

CTF ALTERNATE ENTRANCE ALIGNMENT (WFL)

Project No.: AKBLM AFO 2014(1)/CFHWY00260

DESIGN STUDY REPORT

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

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CENTRAL REGION – DESIGN AND CONSTRUCTION
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NOTICE TO USERS

This report reflects the thinking and design decisions at the time of publication. Changes frequently occur during the evolution of the design process, so persons who may rely on information contained in this document should check with the Alaska Department of Transportation and Public Facilities for the most current design. Contact the Design Project Manager, Edith Mckee, at 907-269-7885 for this information.

PLANNING CONSISTENCY

This document has been prepared by the Department of Transportation and Public Facilities according to currently acceptable design standards and Federal regulations, and with the input offered by the local government and public. The Department's Planning Section has reviewed and approved this report as being consistent with present community planning.

CERTIFICATION

We hereby certify that this document was prepared in accordance with Section 520.4.1 of the current edition of the Department's Highway Preconstruction Manual and CFR Title 23, Highway Section 771.111(h).

The Department has considered the project's social and economic effects upon the community, its impacts on the environment and its consistency with planning goals and objectives as approved by the local community. All records are on file with Central Region - Design and Engineering Services Division, Highway Design Section, 4111 Aviation Avenue, Anchorage, AK 99502.

Wolfgang E. Junge, P.E. Date
Preconstruction Engineer

Todd Vanhove Date
Chief, Planning & Administrative Services

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LIST OF ACRONYMS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACGP	Alaska Construction General Permit
ADA	Americans with Disabilities Act
ADEC	Alaska Department of Environmental Conservation
APDES	Alaska Pollutant Discharge Elimination System
ARRC	Alaska Railroad Corporation
ATM	Alaska Traffic Manual
BLM	Bureau of Land Management
BMP	Best Management Practice
CCSC	Campbell Creek Science Center
CFR	Code of Federal Regulations
CTF	Campbell Tract Facility
DOT&PF	Alaska Department of Transportation and Public Facilities
ESCP	Erosion and Sediment Control Plan
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FLAP	Federal Lands Access Program
FLTP	Federal Lands Transportation Program
HLB	Heritage Land Bank
HMCP	Hazardous Material Control Plan
HPCM	Alaska Highway Preconstruction Manual
HSIP	Highway Safety Improvement Program
LOS	Level of Service
MADT	Monthly Average Daily Traffic
MOA	Municipality of Anchorage
MP	Milepost
MPH	Miles Per Hour
MUTCD	Manual on Uniform Traffic Control Devices
NEPA	National Environmental Policy Act

NPDES	National Pollutant Discharge Elimination System
PGDHS	A Policy on Geometric Design of Highways and Streets
PHV	Peak Hour Volume
PIP	Public Information Plan
ROW	Right-of-Way
SWMM	Storm Water Management Model
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traffic Control Plan
TMP	Traffic Management Plan
USGS	United States Geological Survey
VPD	Vehicles per day
WFLHD	Western Federal Lands Highway Division

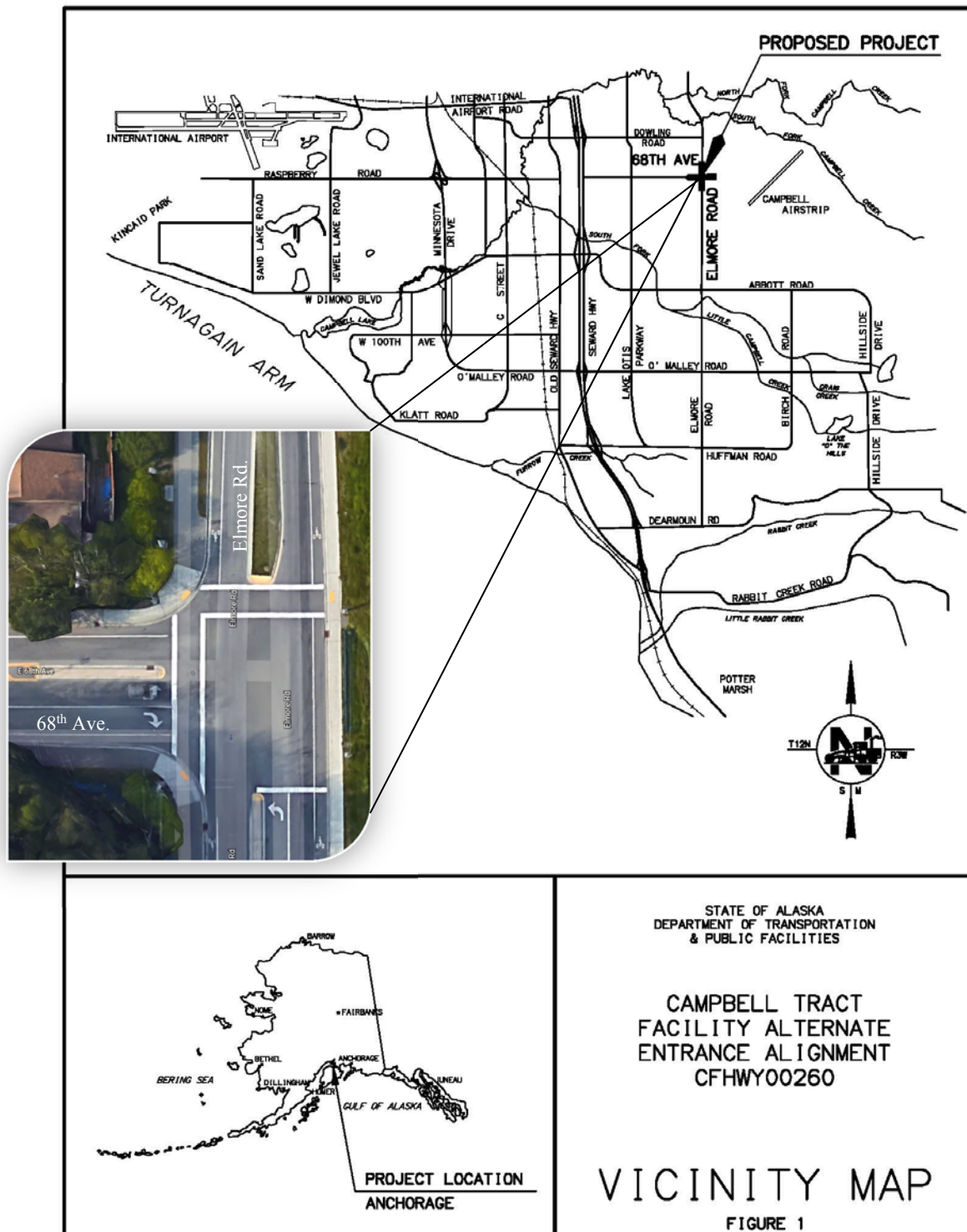


Figure 1: Location and Vicinity Map

1.0 PROJECT DESCRIPTION

1.1 Project Location and Description

Western Federal Lands Highway Division (WFLHD) and Bureau of Land Management (BLM) in cooperation with The Alaska Department of Transportation and Public Facilities (DOT&PF) proposes to realign the Campbell Tract Facility (CTF) BLM Road with the existing signalized intersection at Elmore Road and East 68th Avenue in the Municipality of Anchorage (MOA). The project is located in Sections 3 and 4 Township 12N, Range 3W, Seward Meridian; Latitude 61° 9' 33.12" N, Longitude 149° 48' 15.48" W. Western Federal Lands Highway division will administer the projects contract and funding, as well as the National Environmental Policy Act (NEPA) lead. DOT&PF will provide the design, and administer the construction contract under an agreement with WFLHD. BLM will be providing public involvement throughout the design process and NEPA support. The project location and vicinity map are provided in Figure 1.

The proposed project will include constructing a fourth approach to the existing intersection at Elmore Road and East 68th Avenue and realignment of BLM Road from this intersection to an internal junction on the Campbell Tract Facility.

Additional project scope may include:

- Shared use shoulders for multi-modal access to the trail systems.
- Additional offset left turn lane southbound on Elmore onto BLM Road.
- Converting East 68th Avenue approach to accommodate through movement to the newly constructed BLM Road approach.
- Updates to the existing intersection including, new signal poles, equipment, and LED lighting.
- Americans with Disabilities Act (ADA) compliant pedestrian facilities.
- Sidewalk replacement and drainage improvements, as needed.
- Obliteration of the existing CTF BLM Road entrance to Elmore Road.
- New intersection at the tie-in point of BLM Road and Science Center Drive.
- New signage and striping.
- Relocating and constructing utilities, as needed.
- Clearing and grubbing, as needed.
- Expansion of the Smokejumper trailhead parking area as well as potential lighting.
- Topsoil and seed all disturbed areas once construction is complete.

Funding for the intersection improvements consists of a Federal Lands Access Program (FLAP) contribution of \$2,319,375.00 plus a local agency match requirement of 9.03% from the BLM Federal Lands Transportation Program (FLTP). The funding investment for the realignment of CTF BLM Road is made up entirely by the BLM FLTP funds.

1.2 Existing Facilities and Land Use

East 68th Avenue runs between two main, north/south, thoroughfares, Elmore Road and Lake Otis Parkway. It provides access to local roads, private residents, and Kasuun Elementary School.

Elmore Road is a minor arterial between Abbott and Tudor Road. It provides access to minor and major collector roads, local roads, schools, and parks. In 2005 Elmore Road (previously named Abbott Loop Road) was extended to Tudor Road. See Table 1 for functional classification and existing characteristics of East 68th Avenue and Elmore Road.

Roadway	Approach	Urban / Rural?	Functional Class	Control	Posted Speed Limit	Two-way?	# of Lanes	Turn pockets	Paved
East 68th Avenue	West	Urban	Major Collector	Signal	35	Y	One per direction	Two	Y
BLM Road	East		Local Road	Stop	25		One per direction	None	Y
Elmore Road	South		Minor Arterial	Signal	45		One per direction	None	Y
	North		Minor Arterial	Signal	45			One	

Table 1: Functional Classification and Existing Characteristics

CTF shown in Figure 2 is located in the heart of Anchorage, Alaska, near the intersection of East 68th Avenue & Elmore Road. It is bordered on the north side by the Heritage Land Bank. The administrative site road network includes two roads, the BLM Road and Science Center Drive:

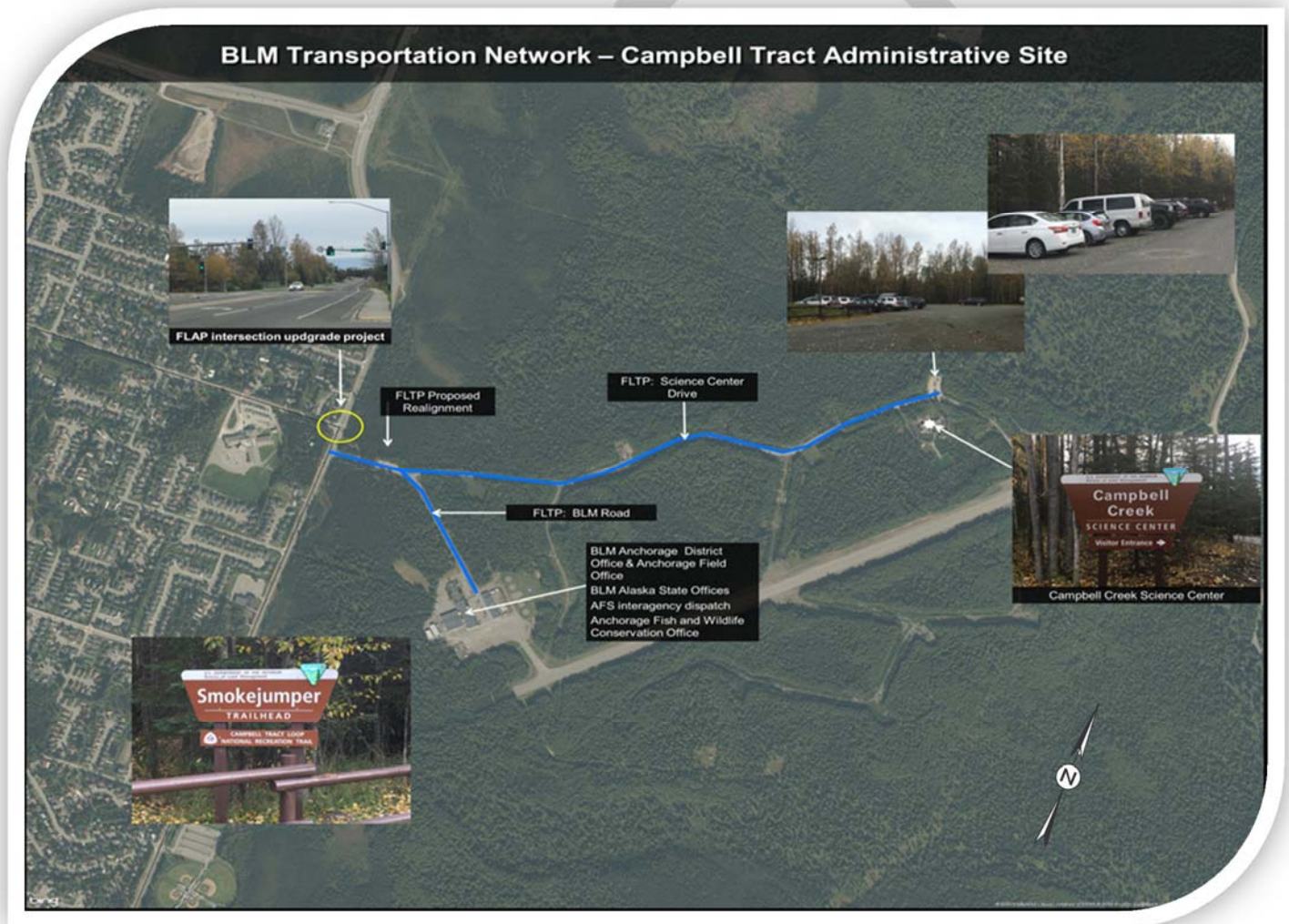


Figure 2: Campbell Tract Administrative Site

- BLM Road: a 0.4-mile, two-lane asphalt road that connects the Campbell Tract Facilities (BLM Anchorage District Office, BLM Anchorage Field Office, BLM Alaska State Offices at Campbell Tract, Alaska Fire Service Interagency Dispatch Center, and the US Fish and Wildlife’s Anchorage Fish and Wildlife Conservation Office) with Elmore Road. See Table 1 for functional classification and existing characteristics of BLM Road.
- Science Center Drive: a 0.9-mile, two-lane asphalt road that connects the Campbell Creek Science Center (CCSC) to BLM Road.

The CTF offers year round non-motorized recreational opportunities and provides access to the Campbell Creek Science Center (CCSC), which is a heavily attended education center. CTF had an estimated 314,000 visitors in FY16. Recreational demand is projected to continue to grow over the next several years, based on economic conditions.

- CTF consists of 12 miles of trails connecting to a broader network of city trails on the adjacent Far North Bicentennial Park, maintained by the Municipality of Anchorage.
- Campbell Creek Science Center receives approximately 34,000 visitors annually. The CCSC provides numerous educational opportunities including school-based, public, adult, and family programs. They also host the Trailside Discovery Summer Camp.

Special events at the CTF include support of the Iditarod Sled Dog Race ceremonial start, outdoor weekend events, water discovery days, National Trails Day, and National Public Lands Day.

Utilities in the area include overhead electric, water, sewer, fiber and gas. Drainage on Elmore Road and E 68th Ave is conveyed through a storm drain system. BLM and Science Center Drive drainage is conveyed in roadside ditches.

1.3 Purpose and Need

The purpose of this project is to improve pedestrian and intermodal connectivity as well as operational safety when accessing the CTF. Elmore Road has experienced a major increase in traffic volumes due to the extension project in 2005. Congestion and safety have become concerns for vehicles and pedestrians/bicyclists making turning maneuvers to access and exit Campbell Tract.

2.0 DESIGN STANDARDS AND GUIDELINES

Design standards and guidelines that apply to the Campbell Tract Facility Alternate Entrance project are contained in the following publications:

Standards:

- A Policy on Geometric Design of Highways and Streets, 6th Edition, American Association of State Highway and Transportation Officials (AASHTO), 2011.
- Roadside Design Guide, 4th Edition, AASHTO, 2011.
- Alaska Highway Preconstruction Manual, State of Alaska, DOT&PF, 2005 as amended.
- Highway Drainage Manual, State of Alaska, DOT&PF, 2006.
- Alaska Traffic Manual, consisting of the Manual on Uniform Traffic Control Devices (MUTCD), 2009 as amended, United States Department of Transportation (US DOT), Federal Highway

Administration (FHWA) and the Alaska Traffic Manual Supplement, State of Alaska, DOT&PF, 2016.

- ADA Standards for Transportation Facilities, US DOT, 2006.
- ADA Standards for Accessible Design, United States Department of Justice, 2010.
- Guide for the Development of Bicycle Facilities, 4th Edition, AASHTO, 2012.
- Recommended Practice for Roadway Lighting (RP-8-14), American National Standards Institute / Illuminating Engineering Society, 2014.
- Highway Capacity Manual, 5th Edition, Transportation Research Board, 2010.
- Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT \leq 400), AASHTO, 2001.

Guidelines:

- Proposed Accessibility Standards for Pedestrian Facilities in the Public Right-of-Way (PROWAG), United States Access Board, 2011.
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition, AASHTO, 2004.
- Traffic Engineering Handbook, 7th Edition, ITE, 2016

3.0 DISCUSSION OF ALTERNATIVES

Four alternatives for the BLM Road realignment were considered. All project alternatives besides the No-Build option will include the reconstruction of the signal at East 68th Avenue and Elmore Road.

3.1 Intersection Modifications

The intersection modifications include an additional southbound left turn bay on Elmore Road. Signal equipment, signal poles, curb ramps, signing and striping will be updated due to the new approach to the intersection. The reconstruction of the signal falls under the purpose and need of this project by increasing connectivity and operational safety.

3.2 Campbell Tract Road Alignment Alternative 1

Alternative one was evaluated with the goal of making the least impact to the land and existing facilities. This proposed alignment uses a minimum curve radius with a superelevation to tie into the existing BLM road without impacting the parking lot, trails, or the internal wye intersection. The intersection at the tie-in would be stop controlled. Parking lot expansion is optional and dependent on funding availability. This alternative includes intersection modifications as described in Section 3.1.

Key points of consideration for Alternative 1 (Figure 3):

- Minor ROW impacts to Heritage Land Bank
- Smaller project footprint, relative to Alternatives 2 and 3.
- New alignment includes a maximum super elevated curve based on the design speed of 20 mph.
- Low cost alternative.
- Road obliteration of existing BLM Road entrance.
- Striping 12 foot lanes and six foot shoulders on both sides.
- Moosetrack Trail will remain as-is.
- Traffic is still routed through Smokejumper parking lot.

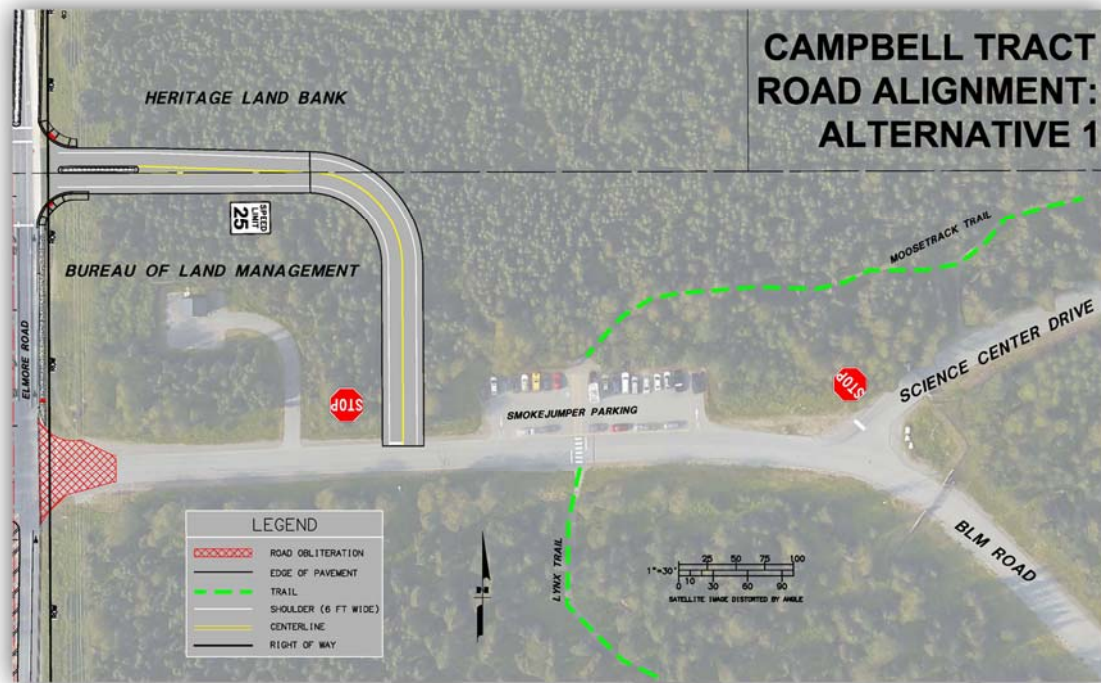


Figure 3: Alternative 1

3.3 Campbell Tract Road Alignment Alternative 2

The second alternative ties the realigned BLM Road in at the existing wye intersection. Although this includes more right of way impacts and land disturbance compared to the first alternative, only one unsignalized intersection is necessary. This internal intersection could be configured such that the through movements are free flowing on BLM Road while the Science Center Drive and the entrance to the Smokejumper parking lot would be stop controlled, or it could be a four way stop controlled intersection. Signage and striping for Moosetrack Trail could be added to notify drivers that a trail crossing is present. Parking lot expansion is optional and dependent on funding availability. This alternative includes intersection modifications as described in Section 3.1.

Key points of consideration for Alternative 2 (Figure 4):

- Larger ROW impacts to Heritage Land Bank compared to Alternative 1.
- New alignment would give the option of the north/south movement to be continuous or stop controlled while the Science Center Drive and Smokejumper parking lot entrance would be stop controlled.
- Road obliteration of existing BLM Road entrance.
- Striping 12 foot lanes and six foot shoulders on both sides.
- Warning signs and possible striping due to the road crossing of the Moosetrack Trail.
- Pedestrian crossings may be provided at the internal intersection

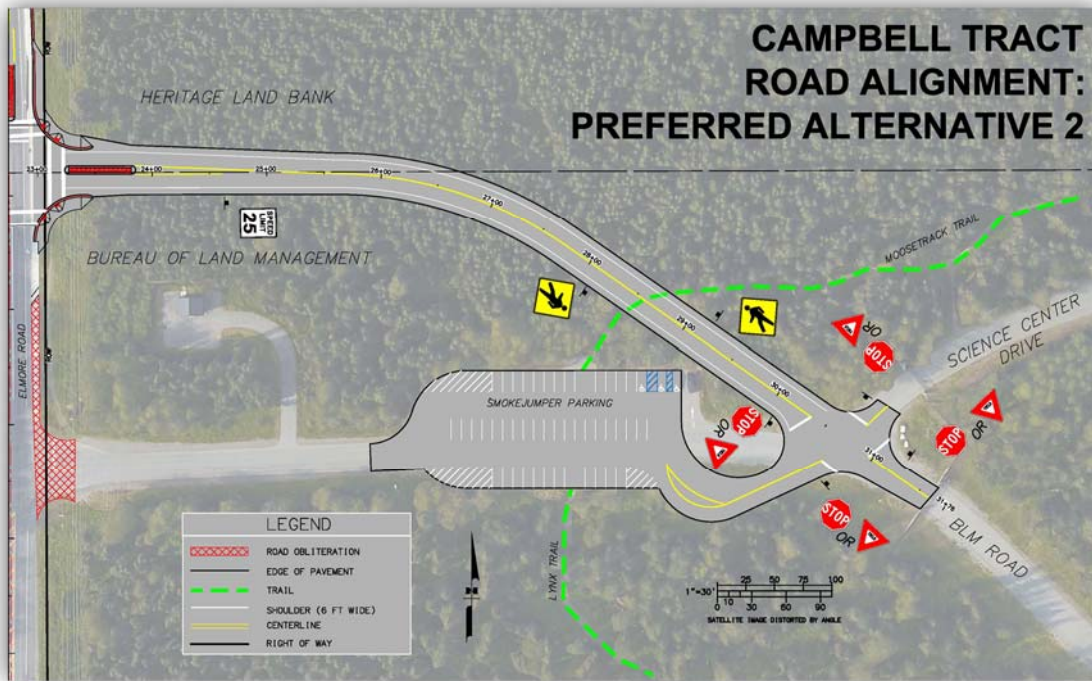


Figure 4: Alternative 2

3.4 Campbell Tract Road Alignment Alternative 3

The third alternative would have a similar alignment as alternative two, but would include a mini roundabout for the internal intersection. Although this option has slightly more right of way impacts and land disturbance it allows all movements to be yield controlled. Signage and striping for Moosetrack Trail could be added to notify drivers that a trail crossing is present. Parking lot expansion is optional and dependent on funding availability. This alternative includes intersection modifications as described in Section 3.1.

Key points of consideration for Alternative 3 (Figure 5):

- Impact to Heritage Land Bank ROW would be slightly larger than Alternative two.
- New alignment would include a mini roundabout at the tie in point with the existing Science Center Drive and BLM Road. All directions of traffic would be yield controlled.
- Road obliteration of existing BLM Road entrance.
- Striping 12 foot lanes and six foot shoulders on both sides.
- Warning signs and possible striping due to the road crossing of the Moosetrack Trail
- Tie-ins to the Smokejumper Parking Lot would be provided.
- Pedestrian crossings may be provided at the internal intersection.

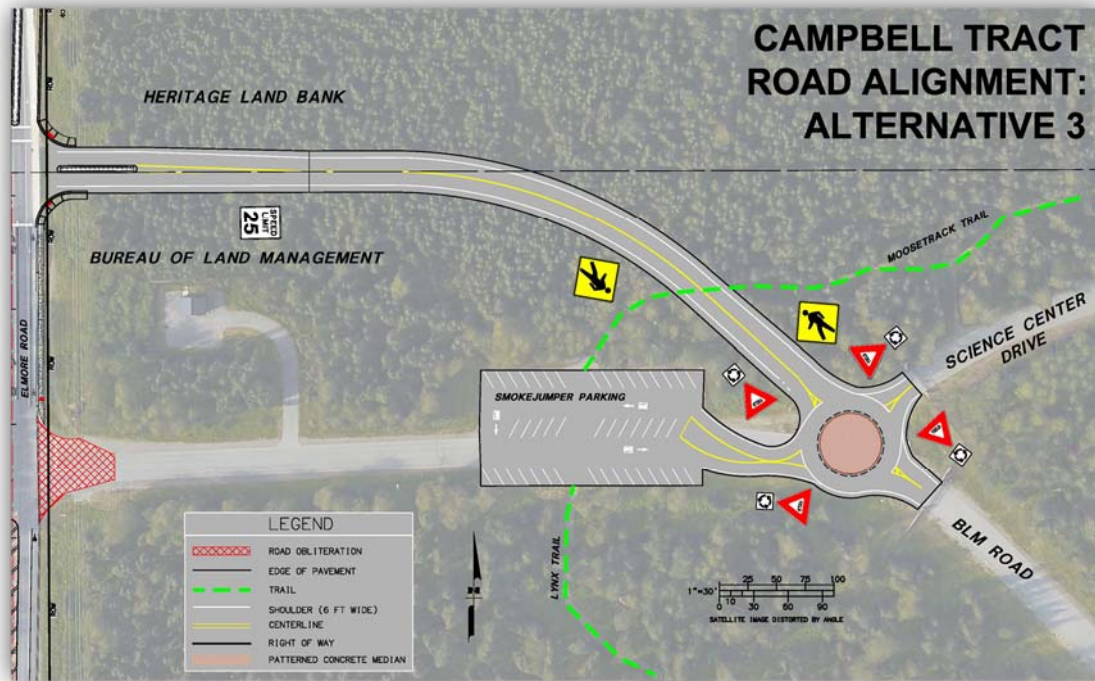


Figure 5: Alternative 3

3.5 Campbell Tract Road Alignment Alternative 4

The fourth alternative is the No-Build alternative. No improvements to the roadway would be constructed.

4.0 PREFERRED ALTERNATIVE

The preferred alternative by the BLM is Alternative 2 due to maintenance concerns, primarily snow removal. The recommended alternative by the State of Alaska DOT&PF is Alternative 3 as it best serves all vehicular movements at the internal BLM intersection based on volume data as well as provides for better approach angle of the Smokejumper Parking Lot with minimal realignment impacts from the parking area. Although crash history and driver behavior is unknown at this location, mini roundabouts, as included in Alternative 3, have also been found to provide traffic calming impacts as well as safety benefits over other intersection control types.

The first alternative was determined to be unfavorable due to several factors. This alternative would include a minimal radii curve with a superelevation and would also require vehicles to travel through two stop controlled intersections to get to CTF and continued travel through the Smokejumper parking lot.

DOT&PF’s recommendation was based on volume and turning movement data acquired at the internal Science Center Drive and BLM Road intersection. Comparatively Alternative 2 was not the preferred alternative by DOT&PF when serving the internal roadway traffic demands. Based on traffic data the largest traffic movement is to and from Elmore Road and Science Center Drive. Alternative 2 would provide a stop control scenario on Science Center Drive while the lower volume movement on BLM Road at the internal intersection would be unimpeded, or also stop controlled. Alternative 2 is expected to be able to function acceptably based on volume data.

Alternative 3 would provide for optimal traffic flow at the internal intersection while also promoting reduced speeds and traffic calming by incorporating a mini-roundabout. The center island of the mini-roundabout would be traversable to allow for large trucks to maneuver through the intersection.

Both Alternative 2 and 3 allow for pedestrians/bicyclists to experience fluid travel by using the six foot wide multiuse shoulders from Elmore Road to the internal roads and trailheads of the CTF. Bicyclists may travel through the internal intersection as a vehicle or as a pedestrian.

5.0 TYPICAL SECTIONS

5.1 BLM Road and Elmore Road Intersection

Proposed new leg to the existing intersection:

- 14 foot multi directional through lane and 3.5-7.5 shoulders (measured from face of curb).
- Raised Median with patterned concrete

5.2 Elmore Road

Proposed new left turn lane with taper:

- 12 foot through lane
- 13.25 foot left turn lane (measured from face of curb).
- Curb and gutter
- Raised Median with patterned concrete
- Sidewalk reconstruction.
- Cut and Fill slopes: 4H: 1V or flatter in the clear zone and 2H: 1V beyond the clear zone.

5.3 BLM Road

Proposed on BLM Road realignment section:

- 12 foot lane and a six foot shoulder in each direction.
- Embankment fore slopes of 3H: 1V or flatter
- Ditches will be included when existing topography requires drainage guidance.

The typical sections are provided in Appendix B.

6.0 HORIZONTAL AND VERTICAL ALIGNMENT

6.1 Horizontal and Vertical Alignment- East 68th Avenue & Elmore Road

Horizontal and Vertical Alignment remains unchanged.

The project will be maintaining the existing taper on Elmore Road. Drivers are familiar and no crash history is present for this area due to the taper rate. This taper will also match the existing taper used in the southbound direction.

6.2 Horizontal and Vertical Alignment- BLM Road

The BLM Road horizontal alignment will extend from the existing intersection of Elmore Road and East 68th Avenue to the existing intersection of Science Center Drive and BLM Road. Normal Crown slope of 2% will be used. Given the design speed of 25 mph, a 35 degree curve with a radius of 350 feet may be used to tie the two existing horizontal road alignments together.

The profile of the vertical alignment will tie the existing tangent grade of the signal at Elmore Road and East 68th Avenue with the existing tangent grade of Science Center Drive and BLM Road Intersection. Existing tangential grade differences are anticipated to be minor for the new section of roadway. The vertical alignment designed will meet the required K values for site distance.

7.0 EROSION AND SEDIMENT CONTROL

The project includes temporary and permanent measures to control or prevent erosion and sedimentation during and post project construction. The contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to construction that conforms to the DOT&PF Best Management Practices (BMPs) for Erosion and Sediment Control in accordance with the DOT&PF contract specifications and follows the guidelines of the Erosion and Sediment Control Plan (ESCP) provided to the contractor. The contractor will submit the SWPPP for approval by the Construction Project Engineer. The contractor will conduct construction activities in accordance with the approved SWPPP. Temporary BMP's will remain in place until permanent erosion and sediment control measures are in place and soil is permanently stabilized.

8.0 DRAINAGE

This project will have no significant change to the current drainage patterns and discharge points. Figure 6 shows the existing surface drainage patterns on 68th and Elmore Road (Blue arrows) and the discharge points into the storm drain system (Orange arrows) throughout the intersection. The addition of the BLM Road leg to the intersection may cause the following impacts:

- Removal of Curb Inlet 1.
- Abandonment of 12" storm drain pipe from Curb Inlet 1 to 3.
- Water from BLM Road onto Elmore will either flow north into next available inlet, or will enter roadside ditches adjacent to BLM Road or newly constructed ditch on southeast side of intersection along Elmore Road.

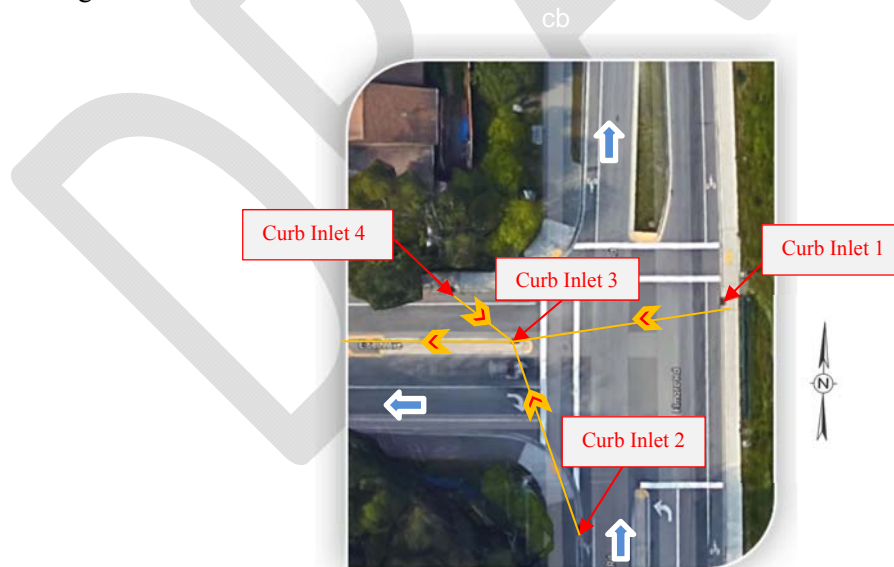


Figure 6: Existing Drainage

Drainage on the new BLM road alignment will consist of roadside ditches or fill slopes that shed water into adjacent wetlands. Were necessary, water detention ponds may be constructed to filter and allow for water storage capacity.

8.1 MS4 Permit

The National Pollutant Discharge Elimination System (NPDES) Program originated under section 402 of the Clean Water Act (CWA, 33 USC §1251), requires that pollutant discharges to surface water be authorized by permit. Together, the Municipality of Anchorage (MOA) and the DOT&PF are authorized to do so through an Authorization to Discharge permit under the National Pollutant Discharge Elimination System. This authorization, *Alaska Pollutant Discharge Elimination System (APDES) Permit No. AKS 052558*, is effective from August 1, 2015 to July 31, 2020. This permit applies to projects within the MOA.

In an effort to comply with the intent of the permit; the project will use, at a minimum, control measures to comply with BMPs and the Storm Water Management Program (SWMP), and follow the Authorization to Discharge under the APDES.

- The project follows the criteria set forth in the DOT&PF's Alaska Highway Drainage Manual and the MOA's Drainage Design Guidelines.
- The contractor will develop a SWPPP prior to construction that follows the guidelines of the ESCP provided to the contractor. The SWPPP will comply with the APDES permitting program and the Alaska Construction General Permit (ACGP).
- The contractor will describe how to minimize and manage to reduce pollution to storm water in the contractor's SWPPP.
- The contractor will comply with all permit conditions with respect to installation and maintenance of control measures, inspections, monitoring (if necessary), corrective actions, reporting and recordkeeping.
- The contractor will address all discharge in the SWPPP. The contractor will prepare a Hazardous Material Control Plan (HMCP).
- The maintenance of the pipes, sewers, and other conveyances will remain the responsibility of the AGENCY.
- State of Alaska will maintain outreach and education through the State of Alaska website. Project specific information will be posted at the project site once construction activity begins.

Bore logs show that the ground water in the project area is approximately 7 feet deep which eliminates the implementation of the structural storm water controls requiring separation from ground water of 2 feet.

Prior to discharging storm water into the right of way at the wetlands; runoff will be treated by the filtration and infiltration of grassy ditches. Silt deposits and debris will be settled out in the rock lined ditches which will filter and dissipate the water.

9.0 SOIL CONDITIONS

A geotechnical investigation was performed by DOT&PF Materials during summer 2017 and is included in Appendix C.

10.0 ACCESS CONTROL FEATURES

Access to the Campbell Tract Facility will be relocated to the signalized intersection of East 68th Avenue and Elmore Road. This relocation will eliminate the existing stop controlled approach which will decrease the amount of interruptions experienced by all users through this segment of Elmore Road.

11.0 TRAFFIC ANALYSIS

A traffic analysis was conducted using the volume counts taken on July 8th 2017 at the intersection of Elmore Road and 68th Avenue, Elmore Road and BLM Road, and at the internal junction of BLM Road and Science Center Drive. Peak hour volumes (PHV) for Elmore Road were present at 7:15 A.M. to 8:15 A.M. and at 4:30 P.M. and 5:30 P.M. Using Synchro software simulation, evaluations of overall intersection delay and Level of Service (LOS) for the P.M. PHV were evaluated to determine the impacts of the new approach. P.M. PHV were used as it was the time period in which the highest daily volumes were observed.

Additional Southbound Left Turn - Due to the high traffic volume in the southbound through movement, the installation of the left turn lane can be expected to decrease rear end crashes and decrease the overall delay for the through movement.

- 13% of the reported crashes at this intersection from 2008 to 2012 were rear end collisions.

Through movement East 68th Avenue - With the additional east leg (BLM Road) to the intersection a through movement will be incorporated into the existing left turn lane or tapered right turn pocket. Including the through movement in the left turn lane will result in the least impact to East 68th Avenue making it the preferred option. It allows for a larger storage length without any reconstruction of the E 68th Avenue approach, as the current largest movement on this leg is left to northbound on Elmore Rd..

Additional Left Turn or Right Turn on BLM Road - An additional axillary lane (Right or Left) for the westbound traffic was evaluated to see what impacts it would have to the overall delay for the intersection. Synchro Simulation results:

- Right turn lane, the intersection delay decreased by 0.03%.
- Left turn bay, the intersection delay increased by approximately 50%.

Intersection Delay and Level of Service - The intersection performance measures for the existing actuated/coordinated intersection were compared to the new four legged intersection in relation to overall delay and LOS of the Intersection for the design year and projected year. Growth Factors used for the simulation were 1.18 for BLM Road, 2.64 for Elmore Road and 0.73 for E 68th Avenue.

Table 2, shows the comparison of delay and Level of Service of the existing intersection to the four legged intersection with different phasing options. Since Elmore Road corridor is actuated/coordinated, keeping the 125 cycle length would allow the flow at all signals within the system to remain the same. Any modification to the length would need to be approved by the maintaining agency, which is MOA. Volume to Capacity ratios for all options, except the 2019 PM movements for NB and SB Four Legged Intersection, have ratios greater than 1. A v/c ratio greater than 1 shows that for the critical movement (southbound through) vehicles in the initial queue will have to wait for the next or multiple cycles before passing through the intersection.

The current T intersection condition is over capacity, also exceeding a v/c ratio of 1. By adding the specific growth factors to the particular roadways, the signal is approximately 10 times worse in intersection delay at the design year (2039). The primary influence to the delay and LOS for this intersection is Elmore Road vehicle volumes. Through volumes on Elmore Road max out the provided phase time and do not allow any gaps for permissive left turning movements. A solution to the intersections performance measures would include an additional lane on Elmore Road which is not in the scope of this project. The addition of the BLM Road approach to the intersection has minor impacts to the overall intersections performance.

	Existing T Intersection		Four Legged Intersection			
	2019	2039	2019		2039	
<i>Year</i>	2019	2039	2019	2019	2039	2039
<i>Cycle Length (sec)</i>	125 (provided by MOA)	125	125	125	125	125
<i>Left turn Movement</i> <i>PM = Permitted</i> <i>PT = Protected</i>	NB & SB PM&PT EB PT	NB & SB PM&PT EB PT	NB & SB PM&PT EB & WB PM&PT	NB & SB PM EB & WB PM&PT	NB & SB PM&PT EB & WB PM&PT	NB & SB PM EB & WB PM&PT
<i>Intersection Delay (sec)</i> <i>% Decrease (-)</i> <i>% Increase</i>	72.7	693.9	-38%	-63%	-25%	-36%
<i>Intersection LOS</i>	F	F	F	F	F	F

Table 2: Synchro Delay & LOS comparison

12.0 SAFETY IMPROVEMENTS

The proposed project improvements are anticipated to yield the following safety benefits:

- Pedestrians and bikers will have a protected phase for crossing the signalized intersection. The new BLM Road will have six foot shoulders. This is anticipated to decrease the number of midblock crossings by pedestrian and bicyclists on Elmore Road.
- The existing entrance to BLM Road will be obliterated, V ditch established, and slopes seeded. This approach obliteration will reduce the amount of uncontrolled traffic flow interruption on Elmore Road (approach consolidation).

2008-2012 Crash Data - Crash data shows that the majority of the incidents at the intersection of East 68th and Elmore Road were property damage related.

- Seven property damage only crashes including one rear end, two vehicle angle hits, and three object hits (snow berm, fence, utility pole).
- One possible injury crash due to vehicle rear ended.

13.0 RIGHT-OF-WAY REQUIREMENTS

Right of Way acquisition, Public Use Easement or other access easement will be needed along the western and southern boundaries of the Heritage Land Bank (HLB) property for construction and long term maintenance of the project. HLB land borders Elmore Road on the northeastern quadrant of the intersection.

14.0 PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian and bicyclist use in the project area is high. The existing conditions for pedestrians and bicyclists on Elmore Road consists of six foot paved shoulders labeled as bike lanes and sidewalk or pathway widths varying from five to 11 feet on both sides of the roadway. The east side north/south sidewalk ends at the East 68th Ave intersection and only exists from the intersection to the existing BLM Road entrance.

East 68th Avenue consists of four foot paved shoulders and sidewalk widths ranging from six to eight feet on both sides of the roadway. The intersection of East 68th Avenue and Elmore Road consists of two crosswalks (1-North/South and 1-East/West) and three curb ramps. The existing BLM road is approximately 24 feet in width of asphalt with gravel shoulders. Pedestrians/Bicyclists traveling from East 68th Avenue to BLM Road either cross at the signalized intersection and walk/bike on the sidewalk opposing

traffic or stay on the west side of Elmore road and use the bike lane or sidewalk south approximately 260 feet and make an unprotected midblock crossing to access BLM Road.

This project will provide pedestrians and bicyclists a path along East 68th Avenue and Elmore Road to facilities within the CTF. Road crossings will be via dedicated and signalized pedestrian crossings. The project should reduce the number of expected midblock crossings by eliminating the approach which attracts this action.

Curb Ramps - Pedestrians and bicycle (non-motorized) facilities will be provided in compliance within current ADA standards for Accessible Design to accommodate users crossing the Elmore Road and 68th Avenue intersection. Two out of the three existing curb ramps at the intersection were identified in a 2015 curb ramp inventory as being out of compliance. The curb ramps will be replaced and installed to current ADA standards in this project.

Shoulders - The new BLM roadway segment will provide accommodations for pedestrians and bicyclists by incorporating six foot paved shoulders on both sides of the roadway. This new roadway will tie into existing trails, parks, and parking lots.

15.0 UTILITY RELOCATION AND COORDINATION

Utility companies with facilities in the project limits with possible conflicts are underlined in the following bullets:

- **Gas line (ENSTAR)** – Transmission pressure and distribution pressure natural gas lines are in the project limits. A 12-inch line runs parallel to Elmore on the east side and will not be impacted. A 2-inch line along BLM Road that continues to Science Center Drive will be impacted by the tie in at the junction of BLM and Science Center Drive.
- **Electrical (CEA)** - Aerial and underground transmission and distribution lines are in the project corridor. Overhead lines will not be impacted. Underground lines (3-phase & single phase). The single phase line ends at the road junction and the 3-phase line continues along Science Center Drive and potential impacts will occur at the tie in location.
- **Water and Sewer (AWWU)** – Water and sanitary sewer (SS) are in the project limits and include: 3 valve boxes, 4 SS manholes, private SS/1 private manhole, and a fire hydrant that may be impacted by the project.
- **Signal & Fiber (MOA)** –The Municipality of Anchorage through agreement maintains the traffic signal at 68th & Elmore. The signal modifications at 68th Ave will require coordination with MOA and will potentially impact the fiber communication run from Lore Road and Elmore Road intersection during construction.

Agreements will need to be developed for utilities that will require relocation at select locations throughout the project.

16.0 PRELIMINARY WORK ZONE TRAFFIC CONTROL

The Alaska Highway Preconstruction Manual (PCM), Section 1400.2 sets forth the criteria for determining if a project is "significant" for the purpose of developing the Transportation Management Plan (TMP). Significant projects fall into either a Category 1 or Category 2 Classification. This project is classified as a Minor Arterial located within the Anchorage urban area. The roadway AADT is below 30,000 vpd, and full closures with a duration longer than one hour are not

anticipated, therefore the project does not meet the “Significant Project” definition and will not require a Traffic Management Plan.

16.1 Traffic Control Plan (TCP)

The contractor will develop a TCP during construction, to safely guide and protect the traveling public in work zones, in accordance with the ATM and the project specifications. The plan will be assessed and approved by the Construction Project Engineer and the Traffic Control Engineer.

The contractor is responsible for providing advance notice to the public, including local businesses, residents, and road travelers, of construction activities that could cause delays, detours, or affect access to adjacent properties.

16.2 Public Information Plan (PIP)

A PIP will be developed prior to beginning construction that will specify the ways and means that the contractor will use to inform the public of upcoming activities that will impact local stakeholders, the roadway users and public entities. The PIP will contain measures to inform stakeholders of project scope, expected work zone impacts, closure details, and recommended action to avoid impacts and changing conditions during construction. Measures to disseminate information include:

- Contractor’s Worksite Traffic Supervisor
- Department’s Construction section thru the Department’s 511 system
- Department’s Navigator website
- Television, Radio, and/or newspaper
- Other location-specific communication tools

The traveling public should not be caught unawares by any closures, detours, delays, night work, or any potentially disruptive activity.

16.3 Transportation Operations Plan (TOP)

The Department will coordinate with relevant public agencies and event organizers, and incorporate means and methods for minimizing traffic impacts with the contractor not covered by the TCP or the PIP within the project plans.

17.0 STRUCTURAL SECTION AND PAVEMENT DESIGN

The preliminary roadway structural section for both Abbott Road and BLM Road includes the following:

17.1 Elmore Road

- 2” Hot-Mix Asphalt (HMA), Type II, Class A, PG 64-40
- STE-1 Tack Coat
- 3” Asphalt Treated Base (ATB), PG 64-40
- 2” Aggregate Base Course, Grading D-1
- 36” (min) Selected Material, Type A – extend from edge of existing pavement, extend new pavement and crushed aggregate layers to existing fog line.
- Selected Material, Type C (as needed)
- Sub-excavation as required

17.2 BLM Road

- 2” Hot-Mix Asphalt (HMA), Type II, Class A, PG 64-40

- STE-1 Tack Coat
- 2" Asphalt Treated Base (ATB), PG 64-40
- 2" Aggregate Base Course, Grading D-1
- 36" (min) Selected Material, Type A.
- Selected Material, Type C (as needed)
- Sub-excavation as required.

17.3 Parking Lot – Widened section

- 3" Hot-Mix Asphalt (HMA), Type II, Class A, PG 64-40
- 2" Aggregate Base Course, Grading D-1
- 24" (min) Selected Material, Type A.
- Geotextile, Separation, Class 3
- Sub-excavation as required to remove existing silt layer ~2.0' below original ground.

17.4 Parking Lot – Reconstructed (over existing)

- 3" Hot-Mix Asphalt (HMA), Type II, Class A, PG 64-40
- 2" (min) Aggregate Base Course, Grading D-1
- Existing subgrade

Structural depths will be designed based on data collected from the site and will be provided in the Material Recommendations (Appendix C). Material sources for this project will be contractor supplied.

18.0 COST ESTIMATE

The project cost estimate is as follows:

Preliminary Engineering	\$	638,000
Right-of-Way	\$	315,000
Utility Relocation	\$	232,500
Construction	\$	2,963,155
Total	\$	4,148,655

19.0 ENVIRONMENTAL COMMITMENTS AND CONSIDERATIONS

FHWA will be the lead Federal agency for National Environmental Policy Act (NEPA) and will complete the compliance process for both the preliminary engineering (ground-disturbing field investigations) and overall project actions. A Categorical Exclusion for the project is expected by the spring of 2018. The BLM will be a cooperating agency for NEPA and will also be obtaining their own environmental documents. Upon completion of the PS&E, but prior to solicitation of bids for construction, FHWA will certify that all environmental commitments have been addressed and that all regulatory permits, necessary for the construction of the project, have been obtained.

FHWA will contract for wetland delineation, archaeological surveys, threatened and endangered species surveys, and eagle and raptor nest surveys as required in support of the NEPA evaluation.

The BLM will be the lead agency for compliance with the Section 106, National Historic Preservation Act, consultation with the federally recognized Tribes, and consultation with the State Historic Preservation Office, if necessary. FHWA will support the BLM in this process as needed.

The following permits are anticipated at a minimum:

- National Pollutant Discharge Elimination System (NPDES) - ADEC
- 401/404 -US Army Corps of Engineers
- Fish Habitat Permit -Alaska Department of Fish and Game
- Noise Permit
- Other State and local agency permits.

The contractor will be required to prepare and implement a SWPPP that conforms to the DOT&PF BMPs for erosion and sediment control in accordance with the DOT&PF contract specifications. Appropriate erosion and siltation controls will be used and maintained in optimal condition during construction and all other exposed soils/fills will be permanently stabilized.

The contractor will be required to dispose of solid waste at an ADEC approved landfill. An ESCP will be made available to the contractor to use as guidance in developing the SWPPP.

The contractor is responsible for obtaining all necessary permits and clearances for materials sites, disposal sites, and staging areas. See the Environmental Document in Appendix E for project specific commitments.

20.0 BRIDGES

No bridges are within the project limits.

21.0 EXCEPTIONS TO DESIGN STANDARDS

There are no exceptions to design standards for this project.

22.0 MAINTENANCE CONSIDERATIONS

Maintenance of Elmore Road will remain the responsibility of the State of Alaska and the local DOT&PF Maintenance and Operations Station located at 5300 E Tudor Road Anchorage, AK 99507.

This project will both increase/decrease maintenance efforts for the **State of Alaska** by:

Decrease	<ul style="list-style-type: none"> • Install inlaid pavement markings. • Possible improvements to drainage and replacement of damaged curb inlets at the intersection. • Replacement of the existing grass center median with a solid surface median, reducing vegetation to maintain during the summer.
Increase	<ul style="list-style-type: none"> • Roadway surface area to be plowed/maintained via added turn bay. • Installation of compliant curb ramps (from 3 to 4 curb ramps).

Maintenance for the signal (via TORA agreement) at East 68th Avenue will remain the responsibility of the Municipality of Anchorage.

The project will both increase/decreases maintenance efforts for the **Municipality of Anchorage** by:

Decrease	• Replace existing signal equipment impacted by the design with new.
	• Installation of new signal poles.
	• Replace median nose on East 68 th Avenue that is damaged.
	• Installation of LED lamps at the intersection, reducing energy consumption.
	• Removal of existing pedestrian fence.
Increase	• Additional signal hardware
	• Additional (or larger) signal poles

Maintenance of BLM Road will remain the responsibility of the Bureau of Land Management.

The project will increase maintenance efforts for the **Bureau of Land Management** by:

Increase	• Roadway realignment and side street approaches includes more surface to plow and maintain.
	• Installation of new signs.
	• Surface applied pavement markings.
	• Any onsite improvements/expansion to lighting or parking facilities that may be included.

APPENDIX A

**Approved Design Criteria
and
Design Designation**

APPENDIX B

Typical Sections

APPENDIX C

Material Recommendations

APPENDIX D

Traffic Analysis

The information in this report is compiled for highway safety planning purposes. Federal law prohibits its discovery or admissibility in litigation against state, tribal or local government that involves a location or locations mentioned in the collision data. 23 U.S.C. § 409; 23 U.S.C. § 148(g); *Walden v. DOT*, 27 P.3d 297, 304-305 (Alaska 2001).

APPENDIX E

Approved Environmental Document

Do not include the Environmental Document's appendices.

APPENDIX F

Design Memos

Design Memos may include: ADA Summary Reports, Drainage Inspection Reports, Guardrail Inspection Reports, etc.

If no design memos have been created for the project at time of signing, insert the following paragraph. This will serve as a placeholder in the case of a significant design change after initial approval.

At this time, no significant design changes were made after the approval of this document. The final as-built plan set for this project will be available at Central Files within the Highway Design section (4111 Aviation Ave. Anchorage, AK 99502).