



# Sterling Highway Interchange

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Prepared by



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# Overview

## Background Recap

## Impacting Factors

## Alternative Comparison Summary:

- Alternative 1 – No Build
- Alternative 2 – Trumpet Interchange
- Alternative 3 – Diamond Interchange

## Final Design:

- Typical Sections
- Overview
- Criteria

# Purpose

## Interchange Design

- Reduce highway congestion.
- Access to Cooper Landing and Recreation.
- Increasing lane size and speed to meet design criteria.

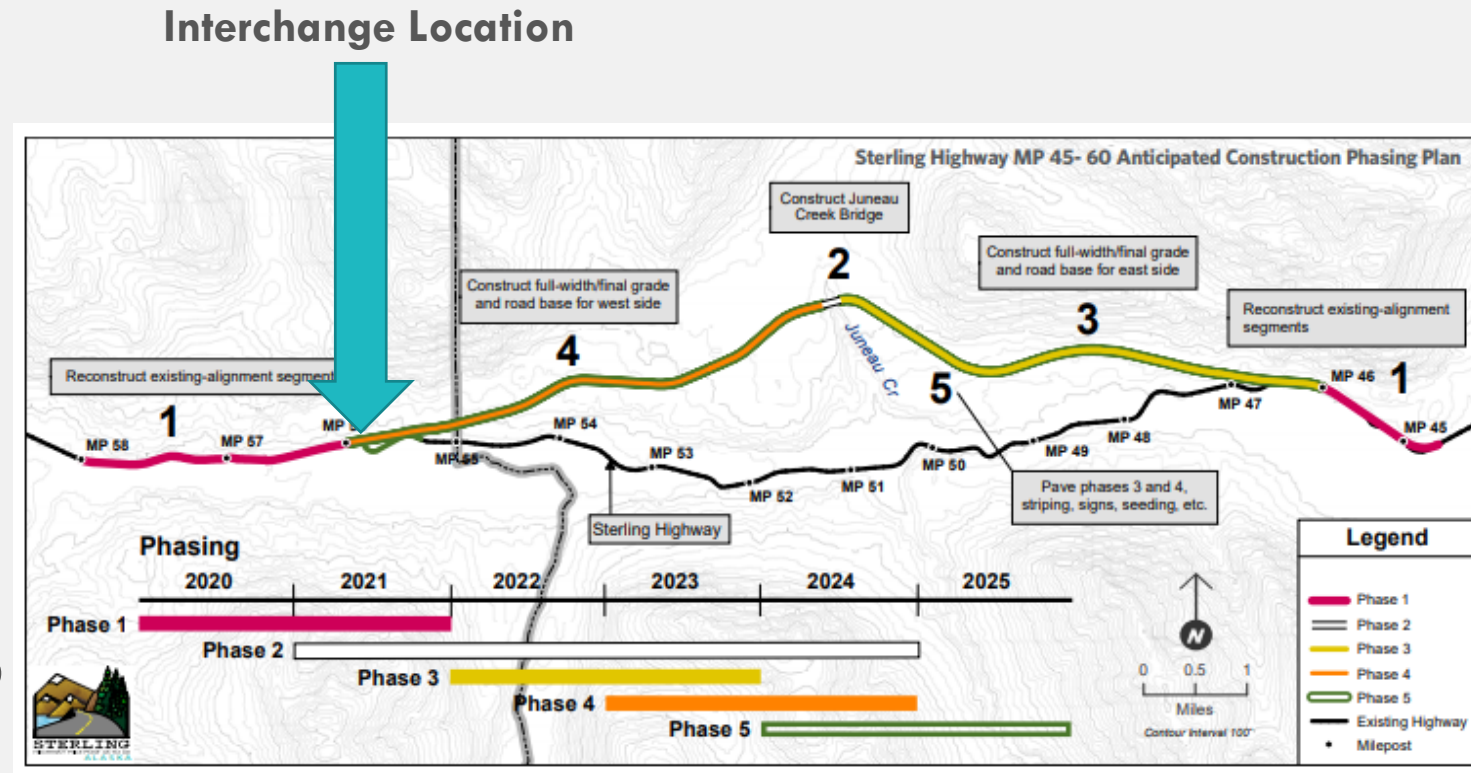


PHOTO. RADIOKENAI.NET



# Background

The **Sterling Highway** is located in the Kenai Peninsula. It was built in 1940-1950 and was classified as a Rural Principal Arterial.



*See detailed project map on pages 3-4.*

# Project Location- Sterling Hwy MP55





# Physical Challenges

## Narrow Valley

## Environmental

- Parks, trails, & campground
- Proximity of Kenai River

## Cultural

- Archaeological sites
- Traditional Cultural Properties



PHOTO AKDOT&PF STERLING HIGHWAY PROJECT WEBSITE ([HTTPS://WWW.STERLINGHIGHWAY.NET/](https://www.sterlinghighway.net/))

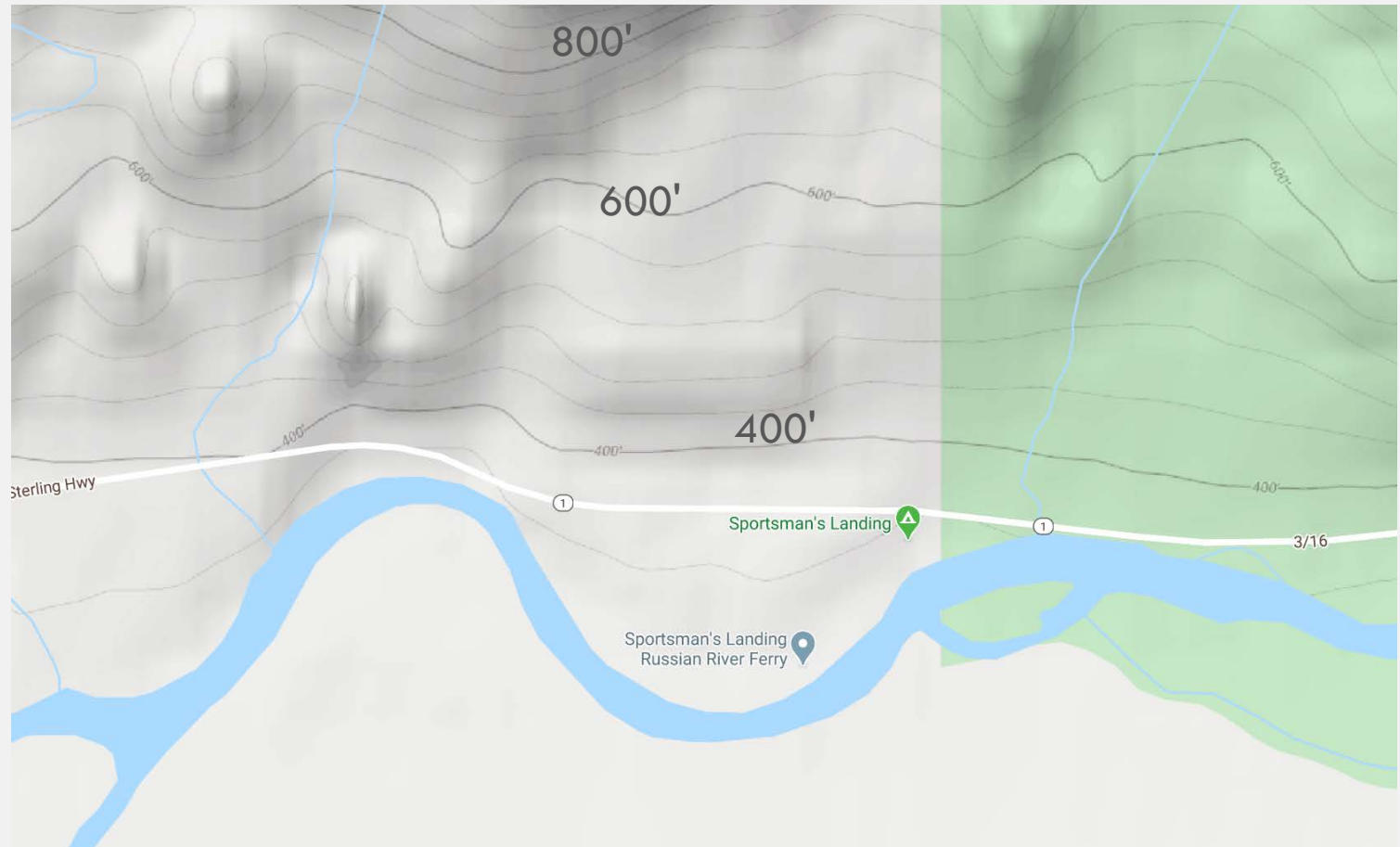
# Technical Challenges

- Narrow and a curvy highway
- Local Traffic / Through-traffic
- Congestion



# Impacting Design Factors

- Topography
- Land Exchange
- Design Speeds and Highway Classification
- Traffic Characteristics





# Topography – Looking North



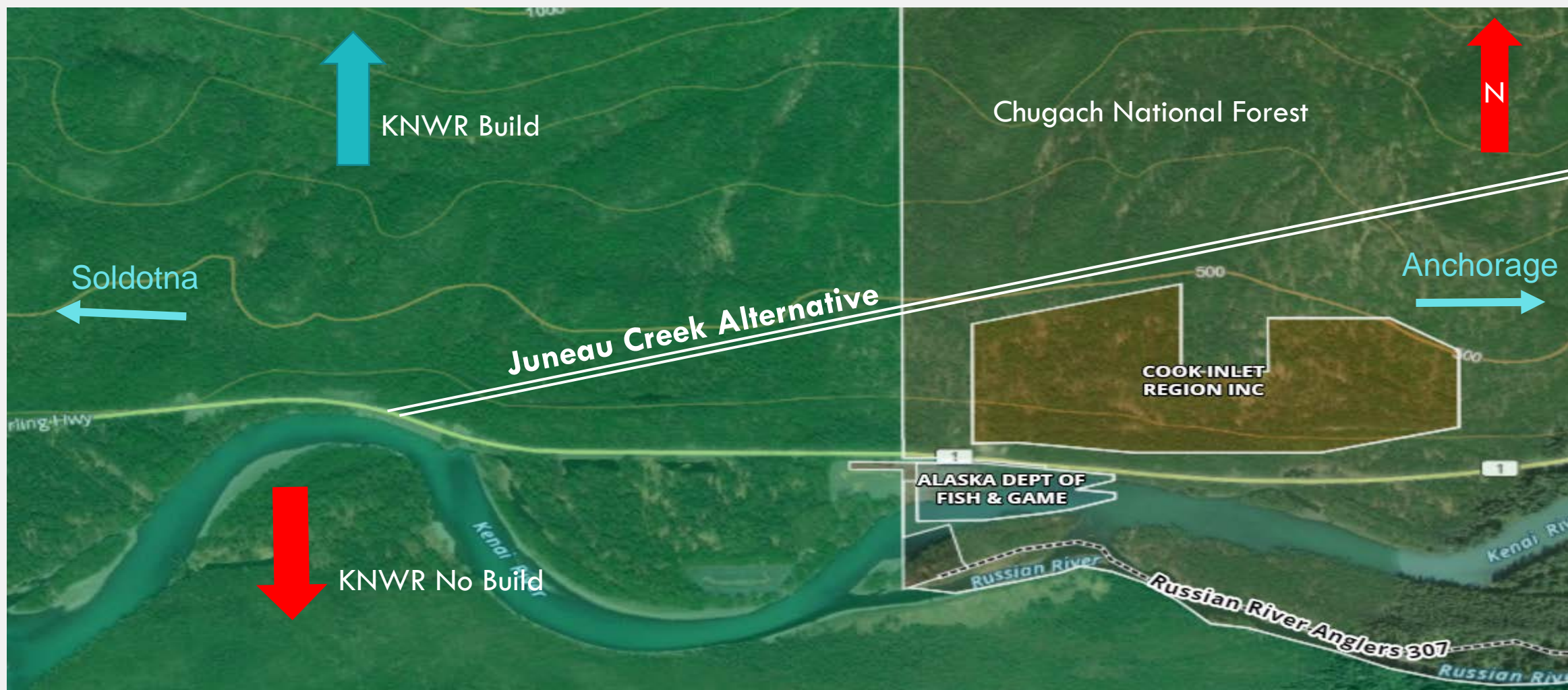
PHOTO GOOGLE EARTH

# Topography – Looking West






# Land Exchange





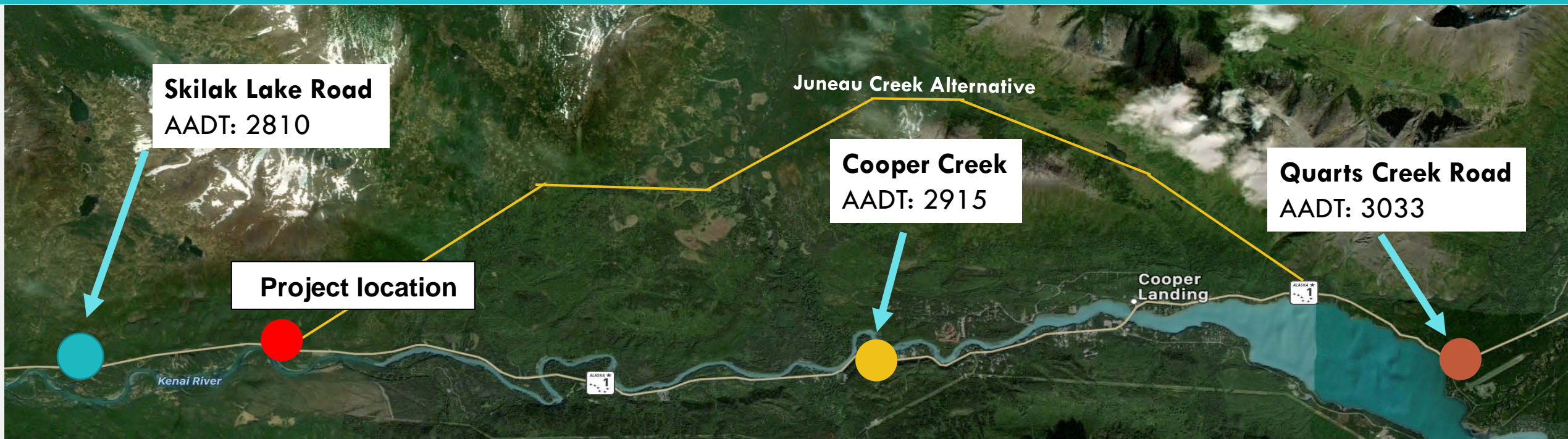
# Design Speeds and Highway Classification

- Existing Sterling Highway Design Speed MP55 is 50mph
- Juneau Creek Alternative Design Speed 60mph
- FHWA Classification: Rural Principle Arterial

Type of Roadway	Terrain	Rural	
		US (mi/h)	Metric (km/h)
	Level	60–75	100–120
	Rolling	50–60	80–100
	Mountainous	40–50	60–80

SOURCE FEDERAL HIGHWAY ADMINISTRATION DESIGN SPEED

# Traffic Characteristics – 2012 Count

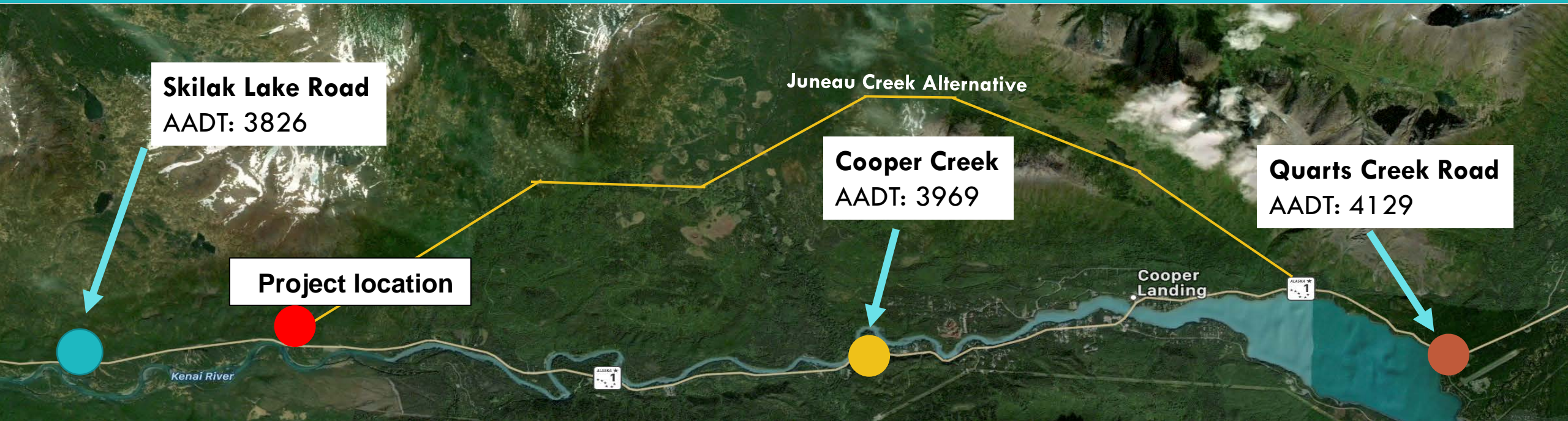


## Key Points

- Major Recreational Destinations Near Project Location
- Only around 200 vehicles stopping in Cooper Landing



# Traffic Characteristics – 2042 Count



## Key Points

- Increased AADT of about 1000, Hourly volume about 200
- Also Seasonal Variations to consider: 1000 VPD winter and 6-8000 VPD summer



# Design Criteria

## **Level of Service**

- Travelers perspective, Demand/Capacity

## **Safety**

- Ramp Geometry, Design Speed

## **Environmental Impacts**

- Stormwater, Kenai River

## **Constructability**

- Traffic Mitigation, Feasibility

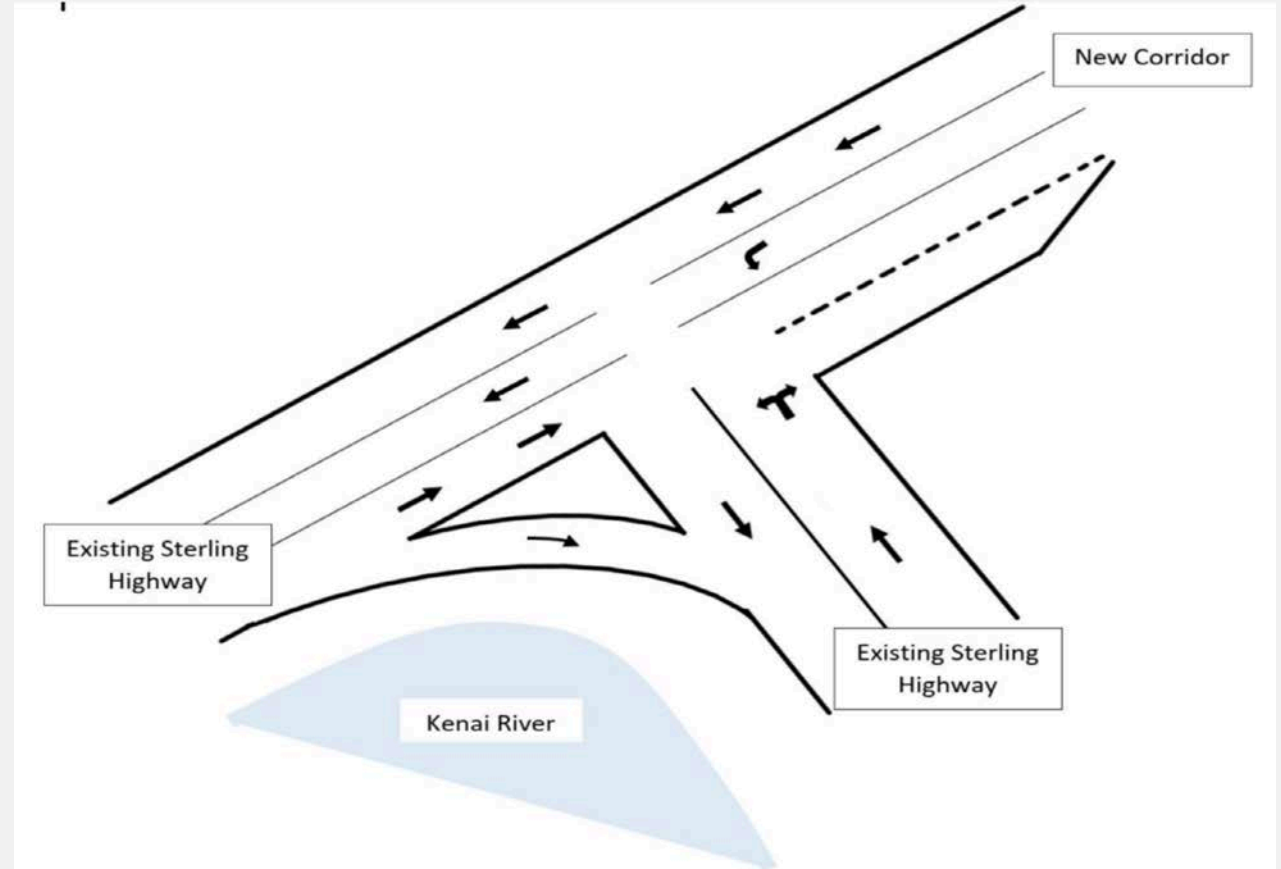
## **ROW Impacts**

- KNWR

# Alternative 1 – No Build - Intersection

## T - Intersection:

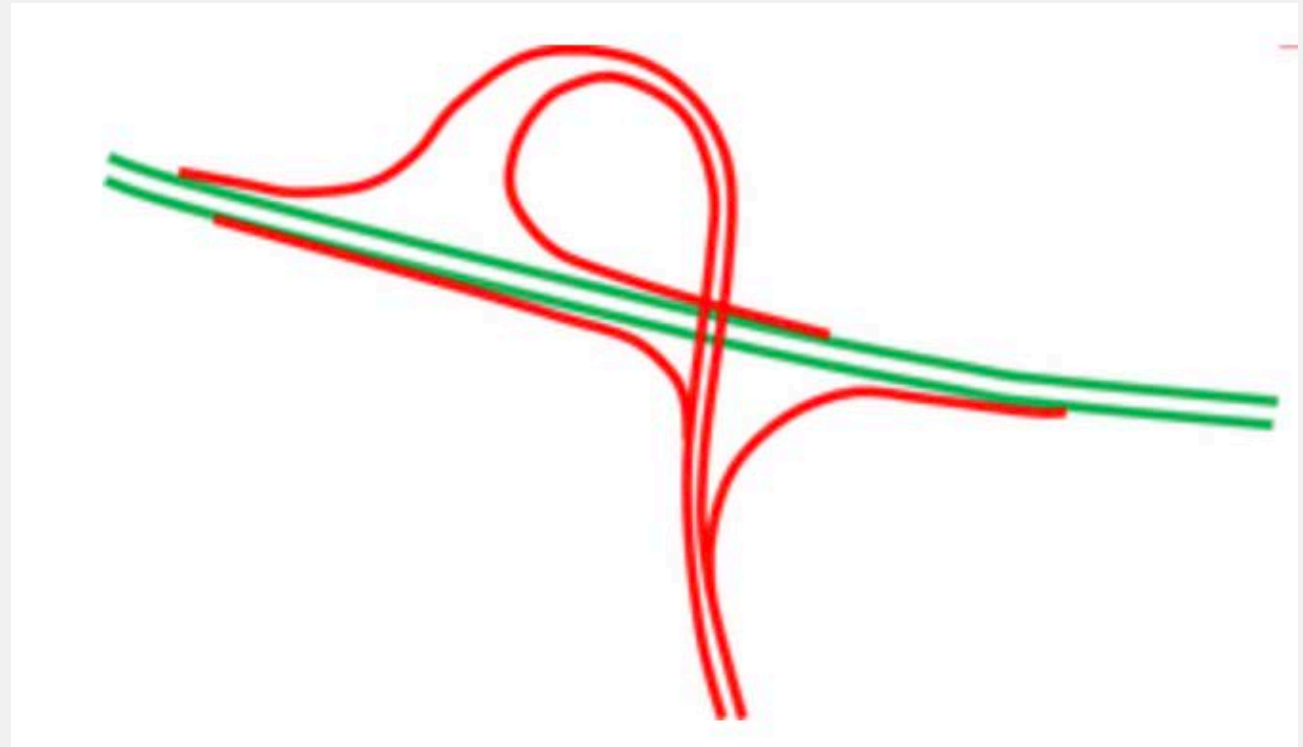
- Provides 4 turning lanes
- Allows continuous traffic on the main highway
- Creates turning lane conflicts
- Does not meet the purpose of Project
- Congestion Issues



# Alternative 2 – Trumpet Interchange

## Trumpet Interchange:

- Consist of 4 ramps 2 off 2 on
- Common Interchange for ending highways
- Saves space
- Continuous traffic in all directions
- Not favorable for pedestrians



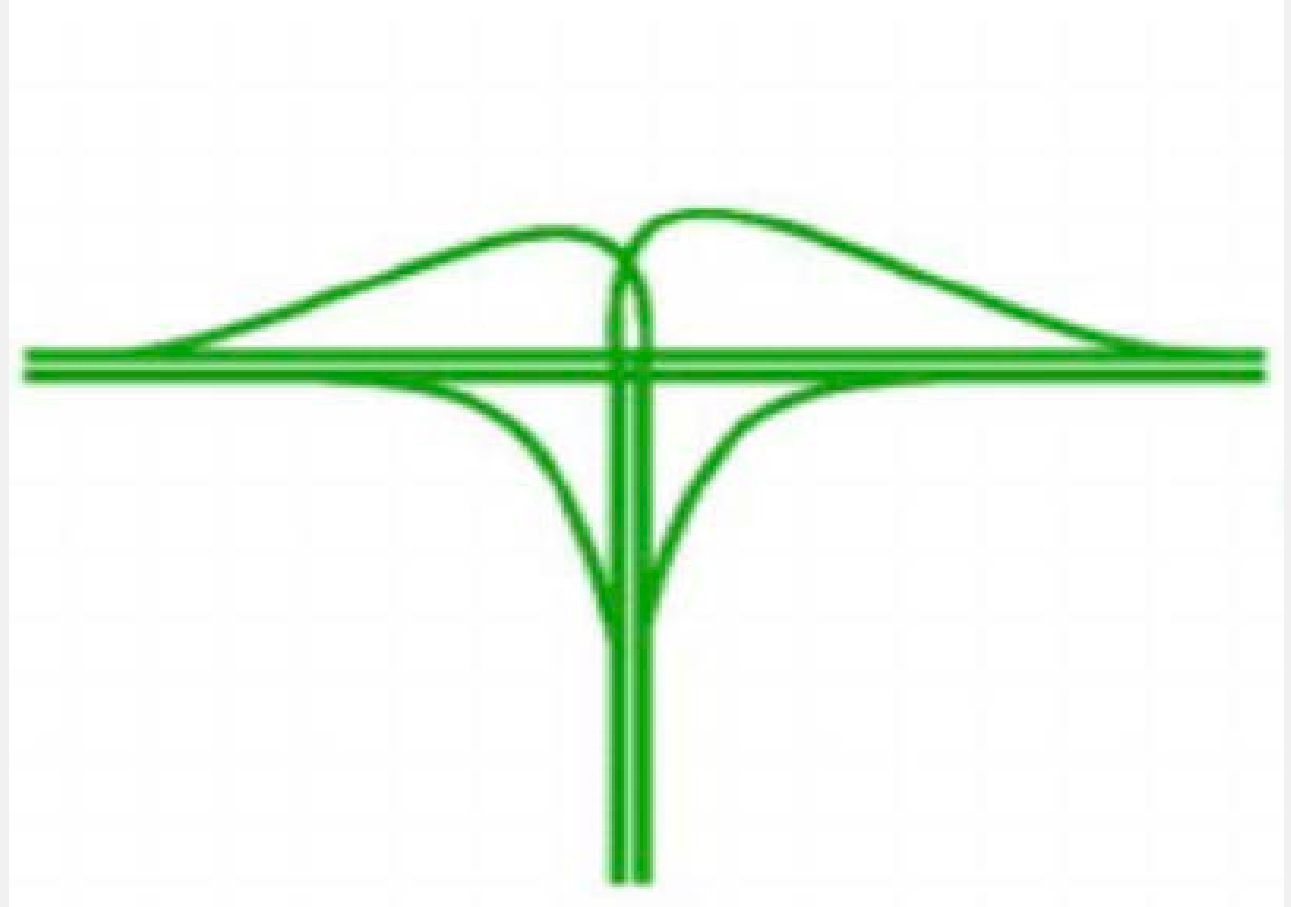
**PHOTO** ROADS AUSTRALIA ([HTTPS://ROADSAUSTRALIA.WEEBLY.COM/ROAD-INTERCHANGES.HTML/](https://roadsaustralia.weebly.com/road-interchanges.html/))



# Alternative 3 – Diamond Interchange

## Diamond Interchange:

- Consist of 4 ramps - 2 on and 2 off ramps
- Continuous traffic in all directions
- Requires large footprint
- Requires Traffic control


















# Cost of Alternatives

Interchange Type	Cost
Diamond	Moderate
Trumpet	Moderate-High

Source: Kentucky DOT

# Alternative Comparison Summary

Alternative Comparison Summary			
	No Build	Trumpet	Y
Level of Service			
Safety			
Environmental Impact			
Constructability			
ROW Impacts	None	None	None
 = Best Option  = Acceptable  = Unacceptable			



# Preferred Alternative

## Alternative 2 – Trumpet Interchange

- Traffic
- Speed
- Safety

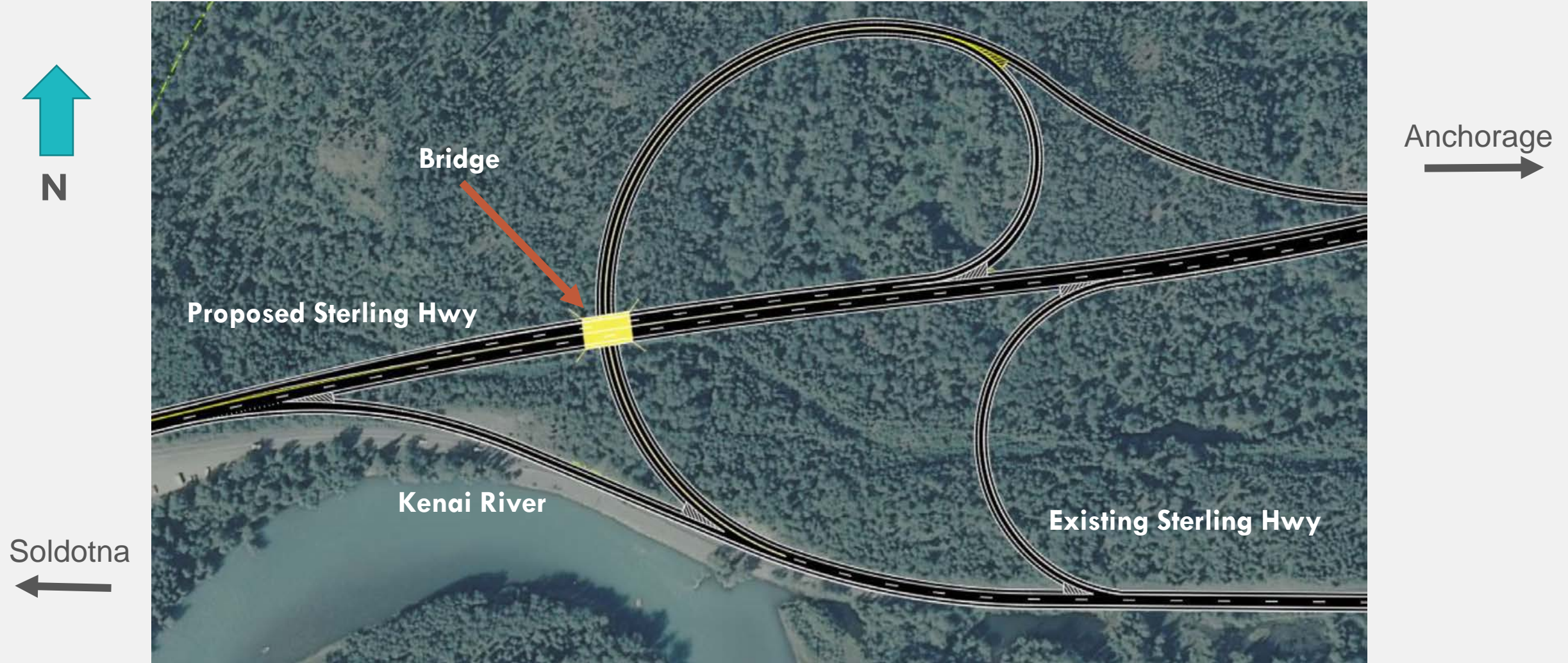
### Design Considerations

- Footprint
- Design Speed
- Sight Distances





# Overview – Final Design



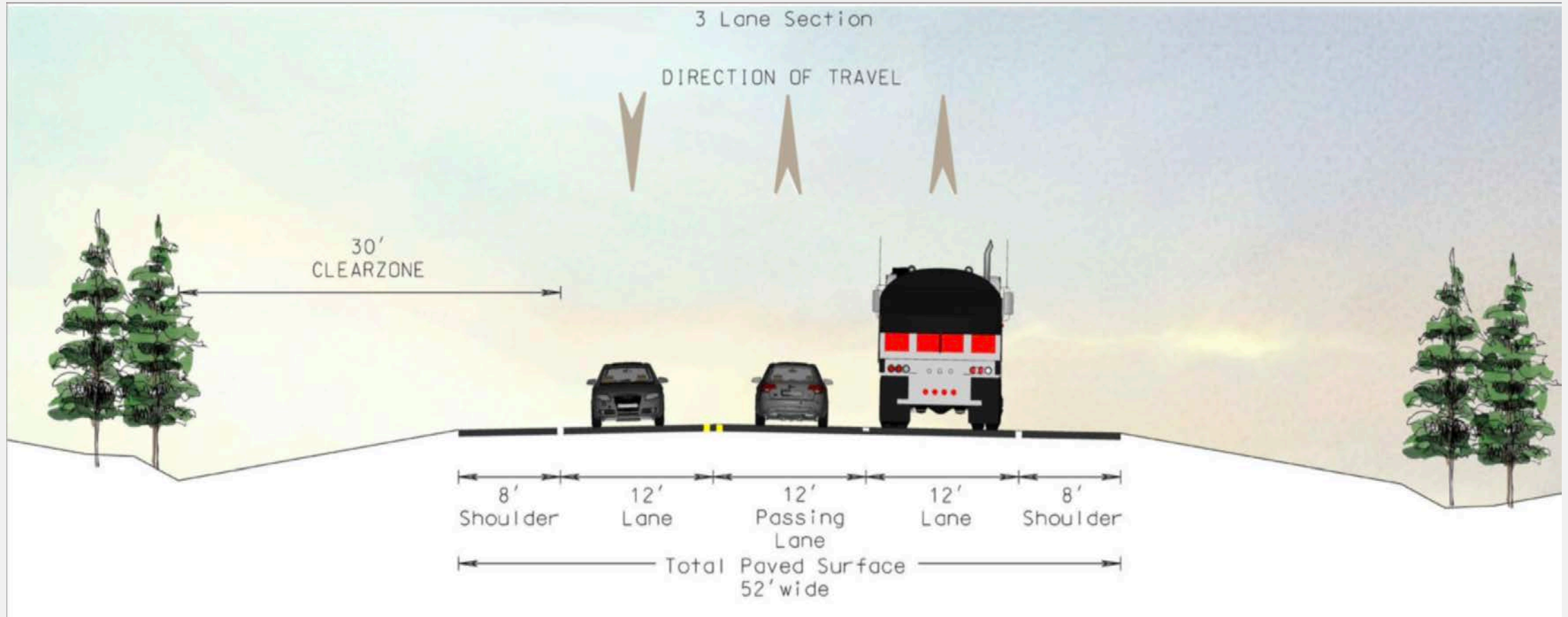
# Typical Sections - Existing Sterling Highway



Existing Highway Cross-Section (applies to all build alternatives)



# Typical Sections - Proposed Sterling Highway



Proposed Highway Cross-Section (applies to all build alternatives)

PHOTO ALASKA DEPARTMENT OF TRANSPORTATION

# Typical Sections – Overpass

## Proposed Sterling Highway

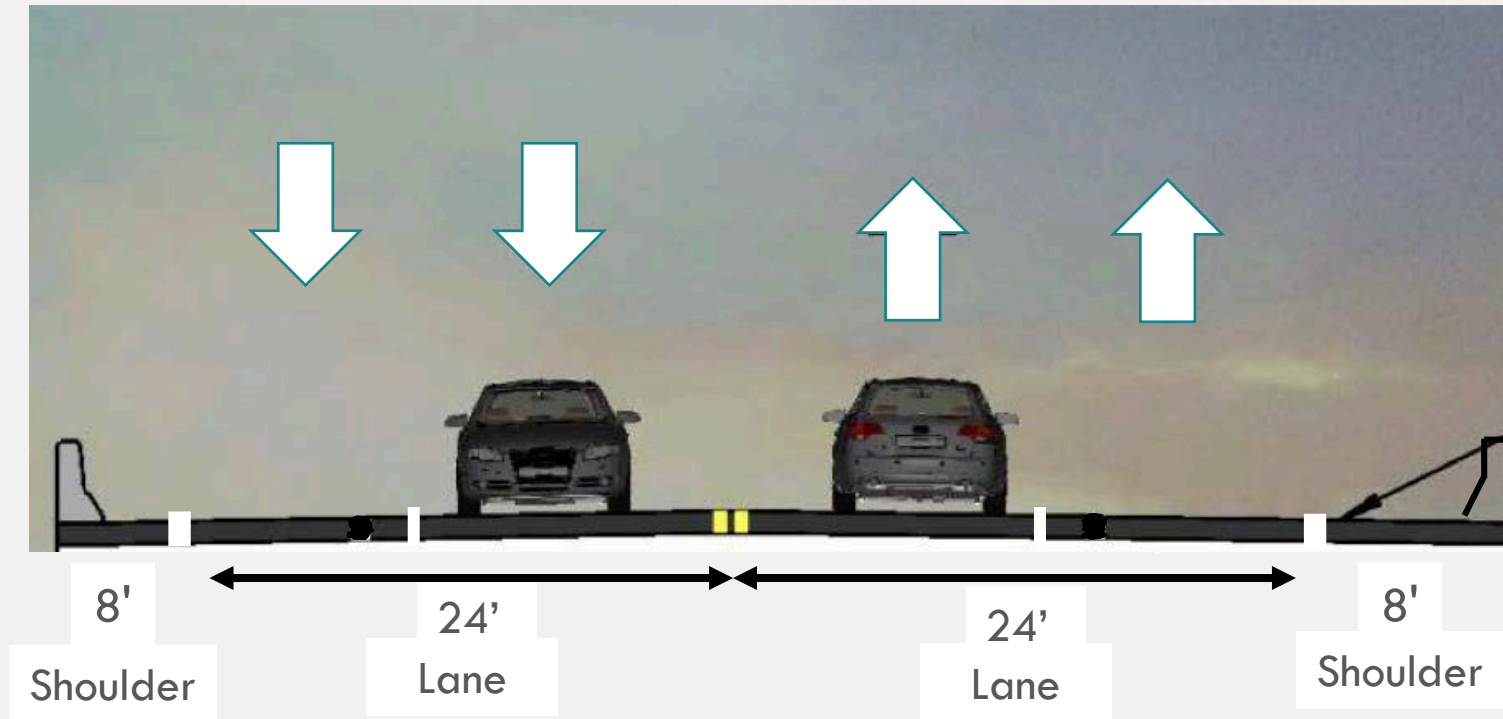


PHOTO ALASKA DEPARTMENT OF TRANSPORTATION

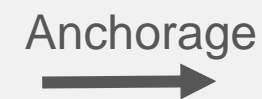
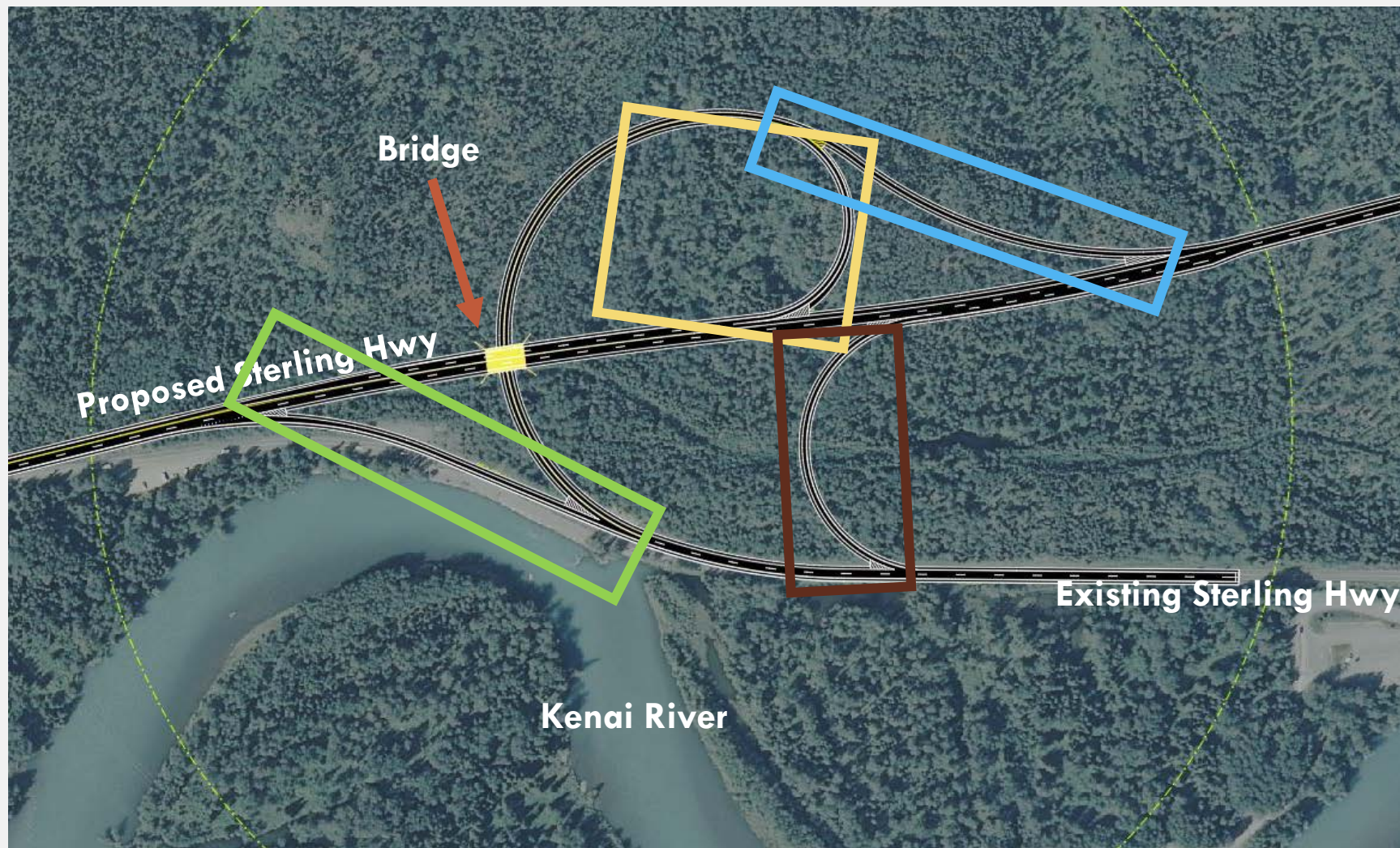
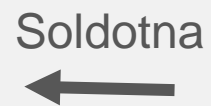
# Bridge Selection



- Deck Bulb Tee Bridge
- DOT&PF Bridge Design



# Section Overview





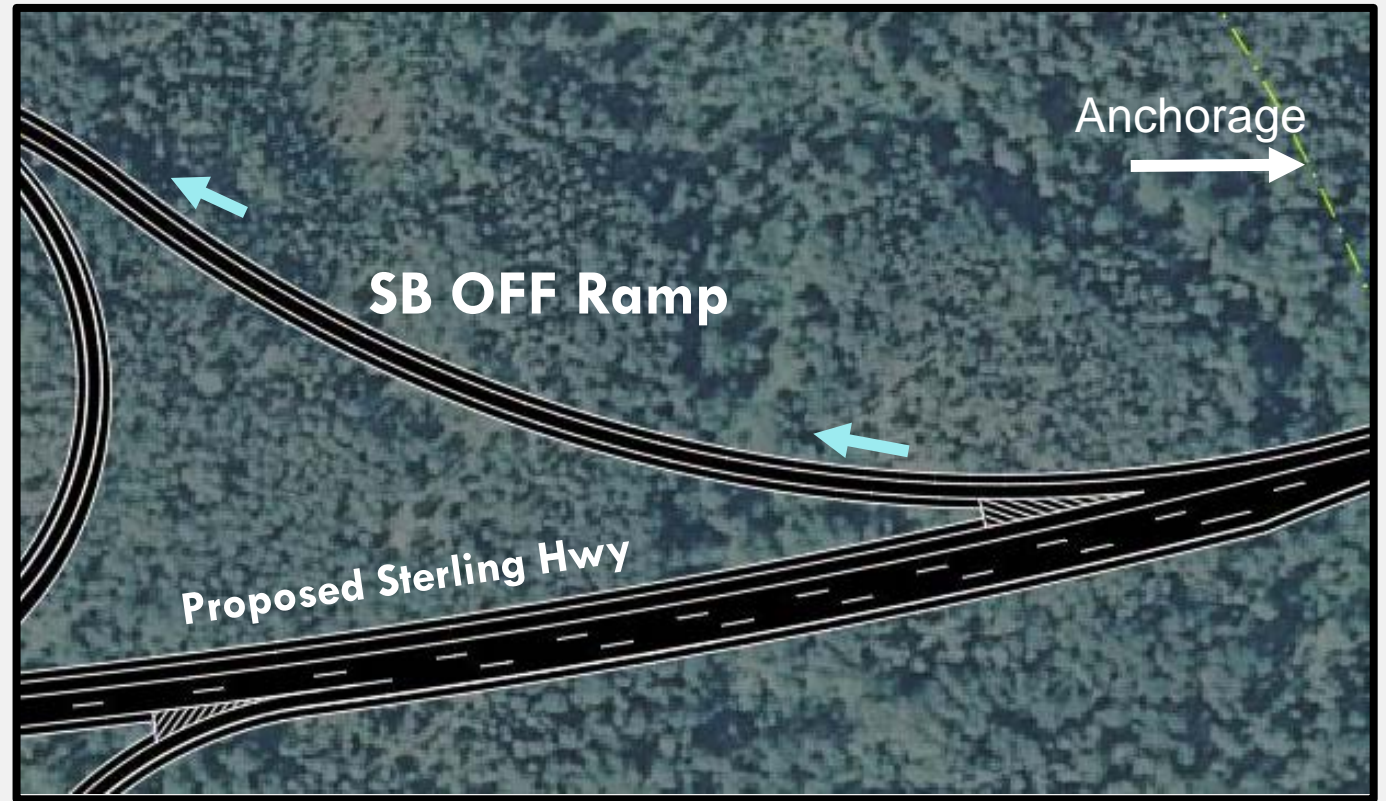
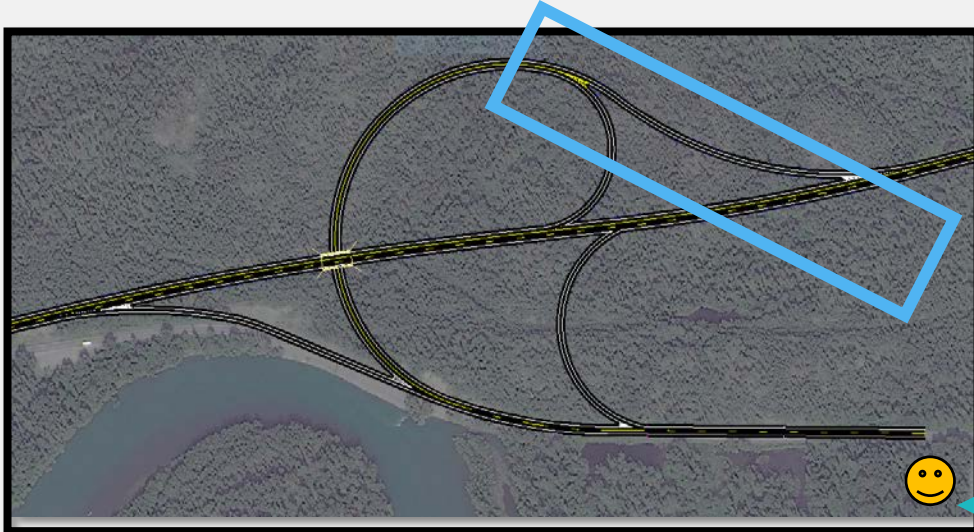
# Section Overview- SB OFF Ramp



N

- Speed Limit: 55 mph
- 12 ' Lane
- 8 ' Shoulders
- Uphill

Soldotna



Anchorage

SB OFF Ramp

Proposed Sterling Hwy

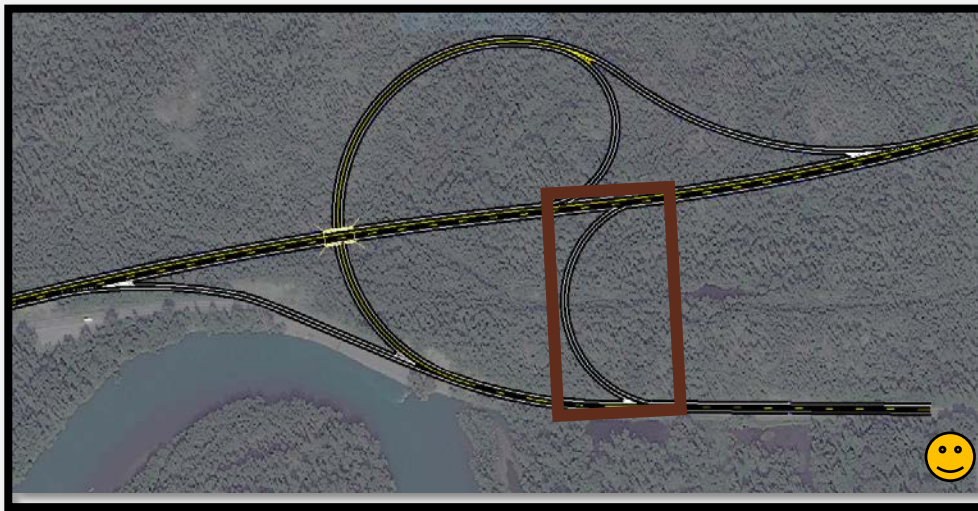


Recreational Area

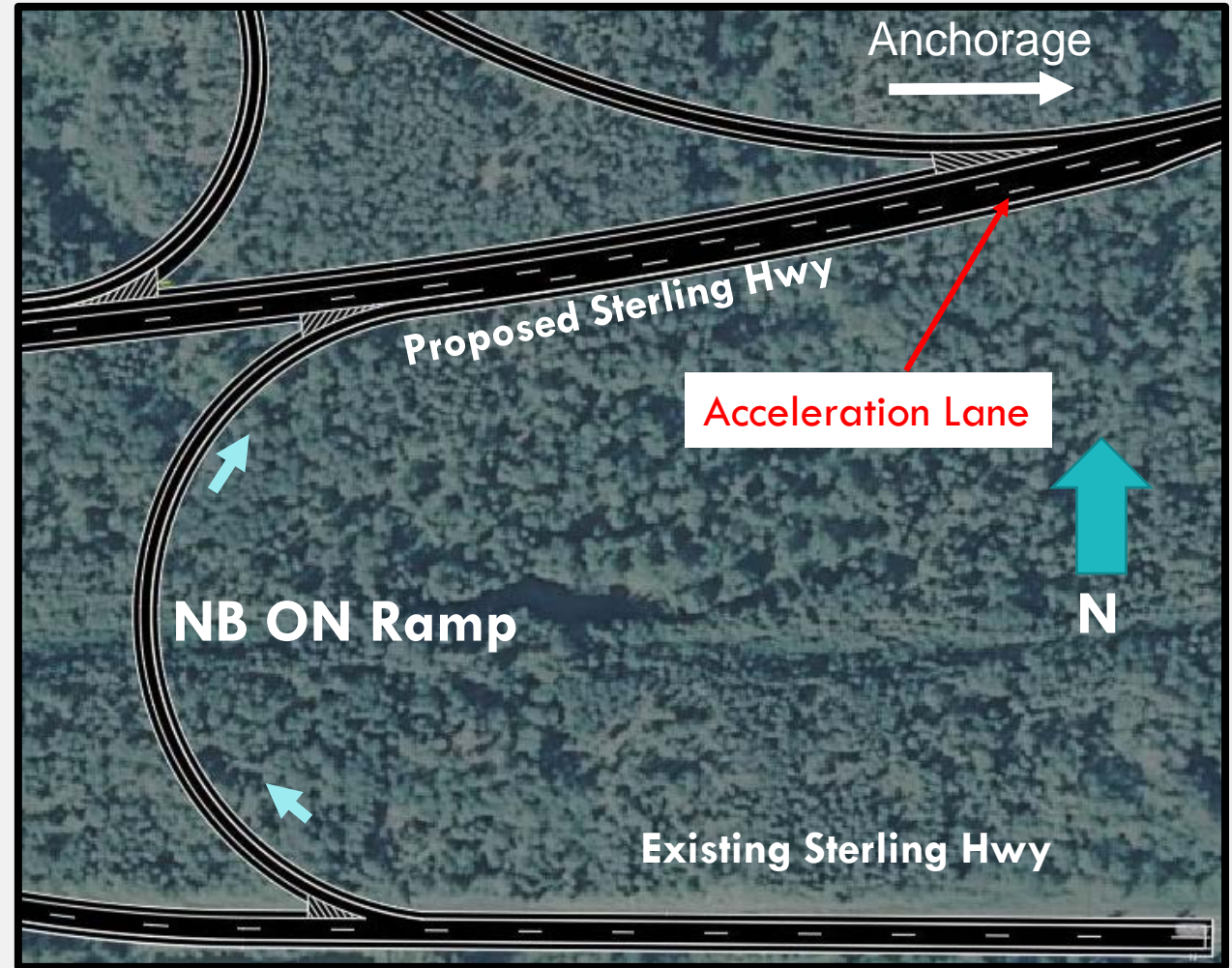


# Section Overview- NB ON Ramp

- Speed Limit: 35 mph
- 12 ' Lane
- 8 ' Shoulders
- Uphill



Soldotna  
←

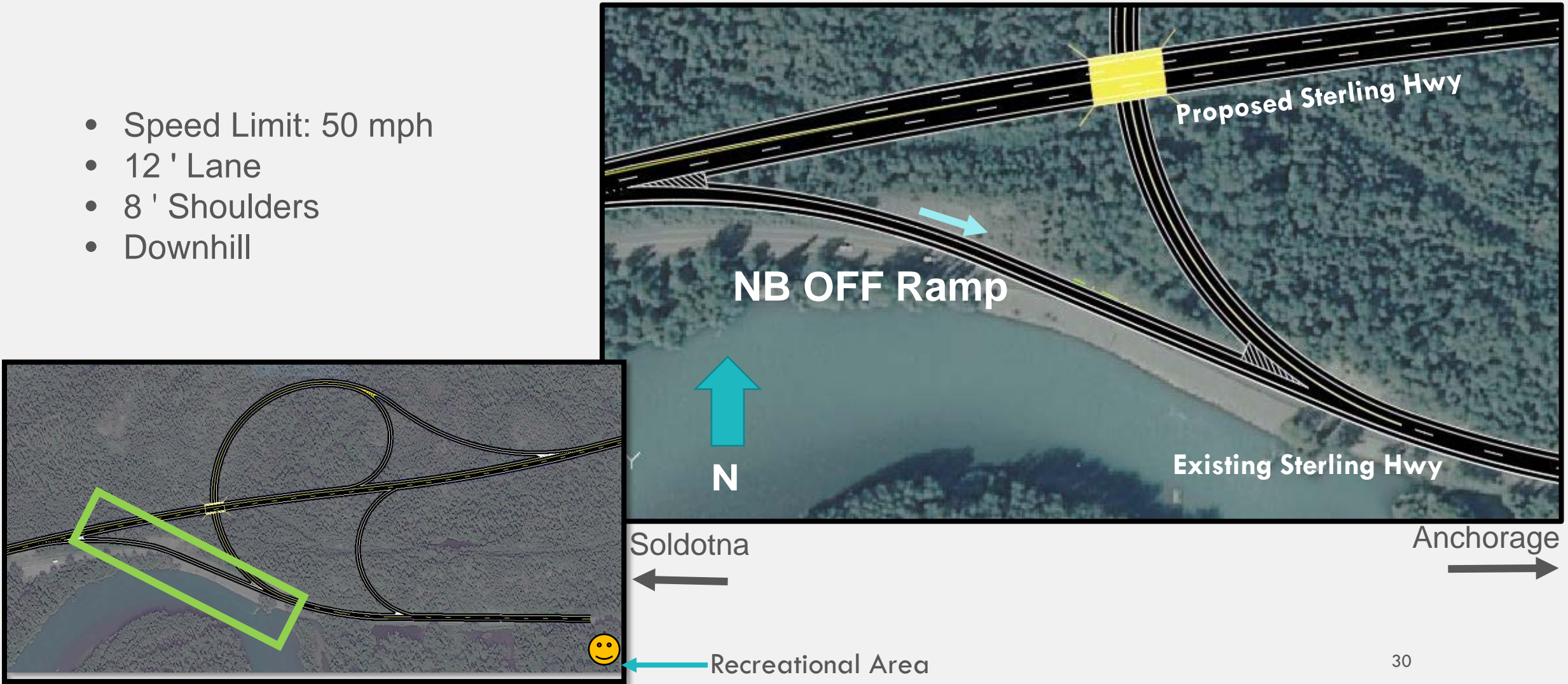


Recreational Area



# Section Overview- NB OFF Ramp

- Speed Limit: 50 mph
- 12 ' Lane
- 8 ' Shoulders
- Downhill

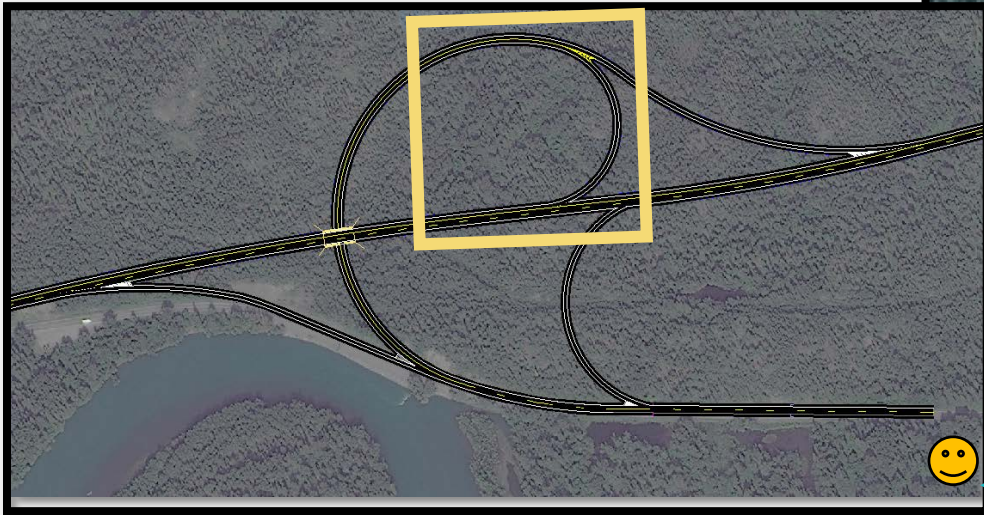




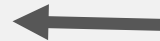
# Section Overview- SB ON Ramp



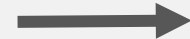
- Speed Limit: 30 mph
- 12 ' Lane
- 8 ' Shoulders
- Uphill



Soldotna



Anchorage

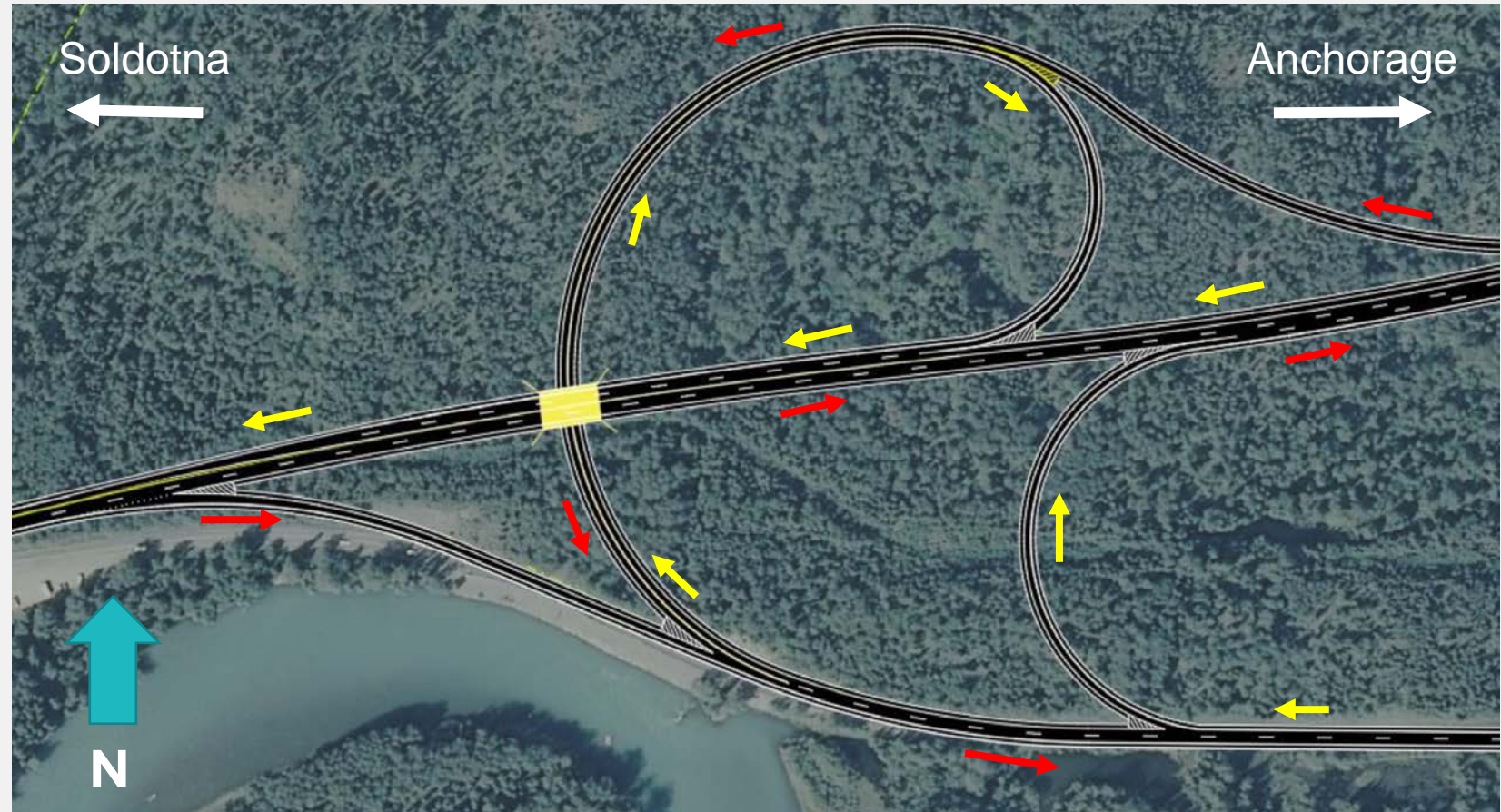


Recreational Area



# Summary

- Free Flow
- Reduce congestion
- Meet scope of work
- Right of Way
- Environmentally Friendly







THANK YOU!

# REFERENCE

- AK Department of Transportation & Public Facility, Sterling Highway MP 45 – 60 Project; <https://www.sterlinghighway.net/index.html>
- <http://alaska.gov/kids/learn/region.htm>
- <https://www.onxmaps.com/>
- [https://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3\\_designspeed.cfm](https://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_designspeed.cfm)
- <https://www.radiokenai.net/dot-held-community-meeting-to-talk-cooper-landing-bypass-project/>