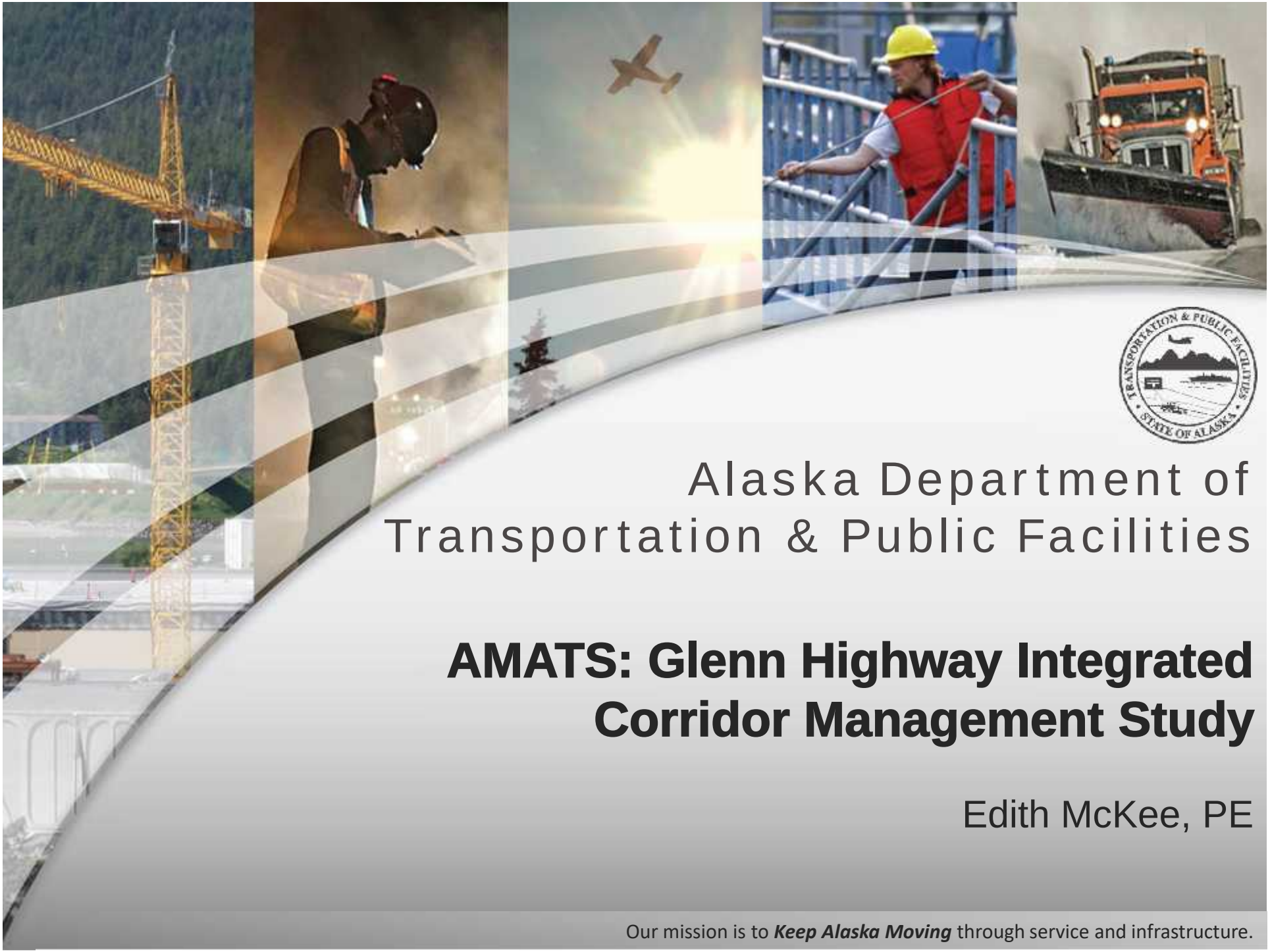


Alaska Department of
Transportation & Public Facilities

AMATS: Glenn Highway Integrated Corridor Management Study

Edith McKee, PE

Today's Topics

Anchorage Metropolitan Area Transportation Solutions (AMATS):

Glenn Highway

Integrated Corridor Management (ICM) Study

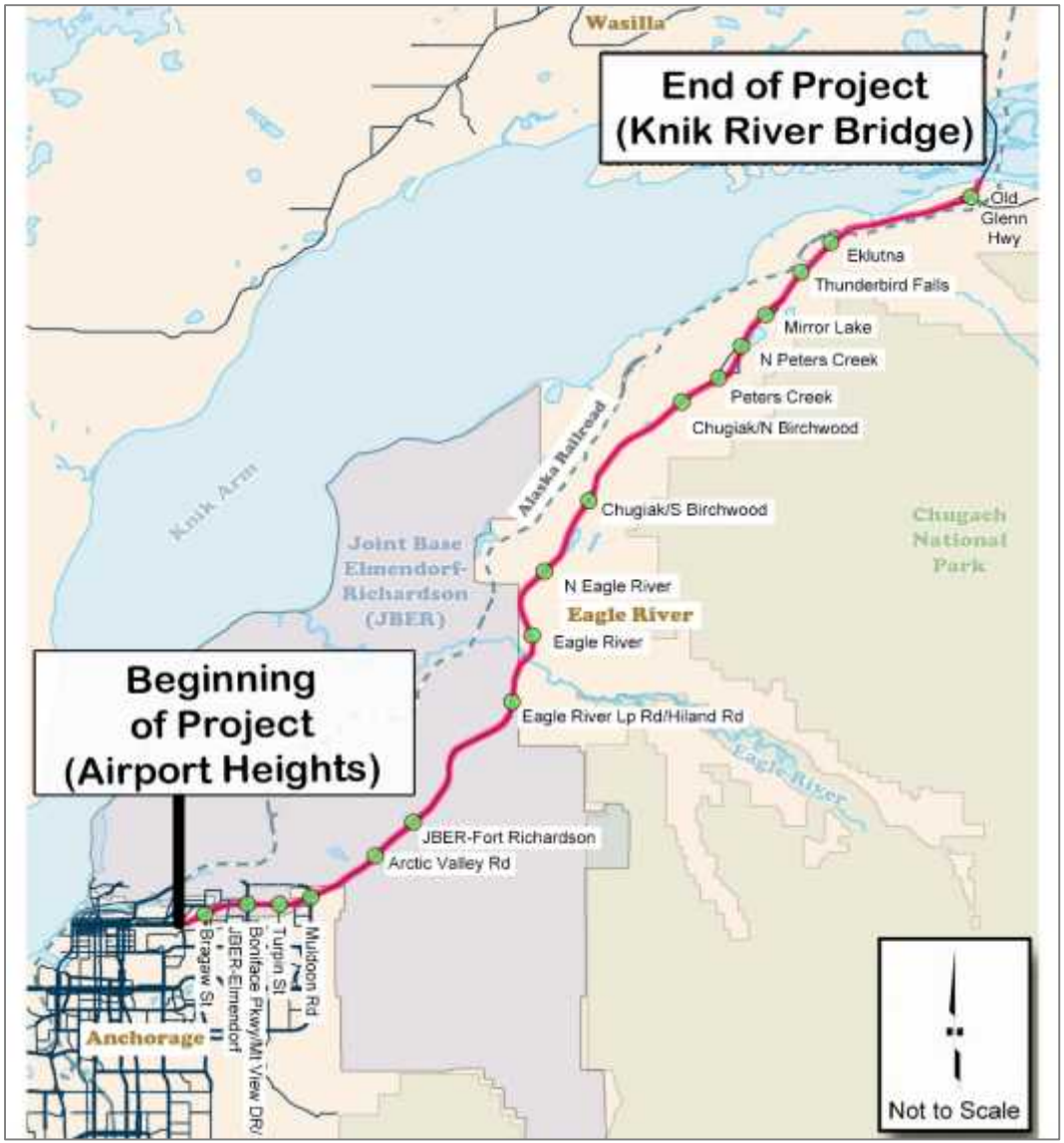
Infrastructure

- Purpose
- Existing Conditions
- Data
- Strategies

Incident Management

- Purpose and Need
- Objectives
- Traffic Control Plans

Project Area



ICM Study Purpose

- **Identify methods to improve efficiency**
- **Discuss how existing facilities and agency coordination can be used during incident management**
- **Discuss future infrastructure, technology, and agency needs**

Existing ITS

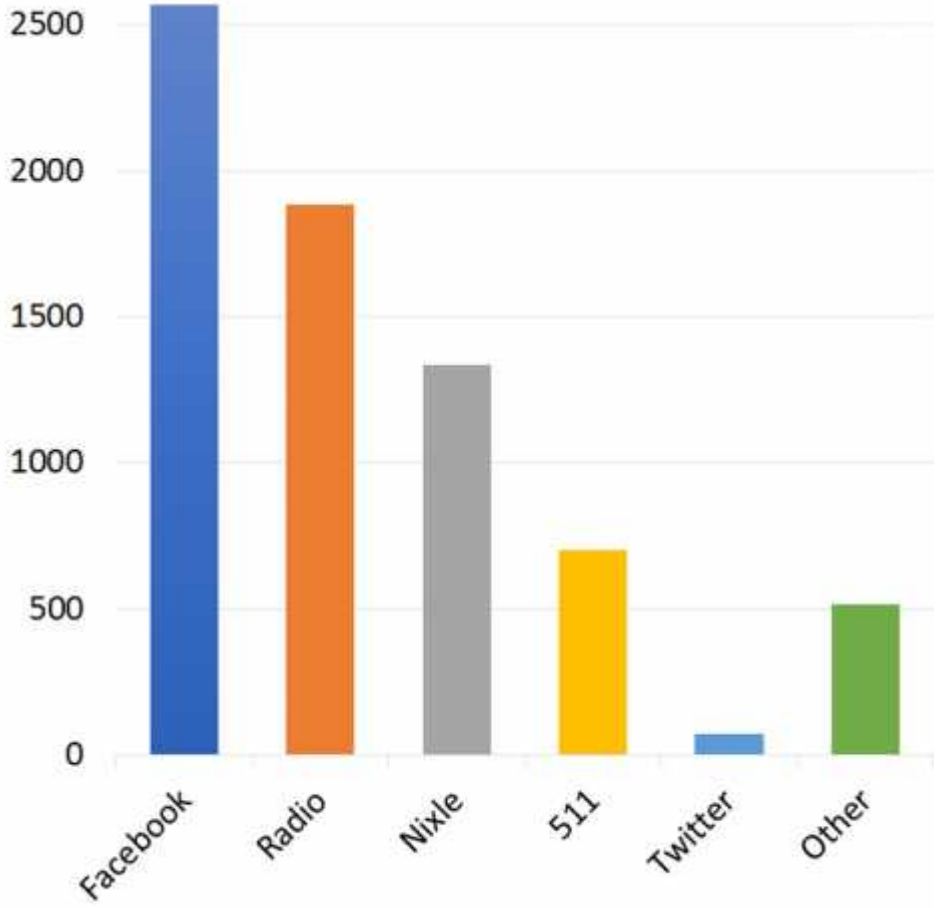
1 Permanent Changeable Message Board

4 CCTV Along The Glenn Providing Weather Info

3 Enviro Sensors That Integrate With 511

How People Currently Get Information

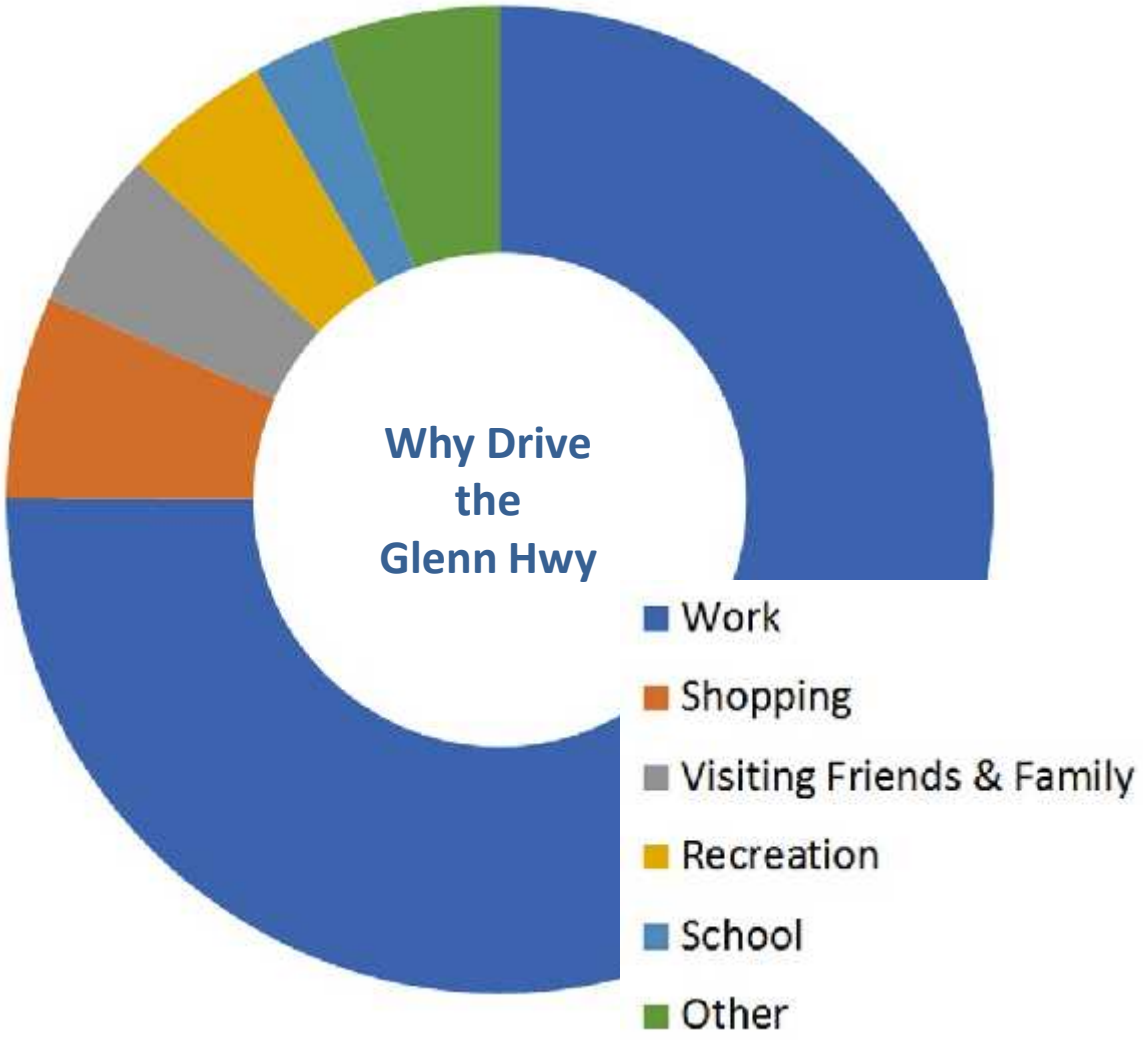
- The Glenn Highway has sections without parallel routes
- Segments with alternative routes, but not able to meet the capacity of the Glenn Hwy
- Limited locations to turn traffic around
- Limited ways to inform the traveling public when an incident has occurred
- High cost of crashes and delays



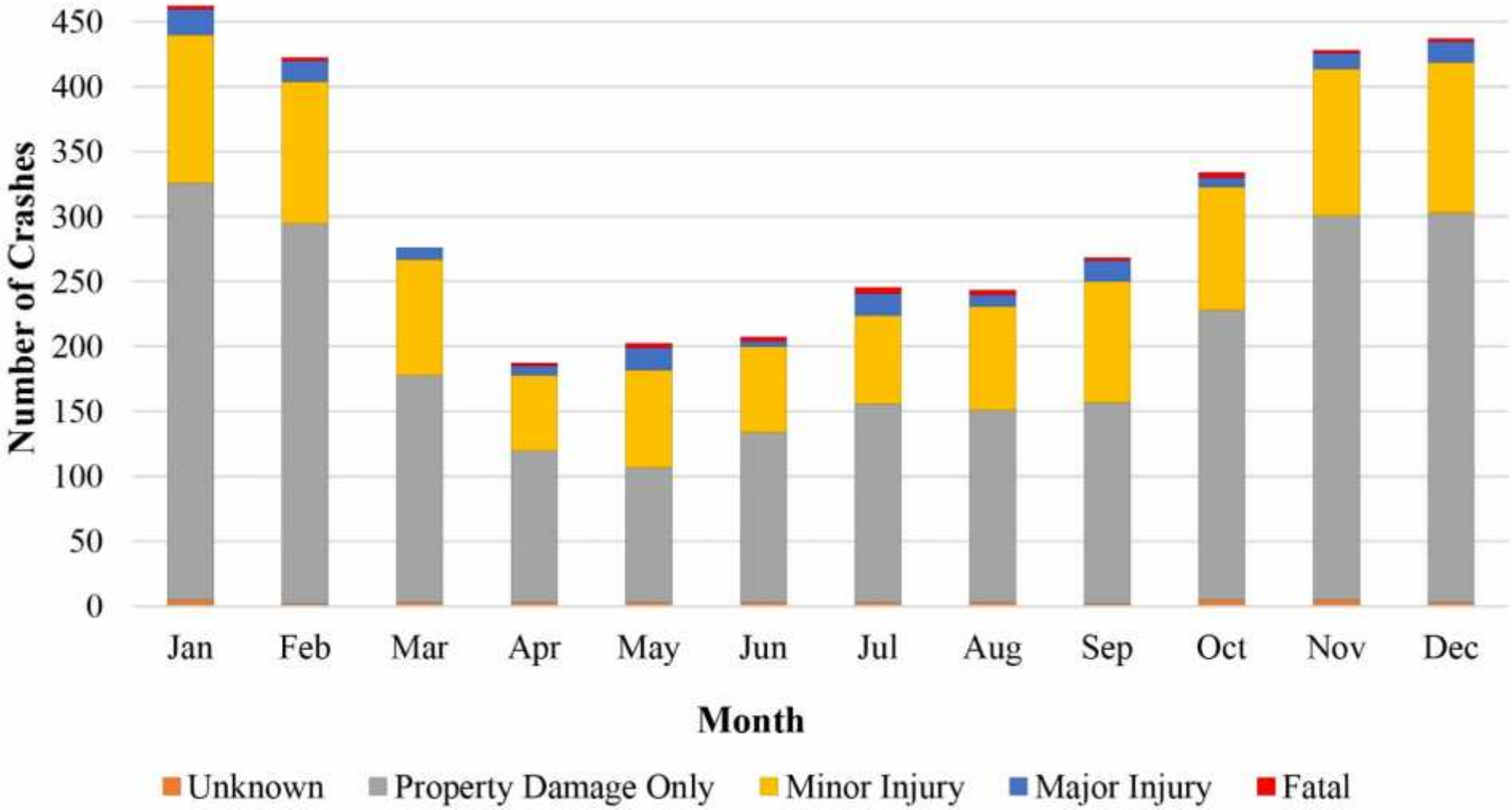
DOT&PF Facebook

Why Drive the Glenn Highway

- More than 35,000 vehicles travel the Glenn Hwy between Anchorage and the Knik River Bridges every day
- Used for work, commercial transport, recreation, and more
- STRAHNET– considered critical to US strategic operations



Crashes (2005 to 2014)



Crash Costs: Analysis

FHWA NATIONAL CRASH COST:

K: Fatal Injury = $ 11,295,400

A: Serious Injury = $ 655,000

B: Minor Injury = $ 198,500

C: Possible Injury = $ 125,600

O: No Apparent Injury = $11,900

ALASKA 2018 CRASH VALUES:

K: Fatal Injury = $ 10,100,000

A: Serious Injury = $ 700,000

B: Minor Injury = $ 140,000

C: Possible Injury = $ 73,000

O: No Apparent Injury = $7,700

Crash Cost: Glenn Highway

Summer Cost of Crashes (May thru Oct, 2005 to 2014) in 2018 AK Values			
Crash Severity	# of Crashes	Cost per Crash	10 Year Cost
Property Damage only	808	$ 7,700	$ 6,221,600
Minor Injury	440	$ 140,000	$ 61,600,000
Major Injury	70	$ 700,000	$ 49,000,000
Fatal	11	$ 10,100,000	$ 111,100,000

Winter Cost of Crashes (Nov thru April 2005 to 2014)			
Crash Severity	# of Crashes	Cost per Crash	10 Year Cost
Property Damage only	1608	$ 7,700	$ 12,381,600
Minor Injury	636	$ 140,000	$ 89,040,000
Major Injury	80	$ 700,000	$ 56,000,000
Fatal	7	$ 10,100,000	$ 70,700,000

Value of Delay

Table 16: Value of Time Guidance and Calculations

Parameter	Definition	Source or calculation
Median income (Anchorage)	$ 80,862	US Census
Number of work hours in a year	2,080	US DOT Guidance
Hourly work income	$ 38.88	= median income ÷ work hours/year
Value of personal travel time as % of hourly work income	70%	US DOT Guidance
Value of business travel time as % of hourly work income	100%	US DOT Guidance
Value of personal travel time ($/hour)	$ 27.21	= hourly work income × value of personal travel time as %
Value of business travel time ($/hour)	$ 38.88	= hourly work income × value of business travel time as %
% of personal travel on roadway	78.6%	US DOT Guidance
% of business travel on roadway	21.4%	US DOT Guidance
Vehicle occupancy rate	1.1	AMATS, "Status of the System Report," 2016 and 2010
Value of Time	**$ 32.68**	= ((value of personal time × % personal travel) + (value of business time × % business travel)) × vehicle occupancy rate

SOURCE: US DOT Guidance = "Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis", September 27, 2016. Accessed at https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-valuation-travel-time-economic on September 13, 2018.

Crash Costs

COMBINED COST OF CRASHES AND DELAY		
Summer	May to October	$22,792,000
Winter	November to April	$22,812,000
Delay		$ 1,700,000
Annual		$47,304,000

Cost of Crashes = $ 456 Million from 2005 to 2014

Cost of Delay = $ 17 Million from 2005 to 2014

$473 Million Dollars

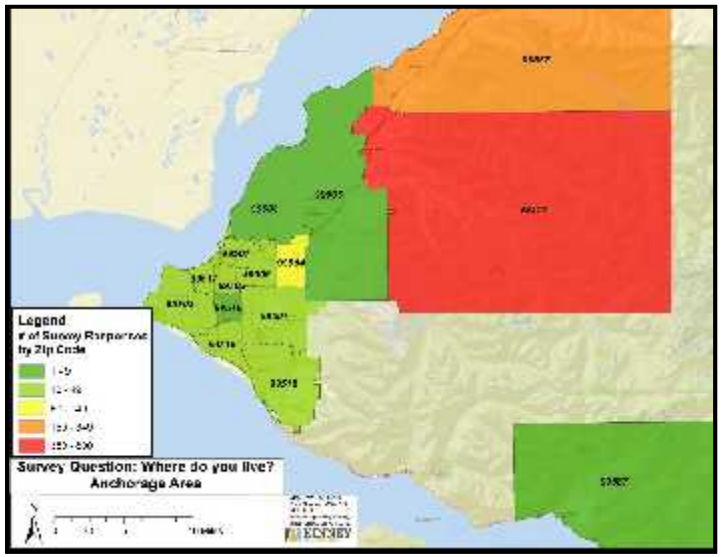
Public and Agency Input

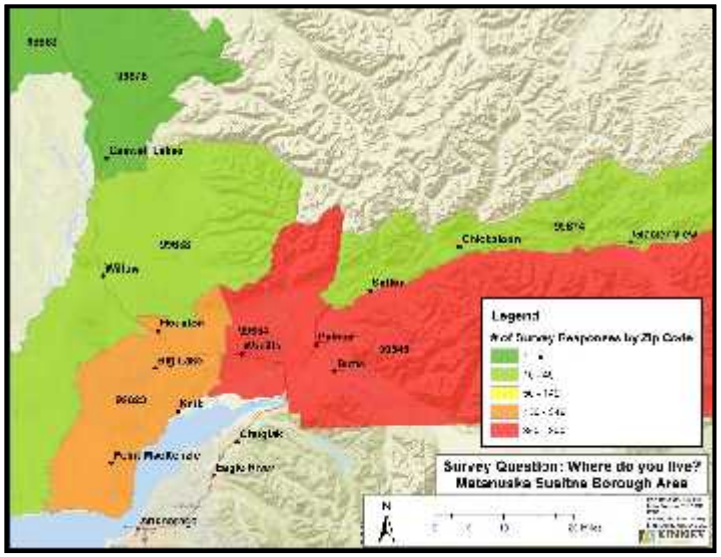
- Metroquest Online Survey

  4,891 participants

- **Public Input:** Online survey, open House Meeting, Community Council Meetings, Anchorage Metropolitan Area Transportation Solutions (AMATS) Meetings, Anchorage & Mat-Su Transportation Fairs

- **Agency Input:** Stakeholder Meeting, Department of Transportation, Municipality of Anchorage and Mat-Su Borough, Emergency Responders, Transit, Joint Base Elmendorf-Richardson (JBER), Alaska Railroad, Alaska Trucking Association, Tribal Representatives, and Chugiak/Birchwood/Eagle River Rural Road Service Area (CBERRRSA)





Study Objectives

Goal A: Improve Safety

Goal B: Improve Mobility

Goal C: Improve Incident and Emergency Management

Goal D: Improve Information Sharing

Strategies

Roadway Strategies:

- 4 New Frontage Roads
- 5 Interchange upgrades
- Adaptable shoulder lanes

Institutional Strategies:

- Incident Management plans
- Service Patrol Program
- Virtual Traffic Management Center Improvements

Strategies report available here:
http://dot.alaska.gov/stwdmno/documents/glennICM/glennhwyicm-chapter-4.pdf

Strategies

TECHNOLOGY BASED STRATEGIES:

- Virtual Traffic Management Center Improvements
- Device Expansion
- Variable Speed Limit Systems
- Snow Removal Equipment Tracking
- Environmental Sensor & 511 Integration
- Over Height Vehicle Detection
- Connected Vehicle Pilot Program
- Advanced Traffic Management System
- Traffic Incident Detection Algorithm for cameras
- Portable Changeable Message Boards
- Additional Permanent Changeable Message Boards

AMATS: Integrated Corridor Management Study

Incident Management &
Traffic Control Plans (TCP's)

Need & Purpose

Legislative Intent for DOT&PF for FY 2019:

It is the intent of the legislature that given the March 2018 accident that closed the Glenn Highway, rerouting traffic for multiple days and negatively impacting commuters and local communities, the Department of Transportation and Public Facilities develop a temporary traffic control plan, as well as emergency traffic control guidelines for the Glenn Highway, specifically from milepost 0 to milepost 35 and make the plan and guidelines available to the legislature and the public by January 30, 2019.

DOT&PF Contracted to:

- Develop temporary traffic control measures that can be used by the incident command management team as needed on the Glenn Highway
- The traffic control plans (TCP's) will include information needed to redirect traffic and inform the public during a non-recurring event/s
- Identify the capacity of alternate routes

Stakeholders

Involvement in the Development of the TCP's

- Anchorage Police Department (APD)
- Municipality of Anchorage
- Emergency Responders
- Transit – People Mover and Valley Transit
- Joint Base Elmendorf – Richardson
- Alaska Railroad
- Native Village of Eklutna
- Trucking / Freight
- Anchorage School District Transportation Department
- Chugiak/Birchwood/Eagle River Rural Road Service Area (CBERRRSA)
- Community Council
- Public Outreach

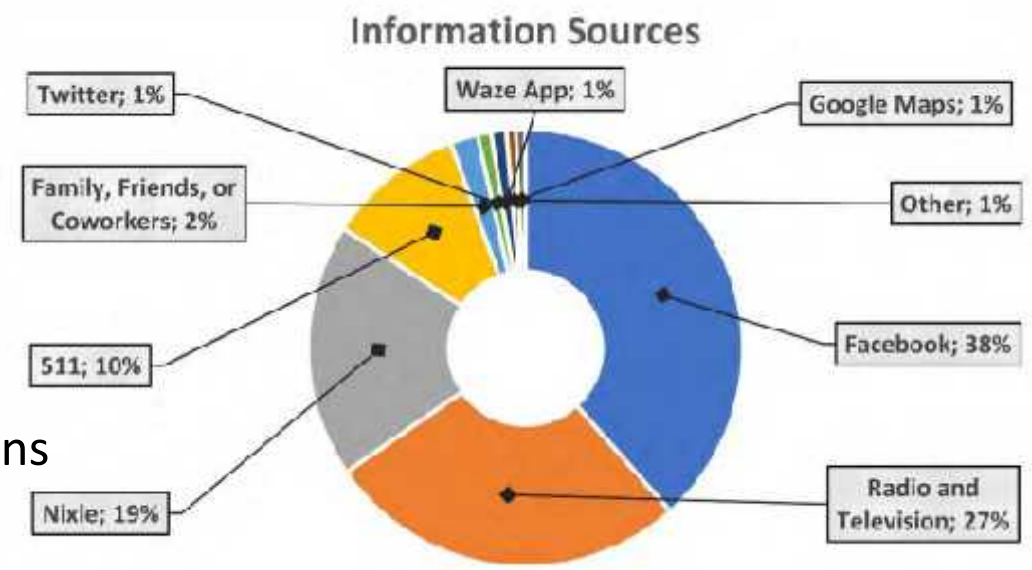
Objectives

Equipment Staging Plan

- Where equipment will be located
- How to get it to the location
- What equipment is needed

Communication Plan

- Agencies contacted
- How the contact will be made
- How to reach the public so they can make informed travel decisions



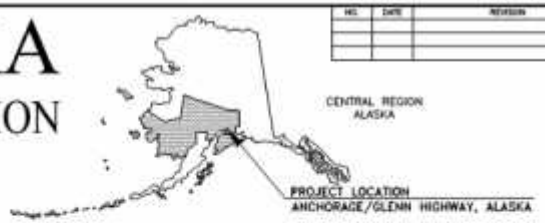
Traffic Control Plans

- Describe proposed detour routes and equipment needed to implement them
- Consider short term and long term detour needs

Traffic Control Plans

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES



NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0A16052/CFHWY00289	2019	A1	A2
						FED. AID PROJ. NO.	142

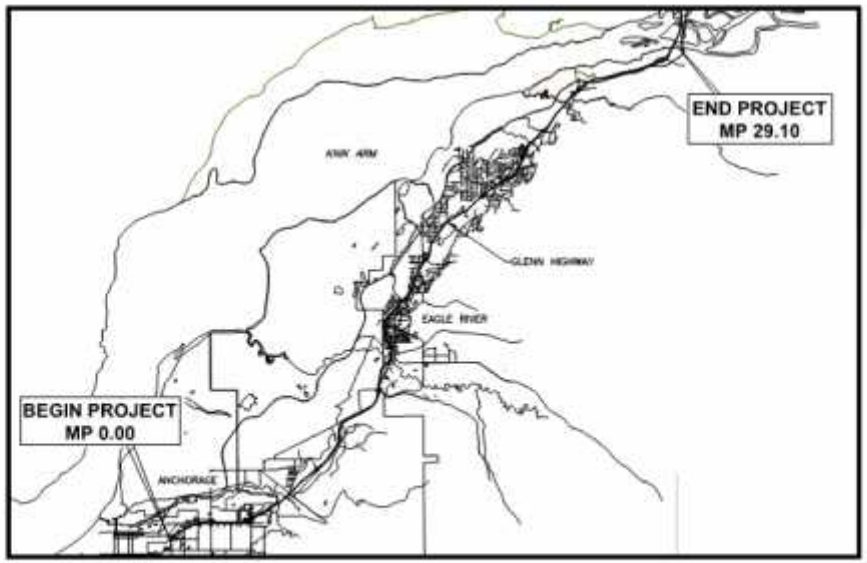
INDEX	
SHEET NO.	DESCRIPTION
A1	COVER SHEET
A2	DETAILED INDEX OF SHEETS
D1–D4	GENERAL DETAILS
J1.1–J1.1–0	INTERCHANGE TRAFFIC CONTROL PLANS
J1.1–J17–0	SEGMENT TRAFFIC CONTROL PLANS

PROPOSED HIGHWAY PROJECT

GLENN HIGHWAY INTEGRATED CORRIDOR MANAGEMENT (ICM) STUDY - PHASE II

PROJECT NO. OA16052/CFHWY00289

TRAFFIC CONTROL PLANS



PLANS DEVELOPED BY: KINNEY ENGINEERING, LLC

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
4111 AVIATION AVENUE, ANCHORAGE, AK 99502
(907)269-0590

APPROVED:

REGIONAL PRE-CONSTRUCTION ENGINEER DATE

CONCUR:

REGIONAL CONSTRUCTION ENGINEER DATE

Interchange Closure

Muldoon:

Interchange Closure

Muldoon: Detour Capacity

CAPACITY CRITERIA QUALITIES OF NORTHBOUND DETOUR SEGMENTS

SEGMENT	1	2	3	4
LENGTH (MILES)	0.19	0.80	0.10	0.32
NUMBER OF LANES IN DETOUR DIRECTION	1	1	2	-
DRIVEWAY DENSITY	Low	Low	Low	Low
MEDIAN TYPE	Open	Open	Closed	Closed
OTHER DESIGN FEATURES (SEE NOTE)	-	25 MPH SPEED LIMIT	-	-
AVERAGE AADT (2015 - 2017)	1,500	4,600	24,250	8,650
SEGMENT DETOUR CAPACITY RATING	★	★	★★★	★
COMMUNITY IMPACT	Low	Low	Low	Low

Note: Standard design features include posted speeds of 35 mph or greater, lanes 12 ft wide or greater, shoulders 6 ft wide or greater, and level terrain. Unless otherwise noted, the segment has standard design features.

CAPACITY CRITERIA QUALITIES OF SIGNALS ON NORTHBOUND DETOUR

SIGNAL	a
NUMBER OF LANES IN DETOUR DIRECTION	1
DETOUR APPROACH ON MAJOR ROAD?	No
MOVEMENT	Left
LANE REDUCTION (MERGE) PRIOR TO INTERSECTION	No
SIGNAL DETOUR CAPACITY RATING	★

OFF PEAK TRAVEL SPEED THROUGH DETOUR	20 MPH

Northbound (NB)

Segment closure with parallel routes:

Southbound (SB)

Segment closure with parallel routes:

NB and SB Closure

Parallel routes available:

NB and SB Closure

Capacity of Detour Routes:

Note: The purpose of this graphic is to show a qualitative comparison of capacity on the segments and intersections along the detour routes. It will help to identify likely locations of bottlenecks, community impacts, and areas of possible improvement.

CAPACITY CRITERIA QUALITIES OF SOUTHBOUND DETOUR SEGMENTS

SEGMENT	1	2	3	4	5
LENGTH (MILES)	0.20	0.33	0.91	0.06	0.17
NUMBER OF LANES IN DETOUR DIRECTION	1	1	1	1	1
DRIVEWAY DENSITY	Low	Low	High	Low	Low
MEDIAN TYPE	Closed	Open	Open	Open	Closed
OTHER DESIGN FEATURES (SEE NOTE)	-	-	NARROW SHOULDERS	-	-
AVERAGE AADT (2015 - 2017)	450	800	1,050	6,350	3,150
SEGMENT DETOUR CAPACITY RATING	★★★	★★	★★	★	★★
COMMUNITY IMPACT	Low	Low	Low	Low	Low

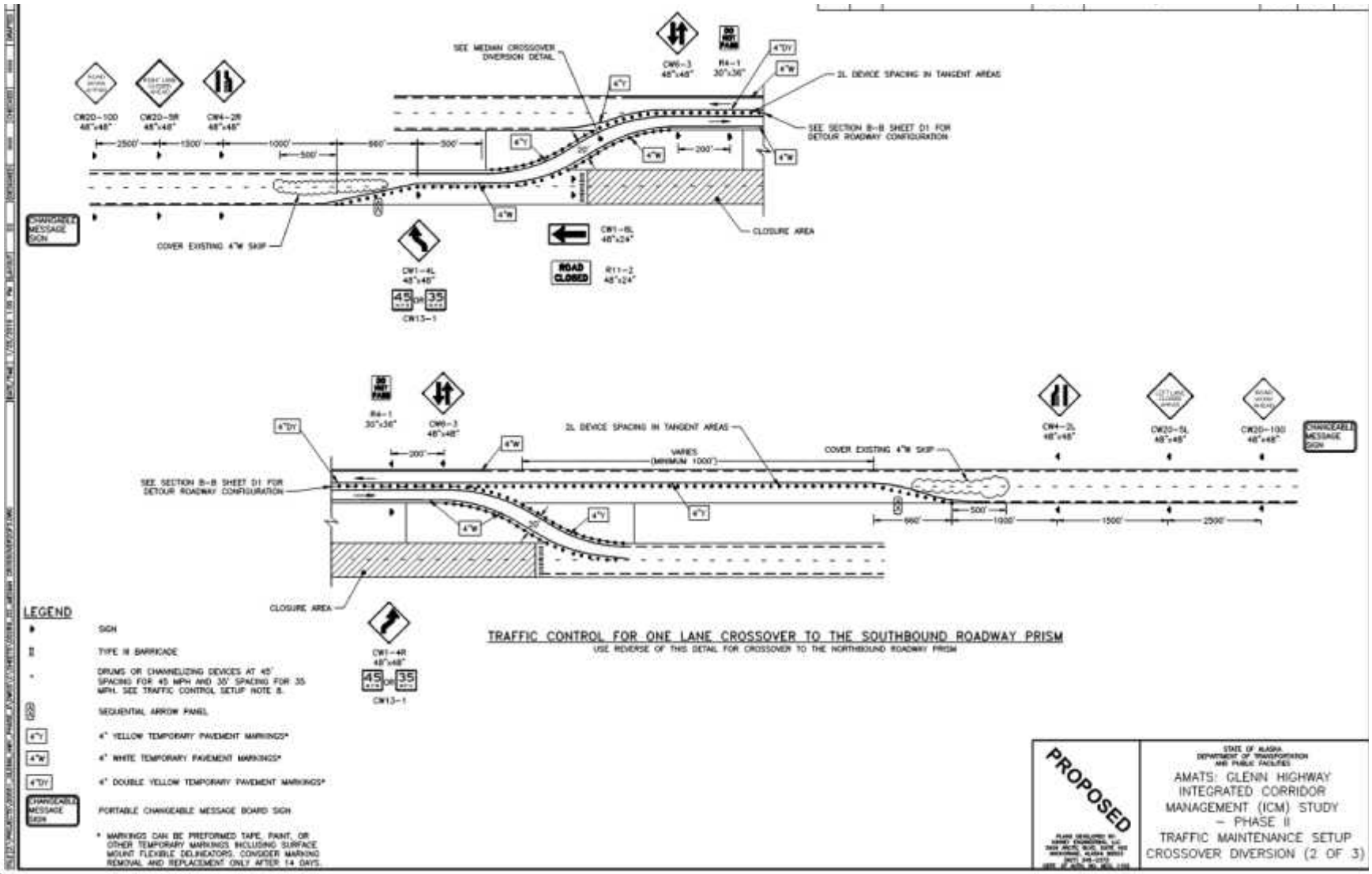
Note: Standard design features include posted speed limit of 35 mph or greater, lanes 12 ft wide or greater, shoulders 6 ft wide or greater, and level terrain. Unless otherwise noted, the segment has standard design features.

OFF PEAK TRAVEL SPEED THROUGH DETOUR	30 MPH

NB Segment Closure

Parallel routes not available:

Crossover Details



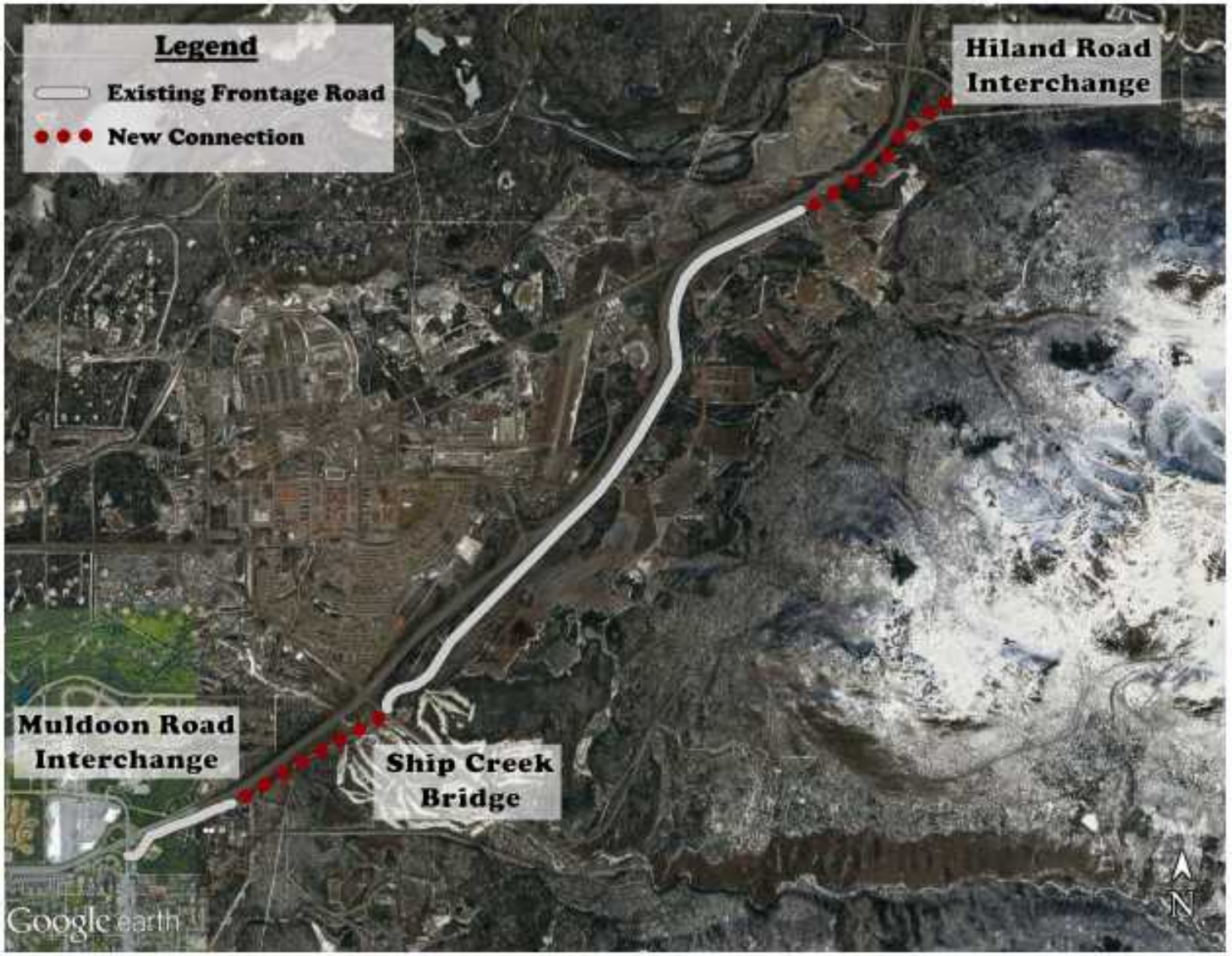
SB Segment Closure

Parallel routes not available:

NB & SB Closure

Parallel routes not available:

NB & SB Closure



Thank you

Questions?