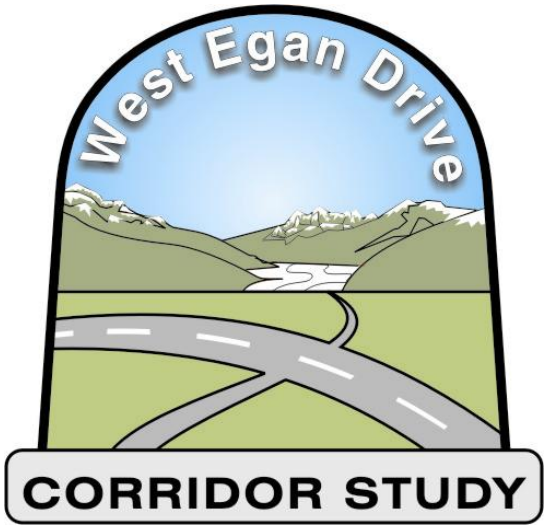
Section 2 - Chapter 6

Refined Evaluation of Most Viable Alternatives



6 Refined Evaluation of Most Viable Alternatives

In response to the discussion at the CAC meeting in November 2002, all four alternatives were reviewed, additional analyses conducted, and the evaluations updated. Using this analysis and input from the CAC and public, the Alaska Department of Transportation & Public Facilities (ADOT&PF) selected a Proposed Action to carry forward into the upcoming environmental documentation process. This chapter, in conjunction with Chapter 5, describes the evaluation of the four alternatives and the selection and evaluation of the Proposed Action.

CHANGES TO THE ALTERNATIVES

The following summarizes changes to the four most viable alternatives as a result of further analyses and the discussion at the CAC meeting in November 2002:

- Alternative 1 – no modifications.
- Alternative 2 – add westbound only connection between the Lemon Spur Road extension to McNugget and Mendenhall Loop Road; extend this road from Mendenhall Loop Road to Riverside Drive. Realign Industrial Boulevard to the west opposite Wildmeadow Lane.
- Alternative 3 – eliminate the westbound only connection between Mendenhall Loop Road and Riverside Drive; add a right-in-right-out connection between Vintage Boulevard and the westbound ramp connecting Riverside Drive to Egan Drive.
- Alternative 4 – no modifications.

These changes, incorporated into the functional layouts, are shown in Figure 6-1 (Sheets 1 and 2); Figure 6-2 (Sheets 1 and 2); Figure 6-3 (Sheets 1 and 2); and Figure 6-4 (Sheets 1 and 2). Bicycle and multi-use facilities for each of the alternatives are shown in Figure 6-5 through Figure 6-8.

ADDITIONAL ANALYSES

The appendices to this document contain detailed studies of the following that were conducted after the completion of Chapter 5:

- Traffic Operations for Alternatives 1 through 4 (Appendix A)
- Constructability, Construction Costs, Maintenance Costs, Right-of-Way Requirements and Environmental Impacts for Alternatives 1 through 4 (Appendix B)
- Compatibility with Built Environment – Short and long-term economic impacts and long-term social impacts for Alternatives 1 through 4 (Appendix C)

Additionally, the project team reviewed the qualitative evaluation conducted in Chapter 5 and confirmed or updated the results as appropriate. The detailed evaluation sheets for all four of the alternatives, plus the no-build alternative, are included in Appendix D. The scoring system for each alternative follows the same as used in Chapter 5.

Each alternative also has been compared to the Purpose and Need statement developed in Chapter 4.

SUMMARY OF EVALUATION

In some cases, after consideration of these additional analyses, the Good, Fair, Poor ratings in Chapter 5 have been changed. In others, additional quantitative information is provided. The information shown in parentheses is the rating from Chapter 5. Where there are no changes from Chapter 5, there is no parenthetical information. Table 6-1 summarizes all of this information.

In summary, these are the results of the changes resulting from the more thorough analyses:

- After the concept changes, Alternatives 2 and 3 have become more compatible with the needs of pedestrians and bicyclists.
- Due to a more thorough evaluation of environmental impacts, Alternative 2 went from fair to poor and Alternative 3 went from good to fair.
- A more thorough evaluation of consistency with other planning efforts caused Alternative 2 to go from good to fair and Alternative 4 to go from poor to fair. Alternative 3 is less compatible with a possible connection to the proposed second channel crossing, whose terminus may be in the Yandukin Drive area.
- After evaluation of the short and long-term economic impacts and long-term social impacts, the study shows construction has a positive economic impact for all the alternatives. It is generally similar for Alternatives 1, 2, and 3, and somewhat less for Alternative 4. Long-term social impacts to neighborhoods of all alternatives is negative. Social impacts are incorporated within the Land Use Impacts category in Table 1. In terms of long-term economic impacts to businesses, Alternative 3 is upgraded from poor to good. This is due primarily to the addition of a right-in/right-out connection at the west end of Vintage Boulevard. The previous Alternative 3 contained a separation from Egan Drive at the west end of Vintage.
- According to the evaluation of constructability, all three interchange options are now considered poor due to similar complexity. Alternative 4, the at-grade option, is downgraded from good to fair.
- In terms of maintenance requirements, Alternatives 1 and 2 are downgraded to poor, consistent with Alternative 3. Alternative 4 is downgraded to fair.
- All the alternatives are considered fair from a design perspective as each will require the use of minimum design standards in certain places (as contrasted to desirable design standards) to reduce impacts in built-up areas. For example, the extension of Riverside Drive to Glacier Highway (North) will require the use of a minimum combination of horizontal radius and superelevation at the intersection to minimize impacts to adjacent properties.
- After a more thorough evaluation of right-of-way requirements, Alternatives 1 and 2 are now considered poor instead of fair, while Alternative 4 is downgraded from good to fair.

Table 6-1 Qualitative Evaluation of Four Most Viable Alternatives

Evaluation Criterion		Alternatives			
		#1	#2	#3	#4
Purpose and Need	**Traffic Considerations**				
	1. Safety	Good	Fair	Fair	Poor
	2. Emergency Vehicle Access and Circulation	Good	Good	Fair	Fair
	3. Traffic Operations (design year)	Good	Good	Good	Fair
	Delay on Egan Drive (veh-hr):				
	a.m. (Existing: 26, No-Build: 60)	7	10	10	71
	p.m. (Existing: 64, No-Build: 270)	13	14	14	160
	Delay systemwide (veh-hr):				
	a.m. (Existing: 79, No-Build: 270)	94	87	81	170
	p.m. (Existing: 200, No-Build:1700)	200	190	180	360
	4. Airport Access	Good	Good	Good	Fair
	5. Local Circulation	Good	Good	Fair	Fair
	Non-Motorized Users and Public Transit				
	6. Compatibility with Public Transportation	Good	Good	Good	Fair
	7. Compatibility with Pedestrians	Good	Good (Poor)	Good	Poor
	8. Compatibility with Bicyclists	Good	Good (Fair)	Good (Fair)	Poor
	Satisfies Purpose and Need?	**YES**	**YES**	**YES**	**YES**
Environmental and Planning					
9. Environmental Impacts		Poor	Poor (Fair)	Fair (Good)	Fair
	Wetlands (acres)	18*	16	12	3*
10. Consistency with Other Planning Efforts		Fair	Fair (Good)	Fair	Fair (Poor)
11. Compatibility with Built Environment		(Good)	(Fair)	(Poor)	(Good)
• Land Use Impacts		Good	Good	Fair	Fair
• Short-term Economic Impacts		Good	Good	Good	Good
• Long-term Economic Impacts		Good	Fair	Good	Good
Practical Considerations					
12. Constructability		Poor (Fair)	Poor (Fair)	Poor	Fair (Good)
13. Funding Feasibility		Poor	Poor	Fair	Good
14. Phased Implementation & Expandability		Fair	Fair	Poor	Good
15. Construction Costs		Poor	Poor	Fair	Good
Estimated Construction Cost (in millions)		$112	$109	$95	$46
16. Maintenance Requirements		Poor (Fair)	Poor (Fair)	Poor	Fair (Good)

Evaluation Criterion	Alternatives			
	#1	#2	#3	#4
Practical Considerations Cont.				
17. Satisfies Design Requirements	Fair (Good)	Fair	Fair	Fair (Poor)
18. Right-of-Way Requirements	Poor (Fair)	Poor (Fair)	Poor	Fair (Good)
Estimated Cost (in millions)	$12	$14	$12	$5

* Does not include James Boulevard extension.

DETAILS OF REFINED ANALYSES AND EVALUATIONS

The results of the analysis and the comparison to the Purpose and Need statements in Chapter 4 follow.

Alternative 1 (Figure 6-1 (Sheets 1 and 2))

No changes have been made to Alternative 1. The following is additional quantitative information.

Traffic Operations

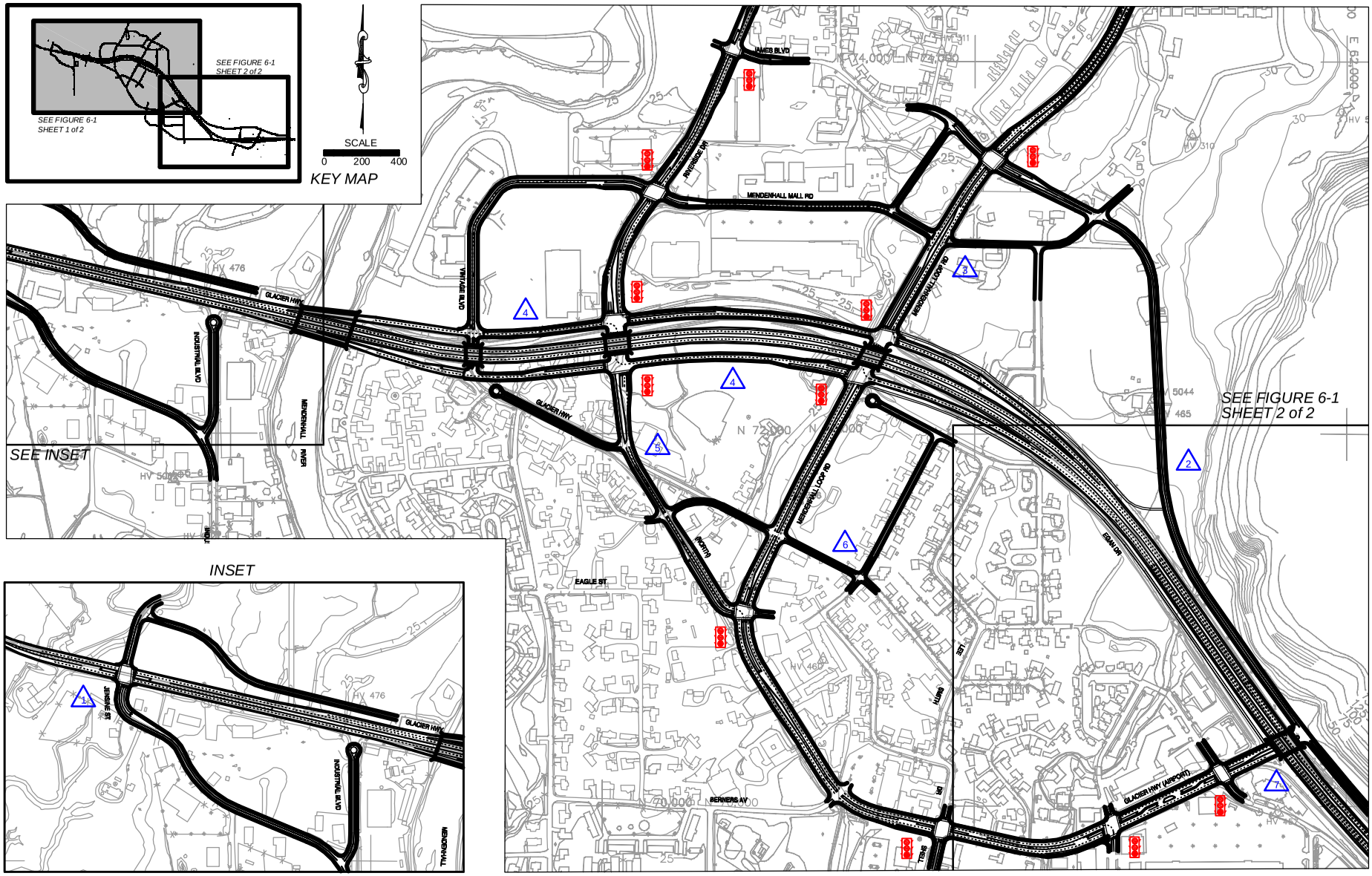
The situations noted in Appendix A are unchanged. All but one of the signalized intersections have been designed to operate at Level of Service (LOS) C or better and a volume-to-capacity ratio of 0.90 or better during both the a.m. and p.m. peak hours. The exception is James Boulevard/Mendenhall Loop Road, which is expected to operate at an acceptable LOS D and volume-to-capacity ratio of 0.81 during the p.m. peak.

All unsignalized intersections operate at LOS D or better except for Glacier Highway (Airport)/Berners Avenue, which operates at a LOS F during both the a.m. and p.m. peak due to side street delay. However, the northbound left-turn volume is light (less than 30 vehicles during either peak hour), and alternative routes to Glacier Highway are available.

System delay in terms of vehicles-hours for motorists traveling during the a.m. and p.m. peak hours also have been calculated. For Alternative 1, the overall system vehicular delay is estimated at 94 vehicle-hours during the a.m. peak and 200 vehicle-hours during the p.m. peak. These are 65% and 88% improvements, respectively, over the no-build alternative and only approximately 0% to 20% higher than existing conditions. Delay at intersections along Egan Drive is estimated at 7 vehicle-hours during the a.m. peak and 13 vehicle-hours during the p.m. peak, 88% and 95% improvements over the no-build alternative and substantially better than existing conditions.

Construction Costs/Environmental Impacts/ Right-of-Way Requirements/Maintenance

Alternative 1 is the most expensive alternative (estimated $112 million) and most difficult to build, for several reasons. The urban raised section of Egan Drive will require temporary retaining structures, roadways and connections to accommodate traffic during construction. These costs have not been calculated separately for this study, but are considered part of the contingency pending detailed design. The bridges across the Mendenhall River are complex as



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FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #1

FIGURE 6-1

West Egan Drive Corridor Study

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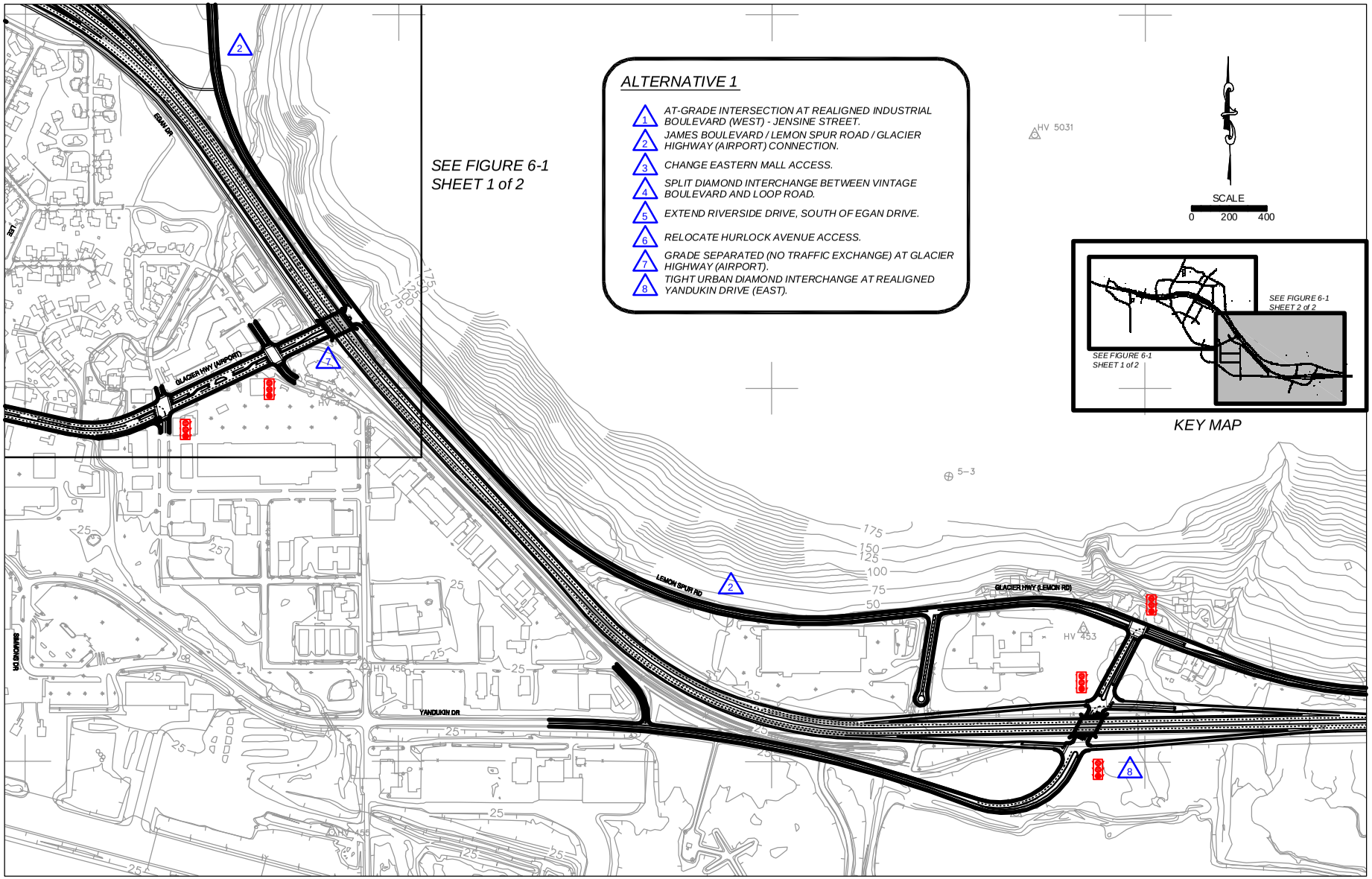

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FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #1

FIGURE 6-1

West Egan Drive Corridor Study

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they include both mainline spans and interchange ramps. The James Boulevard extension crosses sensitive wetlands. In fact, this alternative has the highest estimated value and number of wetlands (18 acres, not including the impacts of the James Boulevard extension). Duck and Jordan Creeks and upland habitat will be affected, as well as the potential for loss of high quality trees near the Duck Creek ponds.

Traffic maintenance will be complicated and extensive. Collection of stormwater is assumed with the urban section. This will constitute a point source of runoff that will require treatment not included in this study, most likely in the form of detention basins. More detailed work subsequent to this study will be required to identify costs and impacts. Land use impacts have not been further assessed since Chapter 5, so the ratings are not updated. Snow removal will be complicated by lack of a median between roadways, barriers, storm drain, retaining walls, structures and ramps. Right of way acquisition is extensive, estimated to be $12 million.

Alternative 1 is consistent with most existing plans, with the exception of its retention of Del Rae Road's connection to Mendenhall Loop Road.

As with all the three alternatives that call for a raised thoroughfare and higher speeds, the built environment will experience increases in noise and light levels. There also will be impacts on residences and church property. Environmental health will be affected, due to the increase of paved area that will cause rapid runoff of storm water. Remaining adjacent wetlands will be more vulnerable to direct deposit of road sand, chemicals and roadway pollutants unless buffer zones or other mitigation is provided.

Compatibility with Built Environment

Short-term (construction) impacts on the Juneau economy from this Alternative 1 are the most substantial of the four. It is estimated to generate more than $110.3 million in business income, 1,018 full-time equivalent jobs for one-year, and nearly $41.0 million in payroll.

This alternative also provided better connection for people traveling between business areas across Egan without having to travel on Egan Drive. Long-term socioeconomic impacts of this alternative include slight to moderate increases in drive-by traffic in the business areas of Vintage Park (10%); Glacier Highway/Airport (9%); Old Dairy Road (30%); and Fred Meyer (30%). Drive-by traffic in the Mendenhall Mall area is reduced slightly (-5%), and the effects to Industrial Boulevard would be negligible.

Negative impacts on neighborhood traffic are substantial. Traffic in the James Boulevard area will increase threefold, more than any other alternative. Glacier Highway North also receives a large increase in traffic. In addition, this alternative routes tourist and recreational traffic through neighborhood streets near Industrial Boulevard. The rerouting of access to Hurlock Avenue in this alternative has mixed impacts due to changing traffic patterns within the neighborhood.

Compliance with Purpose and Need

Table 6-2 summarizes the comparison of Alternative 1 to the project's Purpose and Need Statement.

Table 6-2 Alternative 1: Relationships to Purpose and Need

Purpose & Need Item	Description
Capacity and Level of Service o Minimize travel time and delay along and across Egan Drive for local and through trips.	o Grade separation of Egan Drive removes traffic signals for Egan Drive through traffic, virtually eliminating delay for those movements and reducing delay for other movements. o All signalized intersections along Egan Drive, including its interchanges, operate at LOS C or better and a volume-to-capacity ratio of 0.90 or better. Off Egan Drive, all signalized intersections operate at LOS C and a volume-to-capacity ratio of 0.90 or better, except for James Boulevard/Mendenhall Loop Road (LOS D during the p.m. peak hour). All key unsignalized intersections operate acceptably or do not warrant additional improvements. o Overall system vehicular delay is estimated at 94 vehicle-hours during the a.m. peak and 200 vehicle-hours during the p.m. peak, a 65% and 88% improvement, respectively, over the no-build alternative.
System Linkage o Provide non-Egan Drive local access to decrease delay for local trips within the study area.	o Local eastbound and westbound access are provided between the Fred Meyer area and the upper Mendenhall Valley via a Lemon Spur Road extension to Glacier Highway (Airport) and Mendenhall Loop Road. The road includes a sidewalk on the north side of the roadway and bicycle lanes. No access to Egan Drive at Glacier Highway (Airport). o Grade-separated crossings of Egan Drive are provided for pedestrians, bicyclists and vehicles at Vintage Boulevard, Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport) and Yandukin Drive. Signalized intersections at the interchange ramp terminals have shorter signal cycle lengths than the existing signalized intersections along Egan Drive, resulting in less delay to cross traffic. o A new Riverside Drive extension to Glacier Highway (North) provides access into the Glacier Highway (Airport) commercial area. However, access between Egan Drive and Glacier Highway (North) at the Egan Drive/Vintage Boulevard/Glacier Highway (North) intersection is removed. Local trips on Egan Drive between Mendenhall Loop Road and Riverside Drive are reduced.
Airport Access o Provide clear and direct access to Juneau Int'l Airport	o Airport access is signed for the full access interchange at Yandukin Drive; providing easy access to Downtown Juneau, and to the west out the road.
Safety o Implement improvements that address safety deficiencies at high accident locations	o Frequency and severity of accidents along Egan Drive would substantially decrease with grade-separated interchanges. In addition, the highest-speed through movements on Egan Drive are generally free of right-angle and signal-related conflicts. o Lemon Spur Road extension provides a fourth leg to the intersection of James Boulevard at Mendenhall Loop Road. With higher volumes there is a possibility of additional conflicts and a decrease of safety. o Traffic control at the Mendenhall Loop Road/Mendenhall Mall Road/Atlin Drive intersection becomes unsignalized right-in/right-out. This reduces the number of conflicts at the intersection and improves overall safety at this location as well as on Mendenhall Loop Road between Egan Drive and James Boulevard. o Sight distance constraints for the movements from Industrial Boulevard onto Egan Drive are eliminated through realignment and signalization; however, the new traffic signal at Jensine Street may increase rear-end accidents at this location. In addition, the interchange at Egan Drive/Yandukin Drive eliminates existing sight distance deficiencies.

Purpose & Need Item	Description
Pedestrian and Bicycle Facilities o Develop a transportation system that decreases the barrier effect of Egan Drive; and that provides safe pedestrian and bicycle facilities	o No sidewalks or bicycle lanes are provided along Egan Drive except across the Mendenhall River bridge. Sidewalks and bicycle lanes are provided along the frontage roads parallel to Egan Drive. Multi-use paths connect the frontage roads to the Lemon Spur extension and Glacier Highway (McNugget). o Sidewalks and bicycle lanes are provided on all other improved roads. o There are five grade-separated crossings of Egan Drive for pedestrians and bicyclists: Vintage Boulevard, Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport) and Yandukin Drive. The signalized intersections at the interchange ramp terminals have shorter signal cycle lengths than those currently along Egan Drive, resulting in less delay to pedestrians and bicyclists. o The Egan Drive intersection crossings are narrower than current conditions; however pedestrians/bicyclists will have to cross two intersections to cross Egan Drive.

Alternative 2 (Figure 6-2 (Sheets 1 and 2))

The westbound only link between the intersection of Glacier Highway (McNugget)/Lemon Spur Road Extension and Mendenhall Road and Riverside Drive has been modified in Alternative 2. Specific descriptions follow.

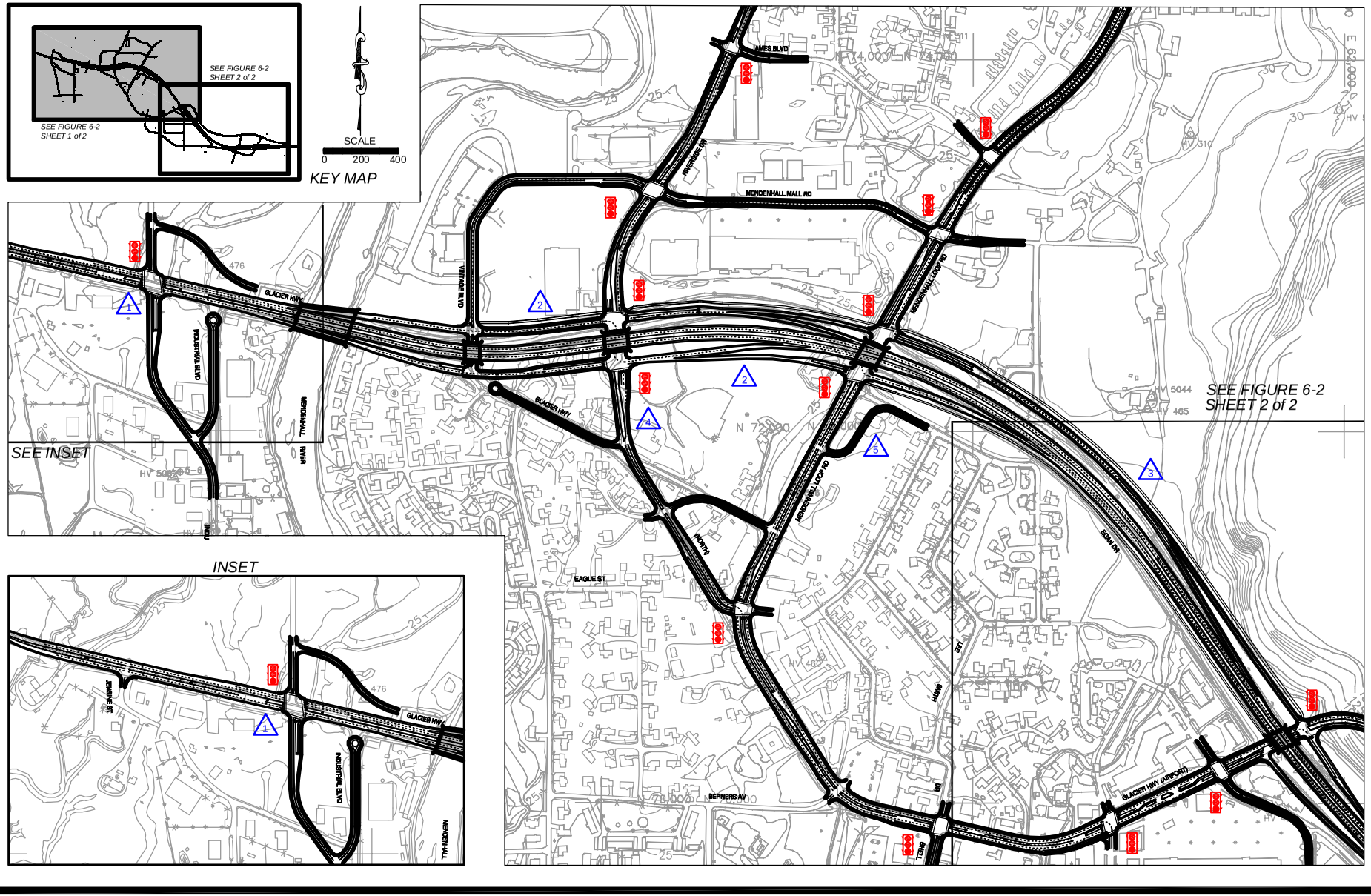
Traffic Operations

The revisions to Alternative 2 have the following effect on these criteria:

- The Egan Drive/Mendenhall Loop South Ramp intersection is improved by the alternative access to westbound Egan Drive via Glacier Highway (Airport).
- A traffic signal at the Egan Drive/Glacier Highway (Airport) north ramp intersection is added, due to the new westbound connection to Mendenhall Loop Road.
- Motorists accessing westbound Egan Drive from the Vintage Boulevard on-ramp and traveling to southbound Industrial Boulevard have a very short distance in which to cross two high-speed Egan Drive through lanes.

All but one of the signalized intersections in Alternative 2 operate at LOS C or better and a volume-to-capacity ratio of 0.90 or better during both the a.m. and p.m. peak hours. The exception is Egan Drive North Ramps/Mendenhall Loop Road, which is expected to operate at LOS C and a volume-to-capacity ratio of 0.92 during the p.m. peak hour.

The unsignalized Glacier Highway (Airport)/Berners Avenue intersection operates at a LOS F during both the a.m. and p.m. peak due to side street delay, while the unsignalized Egan Drive/Vintage Boulevard North Ramp and Glacier Highway (North)/Del Rae Road intersections operate at a LOS E during the p.m. peak. All three have alternative signalized access or have volumes too low to warrant improvements.



FUNCTIONAL DESIGN LAYOUT
ALTERNATIVE #2

West Egan Drive Corridor Study

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FIGURE 6-2

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West Egan Drive
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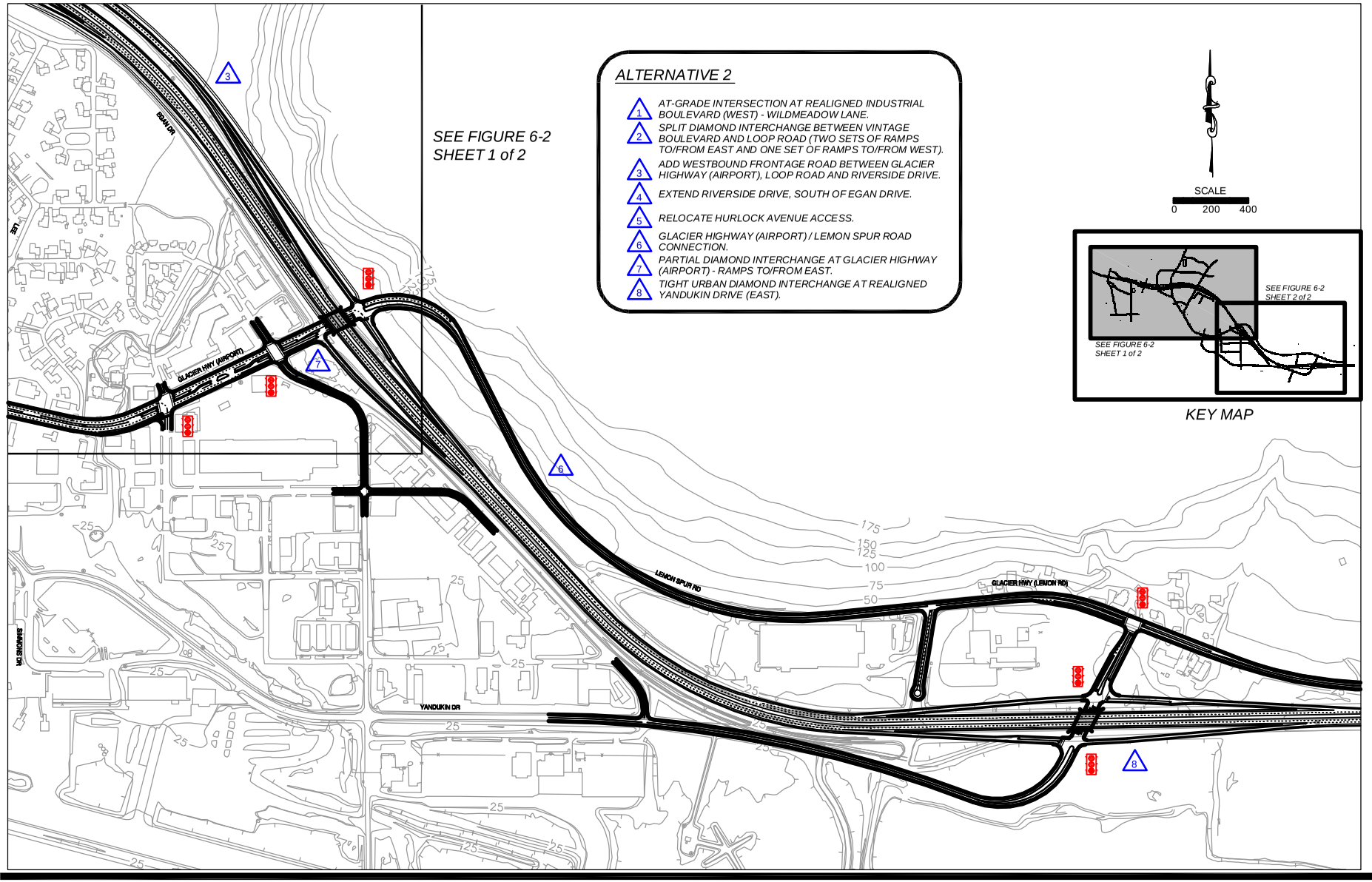

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FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #2

FIGURE 6-2

West Egan Drive Corridor Study

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Overall system vehicular delay is estimated at 87 vehicle-hours during the a.m. peak and 190 vehicle-hours during the p.m. peak, 68% and 89% improvements, over the no-build alternative and within 10% of existing conditions. In addition, delay at intersections along Egan Drive is estimated at 10 vehicle-hours during the a.m. peak and 14 vehicle-hours during the p.m. peak, 83% and 95% improvements, over the no-build alternative and substantially better than existing conditions.

Construction Costs/Environmental Impacts/ Right-of-Way Requirements/Maintenance

It will be difficult to build this alternative for several reasons. The urban raised section of Egan Drive will require temporary retaining structures, roadways and connections to accommodate traffic during construction. These costs have not been calculated separately for this study, but are considered part of the contingency pending detailed design. The bridges across the Mendenhall River include both mainline spans and interchange ramps. Traffic maintenance during construction will be extensive. While Alternative 2 is the second most expensive at $109 million, it is essentially equivalent to the estimated $112 million for Alternative 1. Collection of stormwater is assumed with the urban section. This will constitute a point source of runoff that will require treatment not included in this study, most likely in the form of detention basins. More detailed work subsequent to this study will be required to identify costs and impacts. Land use impacts have not been further assessed since Chapter 5, so the ratings are not updated. Snow removal is complicated by lack of a median between roadways, barriers, storm drain, retaining walls, structures and ramps. Right of way acquisition for Alternative 2 is the most extensive of the four at an estimated cost of $14 million.

This alternative has the second highest amount of wetland habitat loss, with an estimated impact of 16 acres of documented wetland. Duck and Jordan Creeks are affected.

Alternative 2 is consistent with most existing plans, with the exception of its retention of Del Rae Road's connection to Mendenhall Loop Road.

As with all three alternatives that involve interchanges, a raised thoroughfare and high speed traffic, the built environment is affected by an increase in noise and light levels. Even though Alternative 2 improves access at Industrial Blvd., there still are some localized commercial impacts. There also are negative affects on some residences and church property. This alternative also affects the recreational Skate Park along Mendenhall Loop Road. While it does not appear to affect the skate park structure, some parking areas may be impacted. Environmental health will be affected, due to the increase of paved area that will cause rapid runoff of storm water. Remaining adjacent wetlands will be more vulnerable to direct deposit of road sand, chemicals and roadway pollutants unless buffer zones or other mitigation is provided. Collection of stormwater will be required with the urban section. This will constitute a point source of runoff that will require treatment, most likely in the form of detention basins.

Compatibility with Built Environment

Short-term impacts on the Juneau economy from construction are expected to generate nearly $101.2 million in business income, 934 full-time equivalent jobs for one year, and more than $37.5 million in payroll.

Although Alternative 2 provides connectivity for motorists doing business in the corridor without having to use Egan Drive, the connections are not as direct as in Alternatives 1 and 4. Long-term socioeconomic impacts of this alternative include slight increases in drive-by traffic in the Vintage Park area (10%), and the Glacier Highway/Airport area (10%). Drive-by traffic drops in the Old Dairy Road area (-10%), and the Fred Meyer area (-5%). Effects to the Mendenhall Mall and Industrial Boulevard areas would be negligible.

The James Boulevard area neighborhoods receive the least increase in traffic (50%) under this alternative. Glacier Highway (North) also receives a large increase in traffic. In addition, this alternative routes tourist and recreational traffic through neighborhood streets near Industrial Boulevard.

Summary of Compliance with Purpose and Need

Table 6-3 summarizes the relationship between Alternative 2 and the project's Purpose and Need Statement.

Table 6-3 Alternative 2: Relationships to Purpose and Need

Purpose & Need Item	Description
Capacity and Level of Service o Minimize travel time and delay along and across Egan Drive for local and through trips.	o Grade separation of Egan Drive removes traffic signals for Egan Drive through traffic, virtually eliminating delay for those movements and reducing delay for other movements. o All signalized intersections along Egan Drive, including its interchanges, operate at LOS C or better and a volume-to-capacity ratio of 0.90 or better, except for Egan Drive North Ramps/Mendenhall Loop Road (LOS C and 0.92, respectively, during the p.m. peak hour). Off Egan Drive, all signalized intersections operate at LOS C and a volume-to-capacity ratio of 0.90 or better. All key unsignalized intersections operate acceptably or do not warrant additional improvements. o Overall system vehicular delay is estimated at 87 vehicle-hours during the a.m. peak and 190 hours during the p.m. peak, 68% and 89% improvements, over the no-build alternative.
System Linkage o Provide non-Egan Drive local access to decrease delay for local trips within the study area.	o Local eastbound and westbound access is provided via a Lemon Spur Road extension to Glacier Highway (Airport). From Glacier Highway (Airport) to the west, westbound only access is provided. o Lemon Spur extension continues with westbound only access to the Mendenhall Loop Road/Egan Drive North Ramp Terminal Intersection. This reduces local trips on Egan from Fred Meyer or the Glacier Highway (Airport) commercial area. o Grade-separated crossings of Egan Drive are provided for pedestrians, bicyclists and vehicles at Vintage Boulevard, Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport), and Yandukin Drive. Signalized intersections at the interchange ramp terminals have shorter signal cycle lengths than current signalized intersections along Egan Drive causing less delay to cross traffic. o A new Riverside Drive extension to Glacier Highway (North) provides access into the Glacier Highway (Airport) commercial area from the west side of the Valley without using Egan Drive. However, access between Egan Drive and Glacier Highway (North) at the Egan Drive/Vintage Boulevard/Glacier Highway (North) intersection is removed.
Airport Access o Provide clear and direct access to Juneau International Airport	o Airport access is signed for the full access interchange at Yandukin Drive; providing easy access to Downtown Juneau, and to the west out the road.
Safety o Implement improvements that address safety deficiencies at high accident locations	o Frequency and severity of accidents along Egan Drive would substantially decrease with grade-separated interchanges. In addition, the highest-speed through movements on Egan Drive are generally free of right-angle and signal-related conflicts. o Sight distance constraints for the movements from Industrial Boulevard onto Egan Drive are eliminated through realignment and signalization; however, the new traffic signal at Jensine Street may increase rear-end accidents at this location. In addition, the interchange at Egan Drive/Yandukin Drive eliminates existing sight distance deficiencies. o The signalized Mendenhall Loop Road/Mendenhall Mall Road/Atlin Drive intersection is improved.

Purpose & Need Item	Description
Safety Cont.	o Motorists accessing westbound Egan Drive from the Vintage Boulevard on-ramp and traveling to southbound Industrial Boulevard will have a very short distance in which to cross two high-speed Egan Drive through lanes.
Pedestrian and Bicycle Facilities o Develop a transportation system that decreases the barrier effect of Egan Drive; and that provides safe pedestrian and bicycle facilities	o No sidewalks or bicycle lanes are provided along Egan Drive except across the Mendenhall River bridge. Multi-use paths run along the north side of Egan Drive between Vintage Boulevard and Glacier Highway (McNugget) and along the south side between Mendenhall Loop Road Glacier Highway (McNugget). o Sidewalks and bicycle lanes are provided on all other improved roads. o There are five grade-separated crossings of Egan Drive for pedestrians and bicyclists: Vintage Boulevard, Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport), and Yandukin Drive. The signalized intersections at the interchange ramp terminals have shorter signal cycle lengths than current signalized intersections along Egan Drive, causing less delay to pedestrians and bicyclists. o The Egan Drive intersection crossings are narrower than current conditions; however pedestrians/bicyclists will have to cross two intersections to cross Egan Drive.

Alternative 3 (Figure 6-3 (Sheets 1 and 2))

This alternative has been modified to include a right-in-right-out connection between Vintage Boulevard and the westbound ramp connecting Riverside Drive to Egan Drive. The westbound only connection between Mendenhall Loop Road and Riverside Drive is eliminated.

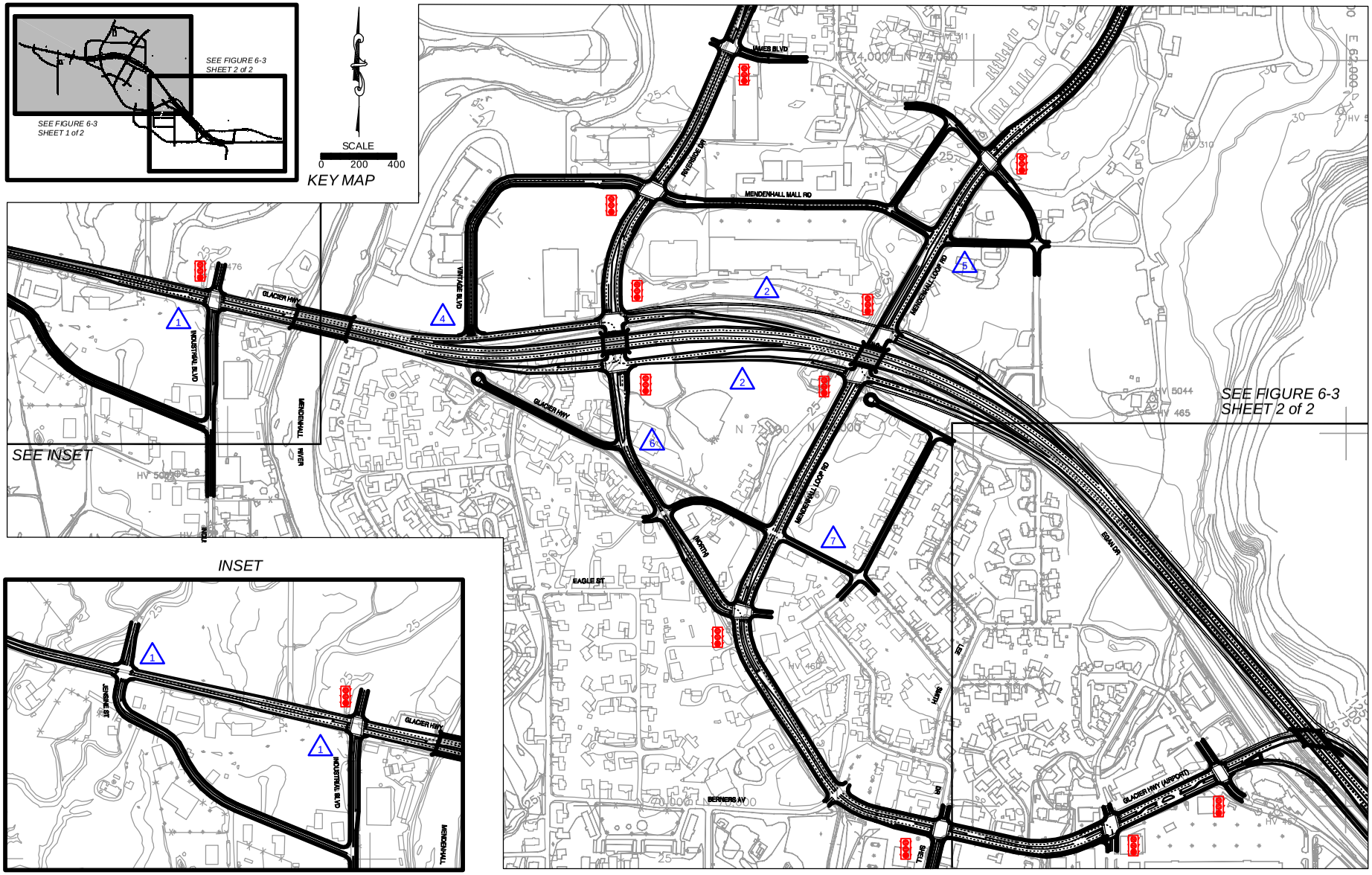
Traffic Operations

Operations at the Egan Drive/Mendenhall Loop North Ramp intersection are improved by eliminating the westbound connection from Mendenhall Loop Road to Riverside Drive. This eliminates the right turn from southbound Mendenhall Loop Road to westbound Egan Drive, as well as the left turn from northbound Mendenhall Loop Road to westbound Egan Drive. There is only one northbound left-turn lane at the Riverside Drive/Vintage Boulevard/Mendenhall Mall Road intersection.

All signalized intersections in Alternative 3 operate at a LOS C or better and a volume-to-capacity ratio of 0.90 or better during both the a.m. and p.m. peak.

The unsignalized Glacier Highway (Airport)/Berners Avenue and Glacier Highway/Jensine Street intersections operate at a LOS F during both the a.m. and p.m. peak, due to side street delay. Motorists have alternative access via nearby signalized intersections. The unsignalized Egan Glacier Highway (north)/Del Rae Road intersection operates at a LOS F during the p.m. peak due to side street delay but does not warrant additional improvements due to low side street traffic volumes.

Overall system vehicular delay is estimated at 81 vehicle-hours during the a.m. peak and 180 hours during the p.m. peak, 70% and 89% improvements over the no-build alternative and within 10% of existing conditions. In addition, delay at intersections along Egan Drive is estimated at 10



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FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #3

FIGURE 6-3

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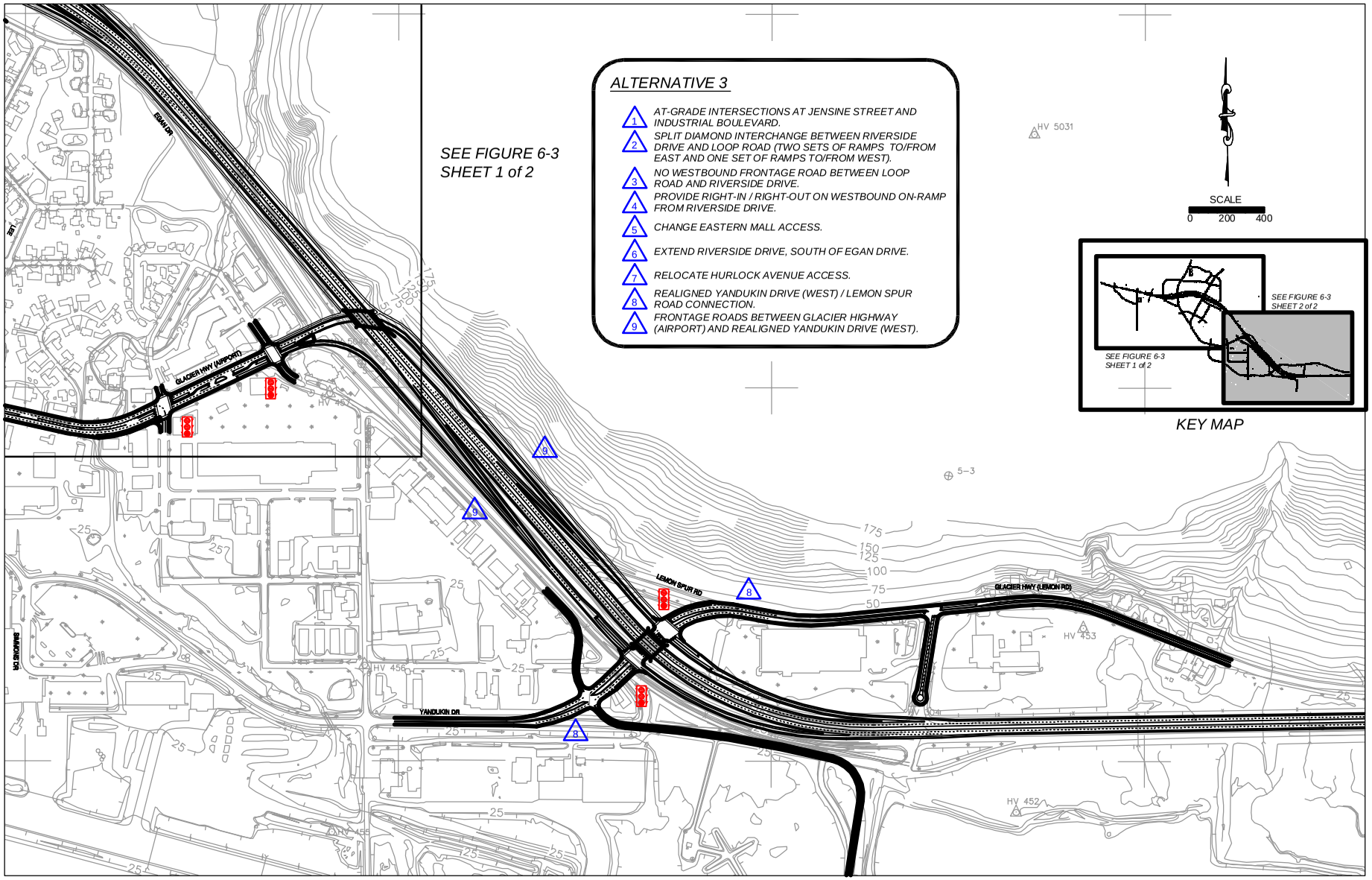

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FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #3

FIGURE 6-3

West Egan Drive Corridor Study

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vehicle-hours during the a.m. peak and 14 vehicle-hours during the p.m. peak, 83% and 95% improvements over the no-build alternative and substantially better than existing conditions.

Construction Costs/Environmental Impacts/ Right-of-Way Requirements/Maintenance

Alternative 3 is the simplest of all the interchange systems to build, though nevertheless difficult. The urban raised section of Egan Drive will require temporary retaining structures, roadways and connections to accommodate traffic during construction. These costs have not been calculated separately for this study, but are considered part of the contingency pending detailed design. The bridges across the Mendenhall River are less complex in this alternative, as they consist only of mainline spans and no interchange ramps. Alternative 3 is ranked third in expense at an estimated $95 million, mainly due to the less extensive structures, especially across the Mendenhall River. Collection of stormwater is assumed with the urban section. This will constitute a point source of runoff that will require treatment not included in this study, most likely in the form of detention basins. More detailed work subsequent to this study will be required to identify costs and impacts. Land use impacts have not been further assessed since Chapter 5, so the ratings are not updated. Snow removal is complicated by lack of a median between roadways, barriers, storm drain, retaining walls, structures and ramps. Right of way acquisition is extensive, at an estimated cost of $12 million.

This alternative has the least amount of estimated wetland impact, 12 acres. It is expected to remain as the lowest even when wetlands currently not accounted for are documented. Duck Creek would be affected. Impacts to Jordan Creek are minimal.

Alternative 3 is consistent with most existing plans, with the exception of its retention of Del Rae Road's connection to Mendenhall Loop Road.

As with all interchange alternatives, the built environment will be affected by an increase in noise and light levels, due to the raised thoroughfare and high-speed traffic. Some residences and church property will be affected. Environmental health will be affected, due to the increase of paved area that will cause rapid runoff of storm water. Remaining adjacent wetlands will be more vulnerable to direct deposit of road sand, chemicals and roadway pollutants unless buffer zones or other mitigation is provided.

Compatibility with Built Environment

Short-term (construction) economic impacts on the Juneau economy from Alternative 3 include more than $90.5 million in business income, 546 full-time equivalent jobs for one-year, and over $33.5 million in payroll.

Alternative 3 slightly improves connectivity between corridor business areas compared to the no-build alternative. Long-term socioeconomic impacts of this alternative include increases in drive-by traffic in the Mendenhall Mall area (6%), the Glacier Highway/Airport area (4%), and the Old Dairy Road area (6%). Drive-by traffic in the Fred Meyer area increases substantially by 150%. Effects to the Industrial Boulevard and Vintage Park areas would be negligible.

Social impacts from Alternative 3 include large increases in traffic in the James Boulevard area neighborhoods (200%) and the Glacier Highway North area neighborhoods (200%). The alternative also disperses traffic in the Industrial Boulevard area by providing two major points

of access to Glacier Highway. The rerouting of access to Hurlock Avenue in this alternative has mixed impacts due to changing traffic patterns within the neighborhood.

Summary of Compliance with Purpose and Need

Table 6-4 summarizes the relationship between Alternative 3 and the project Purpose and Need Statement.

Table 6-4 Alternative 3: Relationships to Purpose and Need

Purpose & Need Item	Description
Capacity and Level of Service o Minimize travel time and delay along and across Egan Drive for local and through trips.	o Grade separation of Egan Drive removes traffic signals for Egan Drive through traffic, virtually eliminating delay for those movements and reducing delay for other movements. o All signalized intersections along and off Egan Drive, including its interchanges, operate at LOS C or better and a volume-to-capacity ratio of 0.90 or better. All key unsignalized intersections operate acceptably or do not warrant additional improvements. o Overall system vehicular delay is estimated at 81 vehicle-hours during the a.m. peak and 180 hours during the p.m. peak, 70% and 89% improvements, over the no-build alternative.
System Linkage o Provide non-Egan Drive local access to decrease delay for local trips within the study area.	o Local access off Egan Drive eastbound and westbound is provided along frontage roads between Yandukin Drive/Lemon Spur Road to Glacier Highway (Airport). o Glacier Highway (Airport) provides only eastbound access to Egan Drive, via a frontage road to Yandukin. o Motorists traveling between the Valley and Fred Meyer use Egan Drive or Glacier Highway (Airport). o Grade-separated crossings of Egan Drive for pedestrians, bicyclists and vehicles are provided at Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport), and Yandukin Drive. Signalized intersections at interchange ramp terminals have shorter signal cycle lengths than current signalized intersections along Egan Drive, causing less delay to cross traffic. o A new Riverside Drive extension to Glacier Highway (North) provides access into the Glacier Highway (Airport) commercial area. Access between Egan Drive and Glacier Highway (North) at the Egan Drive/Vintage Boulevard/Glacier Highway (North) intersection is removed. Local trips on Egan Drive between Mendenhall Loop Road and Riverside Drive are reduced.
Airport Access o Provide clear and direct access to Juneau International Airport	o Airport access is signed for the full access interchange at Yandukin Drive; providing easy access to Downtown Juneau, and to the west out the road.
Safety o Implement improvements that address safety deficiencies at high accident locations	o Frequency and severity of accidents along Egan Drive would substantially decrease with grade-separated interchanges. In addition, the highest-speed through movements on Egan Drive will be generally free of right-angle and signal-related conflicts. Removal of access at the Egan Drive/Glacier Highway (Airport) overpass greatly improves safety at that intersection. o Traffic control at the Mendenhall Loop Road/Mendenhall Mall road intersection is an unsignalized right-in/right-out access point. This reduces the number of conflicts at the intersection and improves overall safety, specifically on Mendenhall Loop Road between Egan Drive and James Boulevard.

Purpose & Need Item	Description
Safety Cont.	o Sight distance constraints for the movements from Industrial Boulevard onto Egan Drive are eliminated through realignment and signalization; however, the new traffic signal at Jensine Street may increase rear-end accidents at this location. In addition, the interchange at Egan Drive/Yandukin Drive eliminates existing sight distance deficiencies.
Pedestrian and Bicycle Facilities o Develop a transportation system that decreases the barrier effect of Egan Drive; and that provides safe pedestrian and bicycle facilities	o No sidewalks or bicycle lanes are provided along Egan Drive except across the Mendenhall River bridge. Multi-use paths run along the north side of Egan Drive between Riverside Drive and Glacier Highway (McNugget) and along the south side between Mendenhall Loop Road and Glacier Highway (McNugget). In addition, a there is a multi-use path connection passing under Egan Drive at Glacier Highway (McNugget). o Sidewalks and bicycle lanes are provided on all other improved roads. o A separate multi-use path is a pedestrian and bicycle connection between Lemon Spur Road and Mendenhall Mall on the north side of Egan Drive. o There are four grade-separated crossings of Egan Drive for pedestrians and bicyclists at Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport) and Yandukin Drive. o The signalized intersections at interchange ramp terminals have shorter signal cycle lengths than the existing signalized intersections along Egan Drive, causing less delay to pedestrians and bicyclists; however, people will have to cross two intersections instead of one.

Alternative 4 (Figure 6-4 (Sheets 1 and 2))

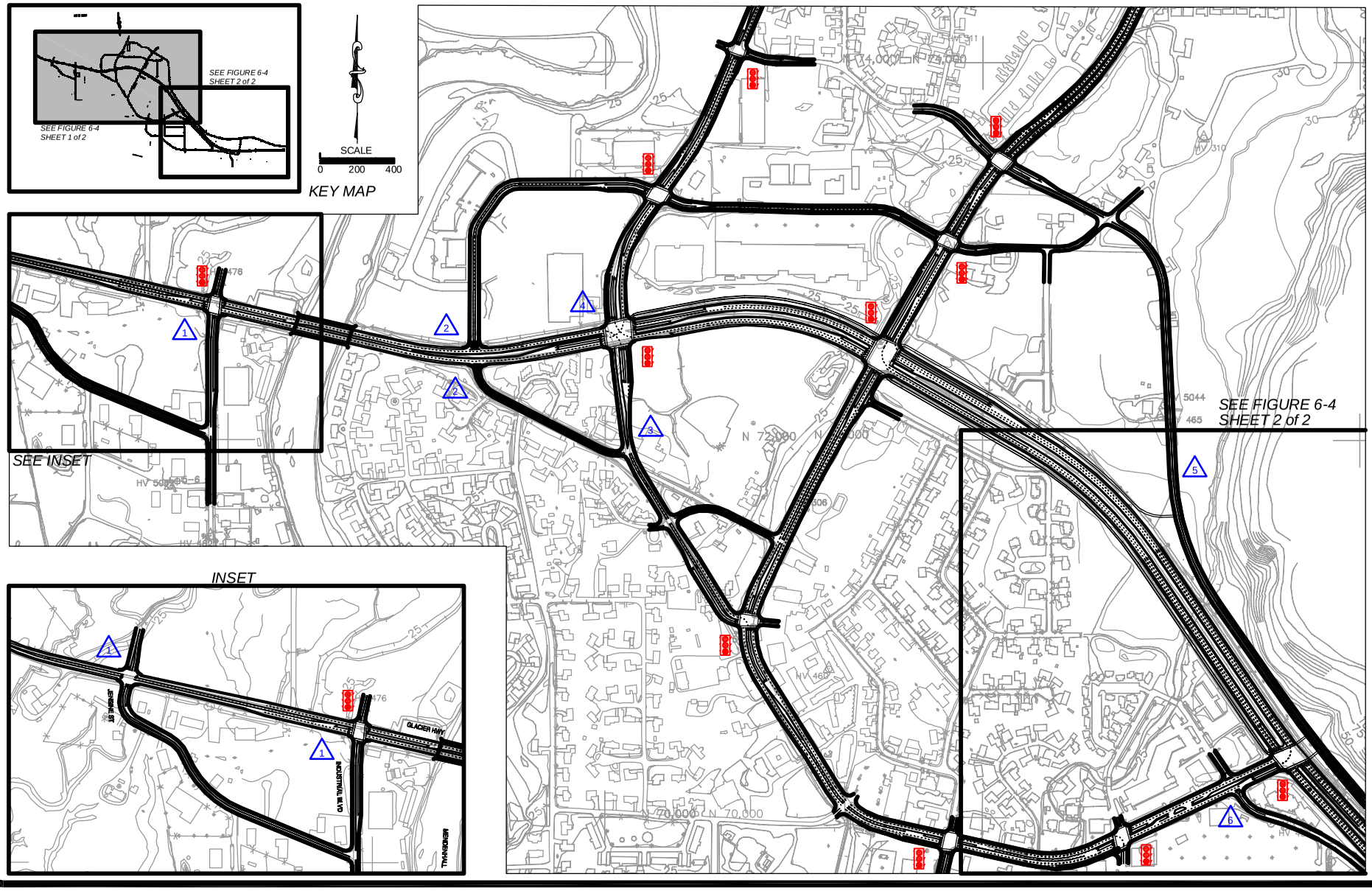
No changes have been made to the Alternative 4 configuration. The following is additional quantitative information.

Traffic Operations

The information included in Appendix A is unchanged. All but four signalized intersections have been designed to operate at Level of Service (LOS) C or better and a volume-to-capacity ratio of 0.90 or better during both the a.m. and p.m. peak hours. The intersections of Egan Drive/Mendenhall Loop Road, James Boulevard/Mendenhall Loop Road, and Glacier Highway (Airport)/Jordan Avenue will operate at LOS D. The intersection of Egan Drive/Riverside Drive will operate at LOS E and a volume-to-capacity ratio of 0.74 during the p.m. peak hour.

The unsignalized Glacier Highway (Airport)/Berners Avenue intersection operates at LOS E during the a.m. peak and at LOS F during p.m. peak, due to side street delay. The unsignalized Glacier Highway/Jensine Street intersection operates at LOS F, during both the a.m. and p.m. peaks. Northbound vehicles going through or turning left will be delayed more than the optimum. Both intersections have alternate signalized access available.

Overall system vehicular delay is estimated at 170 vehicle-hours during the a.m. peak and 360 hours during the p.m. peak, 37% and 79% improvements over the no-build alternative but approximately twice the delay experienced today. Delay at intersections along Egan Drive is estimated at 71 vehicle-hours during the a.m. peak and 164 vehicle-hours during the p.m. peak, 18% **increase** and 40% decrease over the no-build alternative. The increase in delay along Egan Drive during the a.m. peak hour is due primarily to the addition of signalized intersections that



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FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #4

FIGURE 6-4

West Egan Drive Corridor Study

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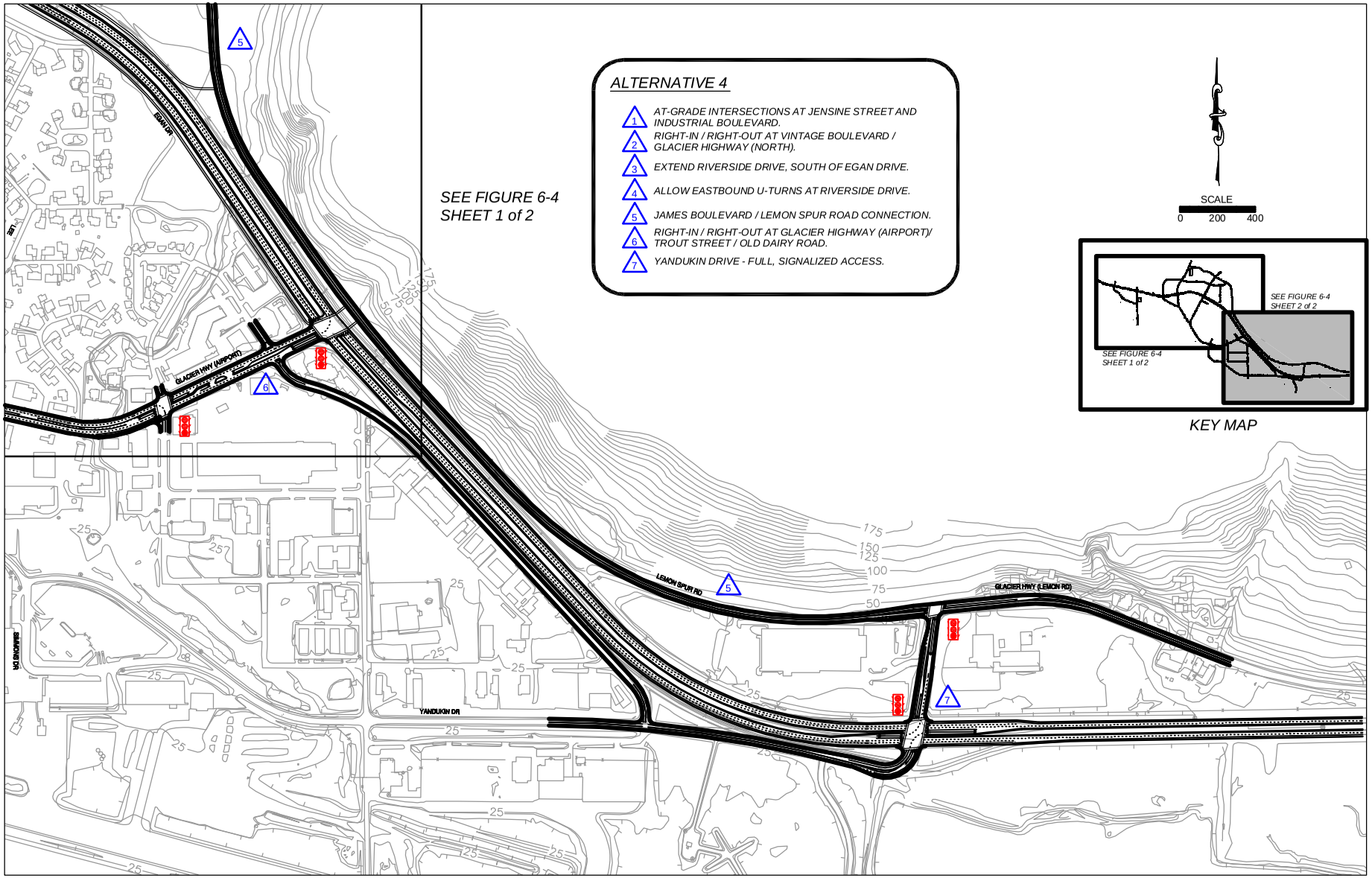

FUNCTIONAL DESIGN LAYOUT ALTERNATIVE #4

FIGURE 6-4

West Egan Drive Corridor Study

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impede through traffic. Under the no-build alternative, Egan Drive traffic is free-flowing at the Industrial Boulevard and Yandukin Drive intersections. Delay along Egan Drive under this alternative is expected to be approximately three times as great as that experienced today.

Construction Costs/Environmental Impacts/ Right-of-Way Requirements/Maintenance

The at-grade Alternative 4 is substantially simpler to build compared to the three interchange options. It also is the least expensive, $46 million. There are fewer unanticipated costs and impacts. Due to the addition of more lanes, maintenance of this alternative will be substantially higher than the current situation, but less than for the interchange options. Snow removal is greatly simplified, with a median between roadways and adequate outside slopes that allow plowing directly off the roadway. Right of way impact, at an estimated $5 million, is the least of all the alternatives.

Alternate 4 has the least amount of wetland impact at 3 acres, as it has the smallest footprint outside of existing right-of-way. This does not include the impacts of the James Boulevard extension.

This alternative is consistent with most existing plans, with the exception of the Area-Wide Transportation Plan (AWTP), that calls for raised intersections where warranted but not defined, and its retention of Del Rae Road's connection to Mendenhall Loop Road. The assumption is made that the existing trail/non-motorized transportation paths would be returned to their existing conditions or improved. Therefore, the planned Under Thunder Trail along Jordan Creek is assumed to be compatible with this alternative.

Due to the increase in signalization along Egan Drive, there is potential for air quality impacts. Additional analyses are needed in order to ascertain whether attainment of EPA standards would be achieved. Alternative 4 has the least direct impact to residences and church property. Rapid stormwater runoff will increase over the existing due to more paved surface. Along Egan, runoff can be handled without a collection system. Direct runoff into sensitive wetlands could require mitigation, and will be determined during environmental documentation subsequent to this study, if this alternative is advanced.

Compatibility with Built Environment

The short-term (construction) impacts on the Juneau economy are the least for this alternative, including nearly $35.5 million in business income, 327 full-time equivalent jobs for one-year, duration, and more than $13.1 million in payroll.

Even without the connection of Lemon Spur Road extension at McNugget found in other alternatives, Alternative 4 still provides good connections between business areas in the corridor without having to use Egan Drive. Long-term socioeconomic impacts of this alternative include slight increases in drive-by traffic in the Vintage Park area (5%), the Glacier Highway/Airport area (3%), and the Old Dairy Road area (4%). Drive-by traffic in the Fred Meyer area is substantially increased (90%) under this alternative. Effects to the Mendenhall Mall and Industrial Boulevard areas would be negligible.

Social impacts from Alternative 4 include large increases in traffic in the James Boulevard area neighborhoods (150%) and the Glacier Highway North area neighborhoods (80%). This is the only alternative that does not include a rerouting of access to the Hurlock Avenue area, and consequently the only one that has no impact on the associated neighborhoods. The alternative also disperses traffic in the Industrial Boulevard area by providing two major points of access to Glacier Highway.

Summary of Compliance with Purpose and Need

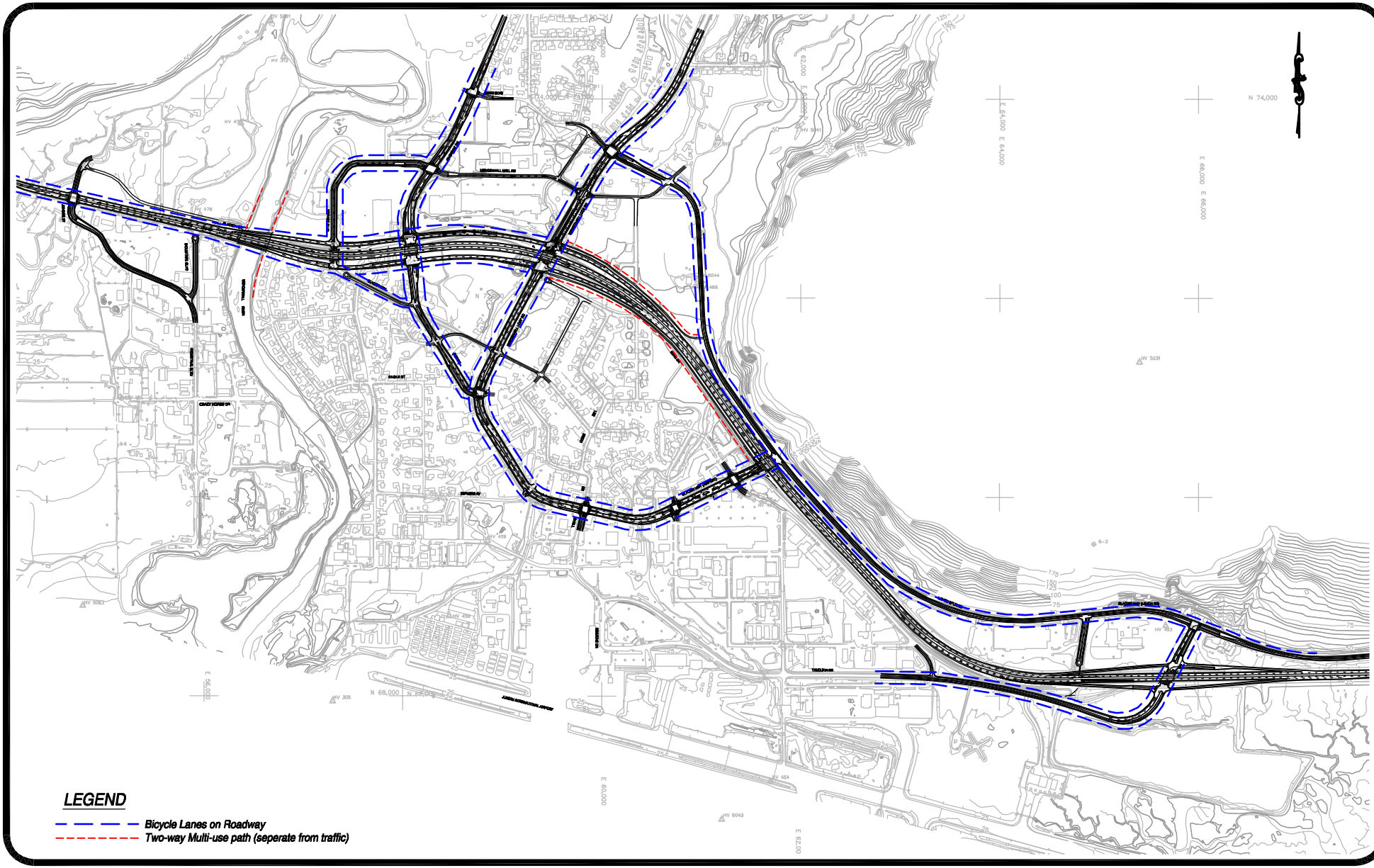
Table 6-5 summarizes the relationship between Alternative 4 and the project purpose and need statement.

Figures 6-5 through 6-8 show the pedestrian and bicycle facilities for Alternatives 1 through 4.

Table 6-5 Alternative 4: Relationships to Purpose and Need

Purpose & Need Item	Description
Capacity and Level of Service o Minimize travel time and delay along and across Egan Drive for local and through trips.	o During the a.m. peak, two signalized intersections operate a LOS D. The rest operate at a LOS C or better. During the p.m. peak, two signalized intersections (Glacier Highway/Industrial Boulevard, Egan Drive/Riverside Drive) operate at a LOS E. Three signalized intersections are at LOS D. The remaining signalized intersections are LOS C or better. o All signalized intersections along Egan Drive operate at LOS C or better, except for the intersections with Mendenhall Loop Road (LOS D during both the a.m. and p.m. peak hours) and Riverside Drive (LOS D during the a.m. peak hour and LOS E during the p.m. peak hour). Off Egan Drive, all signalized intersections operate at LOS C or better, except for James Boulevard/Mendenhall Loop Road (LOS D during the p.m. peak hour) and Glacier Highway (Airport)/Jordan Avenue (LOS D during the p.m. peak hour). The additional delay is primarily due to long signal cycle lengths required at the enlarged intersections. All key unsignalized intersections operate acceptably or do not warrant additional improvements. o Estimated overall system vehicular delay is 170 vehicle-hours during the a.m. peak and 360 hours during the p.m. peak, 37% and 79% improvements over the no-build alternative. o Egan Drive through traffic will experience an 18% increase in delay during the a.m. peak hour and a 40% decrease in delay during the p.m. peak hour as compared to the no-build alternative.
System Linkage o Provide non-Egan Drive local access to decrease delay for local trips within the study area.	o Provides local eastbound and westbound access between the Fred Meyer area and the Mendenhall Valley via extension of Lemon Spur Road to Mendenhall Loop Road at James Boulevard. With no access to the extension at Glacier Highway (Airport), there may continue to be some local trips on Egan Drive between Glacier Highway (Airport) and Mendenhall Loop Road. o Includes at-grade crossings of Egan Drive for pedestrians, bicyclists and vehicles at Riverside Drive, Mendenhall Loop Road, and Yandukin Drive. o Adds Riverside Drive extension to Glacier Highway (North), thus providing access into the Glacier Highway (Airport) commercial area. Reduces local trips on Egan Drive between Mendenhall Loop Road and Egan Drive,
Airport Access o Provide clear and direct access to Juneau International Airport	o Airport access is signed for the full access interchange at Yandukin Drive; providing easy access to Downtown Juneau, and to the west out the road.
Safety o Implement improvements that address safety deficiencies at high accident locations	o Existing signalized intersections on Egan drive are widened and have longer cycle lengths. Intersection expansions do not help reduce frequency and severity of accidents along Egan Drive. Longer cycle lengths may cause more “red light running” and adversely affect safety. o Two signalized intersections (Yandukin Drive and Industrial Boulevard) are added. While this may reduce angle accidents, overall safety may be decreased due to more rear-end accidents and accidents from failure to obey the signals. o Lemon Spur Road extension introduces a fourth leg to the intersection of James Boulevard at Mendenhall Loop Road. With higher traffic volumes and relatively more conflicts, safety at the intersection may decrease.

Purpose & Need Item	Description
Safety Cont.	o Signals at Yandukin Drive and Industrial Boulevard intersections with Egan Drive will eliminate sight distance deficiencies.
Pedestrian and Bicycle Facilities o Develop a transportation system that decreases the barrier effect of Egan Drive; and that provides safe pedestrian and bicycle facilities	o No sidewalks or bicycle lanes are provided along Egan Drive except from Riverside Drive to and across the Mendenhall River bridge. Multi-use paths run along the north side of Egan Drive between Vintage Boulevard and a connection to the Lemon Spur extension and along the south side between Mendenhall Loop Road and Glacier Highway (McNugget). o Sidewalks and bicycle lanes are provided on all other improved roads. o All crossings of Egan Drive for pedestrians and bicyclists are at grade. Widened Egan Drive will increase barrier effect on pedestrians and bicyclists.



West Egan Drive
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PEDESTRIAN / BICYCLE FACILITIES ALTERNATIVE #1

FIGURE 6-5

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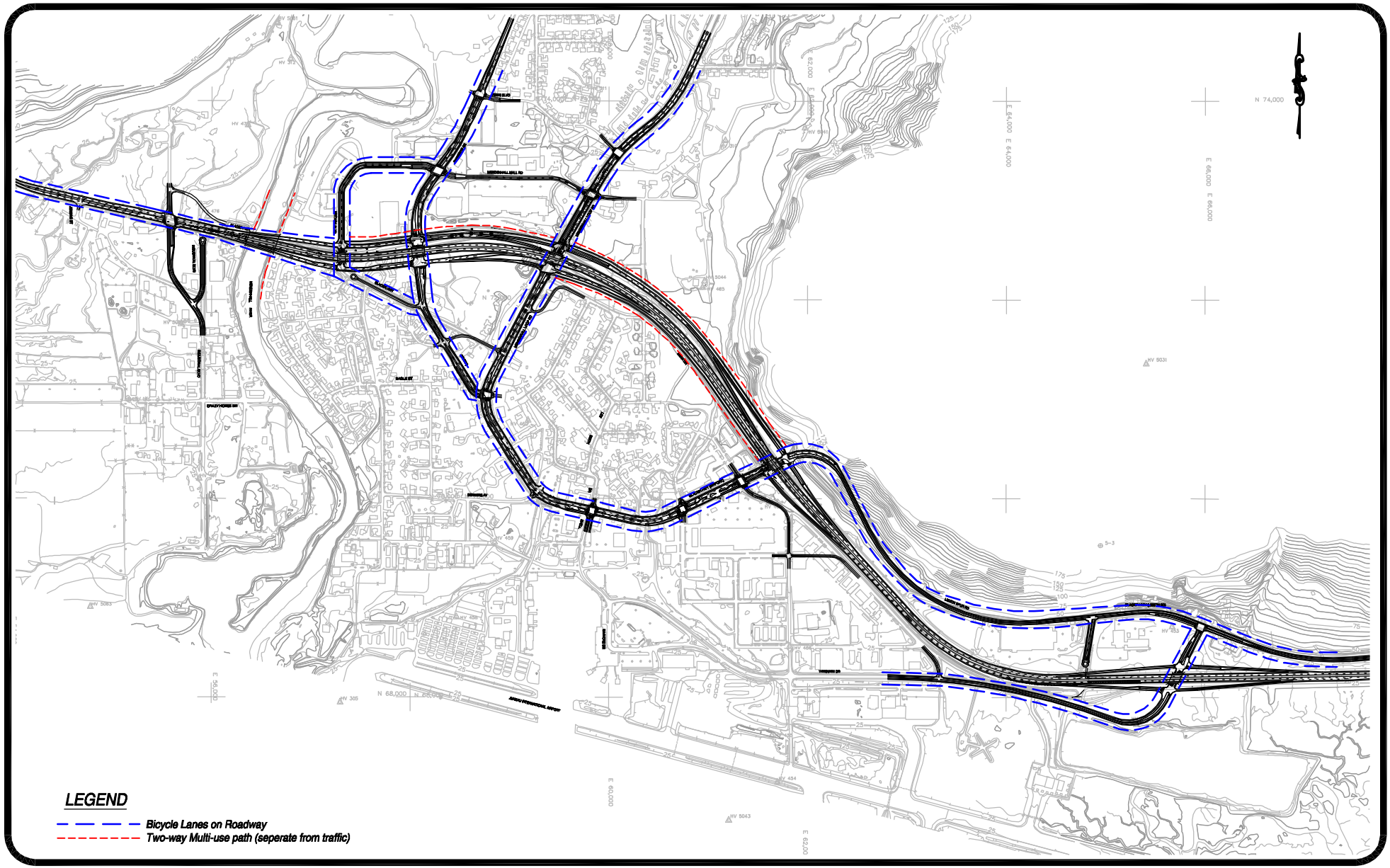

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PEDESTRIAN / BICYCLE FACILITIES ALTERNATIVE #2

FIGURE 6-6

West Egan Drive Corridor Study

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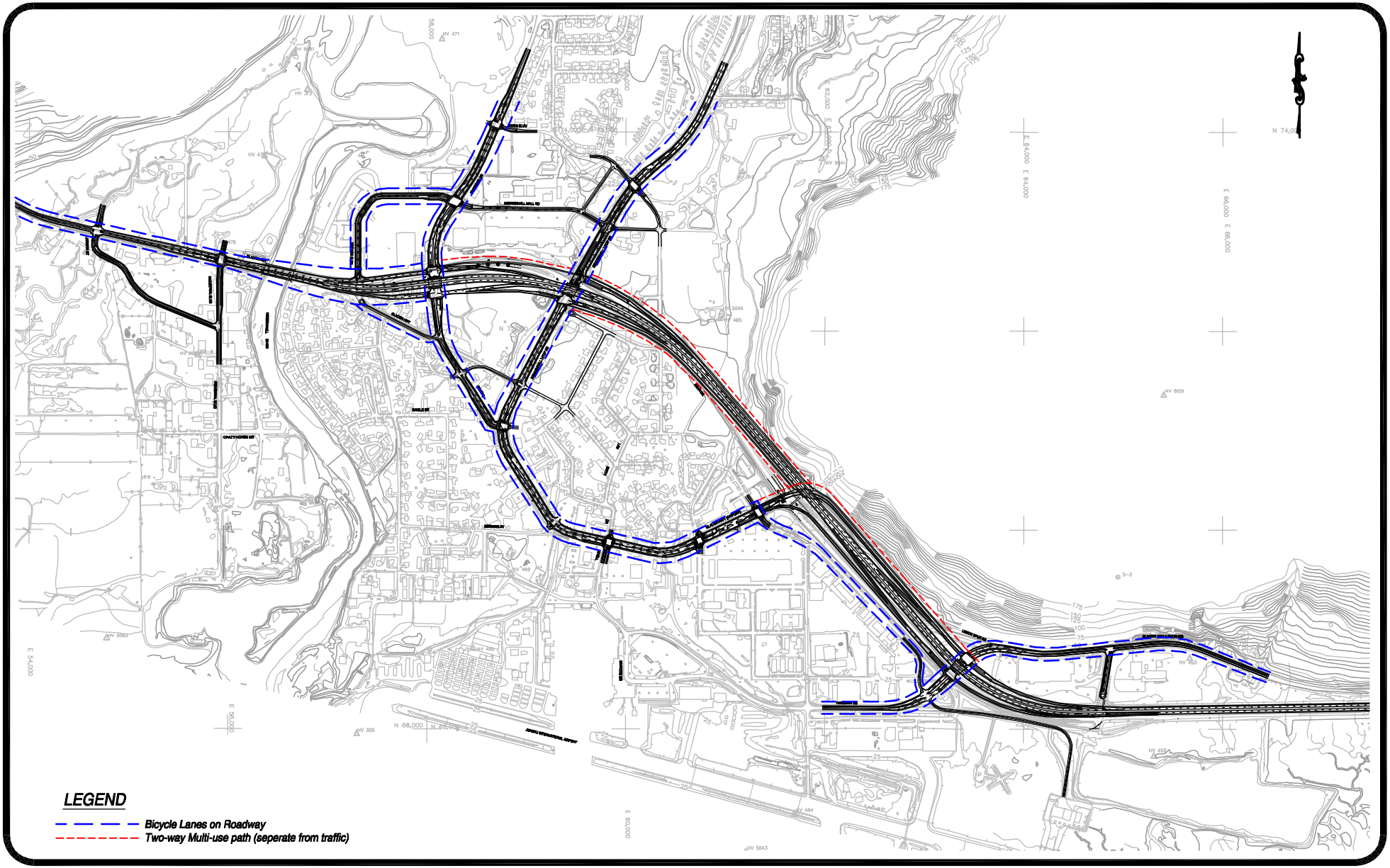

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PEDESTRIAN / BICYCLE FACILITIES ALTERNATIVE #3

FIGURE 6-7

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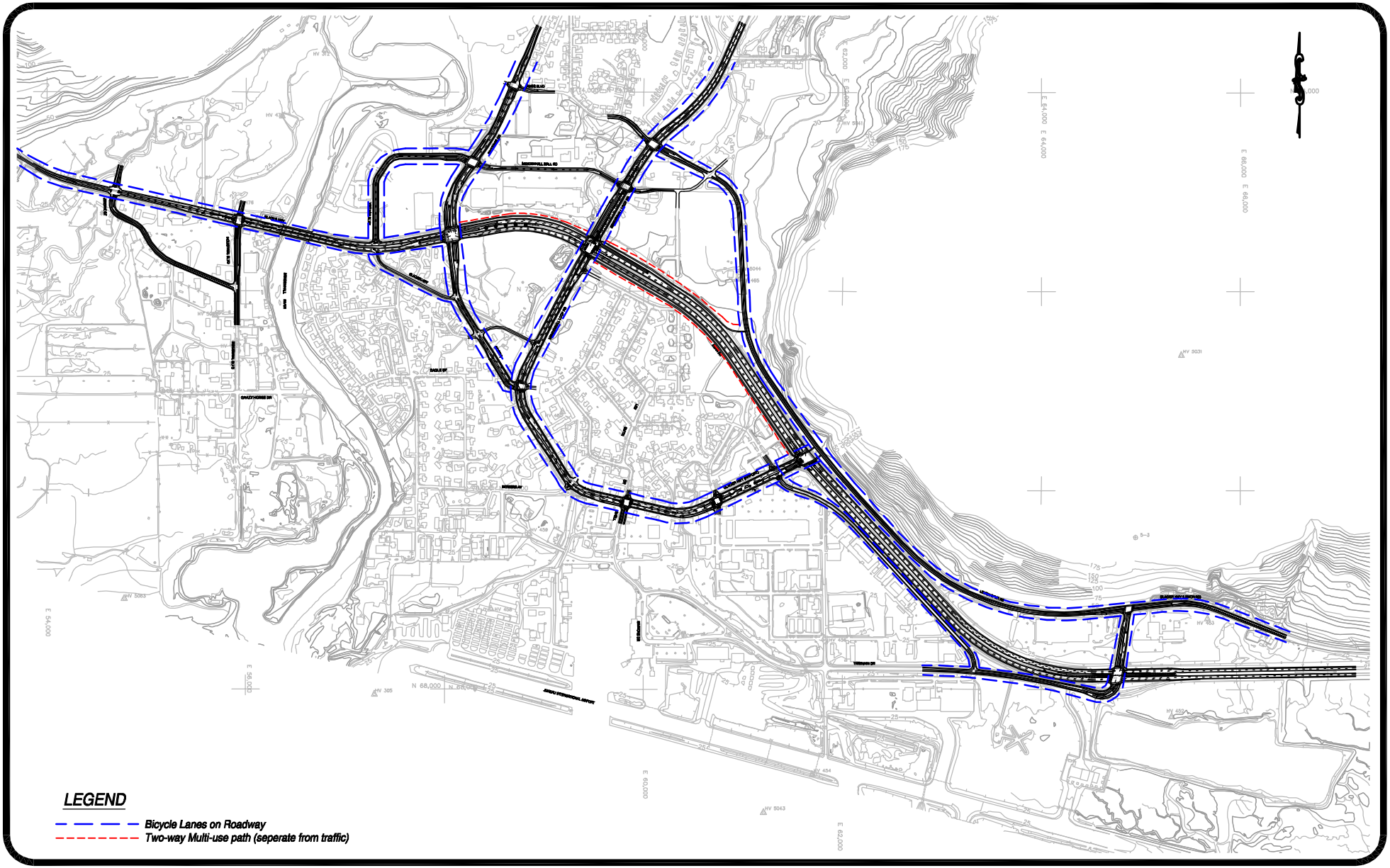

PEDESTRIAN / BICYCLE FACILITIES ALTERNATIVE #4

FIGURE 6-8

West Egan Drive Corridor Study

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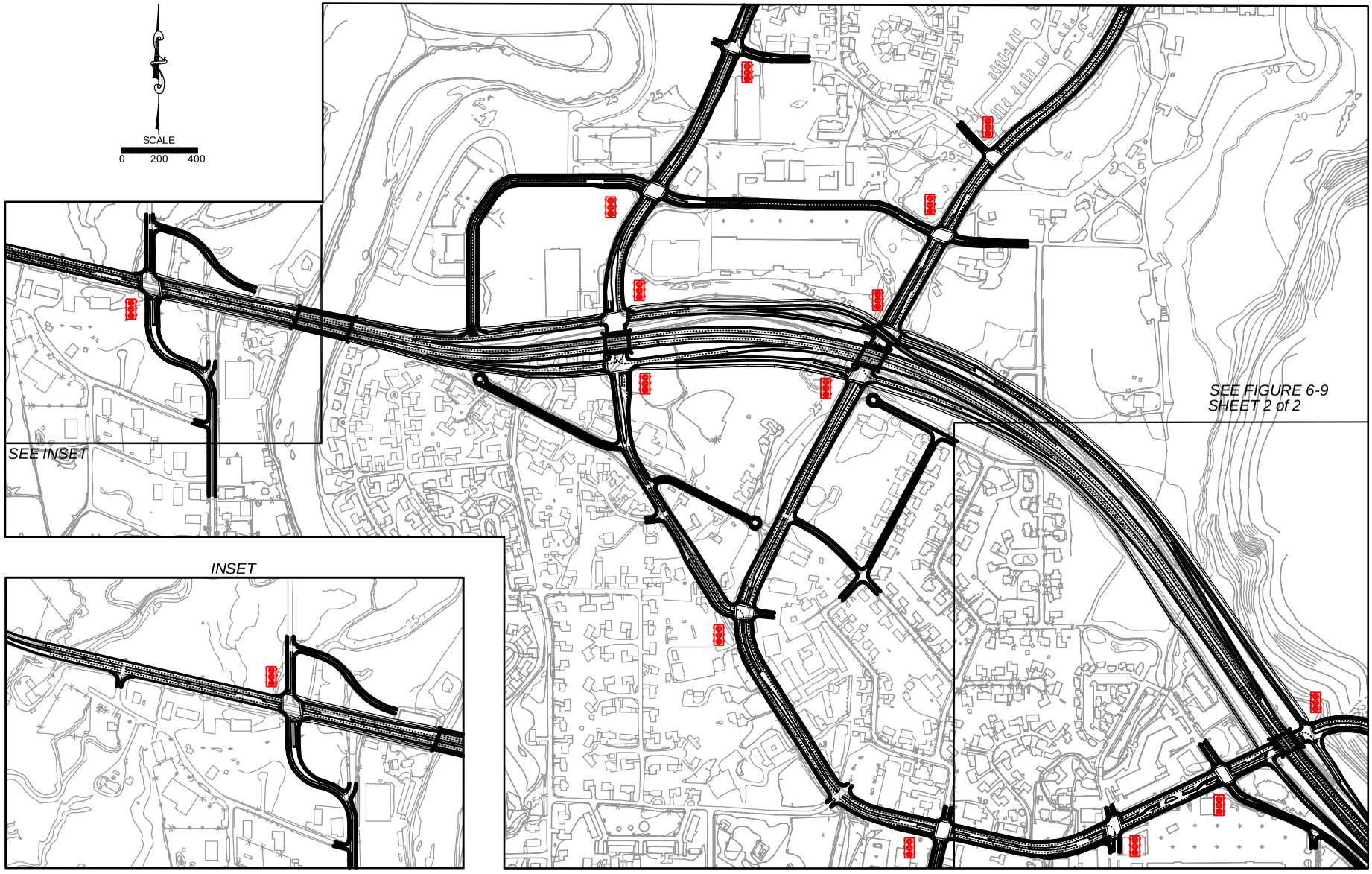
Department's Proposed Action

Based on input from the Citizens Advisory Committee and the public, ADOT&PF has recommended the Department's Proposed Action (Figure 6-9 (Sheets 1 and 2)) for carrying forward into the environmental documentation process. Under this plan, Egan Drive would cross over (be grade-separated from) Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport), and Yandukin Drive. At each of these locations there would be some form of interchange providing either complete or partial access to and from Egan Drive and the adjacent streets. The concept includes re-aligning Industrial Boulevard opposite Wildmeadow Lane and installing a traffic signal. The Proposed Action also includes several changes to the existing roadway system, including extending Riverside Drive south to Glacier Highway (North), removing the connection of Glacier Highway (North) to Egan Drive, and extending Lemon Spur Road to Glacier Highway (Airport).

The Department's Proposed Action represents a combination of Alternatives 2 and 3 primarily. It is the result of a collaborative process between ADOT&PF, CAC, and the public to develop a plan that is generally satisfactory to a wide cross section of participants. A few key elements of the decision process are:

- The CAC and public generally support the idea that grade separation was likely necessary in the long term, even though it substantially changes the character of the area. ADOT&PF recognizes this and has encouraged the development of interim phases where at-grade intersection options could function adequately for part of the design life of the plan (documented in Chapter 7).
- The CAC and ADOT&PF identify that access between Mendenhall Valley and Fred Meyer is important, but not at the expense of neighborhoods and wetlands. Therefore, the Lemon Spur extension ends at Glacier Highway (Airport) and a frontage road completes the connection to Mendenhall Loop Road. No direct connections have been made to James Boulevard.
- ADOT&PF and the CAC believe that maintaining full access and improving safety at Industrial Boulevard is imperative. To achieve this, Industrial Boulevard is re-aligned west of its current location opposite Wildmeadow Lane and is signalized. This facilitates left turns to and from Industrial Boulevard, provides improved distance for lane changing that may occur between Industrial Boulevard and Vintage Boulevard, and provides access to potential future development on the north side of Glacier Highway.
- The team also believes that a full interchange at Yandukin Drive and Egan Drive is important, and that a location east of Fred Meyer has the least impact while still serving the needs of the area, including the airport.



FUNCTIONAL DESIGN LAYOUT
DEPARTMENT'S PROPOSED ACTION

FIGURE 6-9

West Egan Drive Corridor Study

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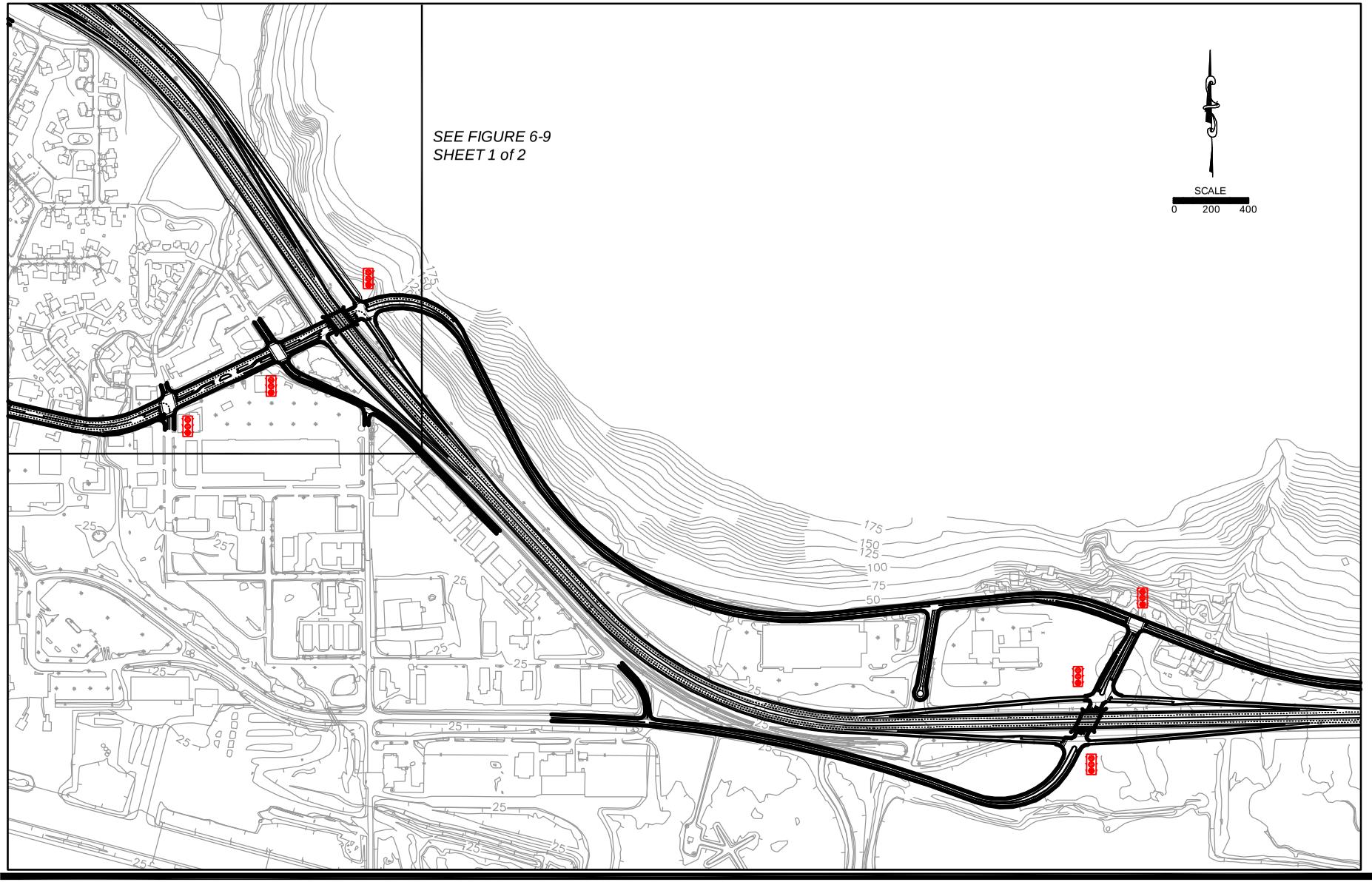

FUNCTIONAL DESIGN LAYOUT
DEPARTMENT'S PROPOSED ACTION

FIGURE 6-9

West Egan Drive Corridor Study

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4978\dwgs\Task-8\FIG_6-9.dwg

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Traffic Operations

In the Department's Proposed Action, all but one of the signalized intersections will operate at Level of Service (LOS) C or better and a volume-to-capacity ratio of 0.90 or better during both the weekday a.m. and p.m. peak hours. The exception is Egan Drive North Ramp/Mendenhall Loop Road, which is expected to operate at LOS C and a volume-to-capacity ratio of 0.92 during the weekday p.m. peak hour.

The unsignalized Glacier Highway (Airport)/Berners Avenue intersection operates at LOS F during both the weekday a.m. and p.m. peak hours due to side street delay, while the unsignalized Glacier Highway (North)/Del Rae Road intersections operate at a LOS E during the p.m. peak. Both intersections have alternative signalized access or have volumes too low to warrant improvements.

Under the Department's Proposed Action, overall system vehicular delay is estimated at 89 vehicle-hours during the a.m. peak and 183 vehicle-hours during the p.m. peak, respective improvements of 67% and 89% over the no-build alternative and within 10% of existing conditions. In addition, delay at intersections along Egan Drive is estimated at 10 vehicle-hours during the a.m. peak and 14 vehicle-hours during the p.m. peak, respective improvements of 83% and 95% over the no-build alternative and substantially better than existing conditions.

The results of the detailed traffic operations analysis for the Proposed Action are included in Appendix E.

Construction Costs/Environmental Impacts/ Right-of-Way Requirements/Maintenance

Constructability of portions of this action will be challenging for several reasons. The urban raised section of Egan Drive will require temporary retaining structures, roadways and connections to accommodate traffic. The cost of temporary structures has not been directly estimated for this reconnaissance level report, but is considered a contingency item. The bridge structures across the Mendenhall River are complex as they include both mainline spans and interchange ramps. Traffic maintenance will be very complex and extensive for long periods during portions of construction. The treatment of storm water is required before release to receiving waters and could be an additional cost and land use impact not covered at the reconnaissance level.

Maintenance will increase due to more lane miles of pavement to maintain, additional structures, guardrail and other barrier, roadway slopes, lighting, signalization and other features. Snow removal will be more complex because the median barriers and urban raised structures in some locations will require transporting snow some distance rather than casting to the side as is done now.

Right of way is fairly extensive for this action at an estimated cost of $10 million. The overall cost estimate for the proposed action is $104 million.

A total of 16.5 acres of wetland impacts has been estimated, including seven high-value wetlands with an estimated area of 12.5 acres and four wetlands of lower value with an estimated area of 4 acres. Both Duck Creek and Jordan Creek will be affected.

The Proposed Action is consistent with most existing plans.

As with all raised Egan alternatives considered, the built environment will be subjected to an increase in noise and light levels with a raised thoroughfare through the project area. The proposed action provides safer access to businesses, some with clearly improved access, some with slightly changed access. Several areas have impacts to residences and to church property. This action may affect the recreational Skate Park property along Mendenhall Loop Road. Environmental health will be affected because of an increase in the amount of roadway, higher stormwater runoff intensity, and an increase in the roads needing snow plowing and treatment during icy conditions. Because of the sensitive wetland and aquatic habitats adjacent to the roads, water and snow collection, handling, and treatment will be important to minimize impacts to these areas.

Compatibility with Built Environment

Short-term (construction) economic impacts from the Proposed Action include generation of nearly $106.1 million in business income, 978 full-time equivalent jobs of one-year duration, and nearly $39.4 million in payroll for the Juneau economy. In addition, more that $1.3 million in local sales taxes will be generated from construction of this project. Although the construction will likely cause occasional short-term restrictions to access for some area businesses, the construction strategy contains alternative access and sequencing plans to minimize any disruption.

Long-term economic impacts of the proposed action to area businesses include a moderate increase in drive-by traffic in the Glacier Highway/Airport area (25%), and slight increases in drive-by traffic in the Vintage Park area (10 %) and the Mendenhall Mall area (4%). Drive-by traffic drops slightly in the Old Dairy Road area (-10%), and the Fred Meyer area (-4%), and remains unchanged at Industrial Boulevard.

The James Boulevard area neighborhoods receive a negligible increase in traffic under this alternative. Glacier Highway (North) between Riverside Drive and Mendenhall Loop Road receives a large increase in traffic (150%) due to the new connection across Egan Drive at Riverside. In addition, the Proposed Action routes tourist and recreational traffic through neighborhood streets near Industrial Boulevard. Appendix F provides further details of this analysis.

Summary of Compliance with Purpose and Need

Table 6-6 summarizes the relationship between the Proposed Action and the project's Purpose and Need Statement.

Table 6-6 Proposed Action: Relationships to Purpose and Need

Purpose & Need Item	Description
Capacity and Level of Service o Minimize travel time and delay along and across Egan Drive for local and through trips.	o Grade separation of Egan Drive removes traffic signals for Egan Drive through traffic, virtually eliminating delay for those movements and reducing delay for other movements. o All signalized intersections along Egan Drive, including its interchanges, operate at LOS C or better and a volume-to-capacity ratio of 0.90 or better, except for Egan Drive North Ramps/Mendenhall Loop Road (LOS C and 0.92, respectively, during the p.m. peak hour). Off Egan Drive, all signalized intersections operate at LOS C and a volume-to-capacity ratio of 0.90 or better. All key unsignalized intersections operate acceptably or do not warrant additional improvements. o Overall system vehicular delay is estimated at 89 vehicle-hours during the a.m. peak and 186 hours during the p.m. peak, 67% and 89% improvements, over the no-build alternative.
System Linkage o Provide non-Egan Drive local access to decrease delay for local trips within the study area.	o Local eastbound and westbound access is provided from Lemon Road to Glacier Highway (airport) via a Lemon Spur Road extension to Glacier Highway (Airport). o Lemon Spur extension continues with westbound only access to the Mendenhall Loop Road/Egan Drive North Ramp Terminal Intersection. This reduces local trips on Egan from Fred Meyer or the Glacier Highway (Airport) commercial area. o Grade-separated crossings of Egan Drive are provided for pedestrians, bicyclists and vehicles at Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport), and Yandukin Drive. Signalized intersections at the interchange ramp terminals have shorter signal cycle lengths than current signalized intersections along Egan Drive causing less delay to cross traffic. o A new Riverside Drive extension to Glacier Highway (North) provides access into the Glacier Highway (Airport) commercial area from the west side of the Valley without using Egan Drive. Access from Vintage Boulevard to Egan Drive is limited to a right-in-right-out only intersection with the westbound Egan Drive Ramp.
Airport Access o Provide clear and direct access to Juneau International Airport	o Airport access is signed for the full access interchange at Yandukin Drive; providing easy access to Downtown Juneau, and to the west out the road.
Safety o Implement improvements that address safety deficiencies at high accident locations	o Frequency and severity of accidents along Egan Drive would substantially decrease with grade-separated interchanges. In addition, the highest-speed through movements on Egan Drive are generally free of right-angle and signal-related conflicts. o Sight distance constraints for the movements from Industrial Boulevard onto Egan Drive are eliminated through realignment and signalization; however, the new traffic signal at Wildmeadow Lane may increase rear-end accidents at this location. In addition, the interchange at Egan Drive/Yandukin Drive eliminates existing sight distance deficiencies. o Motorists accessing westbound Egan Drive from the Vintage Boulevard on-ramp and traveling to southbound Industrial Boulevard will have a relatively short distance in which to cross two high-speed Egan Drive through lanes.

Purpose & Need Item	Description
Pedestrian and Bicycle Facilities o Develop a transportation system that decreases the barrier effect of Egan Drive; and that provides safe pedestrian and bicycle facilities	o No sidewalks or bicycle lanes are provided along Egan Drive except across the Mendenhall River bridge. Multi-use paths run along the north side of Egan Drive between Vintage Boulevard and Glacier Highway (McNugget) and along the south side between Mendenhall Loop Road Glacier Highway (McNugget). o Sidewalks and bicycle lanes are provided on all other improved roads. o There are four grade-separated crossings of Egan Drive for pedestrians and bicyclists Riverside Drive, Mendenhall Loop Road, Glacier Highway (Airport), and Yandukin Drive. The signalized intersections at the interchange ramp terminals have shorter signal cycle lengths than current signalized intersections along Egan Drive, causing less delay to pedestrians and bicyclists. o The Egan Drive intersection crossings are narrower than current conditions; however pedestrians/bicyclists will have to cross two intersections to cross Egan Drive.

Detailed Evaluation

A detailed evaluation of the Department's Proposed Action was conducted and is summarized in Appendix G. Table 6-7 presents a summary of this evaluation and repeats the results of the evaluation of Alternatives 1 through 4 for comparison.

Table 6-7 Summary of Alternatives 1-4 and Department's Proposed Action

Evaluation Criterion		Alternatives				
		#1	#2	#3	#4	Proposed Action
	Traffic Considerations					
Purpose and Need	1. Safety	Good	Fair	Fair	Poor	Fair
	2. Emergency Vehicle Access and Circulation	Good	Good	Fair	Fair	Fair
	3. Traffic Operations (design year)	Good	Good	Good	Fair	Good
	Delay on Egan Drive (veh-hr):					
	a.m. (Existing: 26, No-Build: 60)	7	10	10	71	10
	p.m. (Existing: 64, No-Build: 270)	13	14	14	160	14
	Delay systemwide (veh-hr):					
	a.m. (Existing: 79, No-Build: 270)	94	87	81	170	89
	p.m. (Existing: 200, No-Build: 1700)	200	190	180	360	183
	4. Airport Access	Good	Good	Good	Fair	Good
	5. Local Circulation	Good	Good	Fair	Fair	Fair
	Non-Motorized Users and Public Transit					
	6. Compatibility with Public Transportation	Good	Good	Good	Fair	Good
	7. Compatibility with Pedestrians	Good	Good	Good	Poor	Good
	8. Compatibility with Bicyclists	Good	Good	Good	Poor	Good
	Satisfies Purpose and Need?	**YES**	**YES**	**YES**	**YES**	**YES**
Environmental and Planning						
9. Environmental Impacts		Poor	Poor	Fair	Fair	Poor
• Wetlands (acres)		18	16	12	3*	16.5
10. Consistency with Other Planning Efforts		Fair	Fair	Fair	Fair	Fair
11. Compatibility with Built Environment		Good	Good	Fair	Fair	Fair
• Land Use Impacts		Good	Good	Good	Good	Good
• Short-term Economic Impacts		Good	Fair	Good	Good	Fair
• Long-term Economic Impacts						
Practical Considerations						
12. Constructability		Poor	Poor	Poor	Fair	Poor
13. Funding Feasibility		Poor	Poor	Fair	Good	Poor
14. Phased Implementation & Expandability		Fair	Fair	Poor	Good	Fair
15. Construction Costs		Poor	Poor	Fair	Good	Poor
Estimated Construction Cost (in millions)		$112	$109	$95	$46	$104
16. Maintenance Requirements		Poor	Poor	Poor	Fair	Poor
17. Satisfies Design Requirements		Fair	Fair	Fair	Fair	Fair
18. Right-of-Way Requirements		Poor	Poor	Poor	Fair	Poor
Estimated Cost (in millions)		$12	$14	$12	$5	$10

* Does not include James Boulevard extension.