3 Alternatives

Preliminary development of alternatives included three Build Alternatives along the existing alignment and a No Build Alternative. The Build Alternatives included a 4-lane divided highway with median and partial limited access (Preferred), a 4-lane divided highway with fully controlled access, and a 5-lane section with a center two-way left turn lane (CTWLTL).

The Preferred Alternative would extend the 5-lane section from Lucus Road to Church Road and upgrade the existing highway to a 4-lane divided highway with at-grade intersections spaced every half-mile from Church Road to Big Lake Road. Frontage roads would be improved and the existing 10-foot wide pedestrian pathway would be reconstructed and/or relocated as necessary. Illumination would be installed along the full length of the project corridor. A bridge would be constructed parallel to the existing bridge at the Alaska Railroad crossing. The existing culverts at Little Meadow Creek would be removed and replaced with a short span bridge.

The 4-lane divided highway with fully controlled access alternative would extend the 5-lane section from Lucus Road to Church Road. The remainder of the project corridor from Church Road to Big Lake Road would be designed to be a freeway facility and upgraded to a 4-lane divided highway with 2-lane, 2-way frontage roads on each side and grade separated interchanges at two major intersections.

The 5-lane alternative would construct a 5-lane section the entire length of the proposed project from Lucus Road to Big Lake Road.

All alternatives were initially screened for feasibility based on total costs, ROW impacts, and their ability to meet the projects' purpose and needs. The No Build Alternative and one Build Alternative (Preferred) were chosen for further consideration and evaluated for their potential for environmental consequences.

3.1 Logical Termini Selection

Project corridors (logical termini) are determined using the criteria set forth by FHWA in 23 CFR 771.111(f). Three general principles are considered to ensure meaningful evaluation of alternatives, including 1) the ability to determine environmental impacts on a broad scope, 2) capacity for independent utility (usability), and 3) potential impact on other planned improvements. The limits of the proposed project corridor have been analyzed and found to meet these criteria.

The intersection of the Parks Highway and Lucus Road was chosen as the eastern project logical terminus. Traffic volumes decrease by approximately 27 percent at the junction with Lucus Road. This change corresponds with a change in land use at the intersection. The land use east of Lucus Road is predominately commercial while the land west of Lucus Road is mainly rural residential with pockets of commercial development.

The western project terminus of the project is Airolo Road, which is located approximately one-half mile north of the Big Lake Road intersection. The relative number of residences and

businesses continually decrease as you travel west throughout the project corridor, with a marked reduction at Big Lake Road. Traffic volumes decrease by approximately 40 percent at the junction of Big Lake Road. Lower traffic volumes west of Big Lake Road correspond to a marked reduction in the number of high severity/fatal accidents occurring along that segment of highway. The TSC designation ends at Big Lake Road because the vast majority (85 percent) of the more recent fatal collisions along the segment occurred between Church Road and Big Lake Road.

Criterion 1: The proposed eight-mile project corridor crosses the full extent of the Meadow Lakes area between the City of Wasilla and the City of Houston, giving it sufficient length to address environmental issues on a broad scope.

Criterion 2: The determination of independent utility is based on a project's ability to provide a benefit regardless of other improvement projects. In other words, is the project's value or use dependant on other improvements to the transportation system? If other improvements are required to make the proposed project beneficial, then the proposed project does not have independent utility. The proposed project is improving the link between the City of Wasilla and the City of Houston and providing safer access to the rapidly developing communities of Meadow Lakes and Big Lake.

Criterion 3: A project corridor should not restrict or influence alternative selection of other foreseeable transportation improvements in this area. Because the Parks Highway is the primary surface transportation link between Anchorage and Fairbanks, the proposed project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. Any potential future roadway improvements, such as a Wasilla Bypass or the Knik Arm Bridge and Toll Authority (KABATA), are far enough into the future that they would not preclude the necessity to upgrade the Parks Highway during the design life of 20 years.

3.2 Typical Sections

The existing two-lane section consists of single 12-foot wide lanes in each direction with eight-foot wide shoulders on each side. The existing five-lane section consists of two 12-foot wide lanes in each direction, 8-foot wide shoulders, and a 16-foot wide CTWLTL.

The proposed five-lane section matches the existing five-lane section currently going through the City of Wasilla. Side slopes along the highway would be 5H:1V, with 2H:1V slopes outside the clear zone (Figure 3: Typical Sections).

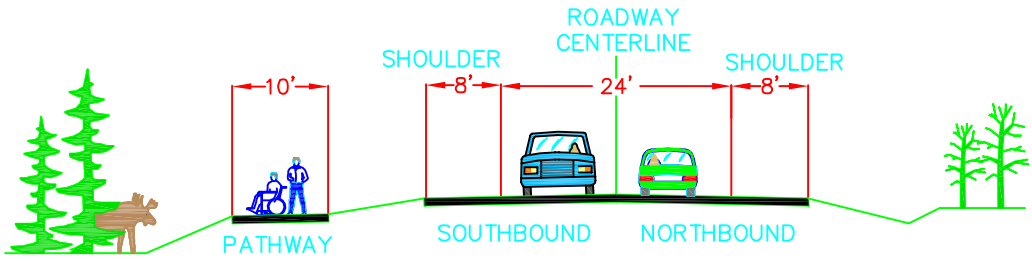
The proposed four-lane divided highway would consist of two 12-foot wide lanes in each direction, eight-foot wide outside shoulders, four-foot wide inside shoulders, and a depressed center median. Similar to the proposed five-lane section, side slopes would be 5H:1V with 2H:1V outside the clear zone.

The center median width would vary be a minimum of 30-feet wide to meet clear zone requirements to a maximum of 42-feet wide where existing ROW will accommodate it. The wider 42-foot wide median would allow for future addition of thru lanes or auxiliary turn

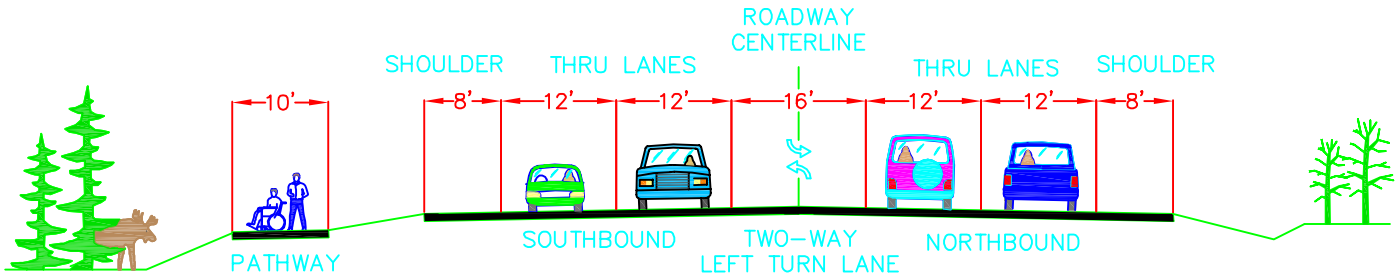
lanes as well as accommodating median crossover U-turns. The smaller 30-foot median also accommodates an anticipated future need (beyond 2033) for dual left turn lanes while still providing desirable pedestrian refuge.). Side slopes along the highway would be 5H:1V, with 2H:1V slopes outside the clear zone.

FHWA research conducted to determine the relative safety effects of various median types indicates "non-transversable" medians, such as depressed grass or raised medians are safer than "transversable" medians, such as a CTWLTL. When CTWLTLs are installed where no prior median existed, 35 percent of total crashes are expected to be eliminated. A "non-transversable" median can be expected to reduce total crashes by an additional 37 percent when they replace CTWLTLs or an approximate overall reduction of 59 percent when no prior median existed (NCHRP Report 395, 1997)

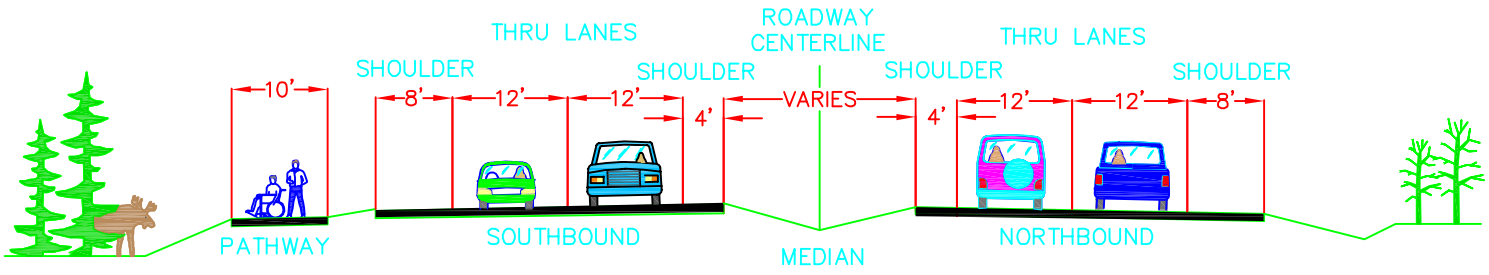
Existing development and the parallel ARRC tracks preclude continuous two-way frontage road development along both sides of the corridor. Where constructed, frontage roads would consist of two 11-foot wide lanes and 5-foot wide shoulders. Side slopes along the frontage roads would be 4H:1V, with 2H:1V slopes outside the clear zone.



EXISTING 2-LANE WITH PATHWAY



5-LANE WITH PATHWAY



4-LANE DIVIDED WITH PATHWAY

	PARKS HIGHWAY MP 44-52 **LUCUS RD TO BIG LAKE CUTOFF**
FIGURE 3	TYPICAL SECTIONS

3.3 General Alignment

Consistent with the initial prescribed scope of the proposed project, all alternatives follow the existing horizontal and vertical alignments; no new alignment alternatives were considered. Utilizing the existing alignment minimizes ROW impacts and costs significantly less to construct. Existing ROW widths from Wasilla to approximately one-half mile south of Big Lake Road are generally 200 feet wide, set 64 feet from the south line and 136 feet from the north line. From one-half mile south of Big Lake Road to the end of the project, the ROW is generally 300 feet wide, set 146 feet from the south line and 154 feet from the north. Where possible, additional lanes would be constructed parallel to existing lanes. Existing horizontal and vertical curves exceed minimum design standard for new construction; therefore, no realignment is warranted.

Existing utilities along the proposed project corridor are owned and operated by Matanuska Electric Association, Matanuska Telephone Association, Enstar Natural Gas Company, and City of Wasilla. Utilities would be affected by this project and relocations would be necessary.

3.4 Access Management

A functional classification of "Interstate" would typically indicate a design with full access control. In accordance with the exemption permitted in 23 USC 103, the DOT&PF would allow less restrictive access to the highway in order to balance the various needs and demands of users. The DOT&PF has developed a Corridor Management Plan that defines limits and types of permissible access onto and across the highway (Appendix A). The proposed project corridor would be developed as a partial limited access facility with allowable access points defined by breaks in controlled access lines. The plan does not eliminate any existing individual property's access onto the highway; however, the proposed median would restrict movement at driveways and at some approach road intersections to right-in/right-out maneuvers. These controls, along with deliberate intersection design and location, would allow traffic to flow in more predictable and safer patterns throughout the area. Between Lucas Road and Deskas Street, traffic channelization and access consolidation will be considered further during final design of the project. The Corridor Management Plan protects and preserves the benefits of the proposed improvements, including improved safety, increased capacity, and enhanced travel efficiency. It would encourage development of a local collector system as development occurs, on an as-needed basis, to serve traffic generated by the development.

3.5 Transit and Roadway Efficiency Considerations

Transportation Systems Management (TSM) and Transportation Demand Management (TDM) are strategies designed to increase the efficiency and overall performance of the existing system by using a variety of techniques, such as improving signage or signal arrangement, ride-sharing, flex time work schedules, and high occupancy vehicle lanes. These alternatives do not address the serious safety concerns associated with the proposed project corridor or increase overall system capacity needed to accommodate projected traffic volumes. As such, these alternatives were not considered.

3.6 Pedestrian Facilities

The DOT&PF considered requests that a pedestrian overpass be included in the proposed project, specifically at the Pittman Road intersection where the existing pathway crosses the highway. The Alaska Preconstruction Manual sets forth three specific criteria for addressing pedestrian grade separation facilities: 1) pedestrian and vehicular volumes, 2) gap availability, and 3) roadway geometry. Specific pedestrian volume counts/studies have not been conducted for this corridor; however, during a recent traffic count at Pittman Road, only 10 pedestrian crossings were noted over a five hour period. The manual states the minimum criteria to consider grade separation is 150 pedestrians per hour, which is significantly higher than the number of observed pedestrians.

With signalization and half-mile intersection spacing, adequate gaps would be provided for pedestrian crossing. Geometrics of the highway in this proposed project corridor do not meet the conditions for considering a pedestrian grade separation. The intersection design would include Americans with Disabilities Act (ADA) compliant crosswalks and pedestrian refuges. A pedestrian overpass is therefore eliminated from consideration.

3.7 Alternative Cost Estimates

Planning level cost estimates were developed for each alternative (Table 5). The estimates include costs for engineering, ROW, utilities, and construction. Except for the No Build Alternative, the least expensive alternative is the five-lane alternative with an estimated cost of $102 million. The Preferred Alternative was somewhat more expensive with an estimated cost of $141 million. The most expensive alternative is the four-lane divided highway with fully controlled access with an estimated cost of $207 million. Refer to section 3.0 for a detailed description of each alternative and Appendix B for more information on the alternatives analysis.

Table 5: Alternative Cost Estimates, millions

	Preferred	Four-Lane with Full Controlled Access	Five-Lane
Design	15	18	11
Construction	102	129	75
ROW	16	50	10
Utilities	8	10	6
Total	**$141**	**$207**	**$102**

3.8 Phased Construction Considerations

The DOT&PF anticipates construction of the Preferred Alternative would be completed in multiple phases depending upon available funding and actual traffic growth**.** The Preferred Alternative cost estimate was split into three construction phases based on preliminary information (Table 6). When the proposed project enters the design phase, logical and feasible break points for construction phasing would be determined. Each phase would be designed and constructed independently. The current STIP funding is intended to cover the first phase of construction. The actual funding required for each phase of construction would depend upon the limits of each phase.

The DOT&PF traffic and accident data indicate the Church Road to Pittman Road segment has experienced nearly twice the number of major injury accidents as the Pittman Road to Big Lake Road segment. Traffic volumes on the Lucus Road to Church Road segment are virtually the same as on the Church Road to Pittman Road segment. Based on this data, it is anticipated the Church Road to Pittman Road segment would be the first construction phase completed. When a major project such as this is constructed in phases, the DOT&PF typically purchases ROW for the entire project at one time if sufficient design information is available to determine ROW needs for all phases.

Table 6: Preferred Alternative Cost Estimate by Phase, million

	Lucus-Church	Church-Pittman	Pittman-Big Lake	Total
Design	2.0	6.0	7.0	15.0
Construction	12.0	42.0	48.0	102.0
ROW	0.5	7.0	8.5	16.0
Utilities	1.0	4.0	3.0	8.0
Total	**$15.5**	**$59.0**	**$66.5**	**$141.0**

3.9 Moose Mitigation

According to crash data gathered by the DOT&PF, this segment of the Parks Highway has the third highest rate of moose-vehicle crashes in the state, with an average of 16 recorded moose-vehicle crashes per year. Between 2000 and 2007, the greatest concentration of moose-vehicle crashes along the project corridor occurred in the two mile segment from milepost 47 to milepost 49. This indicates moose follow an existing migratory corridor through this area. High rates of collisions also occur near Church Road and Big Lake Road where Little Meadow Creek passes under the highway. The cost/benefit ratio was evaluated for several mitigation measures including, continuous roadway illumination, and fencing and wildlife crossings (Appendix F: Moose-Vehicle Collision Analysis).

Crossing options (underpass or overpass) would require fencing and “cattle-guard” type systems to restrict wildlife access to designated locations and prevent access at existing driveways and intersections. Alternatives were considered for the entire proposed project corridor with focused consideration given to the crossings at the ARRC and Little Meadow Creek. The study indicates continuous roadway illumination is expected to reduce the number of moose-vehicle collisions by 70 percent and recommends this measure. Based on

the study results and recommendations, continuous roadway illumination was added to all build alternatives evaluated. The bridge to be constructed over Little Meadow Creek will be designed to facilitate wildlife and fish passage as appropriate including use of streambed materials that will enable passage. Use of localized fencing to encourage wildlife to cross under the bridge as opposed to over the highway may be evaluated during final design.

3.10 No Build Alternative

Evaluation of a No Build Alternative is required under National Environmental Policy Act (NEPA) regulations as a baseline for comparing the effects associated with Build Alternatives. Under this alternative, the existing highway would remain unchanged and only routine activities, such as road maintenance and repair, would occur during the next 20 years. Approximately 2000 feet of existing five-lane roadway west of Lucus Road would remain, and the remainder of the proposed project corridor would retain its existing two-lane configuration along the current roadway alignment. No frontage road, intersection, or pathway reconstruction would be completed.

No improvements would be made to the existing corridor management plan to proactively implement access management. As such, it is likely additional driveways and other roadways would be constructed as development continues, allowing more direct access to and across the highway. Consequences of this action would include increased congestion along the corridor, with travel declining to LOS F, and reduced travel efficiency. High crash rates would continue. Local traffic and access, especially left turns, would become increasingly difficult.

Because the No Build Alternative does not reduce congestion along the corridor or address any of the access-related safety issues, such as left turn movements or head-on collisions, it does not meet the purpose and need for the proposed project.

3.11 Four-lane Divided Highway with Depressed Grass Median and Partial Frontage Roads Alternative (Preferred)

This alternative would extend the five-lane section approximately one mile from Lucus Road to Church Road and upgrade 7.3 miles of the existing highway to a four-lane divided highway with at-grade intersections generally spaced every half-mile and a depressed median from Church Road to Big Lake Road (Figure 4: Preferred Alternative). A 30-foot wide median would be constructed from Church Road to Museum Drive and a 42-foot wide median would be utilized beyond Museum Drive to Big Lake Road. This alternative would provide for increased capacity and improve the LOS.

The existing signalized Church Road intersection, located approximately one-half mile inside the western limits of the City of Wasilla, is a logical boundary between suburban/rural and urban development. Currently, the five-lane section ends approximately half-mile east of Church Road; this alternative would replace the first half-mile of two-lane roadway with a 5-lane section and transition to the four-lane divided cross-section west of Church Road.

Approximately 4 miles of existing frontage roads would be improved, driveways would be consolidated, and at-grade intersections would be placed where conflicts can be minimized to reduce crash rates. Approaches for 11 cross streets would be improved. The existing intersection with Museum Drive would be relocated to the west of its current location to address sight distance issues resulting from the existing alignment in relation to the embankment for the ARRC crossing bridge. The existing 10-foot wide paved multi-use pathway would be reconstructed and/or relocated as required to accommodate mainline, frontage roads, and intersection improvements. Illumination would be provided along the full length of the corridor due to the higher than average proportion of dark and twilight accidents as well as for moose mitigation.

Culverts would be upgraded or extended as needed. The two existing culverts at Little Meadow Creek would be removed and replaced with a short span bridge. A structure parallel to the existing structure would be constructed to accommodate additional through traffic lanes over the railroad. The Bridge and Structures Study Report prepared for this project recommended a spliced post-tensioned concrete girder bridge for the ARRC crossing.

Access management would be utilized to define limits of permissible access onto and across the highway. This design shifts "direct access" onto secondary roads where possible to preserve the high mobility function of the corridor. This would encourage development of the local roadway system to accommodate local traffic circulation off the highway system. Refer to Appendix A for more information on the Parks Highway Corridor Management Plan.

Initial analyses indicate this alternative meets the projects' purpose and need. The median and illumination are anticipated to reduce the high severity crashes. The additional thru lanes would add capacity to the facility, reducing anticipated congestion. The implementation of access management would improve the travel efficiency for all roadway users by reducing the travel time for regional and commuter traffic and improving the circulation patterns for local traffic.

3.12 Alternatives Considered but Not Carried Forward

3.12.1 Four-lane Divided Highway with Fully Controlled Access Alternative

Similar to the Preferred Alternative, this alternative would extend the five-lane section from Lucus Road to Church Road. The remainder of the proposed project corridor, from Church Road to Big Lake Road would be designed as a freeway style facility and would upgrade the existing highway west of Church Road to a four-lane divided highway with two lane, two-way frontage roads on each side and grade separated interchanges at two major intersections. This design would be similar to the Parks Highway between the Glenn Highway and Seward Meridian Parkway east of the City of Wasilla. This alternative would include reconstruction of the multi-use pathway, continuous corridor illumination, drainage improvements, installation of a bridge at Little Meadow Creek and construction of a bridge over the railroad similar to the Preferred Alternative.

Existing frontage roads along this section of the Parks Highway are adequately handling access density in developed areas. In areas without existing frontage roads, driveway density is low as development in these areas is sparse. This alternative would therefore construct frontage roads for undeveloped areas along the corridor where future development may or may not occur.

This alternative would construct full frontage roads along both sides of the highway and grade separated interchanges, which would cause this alternative to have a footprint approximately twice the size as the Preferred Alternative. This would significantly increase ROW requirements and environmental impacts, particularly wetland impacts. Much of the existing development in this section has occurred in areas immediately adjacent to the highway in what is commonly referred to as “strip development”. Because numerous established businesses and residences would be relocated, impacts to the community would be excessive.

This alternative would separate the thru traffic from local traffic accessing adjacent businesses. It would increase capacity, improve mobility, attain full access control, and reduce conflicts that may lead to crashes. However, this alternative was not carried forward due to the significant additional ROW requirements, environmental consequences, and construction costs over the Preferred Alternative.

3.12.2 Five-Lane Section Alternative

This alternative would extend the five-lane section the entire length of the proposed project corridor from Lucus Road to Big Lake Road. As with the other Build Alternatives, this alternative would include reconstruction of the multi-use pathway, continuous illumination, drainage improvements, and construction of bridges at Little Meadow Creek and over the railroad. This alternative would provide increased capacity; however, conflicts between highway through traffic and local community traffic would continue.

The Preferred Alternative was selected over the five-lane section alternative because it holds considerable **safety, capacity** and **efficiency** advantages over a five-lane facility. It more

effectively balances the competing demands for thru-traffic mobility, local access, and public safety.

The five-lane section alternative was eliminated for the following reasons:

- Increases density of vehicles accessing the highway from adjacent properties and side streets, which slows travel speeds for thru traffic;
- Provides less capacity than the Preferred Alternative;
- Fails to provide for efficient movement of through traffic within the corridor;
- Fails to provide sufficient separation of traffic traveling in opposite directions to reduce head-on and side swipe crashes;
- Fails to provide adequate space for future multiple lane left turn pockets forecasted to be needed in the design life;
- Fails to provide for safe movement of local traffic across and throughout the corridor;
- Fails to provide a pedestrian refuge;
- Left turns not as safe as U-turns at designated signals;
- Improper use by merging traffic.