles needing to pass cyclists and pedestrians on what is currently a narrow-to-nonexistent shoulder.

Land Use

There would be no land use impacts associated with this alternative. Per Washington County CDC Article VII, Section 702-3 this project, because it would take place on existing public right-of-way, would be permitted outright subject to design standard review. It is anticipated that 15 feet of right-of-way would be needed on each side of Banks Road for the entire 3,800 feet of the project to match into existing drainage and cut and fill slopes. Based on a cursory GIS assessment, this widening could be accommodated on existing public road right-of-way (a detailed survey of the corridor would need to be performed in the early planning for this alternative to confirm this assessment).

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative.

Support for Implementation

As Banks Road is owned and maintained by Washington County, this alternative would need to be coordinated closely with staff from the Washington County Land Use and Transportation Department to determine when this alternative would be warranted and to plan for implementation. It is anticipated that the Banks community would support this alternative given its overall benefits and lack of permanent impacts to any parties (there would be temporary impacts associated with road delays or closures related with construction).

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$3,856,500. This estimate includes the design and construction of new Washington County Major Collector roadway, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative. It would be most cost-effective to construct this project in concurrence with Alternative 5 (the widening of Banks Road – discussed later in this memorandum).

Conclusion

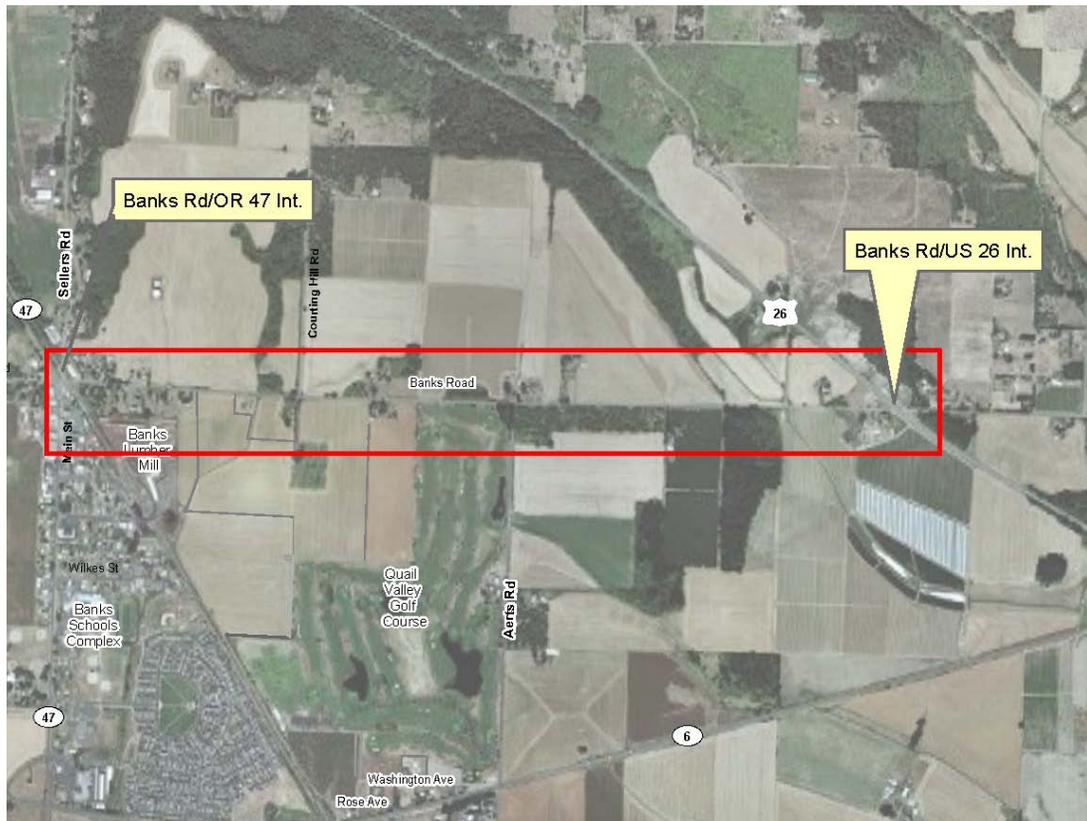
Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions). As noted under the Safety and Cost-Effectiveness criteria discussions, if possible it would be advantageous to construct this project in concurrence with Alternative 5 (the widening of Banks Road – discussed later in this memorandum).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Alternative #5: Widen Banks Road between OR 47 (Main Street) and US 26

This alternative entails widening Banks Road between OR 47 (Main Street) and US 26 (approximately 1.70-mile distance) to include shoulders on both sides of the road that meet Washington County Major Collector standards (see Figure 6 below). It is assumed that existing usable roadway width is 20 feet, and would be widened to 36 feet. This alternative addresses the lack of adequate lane width and shoulders on Banks Road (in consideration of forecasted increases in traffic volume associated with the development of the UGB expansion areas on the east side of Banks) and the need to have a viable east-west alternative to OR 6 for accessing US 26 so as to alleviate congestion and queuing issues at both existing Banks access points to OR 6 (Main Street; Aerts Road). Currently, Banks Road has extremely narrow-to-no roadway shoulders on the road segment between Main Street and Aerts Road, which will be a critical segment to improve in association with the development of the UGB expansion areas on the east side of Banks. This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion areas.

Figure 6: Alternative #5 - Widening of Banks Road between OR 47 (Main Street) and US 26)



Criteria Evaluation

Traffic Operations

Adding roadway shoulders would provide accommodations for vehicles that have broken down or stalled out and would also provide space for slow moving vehicles to move to the

right so as to allow vehicles behind them to pass in a much safer manner than existing conditions would allow, thereby improving traffic operations under such conditions. As noted, this alternative would create a more viable and attractive option for commute traffic between Banks and major employment areas in Hillsboro, Beaverton and Portland. Construction of this alternative could necessitate associated improvements at the Banks Road/US 26 intersection, as that intersection would likely see an increase of volume over present conditions.

Safety

Adding roadway shoulders improves safety conditions for all users. Vehicles needing to pull off the road unexpectedly would have accommodations to do so, bicyclists and pedestrians would have accommodations that were removed from the active travel lanes. The need for the safer roadway conditions that adding roadway shoulders would provide will be heightened considerable over time as the UGB expansion areas are developed and the number of potential bicyclists and pedestrians on Banks Road increases. Moreover, with the completion of the Banks-Vernonia Trailhead in the Autumn of 2010, there will likely be an increase of bicyclists using Banks Road to either access, or return from, the Banks-Vernonia Trail.

Safety conditions would be upgraded to an even higher degree if this project were done in concurrence with Alternative 5 (the widening of Banks Road – discussed later in this memorandum).

Mobility

Adding roadway shoulders would significantly enhance mobility along Banks Road for all users, most notably for bicyclists and pedestrians, who do not currently have any accommodations on Banks Road. Larger vehicles navigating the vertical curves and needing to pass cyclists and pedestrians would also see a benefit in this project.

Land Use

Based on a cursory GIS assessment, it appears that there is sufficient public-right-of way to widen Banks Road to include shoulders on both sides of the road, thereby negating the need to purchase any right-of-way from properties adjacent to the road. It is anticipated the overall benefits described in this section would also benefit property owners in the Banks Road corridor.

Per Washington County CDC Article VII, Section 702-3 this project, because it would take place on existing public right-of-way, would be permitted outright subject to design standard review.

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative.

Support for Implementation

This alternative was preliminarily presented and reviewed by ODOT, Washington County, and City of Banks staff – there has been no expression of disapproval from any of the aforementioned agencies regarding this alternative. It is anticipated that the Banks community would support this alternative given its overall benefits and lack of impacts to any parties.

Cost-Effectiveness

Based on planning level estimate tools, this project is estimated at \$4,377,400. This estimate includes the design and construction of new Washington County Major Collector roadway, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative. It would be most cost-effective to construct this project in concurrence with Alternative 5 (the widening of Banks Road – discussed later in this memorandum).

Conclusion

Washington County staff noted that this alternative would be consistent with the Banks Road’s collector designation in the County’s TSP. ODOT staff concurred that adding shoulders to Banks Road would improve safety.

Based on the above assessment, this alternative is recommended as a project to be placed on the City’s transportation CIP list for consideration to be constructed (when warranted based on future conditions).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

Insufficient vehicle storage capacity at southbound and eastbound left-turn lanes at intersection of Main Street (OR 47) and Oak Way/OR 6 ramp terminal.

Alternative #6: Extend southbound left-turn pocket on Main Street (OR 47) at intersection with Oak Way

This alternative would entail extending the southbound left-turn lane pocket from 125 feet to 350 feet (see figure 7 below). This alternative addresses the need to address forecasted queuing issues at the southbound leg of the intersection of Main Street and Oak Way. This alternative would be designed according to applicable requirements in ODOT’s Highway Design Manual and Striping Manual. This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion areas.

Figure 7: Alternative #6 and #7 - Southbound and Eastbound Left-turn Lane Extensions\



Criteria Evaluation

Traffic Operations

This alternative would reduce vehicle queuing in the southbound left-turn lane; the existing storage is forecasted to be inadequate under 2029 conditions. By having adequate turn-lane storage, through-traffic is able to proceed efficiently. It should be noted that, although the extension of the left-turn lane would improve future operational conditions at the intersection, it will be important to consider the implications of extending the left-turn lane storage with relation to the OR 6 exit ramp geometry as a whole.

Safety

This alternative was not conceived to address an existing or anticipated safety issue. However, by removing left-turning vehicles from the through-lane at this intersection, safety conditions are improved as stopped vehicles wishing to proceed straight would not need to pass from behind to reach the intersection at a green light in a manner that potentially poses safety problems.

Mobility

By reducing queuing issues, freight traffic is able to proceed more efficiently. This alternative would not affect non-motorized uses to any measurable degree.

Land Use

The area where this project would take place is already paved; it would simply require and would not require any right of way acquisition.

Environmental & Social Impacts

This alternative would not impact any significant natural resources nor would it impact any existing residences or businesses.

Support for Implementation

Both ODOT and Washington County staff concur with this alternative. This alternative was also reviewed by City of Banks staff as well as the project Technical Advisory Committee. There has been no expression of disapproval from any of the aforementioned agencies; therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$8,800. This estimate includes the design and construction of new striping and signing associated with the off-ramp and intersection. The estimate includes contingency and engineering costs, but no escalation factor. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Alternative #7: Extend eastbound left-turn pocket on Main Street (OR 47) at intersection with Oak Way/OR 6 ramp terminal

This alternative would entail extending the eastbound left-turn lane pocket from 70 feet to 200 feet (see Figure 7). This alternative addresses the need to address forecasted queuing issues at the eastbound leg of the intersection of Main Street and Oak Way. This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion areas.

Criteria Evaluation

Traffic Operations

This alternative would reduce vehicle queuing in the southbound left-turn lane; the existing storage is forecasted to be inadequate under 2029 conditions. By having adequate turn-lane storage, through-traffic is able to proceed efficiently. ODOT staff noted that as long this widening does not reduce the radius of the first curve exiting from OR 6 traveling westbound, there are no concerns with extending this left-turn lane and that, upon their review, the widening appears not to impact the radius of the curve

Safety

This alternative was not conceived to address an existing or anticipated safety issue. However, by removing left-turning vehicles from the through-lane at this intersection, safety is increased as stopped vehicles wishing to proceed straight would not need to pass

from behind to reach the intersection at a green light in a manner that potentially poses safety problems.

Mobility

By reducing queuing issues, freight traffic is able to proceed more efficiently. This alternative would not affect non-motorized uses to any measurable degree.

Land Use

This alternative would require a minor widening of the OR 6 westbound exit ramp and the placement of additional pavement; however, no additional right-of-way would be necessary.

Environmental & Social Impacts

This alternative would not impact any significant natural resources nor would it impact any existing residences or businesses.

Support for Implementation

This alternative was reviewed by ODOT and City of Banks staff as well as the project Technical Advisory Committee. There has been no expression of disapproval from any of the aforementioned agencies; therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$9,100. This estimate includes the design and construction of new striping and signing associated with the off-ramp and intersection. The estimate includes contingency and engineering costs, but no escalation factor. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

North-south roadway circulation system on west side of Banks in UGB expansion area and provide access to new land uses.

Alternative #8: New north-south circulator road in west side Banks area between Cedar Canyon Road and area south of Sunset Park

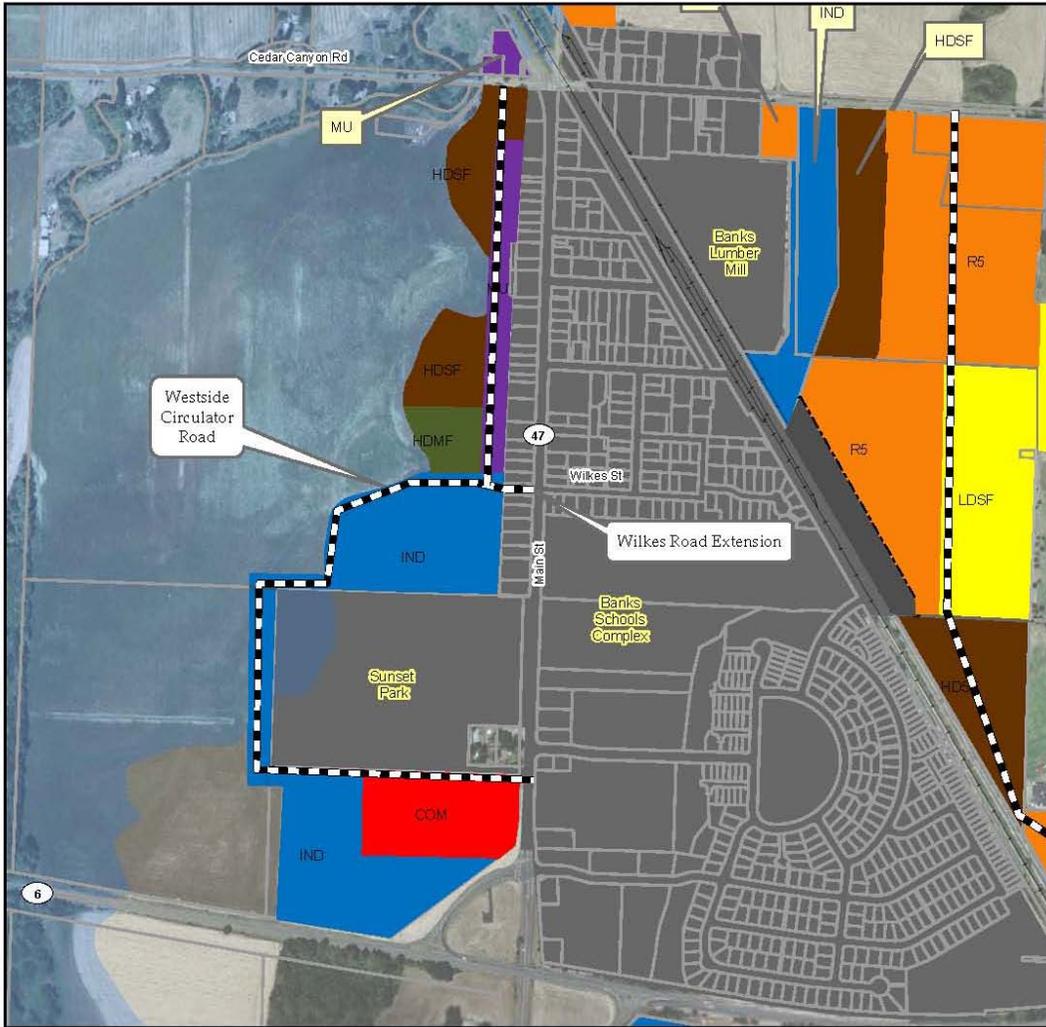
This alternative entails constructing a new north-south road on the west side of the existing City of Banks with termini intersections at Cedar Canyon Road in the north and Main Street in the south (see Figure 8 below). The termini intersection at Main Street south of Sunset Park would be restricted to right-in/right-out movements. This roadway would be a 40 foot wide paved roadway with sidewalks, illumination, landscaping and drainage, occupying a right-of-way footprint of 64 feet, and meeting City of Banks Collector standards. This alternative would address the need to provide a primary circulator road for the UGB expansion area to the west of Main Street (both north and south of Sunset Park).

The location of this proposed roadway is optimal because it will allow for double-loading of mixed uses on the lot line in the northern segment of the road and will provide access to the commercial and industrial areas, while simultaneously providing this critical north-south roadway within the constraints of the adjacent floodplain.

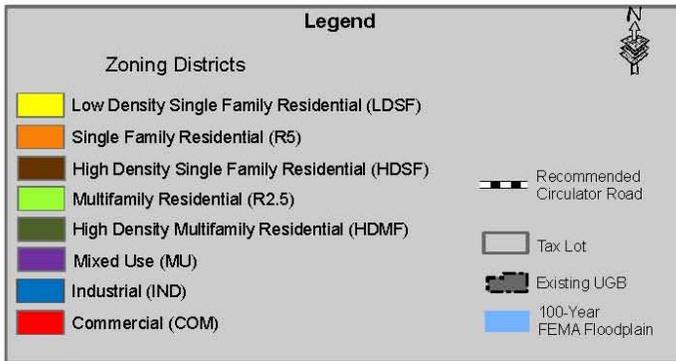
This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area west of Main Street.

The proposed Westside north-south circulator road corridor as shown on Figure 8 is conceptual and would be defined through the land development process as it is funded, designed, and built.

Alternative 8: Westside Circulator Road



VICINITY MAP



Westside Circulator Road & Wilkes Rd. Extension



CH2MHILL

Criteria Evaluation

Traffic Operations

As noted, constructing a circulator road would be necessary for the development of the UGB expansion area west of Main Street, both north and south of Sunset Park. The UGB expansion area north of Sunset Park will be primarily residential (with the exception of approximately 12 acres that would be zoned industrial immediately north of Sunset Park); the area south of Sunset Park would be zoned both industrial and commercial. This alternative would include right-in/right-out only restrictions at the new road's intersection with both Cedar Canyon Road and Main Street. Both of these new intersections would need to be analyzed prior to programming for funding in tandem with trip generation information from planned developments on the west side of Banks to determine the extent to which intersection modifications would be warranted to mitigate traffic operation issues revealed at that future time.

Safety

This alternative was not conceived to address an existing or anticipated safety issue. However, potential safety issues associated with left turning vehicles both onto, and from, the new circulator road from Main Street would be eliminated by the installation of right-in/right-out only restrictions.

Mobility

This alternative would be essential for the mobility of all users living and working in the UGB expansion areas west of Main Street, as currently there is no transportation system in this area.

Land Use

This alternative would be permitted under the Banks Zoning Code (at such time that this road would be warranted, the UGB expansion area would have been annexed into the City). It is also assumed that at such time that this road would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this road.

Environmental & Social Impacts

Approximately 1,300 linear feet of this roadway would be built within the Federal Emergency Management Agency (FEMA) 100-year floodplain. It is assumed that at such time that this road would be built, the City would have already annexed into the City the land upon which the road would be located. It is also assumed that the City would have already adopted a Floodplain Ordinance which would dictate the design standards for constructing a roadway in a 100-year floodplain (likely similar in nature to correlating Washington County standards); therefore, the road would be permitted to be constructed in accordance with the Floodplain Ordinance standards (i.e. without raised structures; built to be overtopped and not channel water flows).

No social impacts are anticipated with this alternative, as it is anticipated that at such time that this road would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this road.

Support for Implementation

This alternative has been presented to ODOT, Washington County, City of Banks staff, City of Banks Council members, City of Banks Planning Commission members, and the general public as a necessary element to UGB expansion on the west side of Banks. There has been some opposition to the planned UGB expansion on the west side of Banks, but no pointed opposition or expressions of disapproval from any of the aforementioned parties with regard to this road alternative (again, assuming UGB expansion west of Banks); therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$12,673,100. This estimate includes the design and construction of new City of Banks Collector roadway, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

Connection from new UGB expansion area on west side of Banks to Main Street to provide access and east-west circulation.

Alternative #9: New west extension of Wilkes Road

As shown on Figure 8, this alternative entails constructing a west extension of Wilkes Road that would connect to Main Street on the east and the new west side circulator road on the west (see Alternative #8), and would result in a new 4-way intersection of Wilkes Road and Main Street. This alternative would include the installation of a striped pedestrian crossing. This alternative addresses the need to provide an outlet from the new UGB expansion area west of Main Street.

This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area west of Main Street. Per ODOT staff, the new roadway would require an ODOT approach permit and the proposed marked crosswalks would need State Traffic Engineer Approval.

The location of the proposed Wilkes Road extension is optimal in that it will allow for a formal 4-way intersection with Main Street and the existing Wilkes Road and will support the circulatory function of a collector (Wilkes Road is proposed for upgrading to collector status).

Criteria Evaluation

Traffic Operations

The intersection at the west extension of Wilkes Street at Main Street would be one of three “outlet” routes available to people living, working, or visiting the UGB expansion area west of Main Street (the other two outlets being Cedar Canyon Road and Main Street south of Sunset Park); it is anticipated that the existence of three outlet points will result in a rational dispersal of traffic emanating to and from the west Banks area. It is further anticipated that the overwhelming majority of vehicles entering and exiting the west side extension of Wilkes Road would be utilizing Main Street (not crossing over to the existing Wilkes Street east of Main Street. Because of this, it is not anticipated that there will be unacceptable traffic congestion at the west extension of Wilkes Road/Main Street intersection. However, this new intersection would need to be analyzed prior to programming for funding, in tandem with trip generation information from planned developments on the west side of Banks, to determine the extent to which intersection modifications would be warranted to mitigate traffic operation issues revealed at that future time.

Safety

This alternative was not conceived to address an existing or anticipated safety issue. However, potential safety issues associated with left turning vehicles both onto, and from, the new west extension of Wilkes Road, would potentially need to be mitigated (as warranted and discussed under the Traffic Operations discussion above). Pedestrian safety would be bolstered by the installation of a striped pedestrian crossing (and potential other measures such as a flashing pedestrian beacon, as warranted by future conditions).

Mobility

This alternative would be significantly important for the mobility of all users living and working in the UGB expansion areas west of Main Street, as currently there is no transportation system in this area.

Land Use

This alternative would be permitted under the Banks Zoning Code (at such time that this road would be warranted, the UGB expansion area would have been annexed into the City). It is also assumed that at such time that this road would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this road.

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative, as it is anticipated that at such time that this road would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this road.

Support for Implementation

This alternative has been presented to ODOT, Washington County, City of Banks staff, City of Banks Council members, City of Banks Planning Commission members, and the general public as a necessary element to UGB expansion on the west side of Banks. There has been some opposition to *the planned UGB expansion* on the west side of Banks, but no pointed

opposition or expressions of disapproval from any of the aforementioned parties with regard to this road alternative (again, assuming UGB expansion west of Banks); therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$464,000. This estimate includes the design and construction of new City of Banks Collector roadway, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

North-south roadway circulation system on east side of Banks in UGB expansion area and provide access to new land uses.

Alternative #10: New north-south circulator road in eastside Banks area between Banks Road and Washington Avenue

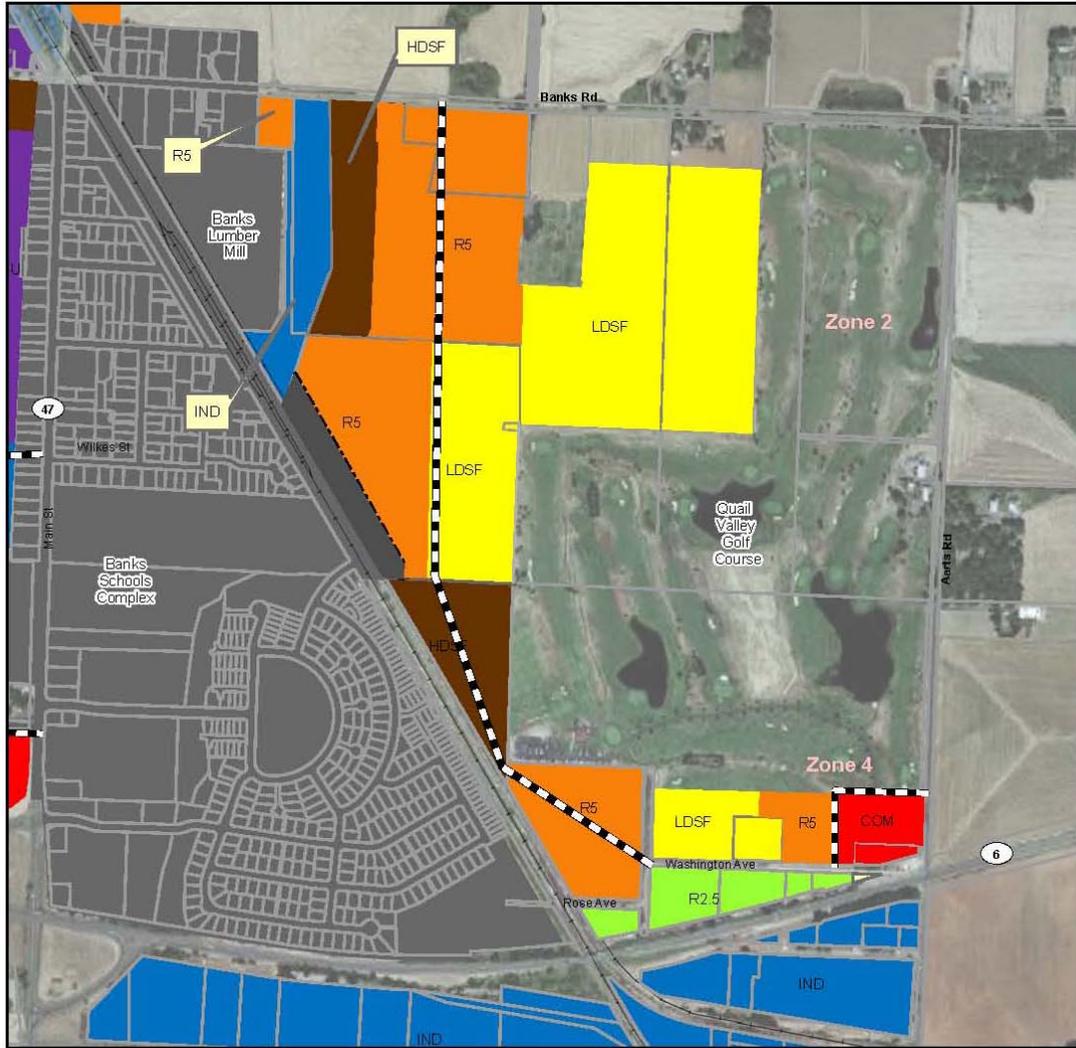
This alternative entails constructing a new north-south road on the east side of the existing City of Banks with termini intersections at Banks Road in the north and Washington Avenue in the south (see Figure 9 below). The proposed roadway would have a 36 foot paved width within a 60 foot right-of-way, meeting Washington County Major Collector standards. This alternative would address the need to provide a primary circulator road for the UGB expansion area to the east of the railroad tracks.

The location of this proposed would be the most efficient because it is central to the new eastside UGB expansion area, would have significant cost-benefits because it could serve adjacent land uses on both sides and would limit out-of-direction travel. Washington County and ODOT staff has concurred on this assessment.

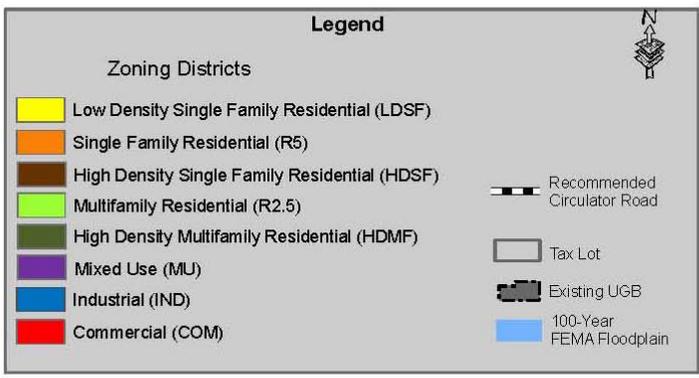
A previously considered eastside circulator road that would be located adjacent to the railroad tracks for much of its length was discarded because it would be ineffective from a cost-benefit perspective with regard to serving adjacent land uses. The rationale for the location of the discarded alternative was to provide a buffer between land use development and the railroad. However, as was noted by Washington County staff, there are other aesthetically pleasing mechanisms, such as berms or vegetated walls, which could be used to provide a buffer function instead of the roadway, which, as noted, would be significantly more effective if located in a more central location that served adjacent land uses on both sides.

The proposed Westside north-south circulator road corridor as shown on Figure 8 is conceptual and would be defined through the land development process as it is funded, designed, and built.

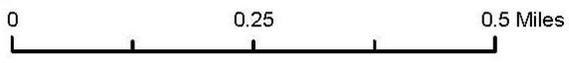
Alternative 10: Eastside Circulator Road



VICINITY MAP



Eastside Circulator Road



CH2MHILL

Criteria Evaluation

Traffic Operations

As noted, constructing a circulator road would be necessary for the development of the UGB expansion area east of the railroad tracks. The UGB expansion area through which this road would extend would be overwhelmingly residential. As warranted, this alternative may necessitate the inclusion of right-in/right-out only restrictions at the new road's intersection with Banks Road (to mitigate potential traffic congestion issues related to left turning vehicles both onto, and from, the new circulator road). The new intersection with Banks Road would need to be analyzed prior to programming for funding, in tandem with trip generation information from planned developments on the east side of Banks, to determine the extent to which intersection modifications would be warranted to mitigate traffic operation issues revealed at that future time.

Safety

This alternative was not conceived to address an existing or anticipated safety issue. However, potential safety issues associated with left turning vehicles both onto, and from, the new east side circulator road, would potentially need to be mitigated (as warranted and discussed under the Traffic Operations discussion above). Based on a preliminary engineering assessment, the location of the new intersection of the east side circulator road at Banks Road would be a practical one because there would not be any sight-distance issues.

Mobility

This alternative would be essential for the mobility of all users living and working in the UGB expansion areas east of Main Street, as currently there is no transportation system in this area.

Land Use

This alternative would be permitted under the Banks Zoning Code (at such time that this road would be warranted, the UGB expansion area would have been annexed into the City). It is also assumed that at such time that this road would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this road.

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative, as it is anticipated that at such time that this road would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this road.

Support for Implementation

This alternative has been presented to ODOT, Washington County, City of Banks staff, City of Banks Council members, City of Banks Planning Commission members, and the general public as a necessary element to UGB expansion on the east side of Banks. There has been some opposition to the planned UGB expansion on the east side of Banks, but no pointed opposition or expressions of disapproval from any of the aforementioned parties with

regard to this road alternative (again, assuming UGB expansion east of Banks); therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$4,441,400. This estimate includes the design and construction of new Washington County Major Collector roadway, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion

Based on the above assessment, this alternative is recommended as a project to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions).

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

Need

East-west bicycle/pedestrian circulation system.

Alternative #11: Install bicycle/pedestrian crossing of railroad from west to east sides of Banks

This alternative addresses the need to provide safe, convenient, and reasonably direct east-west bicycle/pedestrian circulation. This alternative could serve as an affordable interim step to meet this need in the event that the City determines that the longer-term objective of constructing motor vehicle crossings of the railroad with bicycle/pedestrian accommodations (see Alternatives 3a and 3b) will occur at an unacceptably late future time with respect to the need for bicycle/pedestrian accommodations across the railroad (to accommodate the population in the eastside UGB expansion area).

This alternative would encourage the use of alternate modes of travel between the west and east sides of Banks (assuming development of the UGB expansion areas on the east side of Banks) in keeping with City goals and objectives.

Several versions of this alternative were assessed and are discussed in turn below.

The proposed bicycle/pedestrian crossing corridor as shown on Figure 10 is conceptual and would be defined through the land development process as it is funded, designed, and built.

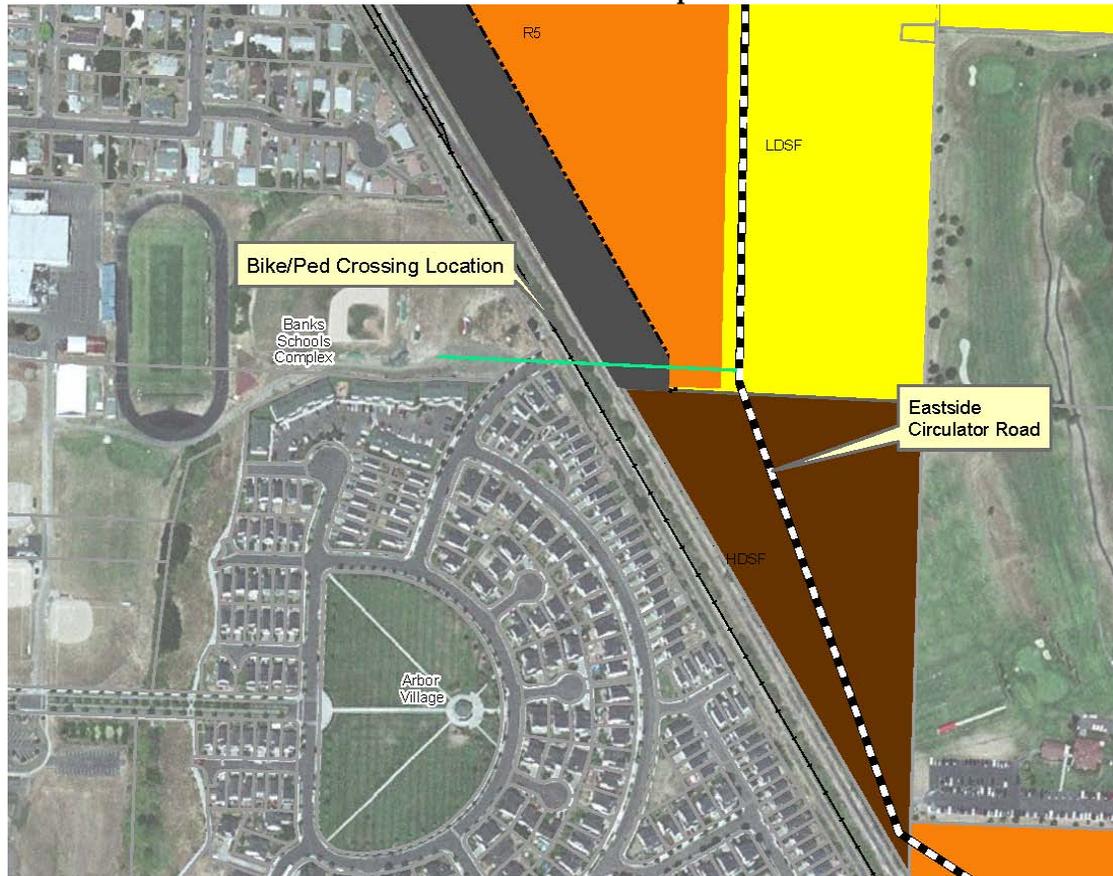
Alternative #11a: Install pedestrian/bicycle overcrossing of railroad from area east of Banks schools complex area to west side of east Banks circulator road

As shown in Figure 10, this alternative entails constructing a pedestrian/bicycle overcrossing of the railroad tracks to connect the UGB expansion area east of the tracks to the west side of Banks (at the Banks schools complex area) and would include a connecting path on the eastside to the circulator road (thereby providing a connection to the bicycle

facilities on the new road). This alternative would entail a temporary closure of the railroad tracks (approximately 2 nights at 6 hours a night).

This location is optimal for a bicycle/pedestrian crossing for the reasons provided in response to the criteria below.

Figure 10: Location of Bicycle/Pedestrian Bridge over Railroad Tracks from East Side Circulator Road to Banks Schools Complex Area



This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area east of the railroad tracks.

Criteria Evaluation

Traffic Operations

This alternative was not conceived to address an existing or anticipated traffic congestion issue.

Safety

This alternative would significantly improve safety conditions for bicyclists and pedestrians who would be provided with an east-west connecting route that was separated from motor vehicle traffic. The location of this crossing would be a pivotal safe route to school measure.

Mobility

This alternative would significantly improve mobility conditions for bicyclists and pedestrians traveling to and from the UGB expansion area on the east side of the railroad tracks. This alternative would enable short trips from east to west Banks (and vice-versa), most importantly to the Banks school complex and downtown Banks, to be made conveniently by foot or bicycle.

Land Use

This alternative would be permitted under the Banks Zoning Code (at such time that the bicycle/pedestrian bridge would be warranted, the UGB expansion area would have been annexed into the City). It is also assumed that at such time that the bicycle/pedestrian bridge would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this alternative.

Environmental & Social Impacts

No significant environmental resources would be impacted by this alternative. No social impacts are anticipated with this alternative, as it is anticipated that at such time that the bicycle/pedestrian bridge would be built, previous coordination between the City and property owners (via the formal subdivision of existing farmland) would have resulted in the dedication of right-of-way for this alternative.

Support for Implementation

This alternative has been presented to ODOT, Washington County, City of Banks staff, City of Banks Council members, City of Banks Planning Commission members, and the general public as a critical element for non-motorized travel for the UGB expansion on the east side of Banks. There has been some opposition to the planned UGB expansion on the east side of Banks, but no pointed opposition or expressions of disapproval from any of the aforementioned parties with regard to this alternative (again, assuming UGB expansion east of Banks); therefore, it is assumed that there is support for this alternative.

Cost-Effectiveness

Based on planning level estimate tools, this projected is estimated at \$5,690,800. This estimate includes the design and construction of a new pedestrian/bicycle overcrossing, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Alternative #11b – discarded due to revised location of eastside circulator road

Alternative #11c: Install pedestrian/bicycle undercrossing of railroad from area north of Arbor Village (at east end of Banks schools complex) to west side of east Banks circulator road

This alternative would be in the same location and provide the same connecting points as in Alternative 11a (see Figure 10) but would entail an undercrossing (tunnel) connection and would include a connecting path on the eastside to the circulator road (thereby providing a

connection to the bicycle facilities on the new road). This alternative would necessitate a total closure of the railroad tracks for approximately 2-4 weeks.

This alternative would be constructed only when warranted based on future traffic conditions associated with future development of the UGB expansion area east of the railroad tracks.

Criteria Evaluation

Traffic Operations

Same evaluation rationale as for Alternative 11a.

Safety

Same evaluation rationale as for Alternative 11a.

Mobility

Same evaluation rationale as for Alternative 11a.

Land Use

Same evaluation rationale as for Alternative 11a.

Environmental & Social Impacts

Same evaluation rationale as for Alternative 11a.

Support for Implementation

This alternative has been presented to ODOT, Washington County, City of Banks staff, City of Banks Council members, City of Banks Planning Commission members, and the general public as a critical element for non-motorized travel for the UGB expansion on the east side of Banks. There has been some opposition to the planned UGB expansion on the east side of Banks, but no pointed opposition or expressions of disapproval from any of the aforementioned parties with regard to this alternative (again, assuming UGB expansion east of Banks); therefore, it is assumed that there is support for this alternative. That said, because this alternative would necessitate the closure of the railroad tracks for 2-4 weeks to allow installation of the tunnel structure, it is very uncertain whether this project could move forward (if the railroad companies find that such a closure would result in an unacceptably high impact to their business operations).

Cost-Effectiveness

Based on planning level estimate tools, this project is estimated at \$4,167,000. This estimate includes the design and construction of a new pedestrian undercrossing of the existing railroad, new right-of-way, contingency, and engineering costs. No escalation factor is included. See Appendix A for further detail on the cost estimate for this alternative. The explicit cost-effectiveness of this alternative would need to be assessed in comparison to the severity of future issues warranting the consideration of funding this alternative.

Conclusion for Alternative 11 alternatives

Of the bicycle-pedestrian crossing alternatives discussed, Alternative 11c would be ranked highest based on likely cost and efficiency. Washington County staff note that the challenge of funding a stand-alone bicycle/pedestrian bridge could be significant and that it would be

more cost-effective to pursue a vehicular crossing with bicycle/pedestrian accommodations. County staff also noted the advantage of limiting the amount of railroad crossings.

Because Alternative 11c would necessitate the closure of the railroad tracks, it is uncertain whether Alternative 11c would be feasible based on potential impact to the railroad companies. Therefore, it is concluded that 11c be recommended as projects to be placed on the City's transportation CIP list for consideration to be constructed (when warranted based on future conditions and in consideration of the related issues discussed in this section). If the construction impacts associated with Alternative 11c were to be acceptable to the railroad companies at a future time when this project would be warranted, then Alternative 11c would be recommended. If Alternative 11c is not feasible (per impacts to the railroad companies) then Alternative 11a would be recommended.

The caveat to the above recommendation is that, as County staff noted, a "combined" vehicular/bicycle-pedestrian crossing would be more cost effective, and therefore Alternative 11a or Alternative 11c should only be considered for implementation if the City determines that the longer-term objective of constructing motor vehicle crossings of the railroad with bicycle/pedestrian accommodations will occur at an unacceptably late future time with respect to the need for bicycle/pedestrian accommodations across the railroad.

A detailed discussion of potential transportation funding sources for this alternative is provided in Section D of this memorandum.

C. Transportation System Improvement Alternatives – Policy

The following are new policies (non-physical transportation system improvement alternatives) recommended for adoption into the Transportation element of the City of Banks Comprehensive Plan.

Policy #1: Regular monitoring of safety conditions at OR 6/Aerts Road intersection

Safety conditions at the OR 6/Aerts Road intersection should be monitored regularly and the potential installation of safety measures should be performed as warranted by future conditions (as the UGB expansion area on the east side of railroad is developed). This intersection has no current status as a location with documented safety issues and there are no existing geometric deficiencies or sight-distance issues. However, in addition to the previously noted fatality at this intersection, north-south users of Aerts Road have repeatedly reported unsafe conditions when trying to cross over OR 6 on Aerts Road or make left turns from southbound Aerts Road to eastbound OR 6. This perceived lack of safety is the result of motorists on Aerts Road trying to find “gaps” in OR 6 traffic, where cars are moving at a high rate of speed (posted speed on OR 6 at this location is 55 miles per hour). The perceived lack of safety at this intersection could worsen operations at the intersection; moreover, the perceived lack of safety could significantly inhibit circulation in the future – the added vehicles that will accompany growth into the expanded UGB area east of the existing city could avoid utilizing this intersection in a manner that would be efficient for the Banks area transportation system as a whole, opting instead for the access point to OR 6 at OR 47 (Main Street), thereby causing potential congestion issues at that location.

If future monitoring of this intersection reveals safety issues, then the following safety measures could be utilized to mitigate safety conditions: increased lighting; a roadside inventory to identify fixed objects in the clear zone, and; increased enforcement of speed limits and safe driving in the vicinity.

Policy #2: Change functional classification of Oak Way, Trellis Way, and Wilkes Street to City collector (existing)

Oak Way, Trellis Way, and Wilkes Street are all currently classified as City local streets. The functional classification for each of these streets should be upgraded to collector status to more accurately reflect the fact that these roads serve a collector road function; that is, they lead traffic from local roads within neighborhoods to activity areas in the Banks community and to the arterial road (Main Street/OR 47). The proposed functional classifications of roadways in the Banks area are shown on Figure 11.

Policy #3: Change functional classification of Aerts Road to collector (future)

Aerts Road is currently classified as a County local street. The functional classification for this road, which would still be a County road, should be upgraded to collector status upon the future build-out of the UGB expansion areas on the east side of Banks, so as to more

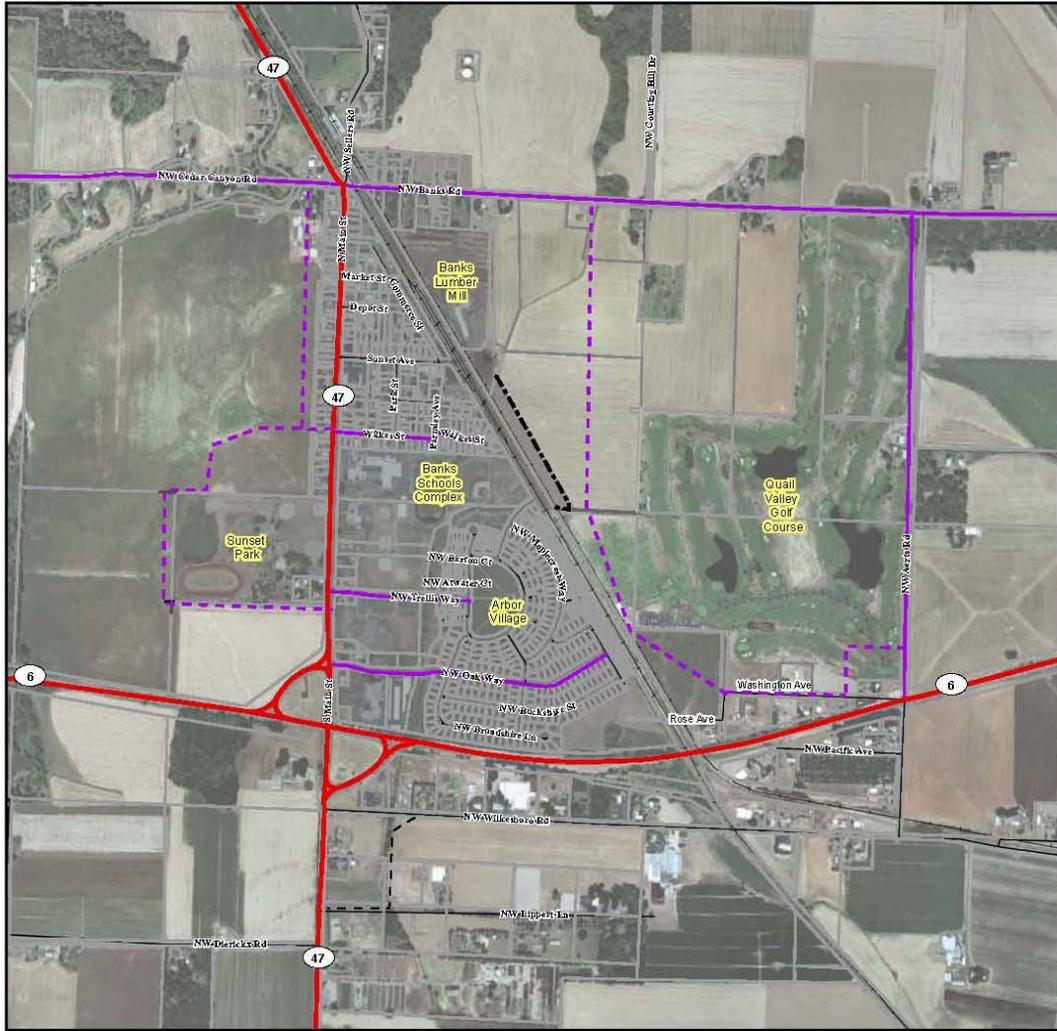
accurately reflect the future role this road would serve – as a collector road; that is, it would directly leads traffic lead traffic from local roads within the new east side neighborhoods to the highway (OR 6). Washington County staff concurs with this policy recommendation. The proposed functional classifications of roadways in the Banks area are shown on Figure 11.

Policy #3: Provide land use/zoning setbacks to allow for future ODOT projects in Banks

Per ODOT staff, the City of Banks and Washington County should provide setbacks to enable ODOT to perform the following unplanned roadway improvements in the future:

- Widen OR 6 at the OR 47 interchange to provide longer deceleration lanes on OR 6.
- Add left-turn lanes on OR 47 and Banks Road at the OR47 / Banks Road intersection.

Figure 11: Future Functional Classifications



VICINITY MAP

Legend

Functional Classification

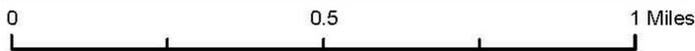
- Arterial
- Collector
- Local Road

Dashed roadway lines indicate that the roadway is planned

Tax Lot



Future Functional Classifications



CH2MHILL

D. Funding Recommended Projects

As noted, per State law, the City of Banks is not required to have a financially constrained transportation capital improvements projects list. That said, this section presents the sources available to fund the projects on the recommended project list. A variety of local and state funding sources can be explored to help fund the recommendations outlined in this report.

Further research should be conducted to ensure the applicability of these funding sources for the projects recommended in this report.

State Administered Funding Sources

State Transportation Improvement Program (STIP)

The STIP is the primary programming document that identifies transportation priorities for federal and state funding in Oregon. The STIP provides a schedule and identifies funding for projects throughout the state. The STIP lists projects that are planned for construction during a four-year period. Projects that are included in the STIP are considered “regionally significant” and have been given a high priority through planning efforts and by the relevant area commissions on transportation (ACT). The STIP has five major programs: modernization, safety, preservation, bridge, and operations – and fifteen specific programs from which projects can receive funding. All federally funded transportation projects and programs, and all state and locally funded projects that are deemed “regionally significant” must be included in the STIP.

Transportation projects in the STIP are generally categorized into the five major programs referenced above, plus a sixth “other,” or “special projects” category. Recommended transportation capital improvement projects related to state facilities may fall within two categories: Operations Projects and Special Programs. The STIP states that the applicable uses under each of these projects are as follows:

- **Modernization:** Capital projects that lead to increased highway system capacity.
- **Operations:** System management and improvements that lead to more efficient and safer traffic operations and greater system reliability.
- **Special Programs:** Bicycle and Pedestrian, Congestion Mitigation and Air Quality Improvement, Federal Lands Highways, Fish Passage and Large Culvert Improvement, Immediate Opportunity Fund, Indian Reservation Roads, Public Transit, Railroad Crossing Safety, Scenic Byways, and Transportation Enhancement.

The funding programs under these three categories are described in more detail in the pages that follow.

Modernization

The 2010-2013 Draft STIP states that projects funded under this section are capital highway improvements that lead to increased system capacity. Increased capacity can be accomplished by either adding additional lanes, constructing new highways, or other system improvements. Strong competition exists for funding through the STIP

Modernization Program as the need for funding such projects greatly outweighs the funds available. Projects are awarded funding through this program by the applicable ODOT Region.

Operations

The 2010-2013 Draft STIP states that projects funded under this section “improve the efficiency of the transportation system through the replacement of aging infrastructure and the deployment of technology that allows the existing system to meet increased demands.” Applicable projects may be listed within four sub-categories: (1) Intelligent Transportation Systems (ITS); (2) Signs, Signals, and Illumination; (3) Slides and Rockfalls and; (4) Transportation Demand Management (TDM).

- **Signs, Signals and Illumination Program** – The Signs, Signals and Illumination program provides funding for the replacement of equipment that has reached the end of its useful life. This program also provides limited funding for new or upgraded signals at problem intersections.

Special Programs

ODOT also provides funding to a number of special programs. This section describes the programs that are applicable to recommended projects for the City of Banks.

- **ODOT Bicycle and Pedestrian Program** – The ODOT Pedestrian and Bicycle Grant Program provides funding to cities, counties and ODOT regional and district offices through a competitive process. Eligible projects are related to the design and construction of pedestrian and bicycle facilities within the public right-of-way. The application process occurs every two years with applications for the 2012-2013 cycle beginning in 2010 and applications for the 2014-15 cycle beginning in 2012. Every biennium, the program awards approximately \$5 million. A local match is expected for projects that receive this grant.

The bicycle and pedestrian recommendations located within the public right-of-way would be eligible for this program. A grant application could be submitted as early as 2010 for receipt of funds in the 2012-2013 funding cycle.

- **Transportation Enhancement Program** – Oregon’s Transportation Enhancement (TE) program provides federal highway funds for project that strengthen the cultural, aesthetic, or environmental value of our transportation system. TE activities are funded through a required state set aside from STP funds of 10%, or the amount set aside in FY 2005, whichever is greater. Projects fall into four main categories: Bicycle and Pedestrian; Historic Preservation; Landscaping and Scenic Beautification; and Environmental Mitigation. The intent of the program is to fund special or additional activities not normally required on a highway or transportation project.

Since the project’s inception in 1992, 190 projects of approximately \$97 million have been funded in Oregon through the TE program. For fiscal years 2008-2011 the Program will have \$6.5 million per year for competitive selection, and \$2 million per year for the TE Discretionary Account. Awards for the 2012-2013 bienniums were approved by the Oregon Transportation Commission in August 2009; applications for the 2014-2015 bienniums start in April 2010. The funds are provided through reimbursement, not grants. Participation requires matching funds from the project sponsor, at a minimum of 10.27 percent. All projects must have a direct relationship to surface transportation.

This is a competitive grant application process facilitated by ODOT that awards funding to local governments on an annual basis. The TE Advisory Committee awards the grants based on a project's technical merit and local support. The committee also considers the TE "focus areas" for the year and the connection to other transportation projects.

- **Immediate Opportunity Fund** – This fund provides funding for the construction and improvement of streets and roads that are crucial to support site-specific economic development projects. ODOT manages this fund on a case-by-case basis in cooperation with the Oregon Economic and Community Development Department.

The fund's use is discretionary, and it can only be used when other sources of financial support are unavailable or insufficient. Its use is also restricted to circumstances where an actual transportation problem exists and where funds are needed to identify or retain employers that provide primary industry employment in a community. A match of at least 50 percent of the total fund requested is expected from project's applicants.

- **Railroad Crossing Safety Program** – This program is administered through the Rail Division of ODOT. They allocate funding by prioritizing projects based on an accident prediction model. The Division also has limited funds for discretionary projects that improve safety at railroad-highway grade crossings.

Special Transportation Fund

The Special Transportation Fund (STF) was created by the Oregon Legislature in 1985. It is funded through a cigarette tax and ODOT Transportation Operating Funds. This state funding source provides support for special transportation services that benefit seniors and individuals with disabilities. Seventy-five percent of the funding is allocated to designated counties, transit districts and Indian tribal governments proportional to population. The remaining 25 percent of the funds are distributed through a discretionary grant program called the Public Transportation Discretionary Grant Program.

STF funds can be used to create, maintain, or expand systems that serve seniors or individuals with disabilities, as well as plan and develop new services for those currently not served. ODOT's STF Guidebook provides a list of TSM and TDM examples of previous fund use (http://www.oregon.gov/ODOT/PT/PROGRAMS/stf_program.shtml).

Special City Allotment Grant

The Special City Allotment Grant was created by the Oregon Legislature. The legislature mandated that a \$1 million be set aside for cities with populations less than 5,000. Half of the funds for this grant come from the cities' share of the state gas tax and half of the funds come from ODOT's portion of the State Highway Fund. The maximum grant allocation is \$25,000. Half of the grant can be allocated to the city up front and the second half is provided when the project is completed.

County Funding Sources

Transportation Development Tax (TDT) program

The Transportation Development Tax (TDT) is a countywide tax applied to all new developments to help pay for the transportation infrastructure needed throughout the County to accommodate growth. Ultimately, the TDT is designed to generate enough revenue to construct approximately 28% of the growth-related transportation infrastructure called for in the county and cities' 20-year Transportation Plans. The TDT is not a property tax. New development is required to pay the tax when a building permit or occupancy permit is issued. The TDT tax rate is uniform throughout the County, and the amount of tax due is based on the estimated traffic generated by each development. TDT taxes are assessed and collected by the Washington County Current Planning Division in unincorporated Washington County, and by the cities within city limits. Remodeling, temporary uses, and state and federal government buildings are exempt from the TDT. All TDT revenue will be dedicated to funding transportation improvements designed to accommodate growth, such as:

- Improvements to Arterial and Collector roadways, including sidewalks and bike lanes;
- Transit capital projects (such as bus shelters).

Developers may be eligible to receive credits against their TDT tax for the value of certain developer-constructed improvements built as conditions of development approval. To be eligible for TDT credits, the improvements must be to an arterial or collector roadway or on the adopted Project List ([link to list/map](#)). There are a number of additional limitations on TDT credit eligibility, and developers are strongly advised to consult with appropriate city or county staff regarding credit eligibility prior to investing in an improvement.

It is important to convey that the TDT is not designed to generate revenues sufficient to pay for all improvements. The TDT is not intended as a resource for addressing existing needs or bringing existing streets up to standard. Existing safety problems (or the addition of highway shoulders, for example) may not be good candidates. The TDT can only be spent on projects that have been placed on the TDT project list; projects can be added to this by submitting a request through the Washington County Coordinating Committee (WCCC) to the WCCC Board, which makes the decision.

Major Streets Transportation Improvement Program (MSTIP)

The MSTIP is a tax that originated in 1986 as a short term levy put forth by Washington County to fund various construction projects throughout the area. As voters continued to approve various MSTIP levies over the years this temporary tax eventually became part of the permanent Washington County property tax rate.

Local Funding Sources

City Budget

Many of the state and federal grants identified in this funding section require a local match. This is the most appropriate use of city budget funding as it can leverage larger pools of money available for identified projects.

Exactions

With developer exactions, an improvement is paid for or built by the developer to City standards and then deeded to the City as a condition for development approval. Developer exactions and contributions can pay for portions of roads in, adjacent to, or through new developments. The City of Banks currently requires that all new subdivisions build sidewalks as a developer exaction.

Local Improvement District

Local Improvement Districts (LIDs) are created by property owners within a specified area to raise revenues for constructing street improvements within the same district. LIDs may be used to assess property owners for improvements that benefit properties. The LID can be a larger geographic area than the area with the actual street improvements but all landowners will need to understand advantage to entering into the LID. Property owners typically enter into LIDs because they see economic or personal advantages to the improvements.

Assessments are secured by property liens. The formation of LID districts is governed by state law and local jurisdictional development codes. LID revenues can be used solely for capital costs.

Urban Renewal Areas

Banks does not currently have any urban renewal areas. To establish an Urban Renewal Areas (URAs) the City of Banks would need to create an Urban Renewal Agency. Once this agency was formed, it could identify blighted areas within the city. In the selected area, tax-increment financing (TIF) could be used to generate urban renewal funds. TIF works by 'freezing' property values at the beginning of an urban renewal plan, and assessing a fee only on the incremental growth in property value observed since the beginning of the urban renewal district plan. The revenues generated within an urban renewal area are used to secure bonds to finance projects and programs within that area.

Local Option Levies

In most taxing districts, voters within an established taxing district, such as a city or a fire district, can approve levies for operating purposes or capital projects. A levy can either be established as a set rate or a set dollar amount. For capital projects, a levy cannot last longer than 10 years. Levies must be approved at a November election in an even numbered year or by more than 50 percent of eligible voters (double majority).

General Obligation Bonds

Bonding allows municipal and county governments to finance costs for construction projects by borrowing money and paying it back over time (with interest). Financing requires smaller regular payments over time compared to paying the full cost at once, but financing increases the total cost by adding interest. General Obligation Bonds are often

used to pay for construction of large capital improvements. This method is typically used to fund road improvements that will benefit an entire community. General Obligation Bonds add the cost of the improvement to property taxes over a period of time. Oregon State law states “A city may issue general obligation bonds to finance capital construction or capital improvements upon approval of the electors of the city.” (287A.050) Revenue for General Obligation Bonds is collected in property tax billings.

Revenue Bonds

Revenue bonds are paid back with dedicated revenue from a source other than property taxes. Revenues from a Systems Development Charge (Washington County’s TDT is a system development charge), Local Improvement District, or other reliable revenue streams can be used. The City of Banks has not used revenue bonds backed by Systems Development Charges, as this funding source is variable based on the amount of development. Revenue bonds are typically used to fund improvements that primarily benefit the people who provide the revenue through fees and assessments.

Appendixes

- A. Planning-Level Cost Estimate Details

Appendix A: Planning-Level Cost Estimate Details

CH2M HILL
SUMMARY - ALTERNATIVE COST ESTIMATE SUMMARY

PROJECT: Banks TSP Alternatives Analysis		DATE:	SHEET:
DESIGN LEVE Planning Level		8/25/2010	1 of 12

CONCEPT	IMPROVEMENT	COST
1	Realign Wilkesboro Road	\$ 853,700
2	Realign Washington Avenue	\$ 1,198,600
3A	Bridge Over Railroad, from south of Arbor Village to Rose Avenue	\$ 8,647,100
3B	Bridge Over Railroad, from Sunset Ave to East Banks Circulator Rd	\$ 6,984,000
4A	Banks Rd/Aerts Road Vertical Sight Dist. Improvements: Signing	\$ 14,000
4B	Banks Rd/Aerts Road Vertical Sight Dist. Improvements: Signing w/Flashing Yellow L	\$ 83,700
4C	Banks Rd/Aerts Road Vertical Sight Dist.:Signal w/Additional Intersection Improver	\$ 1,066,400
4D	Banks Rd/Aerts Road Vertical Sight Dist. Improvements: Re-construct vertical curve	\$ 3,856,500
5	Banks Road, Modernization between OR47 and US 26	\$ 4,377,400
6	Main St & Oak Way: SB Left Turn Pocket lengthening	\$ 8,800
7	Main St & Oak Way: EB Left Turn Pocket lengthening	\$ 9,100
8	West Banks: New North-South Road	\$ 12,673,100
9	Wilkes Street Extension	\$ 464,000
10	East Banks: New North-South Circulator Road	\$ 4,441,400
11A	Bike/Ped Bridge Over Railroad, east end of Banks Schools Complex	\$ 5,690,800
11B	Bike/Ped Bridge Over RR and East Banks Circulator Rd, east end of Schools Comple	\$ 4,638,100
11C	Bike/Ped Box Culvert Railroad Undercrossing, east end of Banks Schools Complex	\$ 4,167,000
12	Pedestrian Crossing (Striping & Adv Signing) at N & E Legs at Main St & Trellis Way	\$ 6,400

— Items Included In This Estimate:

- Inlay of Existing Pavement**
- New Asphalt Concrete and Aggregate Base for Widening**
- Excavation / Embankment**
- Concrete Curbs and Sidewalks**
- Pavement Markings**
- Storm Sewer RCP, Catch Basins, and Manholes**
- Illumination**
- Traffic Signal**
- Retaining Walls**
- Bridges - Pedestrian and Vehicle**
- Streetscape (Planter strip) - City Collector Section**
- Traffic Control and Mobilization**
- Erosion Control**
- Signing and Striping**
- ROW**

Concept 1 Realign Wilkesboro Road

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE Andy Kutansky / 503.736.4335		SHEET 2 of 12	
DESIGN LEVEL: Planning Level		LENGTH (MI.): 0.27		DATE 8/25/2010	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing				NAME A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.00	\$1,298,000	\$0
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	0.67	\$338,903	\$227,065
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.03	\$152,846	\$4,585
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$10,000	\$10,000
12	Illumination	Mi.	0.00	\$260,000	\$0
13	Landscaping - Streetscape	Mi.	0.00	\$434,000	\$0
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	0.00	\$115	\$0
SUBTOTAL					\$241,650

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$5,000
	TP & DT	3.0-8.0%	5.5%		\$13,000
	Mobilization	8.0-10.0%	9.0%		\$22,000
	Erosion Control	0.5-2.0%	1.3%		\$3,000
	Contingency	40.0%	40.0%		\$97,000
	Escalation (per year) -current year	0.5-2.0%	2.0%	2010	\$0
TOTAL CONSTRUCTION COST					\$381,650
	Right-of-Way Parcels	EA	0	\$400,000	\$0
	R/W	SF	48,000	\$8.00	\$384,000
	Design Engineering	13.0%	13%		\$50,000
	Construction Engineering	10.0%	10%		\$38,000
TOTAL PROJECT COST					\$853,650

Concept 1 Assumptions:

Pavement Section:

- 2" Inlay Overlay for Existing 100 ft prior to leaving Wilkesboro Rd
- 6" Asphalt Over 10" Aggregate Base for New Roadway

Right-Of-Way:

- Parcels - Buildings Inside Proposed Roadway Footprint
- R/W Areas Based on 60' required ROW on proposed major and minor collectors

Cross Section: (County Minor Collector)

- Travel Lanes 2 @ 12 ft
- Shoulders 2 @ 4 ft

Concept 2 Realign Washington Avenue

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE		SHEET	
DESIGN LEVEL: Planning Level		Andy Kutansky / 503.736.4335		3 of 12	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing		LENGTH (MI.):	DATE	NAME	
		0.17	8/25/2010	A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.34	\$1,298,000	\$441,320
2	New Roadway with Storm	Lane-Mi.	0.17	\$342,872	\$58,288
3	New Rural Roadway	Lane-Mi.	0.00	\$338,903	\$0
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	0.00	\$10,000	\$0
12	Illumination	Mi.	0.17	\$260,000	\$44,200
13	Landscaping - Streetscape	Mi.	0.17	\$434,000	\$73,780
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	0.00	\$115	\$0
SUBTOTAL					\$617,588

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$12,000
	TP & DT	3.0-8.0%	5.5%		\$34,000
	Mobilization	8.0-10.0%	9.0%		\$56,000
	Erosion Control	0.5-2.0%	1.3%		\$8,000
	Contingency	40.0%	40.0%		\$247,000
	Escalation (per year) -current year	0.5-2.0%	2.0%	2010	\$0
TOTAL CONSTRUCTION COST					\$974,588
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	0	\$8.00	\$0
	Design Engineering	13.0%	13%		\$127,000
	Construction Engineering	10.0%	10%		\$97,000
TOTAL PROJECT COST					\$1,198,588

Concept 2 Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 64' required ROW for City of Banks Collector Road

Cross Section: (City of Banks Collector)

Travel Lanes 2 @ 12.5 ft

Shoulders 2 @ 6 ft

S/W, Curb & Gutter, Streetscapes, Illumination

Concept 3A Bridge Over Railroad, from south of Arbor Village to Rose Avenue

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE Andy Kutansky / 503.736.4335			SHEET 4 of 12
DESIGN LEVEL: Planning Level		LENGTH (MI.): 0.20			DATE 8/25/2010
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing					NAME A. Kutansky
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.32	\$1,298,000	\$415,360
2	New Roadway with Storm	Lane-Mi.	0.52	\$342,872	\$178,293
3	New Rural Roadway	Lane-Mi.	0.00	\$338,903	\$0
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$10,000	\$10,000
12	Illumination	Mi.	0.20	\$260,000	\$52,000
13	Landscaping - Streetscape	Mi.	0.17	\$434,000	\$73,780
14	Bridges	SF	6,800.00	\$200	\$1,360,000
15	Walls	SF	19,550.00	\$115	\$2,248,250
SUBTOTAL					\$4,337,683

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$87,000
	TP & DT	3.0-8.0%	5.5%		\$239,000
	Mobilization	8.0-10.0%	9.0%		\$390,000
	Erosion Control	0.5-2.0%	1.3%		\$54,000
	Contingency	40.0%	40.0%		\$1,735,000
	Escalation (per year) -current year	0.5-2.0%	2.0%	2010	\$0
TOTAL CONSTRUCTION COST					\$6,842,683
	Right-of-Way Parcels R/W	EA SF	0 28,800	\$400,000 \$8.00	\$0 \$230,400
	Design Engineering	13.0%	0		\$890,000
	Construction Engineering	10.0%	0		\$684,000
TOTAL PROJECT COST					\$8,647,083

Concept 3a Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 64' required ROW for City of Banks Collector Road

Cross Section: (City of Banks Collector)

Travel Lanes 2 @ 12.5 ft

Shoulders 2 @ 6 ft

S/W, Curb & Gutter, Streetscapes, Illumination

Concept 3B Bridge Over Railroad, from Sunset Ave to East Banks Circulator Rd

CH2M HILL					
SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE: Andy Kutansky / 503.736.4335		SHEET: 5 of 12	
DESIGN LEVEL: Planning Level		LENGTH (MI.): 0.12		DATE: 10/18/2010	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing				NAME: A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.19	\$1,298,000	\$246,620
2	New Roadway with Storm	Lane-Mi.	0.31	\$342,872	\$106,290
3	New Rural Roadway	Lane-Mi.	0.15	\$338,903	\$50,835
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$10,000	\$10,000
12	Illumination	Mi.	0.12	\$260,000	\$31,200
13	Landscaping - Streetscape	Mi.	0.09	\$434,000	\$39,060
14	Bridges	SF	7,250.00	\$200	\$1,450,000
15	Walls	SF	14,360.00	\$115	\$1,651,400
SUBTOTAL					\$3,585,406

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$72,000
	TP & DT	3.0-8.0%	5.5%		\$197,000
	Mobilization	8.0-10.0%	9.0%		\$323,000
	Erosion Control	0.5-2.0%	1.3%		\$45,000
	Contingency	40.0%	40.0%		\$1,434,000
	Escalation (per year)	0.5-2.0%	2.0%		
	-current year		2010		\$0
TOTAL CONSTRUCTION COST					\$5,656,406
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	15,680	\$8	\$125,440
	Design Engineering	13.0%	0	\$0	\$735,000
	Construction Engineering	10.0%	0		\$566,000
TOTAL PROJECT COST					\$7,082,846

Concept 3B Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 64' required ROW for City of Banks Collector Road

Cross Section: (City of Banks Collector)

Travel Lanes 2 @ 12.5 ft

Shoulders 2 @ 6 ft

S/W, Curb & Gutter, Streetscapes, Illumination

Concept 4C Banks Rd/Aerts Road Vertical Sight Dist.:Signal w/Additional Intersection Improvements

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE Andy Kutansky / 503.736.4335			SHEET 6 of 12
DESIGN LEVEL: Planning Level		LENGTH (MI.): 0.13			DATE 8/25/2010
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing					NAME A. Kutansky
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.00	\$1,298,000	\$0
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	0.41	\$338,903	\$138,950
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.23	\$361,645	\$83,178
6	Restriping Existing Roadway	Lane-Mi.	0.19	\$29,040	\$5,518
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	1.00	\$250,000	\$250,000
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$10,000	\$10,000
12	Illumination	Mi.	0.06	\$260,000	\$15,600
13	Landscaping - Streetscape	Mi.	0.00	\$434,000	\$0
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	0.00	\$115	\$0
SUBTOTAL					\$503,246

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$10,000
	TP & DT	1.0-2.5%	5.5%		\$28,000
	Mobilization	1.0-2.5%	9.0%		\$45,000
	Erosion Control	1.0-2.5%	1.3%		\$6,000
	Contingency	1.0-2.5%	40.0%		\$201,000
	Escalation (per year) -current year	0.5-2.0%	2.0%		\$0
	TOTAL CONSTRUCTION COST				\$793,246
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	11,400	\$8	\$91,200
	Design Engineering	13.0%	0	\$0	\$103,000
	Construction Engineering	10.0%	0		\$79,000
TOTAL PROJECT COST					\$1,066,446

Concept 4C Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway
reconstruct current roadway 300 ft in all directions with same section but no drainage needed

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint
R/W Areas Based on 60' required ROW for Washco Major Collector Road

Cross Section: (County Major Collector)

Travel Lanes 2 @ 12 ft
Shoulders 2 @ 6 ft

Concept 4D Banks Rd/Aerts Road Vertical Sight Dist. Improvements: Re-construct vertical curve

CH2M HILL					
SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE		SHEET	
DESIGN LEVEL: Planning Level		Andy Kutansky / 503.736.4335		7 of 12	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing		LENGTH (MI.):	DATE	NAME	
		0.64	8/25/2010	A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.00	\$1,298,000	\$0
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	2.66	\$338,903	\$901,481
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$10,000	\$10,000
12	Illumination	Mi.	0.00	\$260,000	\$0
13	Landscaping - Streetscape	Mi.	0.00	\$434,000	\$0
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	5,000.00	\$115	\$575,000
SUBTOTAL					\$1,486,481

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$30,000
	TP & DT	1.0-2.5%	8.0%		\$119,000
	Mobilization	1.0-2.5%	9.0%		\$134,000
	Erosion Control	1.0-2.5%	2.0%		\$30,000
	Contingency	1.0-2.5%	40.0%		\$595,000
	Escalation (per year)	0.5-2.0%	2.0%		
	-current year		2010		\$0
TOTAL CONSTRUCTION COST					\$2,394,481
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	114,000	\$8	\$912,000
	Design Engineering	13.0%	0	\$0	\$311,000
	Construction Engineering	10.0%	0		\$239,000
TOTAL PROJECT COST					\$3,856,481

Concept 4D Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway, 36' pvmt width reconstruct current roadway 3800 ft

Right-Of-Way:

Need 15 ft additional on both side for cut/fill slopes
Walls assumed in front of golf course

Cross Section: (County Major Collector)

Travel Lanes 2 @ 12 ft
Shoulders 2 @ 6 ft

Concept 5 Banks Road, Modernization between OR47 and US 26

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE			SHEET
DESIGN LEVEL: Planning Level		Andy Kutansky / 503.736.4335			8 of 12
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing		LENGTH (MI.):	DATE	NAME	
		1.70	8/25/2010	A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.00	\$1,298,000	\$0
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	2.27	\$338,903	\$769,309
4	Inlay/Overlay Extg Roadway	Lane-Mi.	2.83	\$152,846	\$432,555
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$30,000	\$30,000
12	Illumination	Mi.	0.00	\$260,000	\$0
13	Landscaping - Streetscape	Mi.	0.00	\$434,000	\$0
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	8,970.00	\$115	\$1,031,550
SUBTOTAL					\$2,263,414

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$45,000
	TP & DT	1.0-2.5%	5.0%		\$113,000
	Mobilization	1.0-2.5%	9.0%		\$204,000
	Erosion Control	1.0-2.5%	1.3%		\$28,000
	Contingency	1.0-2.5%	40.0%		\$905,000
	Escalation (per year) -current year	0.5-2.0%	2.0%		\$0
	TOTAL CONSTRUCTION COST				\$3,558,414
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	0	\$8	\$0
	Design Engineering	13.0%	0	\$0	\$463,000
	Construction Engineering	10.0%	0		\$356,000
TOTAL PROJECT COST					\$4,377,414

Concept 5 Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway, 36' pvmt width

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 60' extg ROW for Washco Major Collector Road

Cross Section: (County Major Collector)

Travel Lanes 2 @ 12 ft

Shoulders 2 @ 6 ft

Concept 8 West Banks: New North-South Road

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE		SHEET	
DESIGN LEVEL: Planning Level		Andy Kutansky / 503.736.4335		9 of 12	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing		LENGTH (MI.):	DATE	NAME	
		1.12	8/25/2010	A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	2.24	\$1,298,000	\$2,907,520
2	New Roadway with Storm	Lane-Mi.	3.72	\$342,872	\$1,275,483
3	New Rural Roadway	Lane-Mi.	0.00	\$338,903	\$0
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$200,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$30,000	\$30,000
12	Illumination	Mi.	1.12	\$260,000	\$291,200
13	Landscaping - Streetscape	Mi.	1.12	\$434,000	\$486,080
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	0.00	\$115	\$0
SUBTOTAL					\$4,990,283

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$100,000
	TP & DT	1.0-2.5%	5.0%		\$250,000
	Mobilization	1.0-2.5%	9.0%		\$449,000
	Erosion Control	1.0-2.5%	1.3%		\$62,000
	Contingency	1.0-2.5%	40.0%		\$1,996,000
	Escalation (per year)	0.5-2.0%	2.0%		
	-current year		2010		\$0
TOTAL CONSTRUCTION COST					\$7,847,283
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	377,600	\$8	\$3,020,800
	Design Engineering	13.0%	0	\$0	\$1,020,000
	Construction Engineering	10.0%	0		\$785,000
TOTAL PROJECT COST					\$12,673,083

Concept 8 Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway, 40' pvmt width

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 64' required ROW for City of Banks Collector Road

Cross Section: (County Minor Collector)

Travel Lanes 2 @ 12.5 ft

Shoulders 2 @ 6 ft

S/W, Curb & Gutter, Streetscapes, Illumination

Concept 10 East Banks: New North-South Circulator Road

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE		SHEET	
DESIGN LEVEL: Planning Level		Andy Kutansky / 503.736.4335		10 of 12	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing		LENGTH (MI.):	DATE	NAME	
		0.98	8/25/2010	A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.00	\$1,298,000	\$0
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	2.94	\$338,903	\$996,374
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$15,000	\$15,000
12	Illumination	Mi.	0.00	\$260,000	\$0
13	Landscaping - Streetscape	Mi.	0.00	\$434,000	\$0
14	Bridges	SF	0.00	\$200	\$0
15	Walls	SF	0.00	\$115	\$0
SUBTOTAL					\$1,011,374

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$20,000
	TP & DT	1.0-2.5%	5.0%		\$51,000
	Mobilization	1.0-2.5%	9.0%		\$91,000
	Erosion Control	1.0-2.5%	1.3%		\$13,000
	Contingency	1.0-2.5%	40.0%		\$405,000
	Escalation (per year)	0.5-2.0%	2.0%		
	-current year		2010		\$0
TOTAL CONSTRUCTION COST					\$1,591,374
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	310,500	\$8	\$2,484,000
	Design Engineering	13.0%	0	\$0	\$207,000
	Construction Engineering	10.0%	0		\$159,000
TOTAL PROJECT COST					\$4,441,374

Concept 10 Assumptions:

Pavement Section:

6" Asphalt Over 10" Aggregate Base for New Roadway, 36' width

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 60' required ROW for WashCo Major Collector

Cross Section: (County Major Collector)

Travel Lanes 2 @ 12 ft

Shoulders 2 @ 6 ft

Concept 11A Bike/Ped Bridge Over Railroad, east end of Banks Schools Complex

CH2M HILL SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE Andy Kutansky / 503.736.4335			SHEET 11 of 12
DESIGN LEVEL: Planning Level		LENGTH (MI.): 0.13			DATE 8/25/2010
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing					NAME A. Kutansky
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.22	\$1,298,000	\$285,560
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	0.00	\$338,903	\$0
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$5,000	\$5,000
12	Illumination	Mi.	0.11	\$260,000	\$28,600
13	Landscaping - Streetscape	Mi.	0.11	\$434,000	\$47,740
14	Bridges	SF	1,560.00	\$200	\$312,000
15	Walls	SF	19,550.00	\$115	\$2,248,250
SUBTOTAL					\$2,927,150

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$59,000
	TP & DT	1.0-2.5%	5.0%		\$146,000
	Mobilization	1.0-2.5%	9.0%		\$263,000
	Erosion Control	1.0-2.5%	1.3%		\$37,000
	Contingency	1.0-2.5%	40.0%		\$1,171,000
	Escalation (per year) -current year	0.5-2.0%	2.0%	2010	\$0
TOTAL CONSTRUCTION COST					\$4,603,150
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	3,700	\$8	\$29,600
	Design Engineering	13.0%	0	\$0	\$598,000
	Construction Engineering	10.0%	0		\$460,000
TOTAL PROJECT COST					\$5,690,750

Concept 11a Assumptions:

Pavement Section:

12" Conc. Over 10" Aggregate Base for New Roadway, 10' width

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint
R/W Areas Based on 13' required ROW for ped path and walls

Cross Section:

Travel Lanes 1 @ 10 ft
Illumination, Streetscape, and Drainage

Concept 11B Bike/Ped Bridge Over RR and East Banks Circulator Rd, east end of Schools Complex

CH2M HILL					
SUMMARY - QUICK COST ESTIMATE					
PROJECT: Banks TSP Alternatives Analysis		REFERENCE NAME/PHONE		SHEET	
DESIGN LEVEL: Planning Level		Andy Kutansky / 503.736.4335		12 of 12	
KIND OF WORK: New Roadway, Bridge, Signals, Restriping, and Signing		LENGTH (MI.):	DATE	NAME	
		0.12	8/25/2010	A. Kutansky	
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Curb, Sidewalks & Drainage	Mi.	0.18	\$1,298,000	\$233,640
2	New Roadway with Storm	Lane-Mi.	0.00	\$342,872	\$0
3	New Rural Roadway	Lane-Mi.	0.00	\$338,903	\$0
4	Inlay/Overlay Extg Roadway	Lane-Mi.	0.00	\$152,846	\$0
5	Reconstruct Existing Roadway	Lane-Mi.	0.00	\$361,645	\$0
6	Restriping Existing Roadway	Lane-Mi.	0.00	\$29,040	\$0
7	Building Removals	LS	0.00	\$75,000	\$0
8	Interconnect Signal	LS	0.00	\$30,000	\$0
9	New Signal	EA	0.00	\$250,000	\$0
10	Signal Modifications	EA	0.00	\$60,000	\$0
11	Permanent Signing	LS	1.00	\$5,000	\$5,000
12	Illumination	Mi.	0.12	\$260,000	\$31,200
13	Landscaping - Streetscape	Mi.	0.12	\$434,000	\$52,080
14	Bridges	SF	2,340.00	\$200	\$468,000
15	Walls	SF	13,850.00	\$115	\$1,592,750
SUBTOTAL					\$2,382,670

	ADDITIONAL COSTS	RANGE	PERCENTAGE	UNIT COST	TOTAL
	Construction Surveying	1.0-2.5%	2.0%		\$48,000
	TP & DT	1.0-2.5%	5.0%		\$119,000
	Mobilization	1.0-2.5%	9.0%		\$214,000
	Erosion Control	1.0-2.5%	1.3%		\$30,000
	Contingency	1.0-2.5%	40.0%		\$953,000
	Escalation (per year) -current year	0.5-2.0%	2.0%		\$0
			2010		
TOTAL CONSTRUCTION COST					\$3,746,670
	Right-of-Way				
	Parcels	EA	0	\$400,000	\$0
	R/W	SF	3,675	\$8	\$29,400
	Design Engineering	13.0%	0	\$0	\$487,000
	Construction Engineering	10.0%	0		\$375,000
TOTAL PROJECT COST					\$4,638,070

Concept 11B Assumptions:

Pavement Section:

12" Conc. Over 10" Aggregate Base for New Roadway, 10' width

Right-Of-Way:

Parcels - Buildings Inside Proposed Roadway Footprint

R/W Areas Based on 13' required ROW

Cross Section:

Travel Lanes 1 @ 10 ft

Illumination, Streetscape, and Drainage