

Cooper Landing Bypass Interchange to Existing Sterling Highway Project

Abstract

The Sterling Highway is a rural principal arterial highway that connects the Kenai Peninsula to Anchorage and the rest of the Alaska highways. Due to being a popular recreational spot for tourist and locals alike, this highway has seen an increase in traffic volume, especially during the summer season. The Department of Transportation & Public Facilities (AKDOT&PF) has recognized the need for this highway's improvement and has proposed to update the existing highway's old design to meet current standards and to re-route the Sterling Highway north of the community of Cooper Landing to address congestion.

SDE Engineers was tasked with providing professional services to develop an interchange that connects the west end of the proposed Cooper Landing Bypass to the existing Sterling Highway. The interchange configuration will give priority to the traffic travelling from the new bypass alignment heading south to the Kenai Peninsula.

Project Background

The Sterling Highway has inadequately been providing motorists with the level of service and capacity it needs for a highway. Due to this, motorists often spend most of their time driving in a platoon at speeds lower than the posted speed. The Sterling Highway MP 45-60 project proposed by AKDOT&PF aims to re-route the Sterling Highway north of the community of Cooper Landing and to update the existing Sterling Highway to serve the community of Cooper Landing.

Project Description

As part of the Sterling Highway project, This project will evaluate an interchange design at the west connection. The interchange design will involve all the major challenges of a rural Alaskan interchange design. This includes selecting the interchange geometric layout, modeling of the access ramps, and selecting the preferred bridge type.

Project Objective and Goals

The goal of this project is to design an interchange that will connect the existing Sterling Highway and the preferred Cooper Landing Bypass's west end as part of the Sterling Highway improvements. The project will adhere to the current standards and the EIS statement. The interchange aims to help effectively decrease the congestion in the area during peak hours by providing a smooth transition thereby reducing travel times and increasing the level of service.

Clients

Kristina Busch, P.E., Project Engineer, AKDOT&PF
Chris Post, P.E., Project Manager, AKDOT&PF

Project Mentor

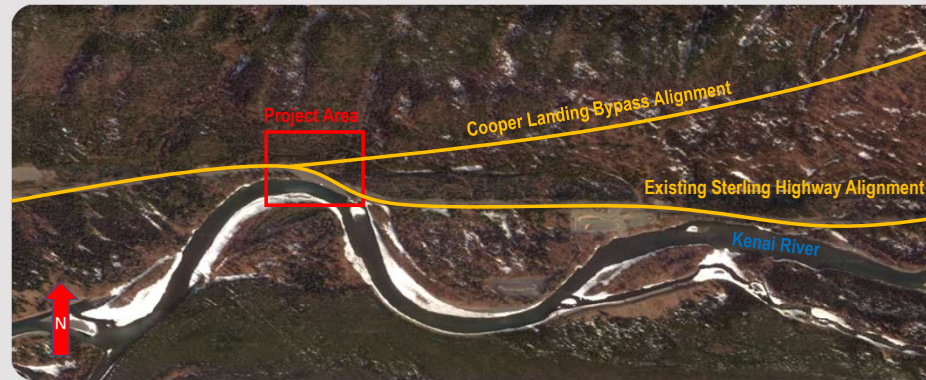
Kelly Kilpatrick, P.E., Project Manager, DOWL

Faculty Advisor

Vinod Vasudevan, Ph.D., P.E., Associate Professor, UAA-CED

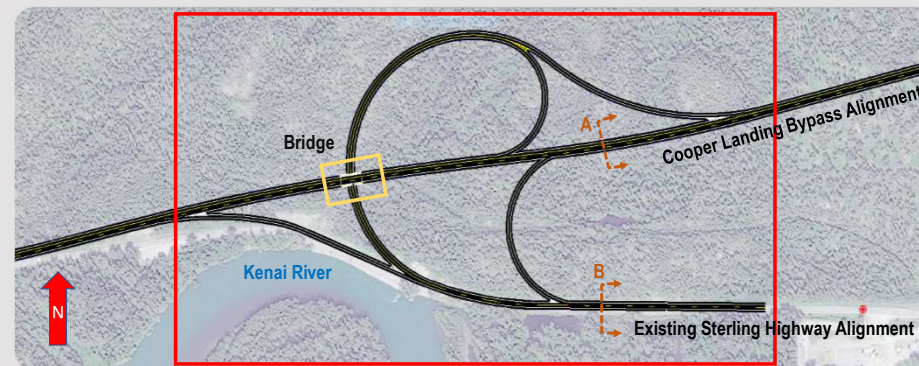
Project Team Members

Aldrey Antonio, Student Project Manager
Patrick Brouse, Senior Student
Mark Credito, Senior Student
Sandy Otaegui, Senior Student
Allen Wilson, Senior Student
Connor Wright, Senior Student



Existing Conditions

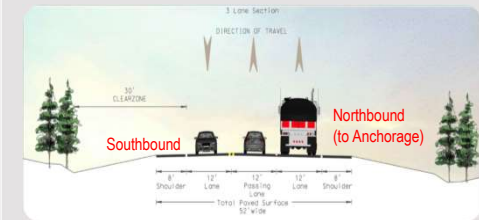
- The Sterling Highway is a rural principal arterial highway.
- Currently, 49% of the curves are too sharp, 100% of the shoulders are narrow and/or nonexistent, 91% of lane width are narrow, and 14 out of 15 miles do not meet standard for clear zones.
- 100% of the highway also does not meet the 60-mph design speed standard.
- The summer season brings in a huge amount of visitors leading to undesirable traffic flow, decrease in level of service, and safety concerns.
- Overall, the existing highway does not meet the requirements of today's standards.



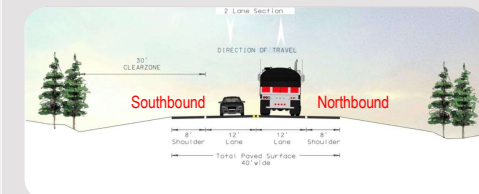
Proposed Design – Trumpet Interchange

- On/off ramps allows for continuous uninterrupted traffic flow without having the need to install signalization.
- Improves safety by decreasing conflict points and providing on/off ramps with adequate acceleration/deceleration lanes and curve radius.
- Increases level of safety and serviceability by providing a much-needed revamp on road design and the addition of shoulders.
- The design hinders any future development north which helps protect the wildlife and natural environment.

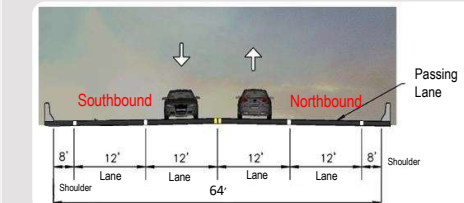
Typical Section – A



Typical Section – B



Typical Section – Bridge



Conclusion

The Trumpet Interchange will allow motorists to continue through the Sterling Highway from the Cooper Landing Bypass uninterrupted as well as allow motorists to smoothly transition from entering or exiting the highway. The design also incorporates a less environmental footprint and decreases the chance of future road development to preserve the nature and wildlife immediately surrounding it.