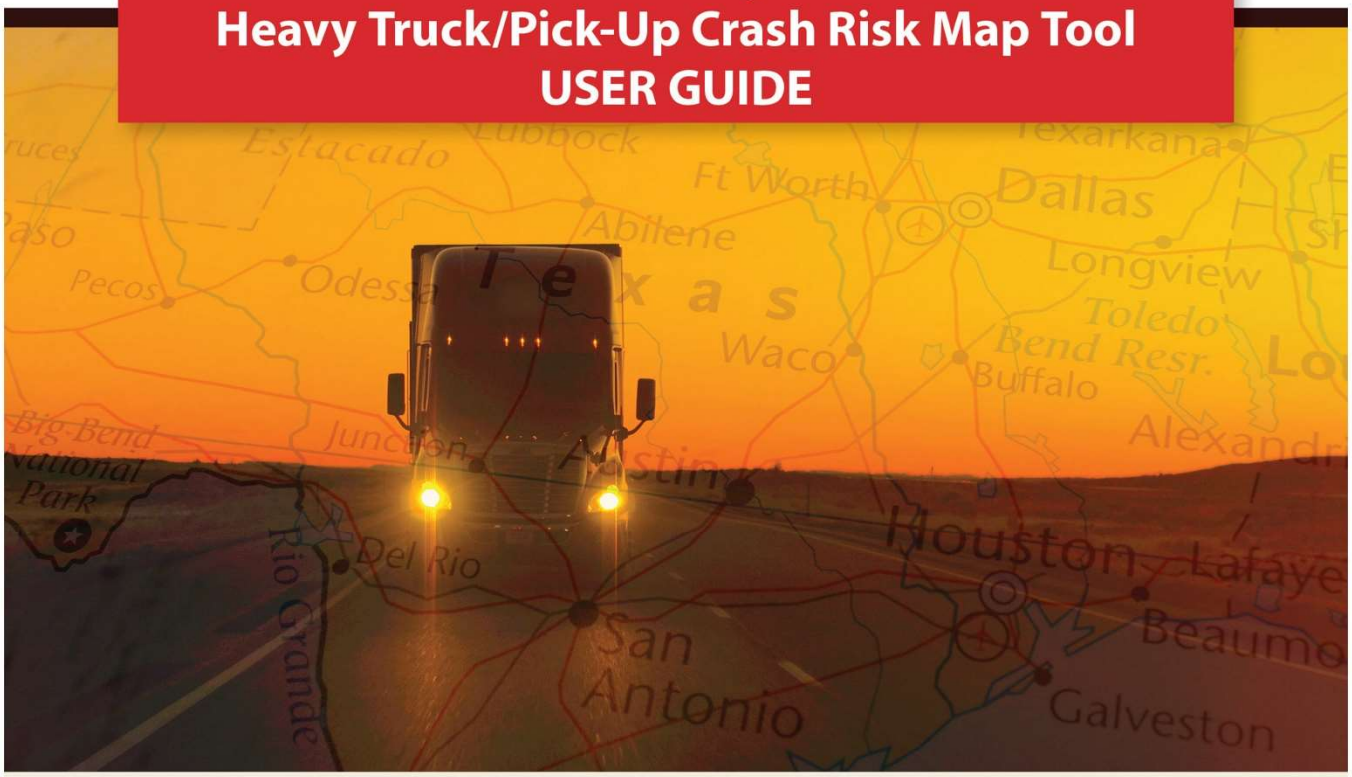
Understanding Crashes Involving Large Trucks on Rural Roads in Texas

Interactive Rural Roadway Truck Tractor and Heavy Truck/Pick-Up Crash Risk Map Tool USER GUIDE



Texas A&M Transportation Institute

Center for Transportation Safety
Safety Research and Outreach

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PROJECT OVERVIEW

The goal of this project is to prevent crashes and reduce crash severity on rural roads involving large trucks by improving law enforcement and driver knowledge of hazardous roadways and behaviors on rural roads. This will be accomplished through an innovative analysis of crash and roadway data, and the production and dissemination of outreach and educational materials (e.g., fact sheets, data dashboards, and high-risk roadway maps).

In addition to the compilation of rural large truck crash data and development of crash profiles, another project objective is to:

- Develop a method for visualizing roadway segments disproportionately prone to crashes known as roadway segments with a potential for improvement (more commonly referred to as risk), and
- Create a rural roadway CMV crash risk visualization tool accessible to critical stakeholder groups (law enforcement and fleet operators).

INTRODUCTION

The traditional hotspot identification approaches (the safety performance approach described above) are based on crash occurrences. Under this approach, high crash-potential sites (defined as sites that experience more crashes than expected) are identified through network screening, and investments are then decided based on the observed crash frequencies. However, this traditional approach may not provide adequate results when crashes are more sporadic, such as the case with large truck crashes in rural areas. As a result, transportation agencies would have trouble meeting safety performance goals by only investing in high-crash locations when traditional techniques are employed.

The systemic approach to safety involves identification and implementation of countermeasures that address high crash-potential roadway factors, (i.e., factors with potential for improvement), through system-wide analysis of specific target crash types (in this case, it is truck tractor and heavy truck/pick-up crashes). Since systemic improvements focus on high crash-potential roadways rather than specific locations, it is possible to use the roadway characteristics that are associated with truck tractor and heavy truck/pick-up crashes to identify the factors with potential for improvement. The proportion of truck tractor and heavy truck/pick-up crashes for a specific range or value of a variable are then compared to the proportion of existing vehicle miles traveled (VMT) (VMT is calculated as a product of roadway segment length and the ADT) within the respective range or value. A total of 121,186 truck tractor crashes and 44,158 heavy truck/pickup crashes were identified using this process.

INTERACTIVE VISUALIZATION TOOL

Alternate Platform

Based on comments received from the stakeholders, especially the fleet operators, an alternative more streamlined and user-friendly version of the visualization tool was developed using the same data and risk assessment methods. The objective was to provide busy fleet operators with an easily accessible snapshot of various rural roadways to help with high level routing decisions, without the computer requirements of Google Earth. In addition, the user can select ranges of AADT and specific levels of risk (hence "interactive"). The interactive visualization tool is available at:

https://safety.shinyapps.io/FMCSA_Truck_Safety/

Using regional geography based on the six DPS regions, filters are provided for:

- Minimum truck AADT,
- Maximum truck AADT, and
- Risk Level.

Figure 1 shows the basic map and filters. The filter defaults are noted. The map can zoom as desired.

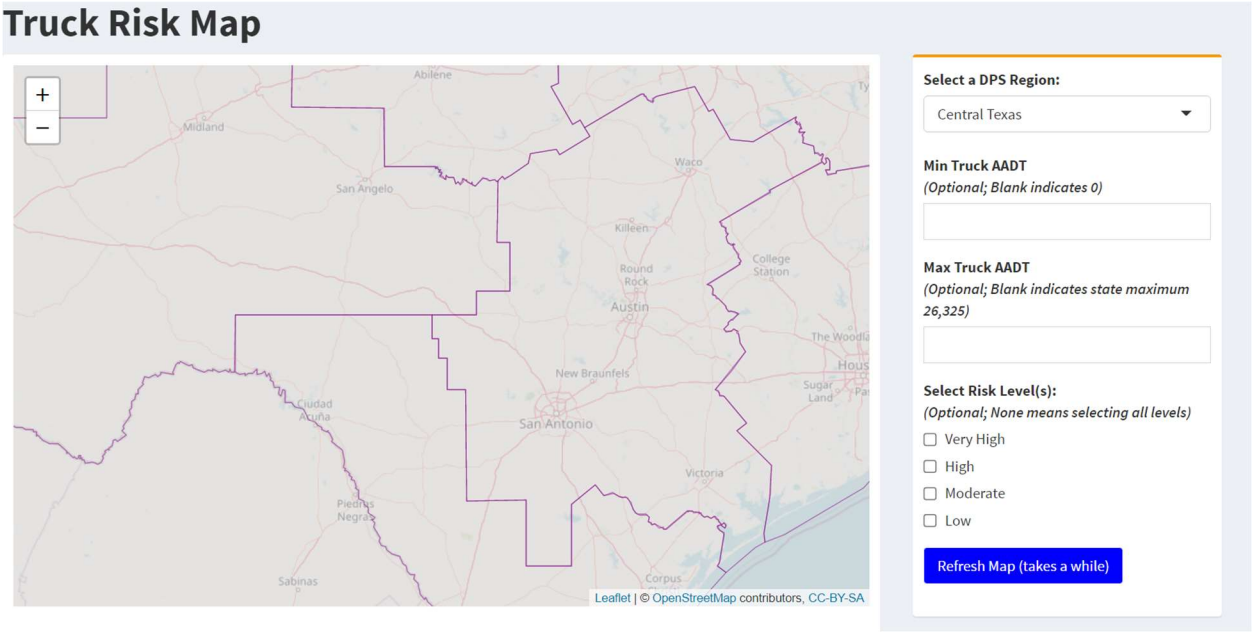

Figure 1. Alternate Visualization Filters and Map.

Figure 2 shows the entire Central Texas Region with the default filters, all four risk levels and no constraints on truck AADT.

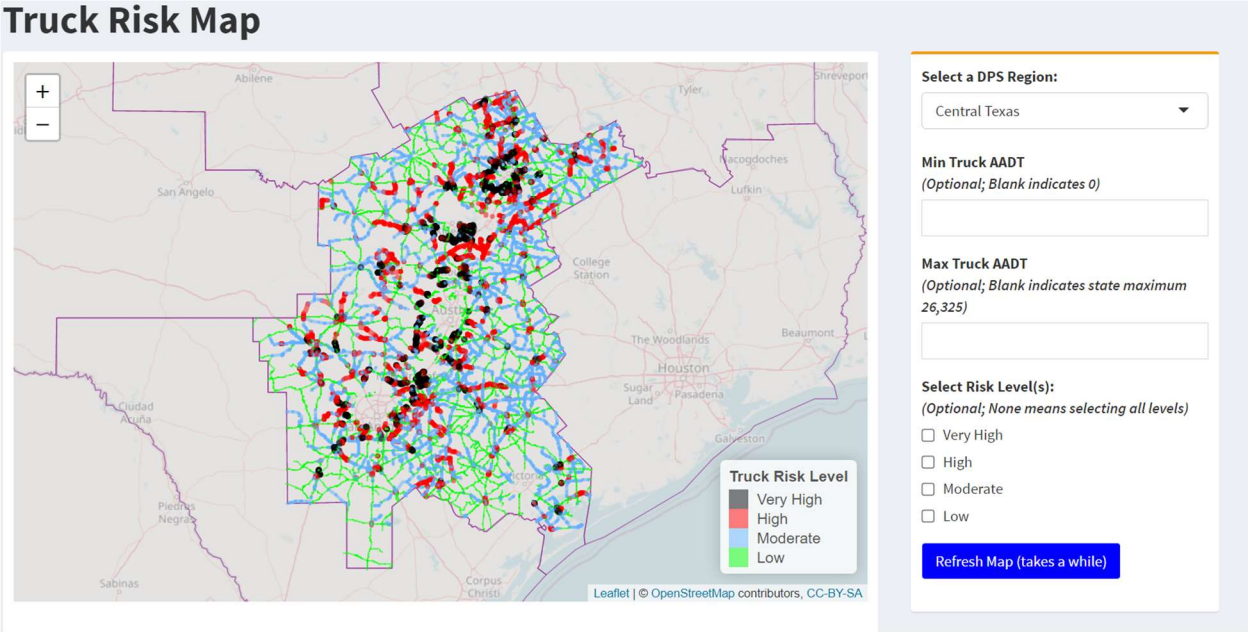

Figure 2. Central Texas Region Default Filters & Risk Levels.

Figure 3 shows the Central Texas region filtered for Very High and High rural roadway risk levels and no constraints on truck AADT.

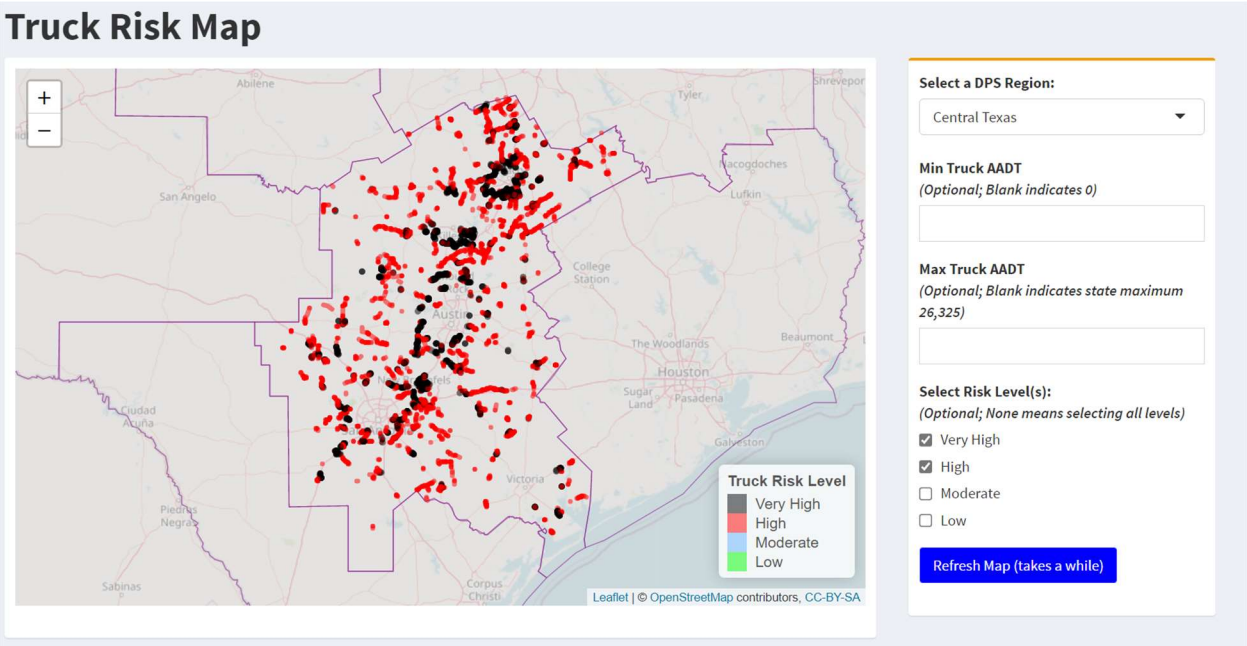

Figure 3. Central Texas Region Very High & High Risk Levels.

Figure 4 shows segment detail for FM-672 near Lockhart, Texas. Similar to the Google Earth based visualization tool, clicking on a color-coded roadway opens a pop-up with the key information for that segment, including:

- DPS District,
- Roadway name,
- Area type,
- Truck annual average daily traffic (AADT),
- Truck AADT percentage,
- Number of lanes,
- Lane width,
- Number of lanes
- Posted speed limit (PSL), and
- Risk level category.

Unlike the Google Earth based visualization tool, the map is a basic schematic representation of the road network, with no terrain or satellite imagery.

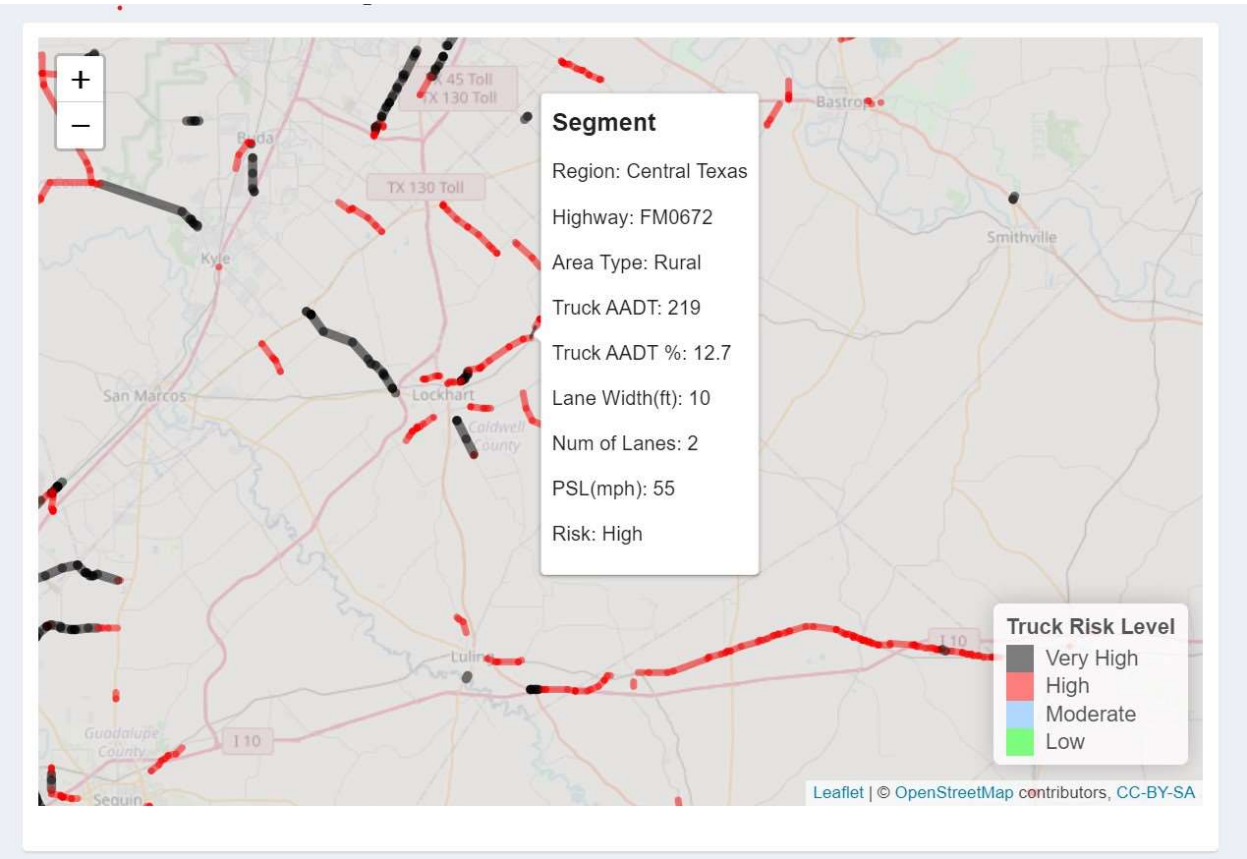

Figure 4. Segment Detail for FM-672 near Lockhart, Texas.