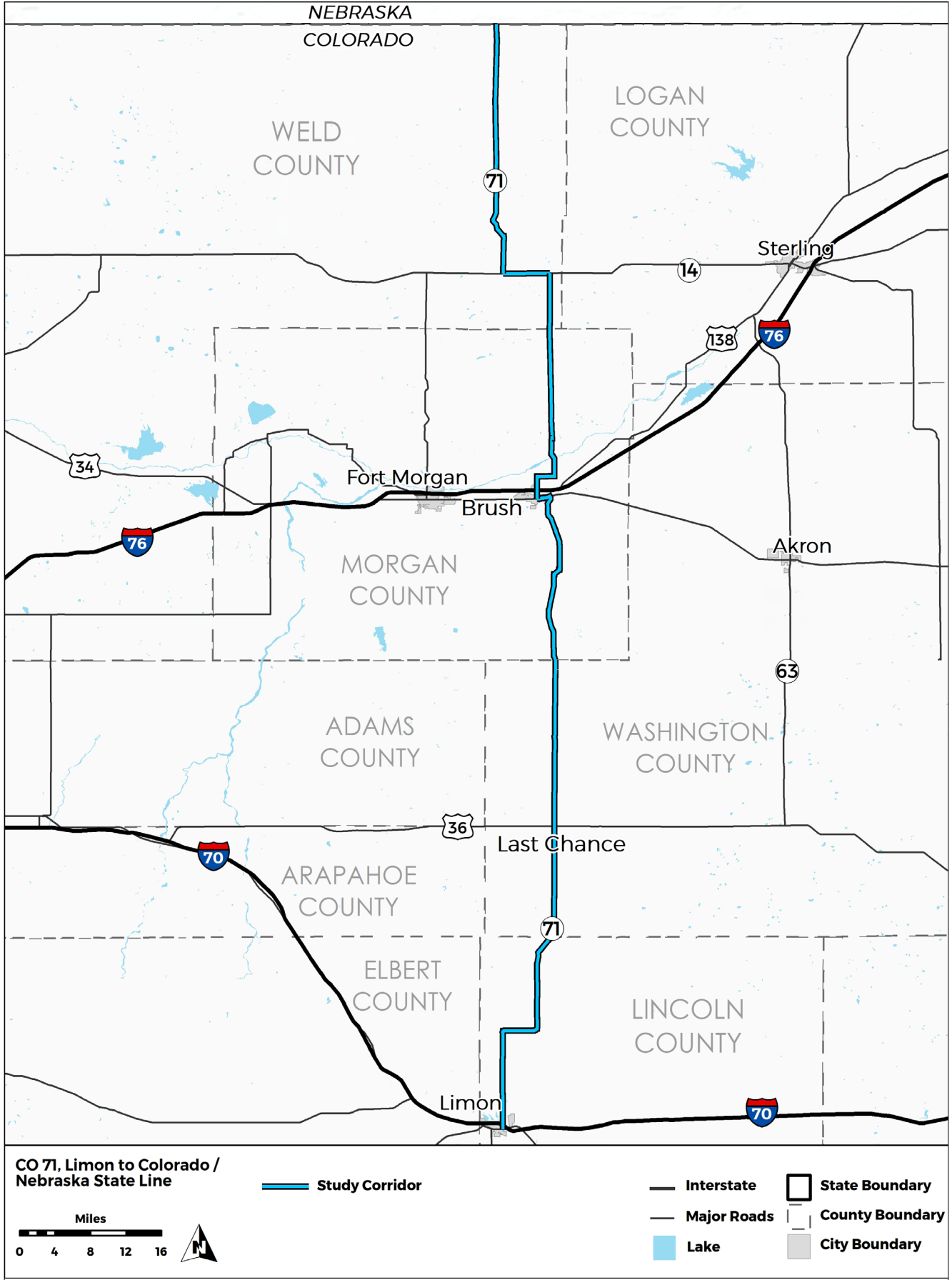


Location & Context

The Study area of CO 71 is illustrated in **Figure 1**, beginning at Milepost (MP) 102 in Limon, Colorado, and ending at MP 232 at the Colorado-Nebraska state line. The study area includes the towns of Limon and Brush, Lincoln County, Washington County, Morgan County, and Weld County. The study area was also broken into 3 segments. Segment 3, between Limon and Brush, is also a key part of the P2P Heartland Expressway because it serves the Eastern Plains of Colorado by connecting I-70 and I-76. The CO 71 leg of the P2P Heartland Expressway continues north until it ties into NE 26 near Scottsbluff/Terrytown, Nebraska.



Figure 1: STUDY AREA



2. Current Conditions

To develop the analysis for this study, the project team conducted an in-depth analysis of the study area's current conditions, including:

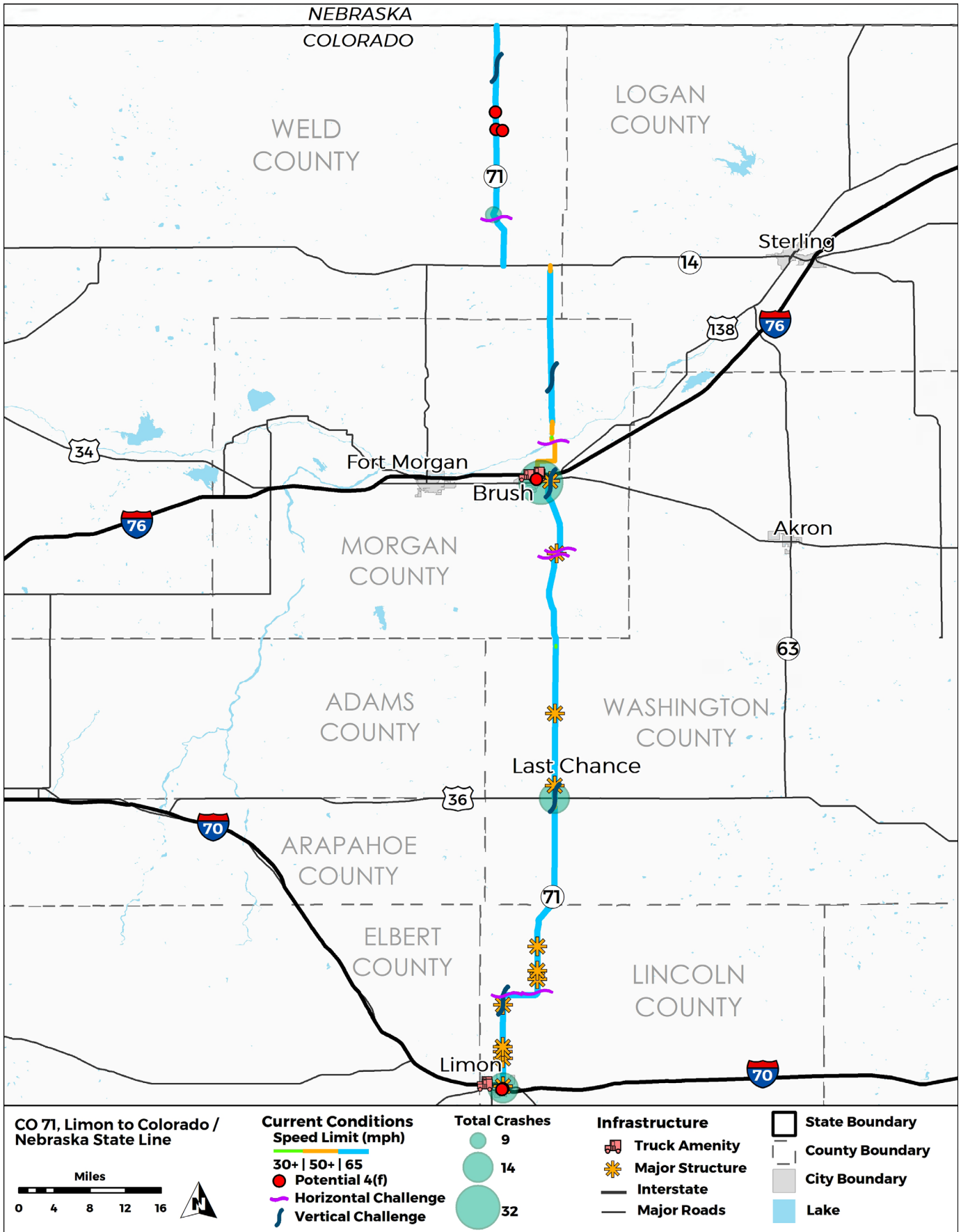
- » Environmental Scan
- » Travel speed
- » Horizontal/Vertical Challenges
- » Environmental hot-spots
- » Crash Data/LOS
- » Horizontal/Vertical Challenges
- » Infrastructure
- » Commercial Freight Amenities

A summary of these conditions is highlighted in **Figure 2**. Some of the key findings include potential 4(f) properties in the towns of Brush and Limon and between CO 14 and the Nebraska- Colorado Stateline. There are minimal horizontal/vertical challenges along the study area and truck amenities are located in Limon and Brush. The speed limit is posted at 65 MPH for most of the corridor. The highest concentration of crashes was found to be in the Town of Brush.

The Environmental Scan was an extensive review of local data and resources by 18 state and federal agencies and is meant to inform environmental reviews for project design, construction, maintenance, and operations for future projects along the corridor. The 4(f) properties identified in the Environmental Scan will require further evaluation for projects along this corridor that move forward. The full report and additional details can be found in **Appendix A**.



Figure 2: Current Conditions



3. Truck Freight Model

To understand how the recommended scenarios impact traffic operations within Colorado and along CO 71, the project team utilized a planning level Multi-Unit-Truck (MUT) traffic model. The model analyzed the 2018 and 2040 Build and No-Build scenarios for diverting truck traffic from I-25 to CO 71 and the analysis provides an overview of relieving congestion. The scenarios include simplified speed adjustments tested in 5 mph increments along CO 71 and speed reductions on the Front Range. Additional data used for the model includes state and national traffic models, state and national roadway networks, the Freight Analysis Framework (V4.3), and Scenario Speed and Capacity assumptions.

Methodology

The Study team has determined that since CO 71 does not experience congestion, the recommended improvements will not decrease travel time through the corridor and the team will rely on qualitative benefits like driver comfort which can inform a drivers' decision to reroute from I-25 to CO 71. However, there are no approved methods for modeling qualitative measures, therefore the project team used incremental travel speeds to serve as the "quantitative" proxy in the model. This approach enabled the model to run scenarios and determined which scenario had the largest effect on truck volume changes. Multiple tests were run to ensure accuracy, consistency, and to "average out the time to traverse" the I-25 and CO 71 corridors within the model. The initial findings concluded that freight traffic would divert to Segment 3 to bypass the building congestion on the Front Range (modeled by reducing the speed/ increasing the travel time on other Front Range corridors like I-25).

Per Figure 3, the modeling indicates that Segment 3 (between Limon and Brush, connecting I-70 and I-76) has the largest increase in truck volume, whereas Segments 1 and 2 have nearly parallel MUTs below 800. Overall, truck volumes begin to flat line for all segments at speeds of 75 - 80 mph on CO 71, which creates "diminishing returns". The Super Two Scenario on CO 71 indicates a 5-6% reduction in Truck Vehicular Miles Traveled (VMT) on I-25 (which is equivalent to approximately 700 MUTs), while a 7-9% reduction (which is equivalent to approximately 1,000 MUTs) occurs with the Four-lane divided highway scenario. The 10% speed reduction measure (simulating the highest projected congestion) on the Front Range also correlates with the highest truck volumes for all three segments of CO 71. For a detailed review of the modeling analysis please see **Appendix J**.

Segmentation & Select Link Analysis

The CO 71 corridor was divided into three distinct segments (**Figure 4**) to differentiate truck travel patterns and prioritize improvements. The corridor segmentation was determined by major roadway crossings along CO 7. Corridor segmentation allows the team to calculate and report the centerline road length, drive time in minutes, and average speed to traverse.

The Select Link Analysis (**Figure 5**) provides information of where traffic comes from and goes to at selected links. Links are bi-directional road segments located at typical cross sections of the study corridors, clearly illustrating the truck market patterns. It indicates a broader spread of traffic flow patterns in all directions for I-25 and concentrated traffic movements in the north-south direction for CO 71.

Figure 3: Diversion Model Summary by Segment

