

### **NOTICE TO USERS**

This report is intended to document the methodologies, findings, and conclusions of a Design Study completed for the Matanuska-Susitna Borough. Changes frequently occur during evolution of the planning/design process. Persons who may rely on the information contained in this document should contact the following:

Jim Rowland, P.E.  
Matanuska-Susitna Borough  
350 E. Dahlia Avenue  
Palmer, Alaska 99645  
(907) 745-4801

or

Tom Adams, P.E.  
Lounsbury & Associates, Inc.  
3161 E. Palmer-Wasilla Hwy., Suite 2  
Wasilla, Alaska 99654  
(907) 357-9129

---

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 PROJECT DESCRIPTION .....	1
1.2 PURPOSE AND NEED .....	1
<b>2.0 EXISTING CONDITIONS .....</b>	<b>3</b>
2.1 MACHEN ROAD .....	3
2.2 MACHEN ROAD EXTENSION .....	3
2.3 CHURCH ROAD .....	3
2.4 NICOLA AVENUE.....	3
2.5 RIGHT-OF-WAY.....	4
2.6 PEDESTRIAN FACILITIES .....	4
<b>3.0 DESIGN CRITERIA .....</b>	<b>4</b>
3.1 FUNCTIONAL CLASSIFICATION.....	4
3.2 DESIGN TRAFFIC VOLUMES.....	5
3.3 TYPICAL SECTION .....	5
3.4 DESIGN SPEED .....	5
<b>4.0 MAJOR DESIGN ELEMENTS .....</b>	<b>6</b>
4.1 SOILS .....	6
4.2 PAVEMENT DESIGN .....	7
4.3 DRAINAGE .....	7
4.4 PEDESTRIAN ACCOMMODATIONS.....	7
4.5 UTILITIES.....	7
4.5.1 Water.....	7
4.5.2 Gas.....	9
4.5.3 Telephone (MTA).....	9
4.5.4 Telephone (GCI).....	10
4.5.5 Electric .....	10
<b>5.0 SAFETY IMPROVEMENTS .....</b>	<b>11</b>
5.1 CAPACITY ANALYSIS.....	11
5.2 ILLUMINATION .....	11
<b>6.0 DESIGN ALTERNATIVES .....</b>	<b>12</b>
<b>7.0 ENVIROMENTAL CONSIDERATIONS .....</b>	<b>12</b>
7.1 WETLANDS .....	12
7.2 WATER QUALITY .....	12
7.3 COASTAL ZONE.....	13
7.4 THREATENED AND ENDANGERED SPECIES.....	13
7.5 WILDLIFE .....	13
7.6 HISTORIC RESOURCES .....	13
<b>8.0 RIGHT-OF-WAY REQUIREMENTS.....</b>	<b>13</b>
8.1 ROW ASSUMPTIONS .....	13
8.2 ESTIMATED ROW IMPACTS.....	14

**9.0 COST ESTIMATE ..... 14**

**APPENDICES**

**APPENDIX A - PROJECT DESIGN CRITERIA ..... A**

**APPENDIX B – PRELIMINARY PLANS (LOCAL REVIEW) ..... B**

## **LIST OF ACRONYMS**

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
DSR	Design Study Report
DOT&PF	State of Alaska Department of Transportation and Public Facilities
LOS	Level of Service
MSB	Matanuska-Susitna Borough
ROW	Right-of-Way

## **1.0 INTRODUCTION**

The Matanuska-Susitna Borough (MSB), in coordination with the City of Wasilla, is proposing to extend Machen Road in Wasilla, Alaska, eastward approximately 1.4 miles from the existing George Parks (Parks) Highway frontage road (Machen Road) to Nicola Avenue (Figure 1) (T17N, R1W, S7&8, Seward Meridian).

This Design Study Report (DSR) documents and summarizes the purpose and need, design considerations, and recommendations for roadway improvements.

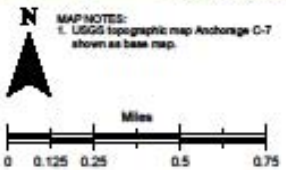
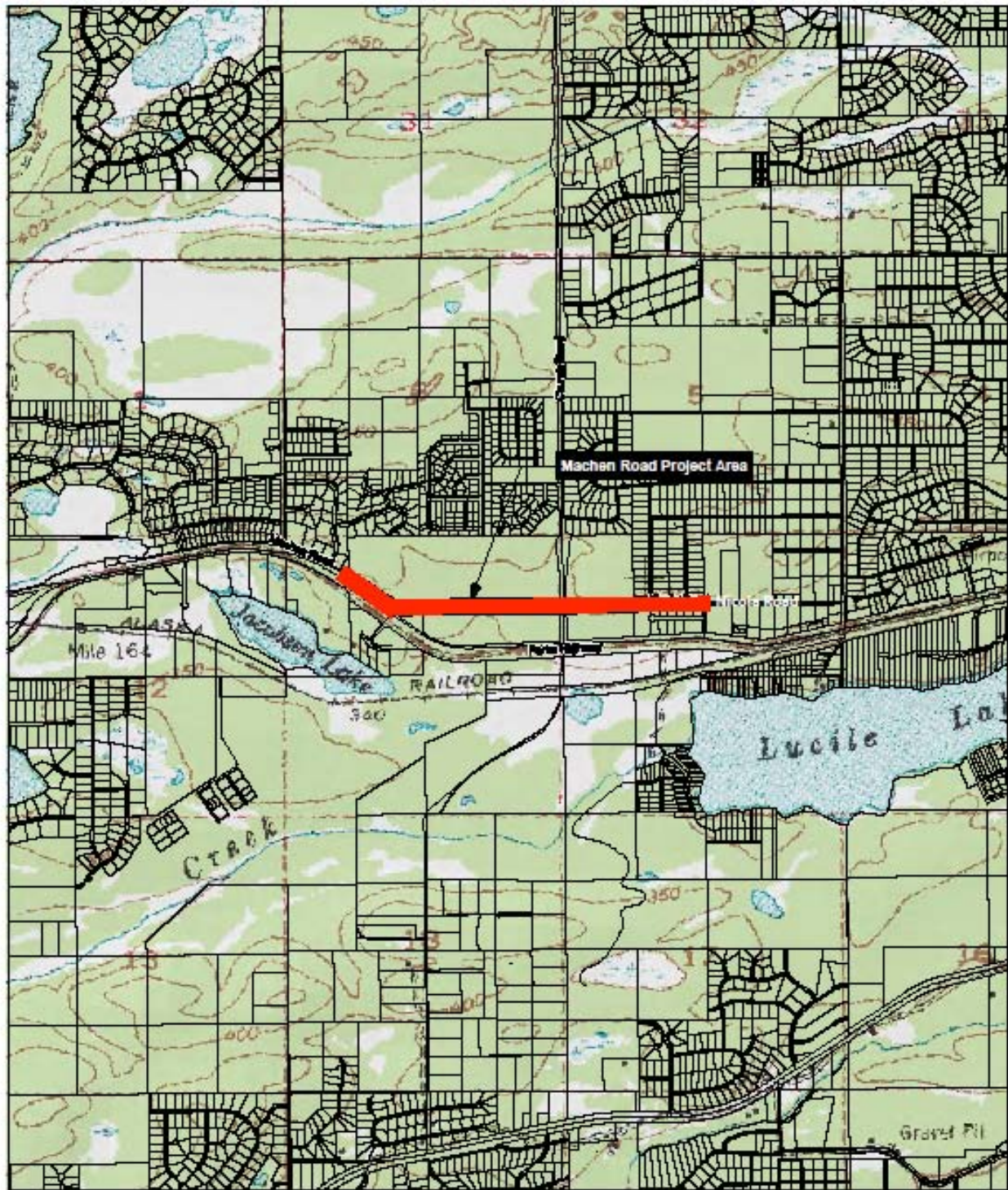
### **1.1 PROJECT DESCRIPTION**

The proposed Machen Road extension would generally parallel the Parks Highway between Day Street and Deskas Street, intersecting Church Road approximately 750 feet (750') north of the Parks Highway. The road will be constructed to rural road standards and include 11' wide lanes with paved shoulders. Construction of the road extension will take approximately four months and is planned to begin in summer 2010. Construction timing is contingent upon acquisition of required right-of-way (ROW).

### **1.2 PURPOSE AND NEED**

The Wasilla to Big Lake area of MSB has experienced rapid growth in the past few years resulting in increased land development and corresponding increases in local traffic. The Alaska Department of Transportation and Public Facilities (DOT&PF) is planning to upgrade Parks Highway from Lucas Road in Wasilla to Big Lake Road from a 2-lane State highway to a 4-lane divided State highway with limited access; however, the highway improvement project is many years from construction. MSB recognizes the need for additional collector roads to be constructed in conjunction with the highway project and has received grant funding from the State of Alaska Department of Commerce, Community and Economic Development to address the problem. The purpose of this project is to extend Machen Road to provide a continuous connection along the north side of Parks Highway in Wasilla/Big Lake area. The project is needed to:

- Improve safety along a transportation corridor that is experiencing rapid growth.
- Alleviate traffic problems and better distribute traffic.
- Connect a road that parallels Parks Highway, thereby providing a way for local traffic to travel efficiently.



MAP NOTES:  
1. USGS topographic map Anchorage C-7  
shown as base map.

- LEGEND**
- Mapping Area
  - Roads
  - Parcels

**Vicinity Map**  
*Machen Road Extension*

## **2.0 EXISTING CONDITIONS**

### **2.1 MACHEN ROAD**

Machen Road is a 24' wide gravel road that begins near Lamont Way and terminates approximately 600' east of Day Road (approximately 2,800' to the east). It is within a 50' ROW owned and maintained by the MSB. The existing frontage road provides access for many commercial properties along the north side of Parks Highway and has numerous intersecting driveways.

### **2.2 MACHEN ROAD EXTENSION**

The project corridor is not developed, nor does continuous ROW exist for the full length of the corridor. The terrain is forested and considered rolling.

### **2.3 CHURCH ROAD**

Church Road links the Parks Highway to Schrock Road, roughly four miles north. The ROW is owned and maintained by DOT&PF. Based on DOT&PF's Traffic Volume Report (2006–2008), Church Road functions as a minor collector. The intersection at Parks Highway is signalized.

Church Road divides the project area. The land between Church Road and Machen Road is undeveloped forest with a mild slope to the south. There are wetlands in this area, but no other identified water bodies. The land between Church Road and Nicola Avenue is also undeveloped forest with a mild slope to the south. There are no wetlands or water bodies in this area.

### **2.4 NICOLA AVENUE**

Nicola Avenue extends ½-mile westward from Lucus Road to Southway Street. The 24' gravel roadway is owned and maintained by the City of Wasilla. Nicola is intersected by two other City of Wasilla roads, Deskas Street and Southway Street.

Deskas Street is a 600' segment of paved roadway that links the Parks Highway to Nicola Avenue. The street provides access to a school and commercial properties within Carol Subdivision, including NC Machinery.

Southway Street starts at Nicola Avenue and extends 1600' northward to Vaunda Avenue. It is a 20' wide gravel street within a 50' ROW that provides residential access to Wasilla Acres Subdivision.

Kimberly Street is a gravel roadway located 650' west of Southway Street. Since the Nicola Avenue ROW ends at Southway Street, there is no southern access to Kimberly Street. Instead, access is via Vaunda Avenue to the north.

## 2.5 RIGHT-OF-WAY

Right-of-Way for the proposed road extension is both discontinuous and insufficient for the desired ROW width of 100 feet. ROW acquisition will be required and will constitute a significant portion of the project cost.

## 2.6 PEDESTRIAN FACILITIES

A separated eight foot multi-use trail parallels the north side of Parks Highway along the entire project length; a similar trail parallels the east side of Church Road.

## 3.0 DESIGN CRITERIA

Road design criteria for the Machen Road Extension project is developed from the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets (2004), as supplemented by DOT&PF's current edition of the Alaska Preconstruction Manual. Table 1 summarizes the design criteria; the Project Design Criteria data sheet found in Appendix A has a comprehensive outline of design recommendations used for this project.

**Table 1. Design Criteria**

<b>Item</b>	<b>Criterion</b>
Functional Classification	Minor Collector
Design Vehicle	AASHTO WB-50
Design Speed	40 mph
Minimum curve radii	750'
Lanes	2, each 11' wide
Surface	Paved
Shoulder Width	5'

## 3.1 FUNCTIONAL CLASSIFICATION

The development or improvement of streets should be based on a functional classification established as part of a comprehensive community development plan. MSB has identified Machen Road extension as a minor collector. A minor collector provides movement from subdivisions and residential street to major collectors, arterials or Highways. Residential frontage is limited and/or restricted to encourage mobility and enhance safety. This functional classification sets the design standards to be used for the Machen Road Extension project.

### 3.2 DESIGN TRAFFIC VOLUMES

Per AASHTO, collector roads should be designed for specific traffic volumes and acceptable levels of service (LOS). Usually, the design year is 20 years from the date of construction completion but may be any number of years within a range from the present (for restoration projects on existing roads) to 20 years in the future (for new construction projects). For this new construction project, road improvements can be completed by the end of 2010; therefore, the design year has been identified as 2030.

The average annual daily traffic (AADT) volume for the design year should serve as basis for the project design. Based upon the Design Designation Study prepared for this project, design year traffic volumes are as follows:

**Table 2. Traffic Volume Projection Summary**

Road Segment	AADT
Machen Road	2710

### 3.3 TYPICAL SECTION

The project is to be designed to fulfill the requirements of a minor collector. Two travel lanes are acceptable for the project design year volumes of 2,710; however, the intersection with Church Road should be channelized. The desirable road section consists of two 11' travel lanes, a 5' shoulder on the south side and 1' shoulder on the north with Type I Curb and Gutter, and an 8' asphalt bike path. Side slopes will be 4:1, with 2.5:1 fill slopes and 2:1 cut slopes outside the clear zone.

### 3.4 DESIGN SPEED

Design speed is a selected speed used to determine the various geometric design features of the roadway. The assumed design speed should be a logical one with respect to topography, anticipated operating speed, the adjacent land use, and the functional classification of roadway. Except for local streets where speed controls are frequently included intentionally, every effort should be made to use as high a design speed as practical to attain a desired degree of safety.

Machen Road is within Wasilla city limits and Municipal Code limits the posted speed to 35 miles per hour (mph). Since it is desirable that the average operating speed of a large proportion of drivers be lower than the design speed, this report recommends a design speed of 40 mph.

## **4.0 MAJOR DESIGN ELEMENTS**

### **4.1 SOILS**

A geotechnical engineering study was conducted for this project to determine subsurface conditions along the alignment. During field exploration 21 borings were advanced and sampled. In general, the soils consist of a layer of silt over gravels with an overlying organic mat in undisturbed areas. The silt overlying the gravels varies in thickness from a few inches to multiple feet. The underlying gravels with sand have silt contents that range between 5 and 30 percent.

According to the study, surface soils over the length of the road extension are largely composed of organic silt or silt and sand containing roots and decayed plant matter. The thickness of these soils range between 0 and 3.5 feet below ground surface, but is generally less than 2.5 feet thick in areas that have not been developed. This soil is frost susceptible, has a tendency to retain water, and is compressible. Therefore, the report recommends this layer be removed and disposed prior to placing fill material. The soils investigation suggests the existing sand and gravel may meet the requirements for Select Material Type C. The Select Material Type C material may be used in embankment construction below the pavement section as long as it meets specification and the contractor is able to achieve compaction requirements. It should be noted that soils with fines content above 20 percent may be difficult to work with and compact, particularly in wet conditions. The contractor should only use material with more than 20 percent fines if they are confident the material can be placed and compacted according to specification.

In the vicinity of the wetlands, peat in excess of three feet was encountered. However, the depth of the organics and peat are not well defined and there is a potential that the base of the layer may be significantly deeper than that observed in the boring. The peat overlies silts with a perched water table and was fully saturated. Since excavation of the peat layer may not be economical, the geotechnical report recommends a preloading embankment (surcharge) be constructed in the initial phases of the project. A surcharge height of 125% of the design embankment is recommended and will require several weeks for consolidation to occur. The embankment should be monitored until there is less than 0.1 inch settlement observed over a period of one week. Then, the embankment material can be removed to the base of the design pavement section.

Prior to constructing the embankment, woody vegetation should be cut and removed and a layer of nonwoven geosynthetic should be placed upon the ground surface.

## **4.2 PAVEMENT DESIGN**

The thickness of the asphalt pavement and leveling course is dependent upon traffic loads, design life, and use. For construction of the embankments it is assumed that there will be various types of fill suitable for use; Selected Material Type A, B, and C per DOT&PF specifications.

On the basis of the subsurface conditions outlined herein, the geotechnical report recommends a typical pavement section as follows:

- 2 inches of Asphalt Concrete,
- 4 inches of Crushed Aggregate Base Course,
- 31 inches (minimum) of Selected Material, Type A, and
- Selected Material, Type B or C as needed in deeper excavations.

## **4.3 DRAINAGE**

The design will include roadside ditches on the south side of the alignment and a curb and gutter system along the north side of the alignment. The north side will periodically convey collected runoff to the south side ditches via catch basins and cross culverts. The ditches on the south side will release the runoff to low points in the terrain. Cross culverts with a minimum diameter of 24 inches will be installed at these low points and in other locations that best maintain the overall drainage patterns of the surrounding watershed without impacting adjacent properties.

## **4.4 PEDESTRIAN ACCOMMODATIONS**

Pedestrian facilities are proposed along the entire length of the project on the north side of the alignment. The path will begin at Day Road to the west and end at Deskas Street to the east.

## **4.5 UTILITIES**

Preliminary research identified underground utilities within project limits, including water mains, telephone cables and gas lines. Above ground utilities include fire hydrants, utility poles, overhead electric and telephone lines. The majority of the alignment (station 6+00 to 61+00) is within an undeveloped area and there are no nearby utilities.

### **4.5.1 Water**

- A 16-inch ductile iron pipe (DIP) starts at station 60+30 and extends east along the north shoulder of the proposed extension. At station 61+46 to station 64+06 the 16" main line is buried 9.5' below ground surface; reductions in cover may warrant

relocation or insulation. At station 63+62 the 16" main line connects to an existing 24" water main line extending north along Kimberly Street on the east shoulder. At station 63+70 the 16" main line connects to an existing 12" water main line extending north along Kimberly Street on the east shoulder. At station 63+00 to station 64+00 there are 5 valve boxes that need to be adjusted to the proposed road extension surface. At station 63+85 a 1-inch service line off the 16" main line extends to the north. At station 64+34 there is an 8" service line that tees off the 16" main line extending south. At station 69+56 there is a stub that tees off the 16" main line extending 10' to the south with a valve and valve box at the end. The valve box will need to be adjusted to the proposed road extension surface. At station 69+50 to station 72+75 the water main has 6.5' of coverage and may need relocated or insulated. At station 70+26 there is a 16"x12" cross. From the cross there is 12" line that extends to the north and feeds an existing fire hydrant and assembly. The fire hydrant and the assembly will need to be relocated. Also from the cross there is a 12" line that extends to the south where it is plugged; this segment of line may need extended further south to avoid road excavation for future tie-ins. At station 71+89 there is a 1-inch service line that extends 60' to the north and terminates at an air release valve. The air release valve box will need to be adjusted to the proposed surface. At station 73+51 there is a valve box that will need to be adjusted to the proposed surface. At station 73+79 a 12-inch stubout extends south 29 feet. At station 74+11 there is a valve box that will need to be adjusted to the proposed surface and a 16" line extending south that terminates into a fire hydrant. The fire hydrant and assembly will need to be relocated. The 16-inch water main line continues south at station 75+06 as it leaves the project area.

- A 24-inch water main line connects to an existing 16-inch water main line and extends north along the east side of Kimberly Street to Vaunda Avenue. At station K0+00 to K1+69 the 24-inch water main has insufficient coverage and may need to be relocated or insulated. The 24-inch main line continues north and leaves the project area at station 3+00.
- A 12-inch water line connects to an existing 16-inch water main line and extends north along the east side of Kimberly Street to Vaunda Avenue. At station K0+00 to station K1+69 there is insufficient coverage and the main may need to be relocated or insulated. At station K0+56 there is a valve box to be adjusted to proposed

surface. There is also a 12-inch line that extends east and terminates at a fire hydrant; the fire hydrant and assembly will need to be relocated.

#### 4.5.2 Gas

- Machen Road has a 6-inch plastic line extending eastward along the north shoulder. The 6-inch line crosses Machen Road at station 5+50 and extends southeast along the north side of an existing paved path and out of the project area. At station 1+27 there is a 2-inch plastic line that splits from the 6-inch line and extends north along Day Road on the east shoulder and out of the project area.
- Church Road has a 6-inch plastic line that starts at Parks Highway and extends north along the west side of Church Road. The 6-inch line crosses the proposed Machen Extension alignment at station 46+37. At station 46+37 the design is in a large cut section that is 6 to 8' in depth. The 6-inch line crosses the alignment and may need to be relocated.
- Nicola Avenue has a 2-inch plastic line extending west along the north shoulder. At station 73+75 the 2-inch line turns north and out of the project area.
- Starting at station 70+15 a 2-inch plastic line extends west along the northern boundary of Carol Subdivision. From station 63+75 to 65+50 and from station 69+00 to 70+15 the line will likely be exposed and may have to be relocated. At station 63+75 the 2-inch line turns north along Kimberly Street on the east shoulder. The first 140' north along Kimberly Street (station K0+00 to K1+40) may need to be relocated.
- Southway Street has a 2-inch line that starts at station S0+95 and extends north 7 feet to the east of the centerline. From station S0+95 to station S1+75 the 2-inch gas line may need to be relocated. At station S3+00 the 2-inch line leaves the project area.

#### 4.5.3 Telephone (MTA)

- A buried fiber cable extends south along Day Road on the east shoulder. It crosses Machen Road at station 1+31 and continues south. It terminates at a pedestal 56' to the south; 41' to the north the fiber cable line goes through a pedestal. There is also buried fiber cable that extends west from that pedestal along the north shoulder of Machen Road and crosses Day Road 35' to the north of the street intersection.
- Two buried cable lines extend north along the west side of Church Road. A fiber optic line which crosses the proposed Machen road alignment at station 46+37 and a

- fiber cable that crosses the proposed Machen Road alignment at station 46+42. Both lines may need to be relocated.
- At station 64+25 a buried fiber cable extends east within a 15' easement along the south of Lot 1 and Lot 24. At station 69+82 it enters a pedestal and continues east along the north shoulder of Nicola Avenue and leaves the project area. From station 63+47 to 64+00 and station 69+82 to 70+90 the cable line may need to be relocated. At station 71+18 to station 74+50 the cable may need to be relocated. At station 76+00 the cable continues east of the project area. There are two pedestals at station 64+25 and 69+82 that may need to be relocated.
  - The pedestal at station 69+82 has a fiber cable line that extends north along the west shoulder of Southway Street and out of the project area.
  - The pedestal at 64+25 has a buried fiber cable that extends north along Kimberly Street on the west shoulder. The first 182' along Kimberly Street may need to be relocated.

#### 4.5.4 Telephone (GCI)

- An underground cable line runs south from Vaunda Avenue along North Kimberly Street. The cable ends at station 2+94 (Kimberly) and present no know conflict.
- An underground cable line runs south from Vaunda Avenue along North Southway Street. At station 0+63 the cable line turns east and runs along the existing Nicola Avenue. There is an apparent conflict at station 0+63 to 1+25. There is a cut in the section and it may expose the existing cable line.

#### 4.5.5 Electric

- An overhead power line starts at a power pole 90' south of the proposed Machen Road alignment. The line extends north crossing Machen Road at station 3+32. The line terminates at a power pole 111' north of the proposed Machen Road alignment.
- Overhead line extends north along the west shoulder of Church Road. The lines cross the proposed alignment at station 46+56.
- Overhead lines extend east along Machen Road alignment from station 63+25 past the project limits. Power poles at station 63+25, 69+82, 72+31 and 74+77 may need to be relocated.

## **5.0 SAFETY IMPROVEMENTS**

### **5.1 CAPACITY ANALYSIS**

A Design Designation Study completed for the proposed Machen Road extension reviewed traffic projections for 2010 (construction year), 2015 (signal warrant year), 2020 (mid year) and 2030 (design year). Based upon the recommendations in this report and assumed traffic movements, a level of service (LOS) analysis was completed for the proposed intersection at Church Road. The analysis reviewed two intersection configurations; one in which there is one lane for all directions and one where Machen Road has exclusive left turn lanes onto Church Road. Each configuration assumes a two-way, stop-controlled intersection (Machen being the minor approach).

The analysis suggests the Church Road intersection with one west bound lane and one east bound lane was sufficient through 2015. However, at 2015 the west bound lane had a LOS D and diminished to LOS F by 2030. Adding a left-turn lane to both the west and east bound approaches improved the rating to LOS B in 2015, but the design year 2030 turning movements still result in a LOS F. Based upon traffic projections for the design year and without implementing other forms of intersection control, it appears the minor approaches may experience significant turning movement delays in the peak hour.

Analysis indicates there is no warrant for a traffic signal within the first ten years of service life (2020). Furthermore, due to its proximity to the traffic signal at Parks Highway, it is unlikely DOT&PF would approve installation of a signal at the Machen Road intersection to Church Road.

Since this analysis is based upon traffic projections that may vary significantly, and delay to minor approaches is generally accepted during the peak hour, MSB is willing to accept the intersection design as proposed. However, to plan for future intersection improvements, they requested an evaluation of ROW requirements to construct a roundabout, if necessary. Once identified, MSB will decide whether to pursue acquisition of additional ROW for future improvements.

### **5.2 ILLUMINATION**

The primary goal of lighting is to enhance traffic and pedestrian safety. Because of the many pedestrian and vehicular conflict points at intersections, proper intersection lighting is a critical design component. This report recommends the roadway be illuminated at the intersection of Church Road and considers lighting for transition segments to intersections with existing roads.

## **6.0 DESIGN ALTERNATIVES**

The design alternatives consist of a combination of four variable elements. These four variables are structural section, horizontal and vertical alignments and the typical cross-section. The structural section affects only the below grade portion of the project. The variations of the structural section are discussed in detail within Section 5.2 of the Geotechnical Engineering Report. Since the structural section can be made independently of the other elements, it is not considered further here. For this project, the horizontal alignment is straight forward as it must connect two existing roads and was determined by prior study. Slight variations in the horizontal alignment can be made by shifting it north or south to better accommodate the typical section within topographic or ROW constraints, but this is of little concern in the development of the alternatives for this project. The typical section and vertical alignment are the two variables that have the greatest impact on the design of the road. The vertical alignment has been developed to follow existing topography, minimize cut/fill volumes and mitigate ROW acquisition. Changes to the profile will alter the volume of material necessary for construction and could have an impact upon ROW requirements. Cross section alternatives considered whether or not to include pedestrian amenities. Upon analysis, it was determined the estimated cost to construct an 8' attached pathway was roughly \$300,000; ROW impacts were negligible between the two alternatives.

## **7.0 ENVIRONMENTAL CONSIDERATIONS**

As shown below, permits and clearances expected for this project include a Section 404 (wetlands) Permit from the Corps of Engineers, a Certificate of Reasonable Assurance (Section 401 Water Quality Certification) from the Alaska Department of Environmental Conservation, and a Coastal Zone Consistency Determination from the Alaska Department of Natural Resources Division of Coastal and Ocean Management.

### **7.1 WETLANDS**

Based on a preliminary jurisdictional determination prepared for this project, the road would impact shrub bog and wetland birch forest, which appear to be subject to the U.S. Army Corp of Engineer's jurisdiction. A Section 404 Wetland Fill Permit should be secured prior to construction.

### **7.2 WATER QUALITY**

Wetland water quality will be protected during construction through best management practices. A Certificate of Reasonable Assurance (Section 401 Water Quality Certification) will be acquired from the Alaska Department of Environmental Conservation prior to construction.

### **7.3 COASTAL ZONE**

Work will occur within the MSB Coastal Management Zone. The project will comply with the State of Alaska and the MSB's Coastal Management Plans Enforceable Policies.

### **7.4 THREATENED AND ENDANGERED SPECIES**

No state or federal threatened or endangered species are expected in the area.

### **7.5 WILDLIFE**

The project area is mostly undeveloped and may provide wildlife habitat. The area of the Parks Highway adjacent to the Machen Road Extension Project has experienced moose strikes. Vegetation clearing would not occur between May 1 and July to protect migratory bird nesting activities.

### **7.6 HISTORIC RESOURCES**

The Cultural Resources Division of the Matanuska-Susitna Borough reviewed the AHRS files for cultural resources within the Area of Potential Effect. The Museum of Alaska Transportation and Industry is situated in T17N, R2W, Section 12, adjacent to Section 7, within the next township. A review of the AHRS numbers indicated there were no historic sites on file within sections 5, 6, 7 or 8 within the project township. A review of Homesteads revealed ownership of several homesteads and home sites within and surrounding the proposed ROW. A field survey was conducted on October 30, 2009, by MSB staff; little evidence was found associated with early patented homesteads. No significant historic resources will be negatively impacted by construction of the road extension.

## **8.0 RIGHT-OF-WAY REQUIREMENTS**

Right-of-way acquisition will be necessary for the extension of Machen Road. Acquisitions are required to establish right-of-way where none currently exist, and possibly to widen existing right-of-way where current right-of-way is inadequate.

### **8.1 ROW ASSUMPTIONS**

Estimated ROW impacts were assessed based on the following assumptions:

1. The desired ROW width for the entire project is 100 feet.
2. If a parcel appears to be minimally impacted by the proposed improvements, then it was assumed that a public-use easement (or similar ROW easement) could be acquired rather than acquiring the parcel in whole or replatting narrow strips of property.

3. Where existing easements are located within the proposed 100' wide ROW, the land containing the easement will be appraised and purchased fee simple.

Lounsbury & Associates is coordinating ROW acquisition for this project with its subcontractors and the MSB. The following acquisitions are expected:

**8.2 ESTIMATED ROW IMPACTS**

Machen Road has a 50' ROW from the beginning of project at Station 0+00 to Station 5+70. East of the intersection with Day Road (Sta 1+00), the alignment runs southeasterly along the existing ROW that provides access to several businesses. From Station 5+70, the alignment continues southeast in Section 7 across parcel A4, then turns east crossing Tract A, McAllister Subdivision, and parcel A5 to Church Road (Station 46+53).

Further east in Section 8, the alignment crosses a large undeveloped parcel, B5 (Station 47+53 to 60+22), before extending across the northern border of Lots 1 thru 7, Carol Subdivision (Station 60+22 to 73+05) to the existing ROW at Nicola Avenue. Except for NC Machinery (Lot 7), the lots within Carol Subdivision are undeveloped. At Carol Subdivision, the ROW width was reduced to 80' to minimize impacts to NC Machinery site operations and maintain viable commercial properties for Lots 1 thru 6.

**9.0 COST ESTIMATE**

A preliminary cost estimate for the proposed improvements is summarized in Table 3.

**Table 3. Opinion of Cost**

Item	Cost
Construction Subtotal	\$2,141,425
ROW Acquisition	\$1,258,000
Utility Relocation	\$50,000
<b>Subtotal</b>	<b>\$3,449,425</b>
Estimate Contingency (15%)	\$517,415
<b>Subtotal</b>	<b>\$3,966,840</b>
Engineering/Administration	\$400,00
Construction Administration	\$100,000

<b>Project Total</b>	<b>\$4,376,840</b>
----------------------	--------------------

## **APPENDIX A - PROJECT DESIGN CRITERIA**

## **APPENDIX B – PRELIMINARY PLANS**