Priority Active Connections Explorer (PACE) Tool User Guide

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Table of Contents

List of Figures

Introduction

Designed by the Colorado Department of Transportation (CDOT), the PACE (Priority Active Connections Explorer) Tool is an interactive, map-based decision-support platform to help planners and partners assess and prioritize highway segments for active transportation improvements. Built on a robust framework of data-driven criteria, the PACE Tool guides decision-making across four key goal areas: Safety, Equity, Mobility Choice, and Connected Communities. It offers three core functions—Heat Map, Filter, and Compare—to support a range of planning activities, from statewide screening to site-specific evaluation.

- **Heat Map Function: Statewide Visualization of Needs**: The Heat Map function provides a powerful visualization of scoring results across Colorado's state highway network. Users can view relative performance in each of the four goal areas, along with a combined total score. Color-coding indicates segment performance and helps users quickly identify high-priority locations based on data such as vulnerable road user crashes, equity indicators, facility gaps, access to recreation and transit, and more. Clicking on a segment reveals detailed information via a pop-up that offers transparency into the underlying scoring.
- **Filter Function**: **Focused Identification of Priority Locations:** The Filter function allows users to refine their analysis to a specific geography and set of goals. Users can define an area of interest, such as a CDOT Region, metropolitan planning organization (MPO), county, or individual state highway, and then select which Active Transportation Plan (ATP) goal areas to emphasize. The tool highlights the top-performing segments based on this customized focus, considering gaps in the active transportation network and other key factors. This targeted output helps planners quickly generate a shortlist of candidate locations for active transportation improvements.
- **Compare Function: Side-by-Side Evaluation of Segments**: The Compare function enables side-by-side analysis of two or more highway segments. This function is especially useful when evaluating potential projects for funding or prioritization. Users can select routes or specific mileposts on two parallel maps (Map A and Map B) and review scoring and attribute data in synchronized panels. The tool dynamically updates results as users select segments and calculates average scores when multiple segments are selected. A dedicated dialog box presents attribute details and evaluation criteria to offer a comprehensive snapshot of each location's performance.

Together, these tools form a comprehensive system for prioritizing investments that enhance safety, equity, mobility, and connectivity for all road users. The PACE Tool is designed for use by CDOT, regional planners, and local jurisdictions and reflects a commitment to transparent, data-informed planning across Colorado's state highway network.

Use in Context: A Tool to Inform, Not Prescribe

It is important to note that while the PACE Tool provides robust, data-driven insights about where improvements may have the greatest impact, it does not recommend specific facility types or designs. The tool should be used in conjunction with professional engineering judgment and a nuanced understanding of local conditions, community priorities, and the surrounding active transportation network. Ground-truthing, engagement, and contextual analysis remain essential components of planning and project development.

Potential Uses of PACE Tool

The PACE Tool offers significant value beyond long-range planning and prioritization; it can also support operational, safety, and project-level evaluations. For CDOT staff and partners conducting Operational and Safety Evaluations, the tool provides a consistent, data-informed way to assess the presence and potential needs of bicyclists and pedestrians. Rather than relying solely on anecdotal or observational inputs, the PACE Tool offers an equitable and statewide baseline for understanding whether a given location exhibits characteristics, such as crash history, equity concerns, facility gaps, or proximity to key destinations, that justify deeper analysis.

Because the tool incorporates scoring across goal areas that align with broader agency values—safety, equity, mobility choice, and connected communities—it can help make the case for including active transportation improvements in the scope of existing or upcoming projects. This functionality supports a shift toward proactively integrating active transportation needs into traditional project development workflows, rather than addressing them only through standalone projects or reactive measures.

In addition to supporting existing project evaluations, the PACE Tool can also serve as a strategic guide for identifying where further study is warranted. Segments with low to moderate scores may not immediately stand out as high-priority statewide, but they may represent locations where targeted improvements could meaningfully raise the performance of the active transportation network. By identifying such areas, planners and engineers can focus limited study and design resources where they might have the greatest impact. This approach helps foster a more iterative and improvement-oriented process; one that not only responds to current conditions but actively seeks to improve future conditions for active modes across a variety of project types and geographies.

Ultimately, the PACE Tool is both a diagnostic and a planning resource: it highlights where needs exist today and helps identify where efforts can be focused to improve active transportation outcomes in the future.

Understanding Relative Opportunities Across Regions

While the PACE Tool's statewide heat map provides a powerful, at-a-glance visualization of need, it is equally important to consider relative opportunities for improvement within each CDOT Region, county, or Transportation Planning Region (TPR). Because the heat map is designed to show scores across the entire state highway system, it naturally highlights areas with higher concentrations of population and active transportation demand, such as those along the Front Range. However, this statewide view should not be interpreted as minimizing the needs or opportunities in more rural areas.

The tool's Filter and Compare functions are essential for uncovering the highest-priority segments within a specific geography. By filtering to a particular county, CDOT region, MPO, or TPR, users can shift their focus from absolute scores to relative opportunities, identifying which segments are most in need within that local context. This is especially important for ensuring rural communities and lower-density areas are not overlooked. Even if overall scores are lower due to lower population or activity levels, segments may still rank high relative to nearby corridors and represent meaningful opportunities for safety, access, mobility, and equity improvements.

Using the PACE Tool in this way encourages a more balanced and equitable planning approach; one that respects geographic diversity and local priorities while still leveraging consistent statewide criteria. It supports planning partners in identifying the top opportunities within their jurisdictions, regardless of how those areas compare to the state's urban centers.

Local Network Solutions

While the PACE tool is focused on state highways, many gaps and needs identified along these corridors can be effectively addressed through improvements to parallel routes on the local street network. These parallel facilities often offer lower traffic volumes and speeds, making them safer and more comfortable for people walking, biking, and using mobility devices. Enhancing connectivity, signage, crossings, and infrastructure on local streets can provide viable alternatives to state highways, particularly where direct improvements on the highway corridor may be constrained. By leveraging local networks to complement the PACE-identified priorities, agencies can create more continuous, accessible, and community-oriented active transportation systems.

About Page

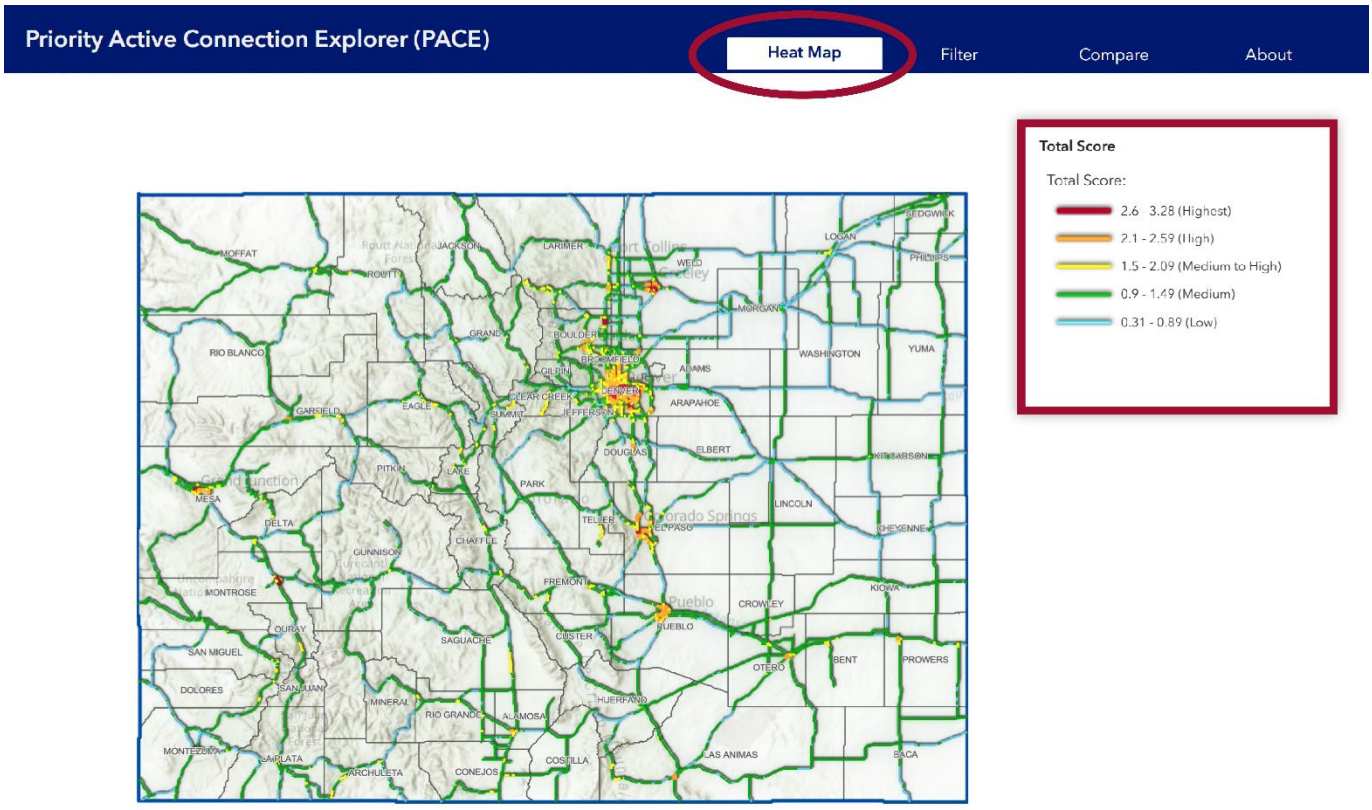
The About page of the PACE Tool (**Figure 1**) provides an overview of the Tool's purpose and core components (Heat Map, Filter, and Compare) designed to help users make informed, data-driven decisions for active transportation improvements across Colorado's state highway system. It highlights how each feature supports project prioritization: Heat Map visualizes statewide scores and input data through an intuitive color scheme; Filter pinpoints locations most suitable for investment; and Compare allows side-by-side evaluations of different highway segments. The About page serves as a starting point for understanding how PACE supports equitable and strategic planning for active modes, and this User Guide can be accessed from the About page.

Figure 1. PACE Tool About Page

Heat Map Function

The Heat Map Tool allows users to visualize scoring results for highway segments in **four** main goal areas: Safety, Equity, Mobility Choice, and Connected Communities. It also provides an overall Total Score at a statewide scale. Click the Heat Map tab on the top ribbon to navigate to heat maps. The first map that displays is the Total Score heat map. Data is broken out in ranges using a heat map color scheme to indicate the highest to lowest score, as shown on **Figure 2**. The red lines show the highway segments with highest scores (indicating the greatest potential for investment in active transportation) and the blue lines show the lowest scores.

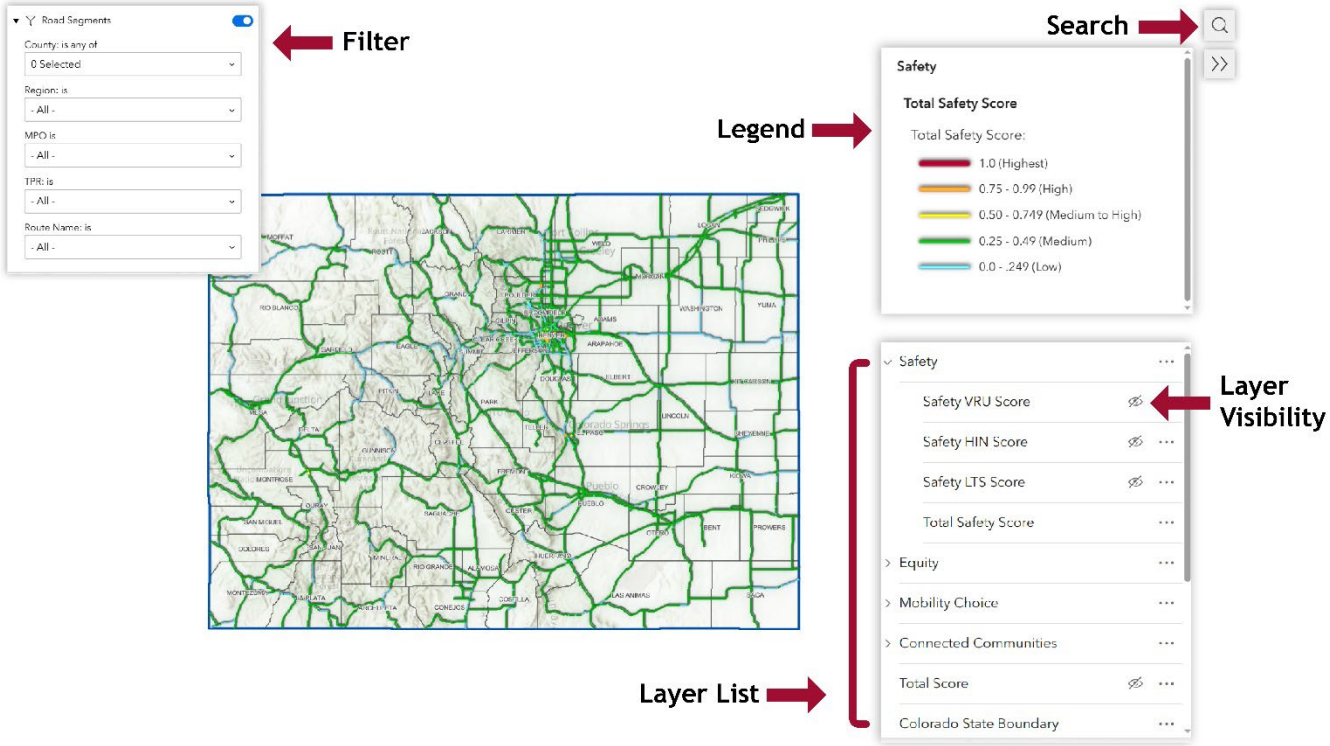
Figure 2. PACE Tool Heat Map



To view the available heat maps, use the layer list in the lower right corner. Use the arrow next to the layer name to expand the layer list for each layer. Use the eye icon next to the layer name to turn layers on and off.

The Heat Map Tool provides a geo-location search, legend, layer visibility, and a filter option as shown on **Figure 3**.

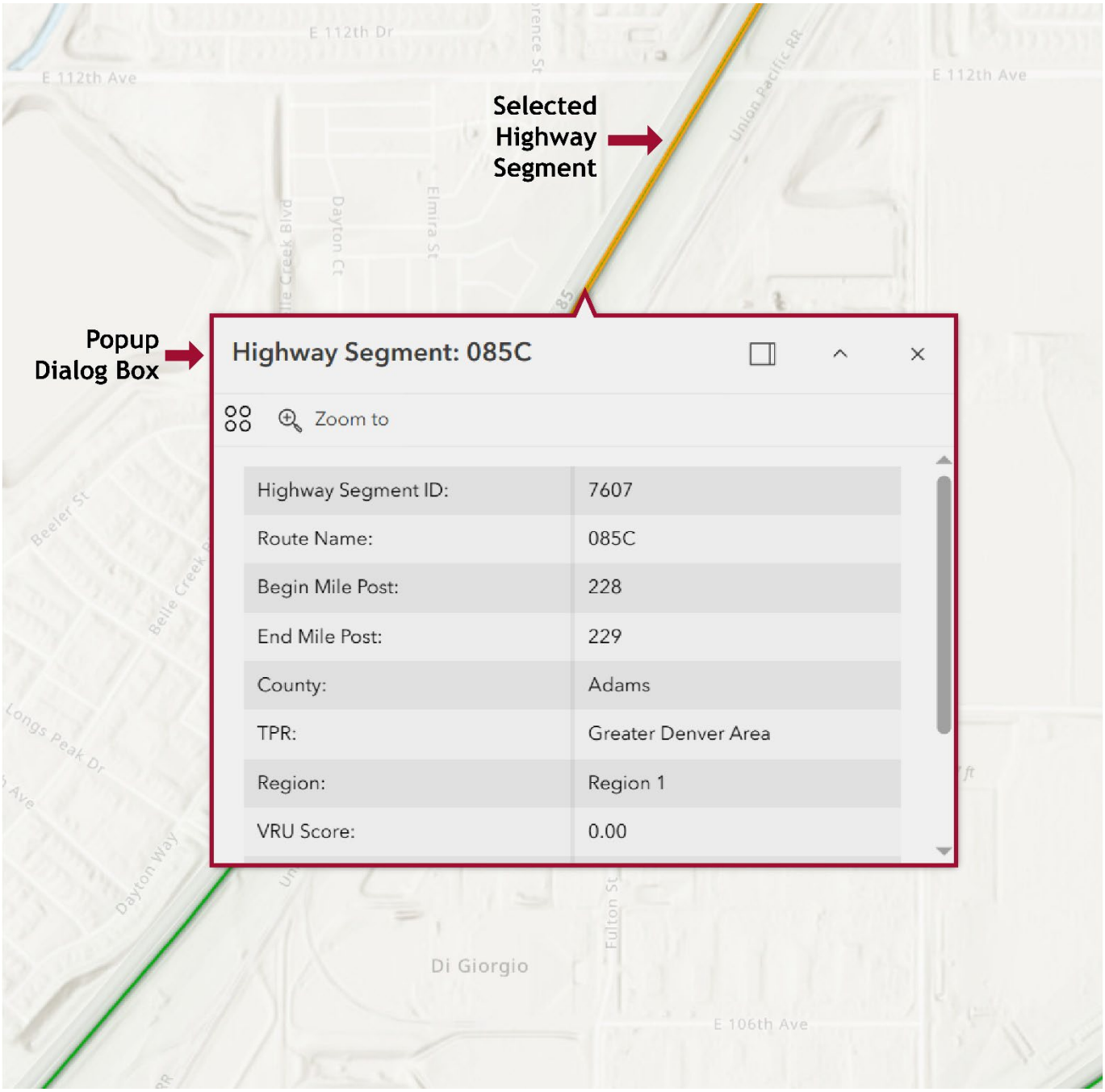
Figure 3. Heat Map Options



To use the filter option, select a geographic area of focus (Statewide, County, CDOT Region, MPO, TPR, or State Highway). Once a geographic area is selected, the filter applies automatically to the map. The Filter Tool sorts out the highway segments within the selected areas and adjusts the map extents.

Click any segment within the map. The highlighted segment displays, along with a pop-up dialog box on the right detailing information about that highway segment. Details include highway segment ID, route name, beginning and ending mile posts, county, TPR, CDOT region, Safety score, Equity score, Mobility Choice score, Connected Communities score, and Total Score, as shown on **Figure 4**.

Figure 4. Highway Segment Selection with Detailed Segment Information

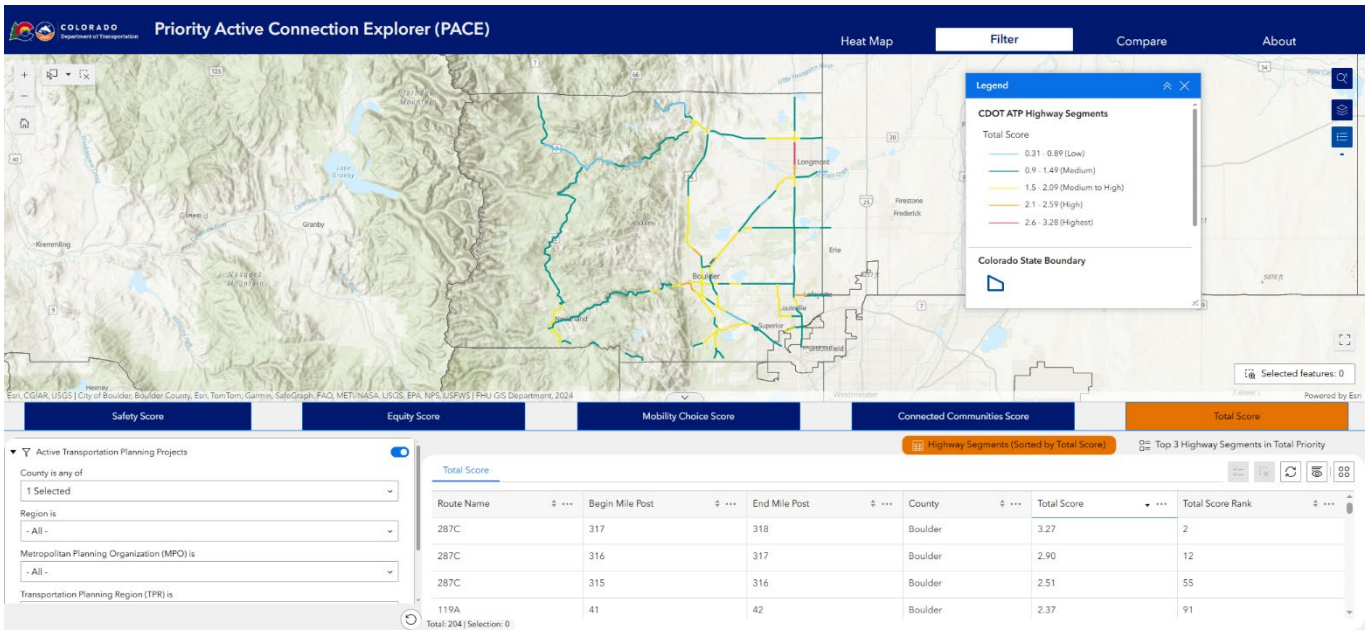


Filter Function

The Filter Tool helps users identify locations that are priorities for active transportation improvements based on the criteria explained in the Methodology document. Click the “Filter” tab on the top bar to enter the “Filter” page.

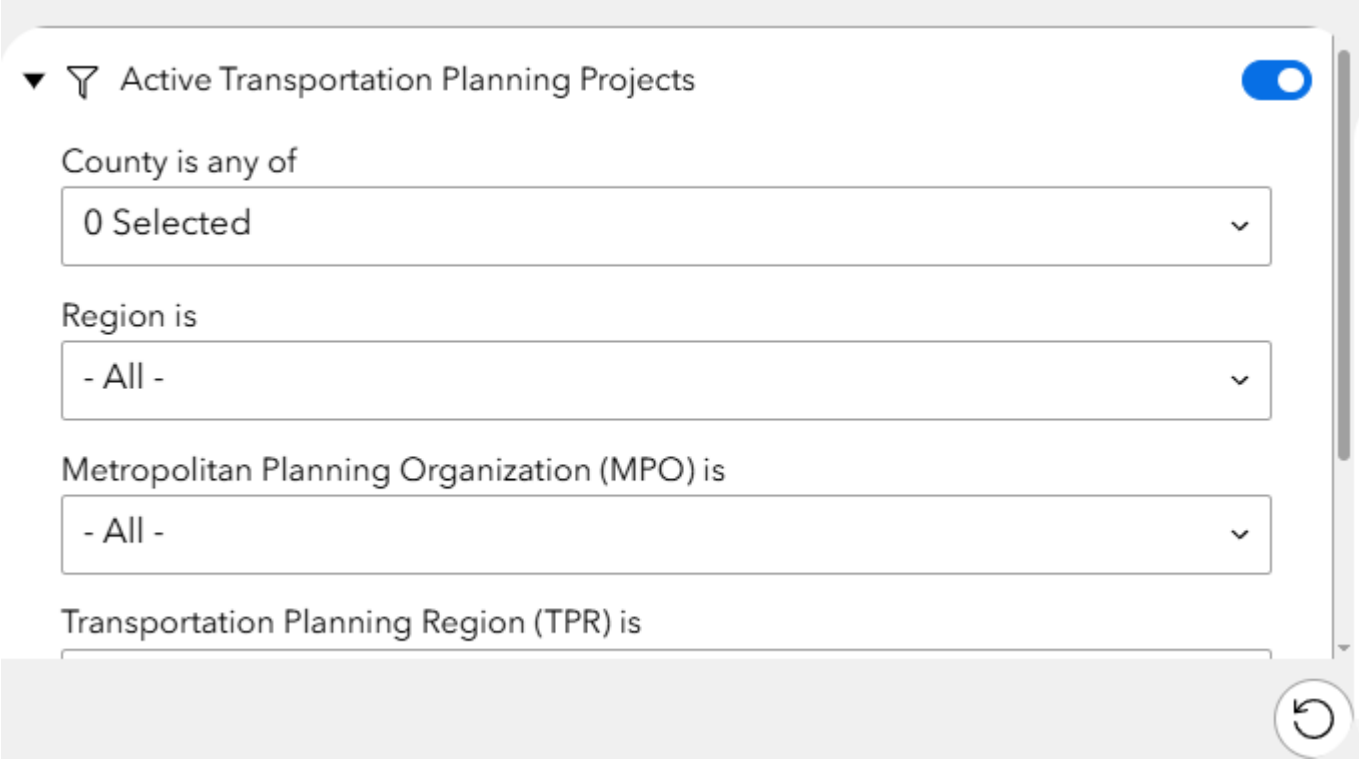
Five map-based subsections correspond to four categories of scores (Safety Score, Equity Score, Mobility Choice Score, and Connected Communities Score) and a composite total score, as shown on **Figure 5**. Each subsection has the same layout. Begin with the lower-left filter to select a geographic area of focus (Statewide, County, CDOT Region, MPO, TPR, or State Highway).

Figure 5. Filter Tool



Once a geographic area is selected (see **Figure 6**), the filter applies automatically to the map and tables. The Filter Tool sorts out the highway segments within the selected areas and adjusts the map extents.

Figure 6. Geographic Location Filter



Two tables on the lower right show the more detailed values regarding the potential for active transportation improvement. As highlighted with a red box on **Figure 7**, users can switch between the two tables by clicking on the tab. The **Highway Segments (Sorted by Total Score)** table shows all the segments within the selected areas sorted by scores in descending order (from highest potential to lowest potential for an active transportation project). The **Total Score Rank** panel of the **Top 3 Highway Segments in Total Priority** ranks the three segments with the highest scores (i.e., listed by highest potential for an active transportation improvement). Click any **Top 3 segments** to view the specific location and context. If more than 3 top segments are desired, use the Highway Segments function and sort by Total Score.

Figure 7. Toggle Between Highway Segments and Top 3 Highway Segments

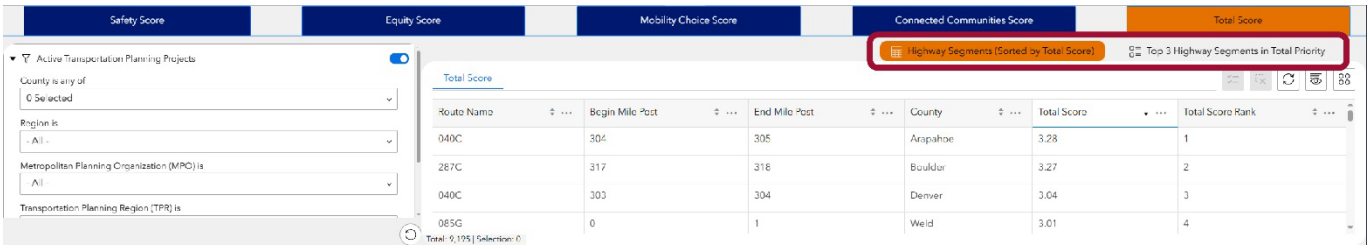
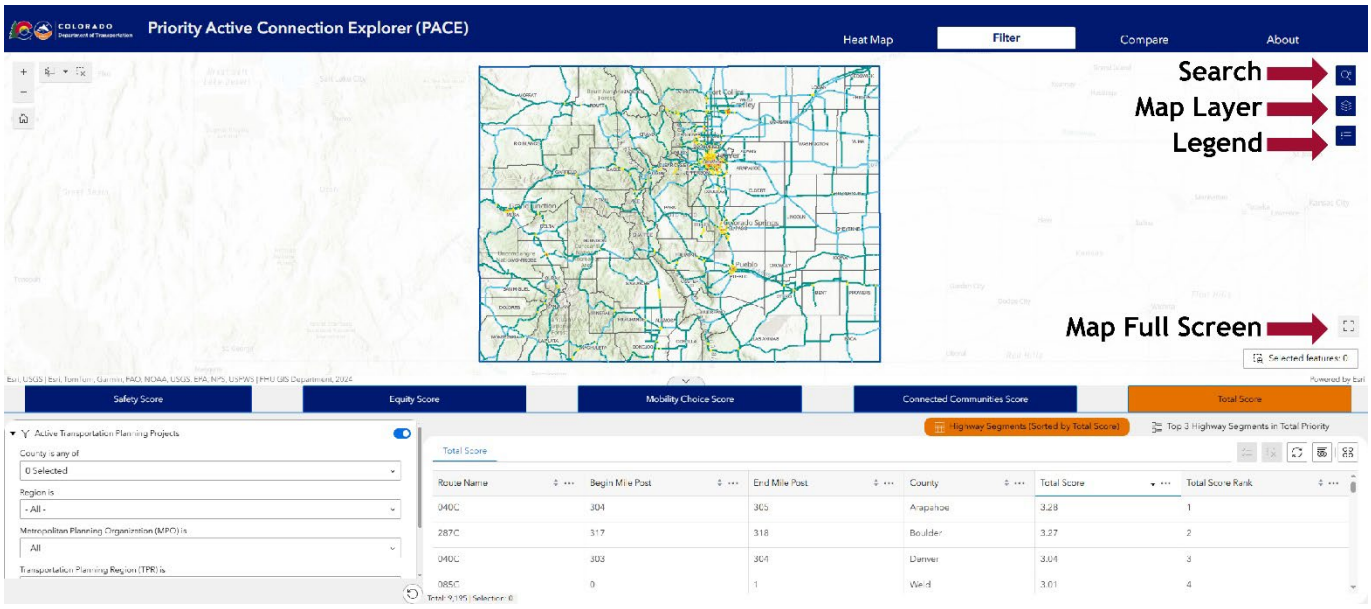


Figure 8 shows how to navigate the filter and table functions to export data for a selected area. To download the data for the selected features, click the **Actions** (four circles) button, and "**Export**" on the Highway Segments table. Click the **Clear** (X) button on the table to clear the selection. To reset the overall selection, click the **Reset** (circle with arrow) button to clear the filter.

Figure 8. Filter and Table Functions

Search, **Map Layer**, **Legend**, and **Full Screen** functions are available on the top right. Click the **Search** icon to open a search bar where users can enter an address or place to quickly locate them. **Map Layer** allows users to switch on/off boundary layers for different jurisdictions. **Legend** shows the heat map color scheme that represents the highest (in red) to the lowest scores (in blue) in each category. The Map Full Screen button on the lower right can be used to expand the map. **Figure 9** shows where to find these map tools.

Figure 9. Search, Layers, Legend, and Full Screen Functions



Note: The filter function filters and selects only the highway segments for the current goal area. For example, selecting the geographic areas in the Safety Score section does not carry the filtering and segment selection to the Equity Score section, even though the zoom-in levels are consistent. Therefore, for Equity, Mobility Choice, Connected Communities, and Total scores, the user must follow the same process.

Compare Function

To navigate to the Compare Tool, click the **Compare** tab on the top ribbon (**Figure 10**). The Compare Tool allows users to compare two highway segments at the same time to retrieve detailed information about the segment and to see the scoring results side by side.

Figure 10. Compare Tool Dashboard

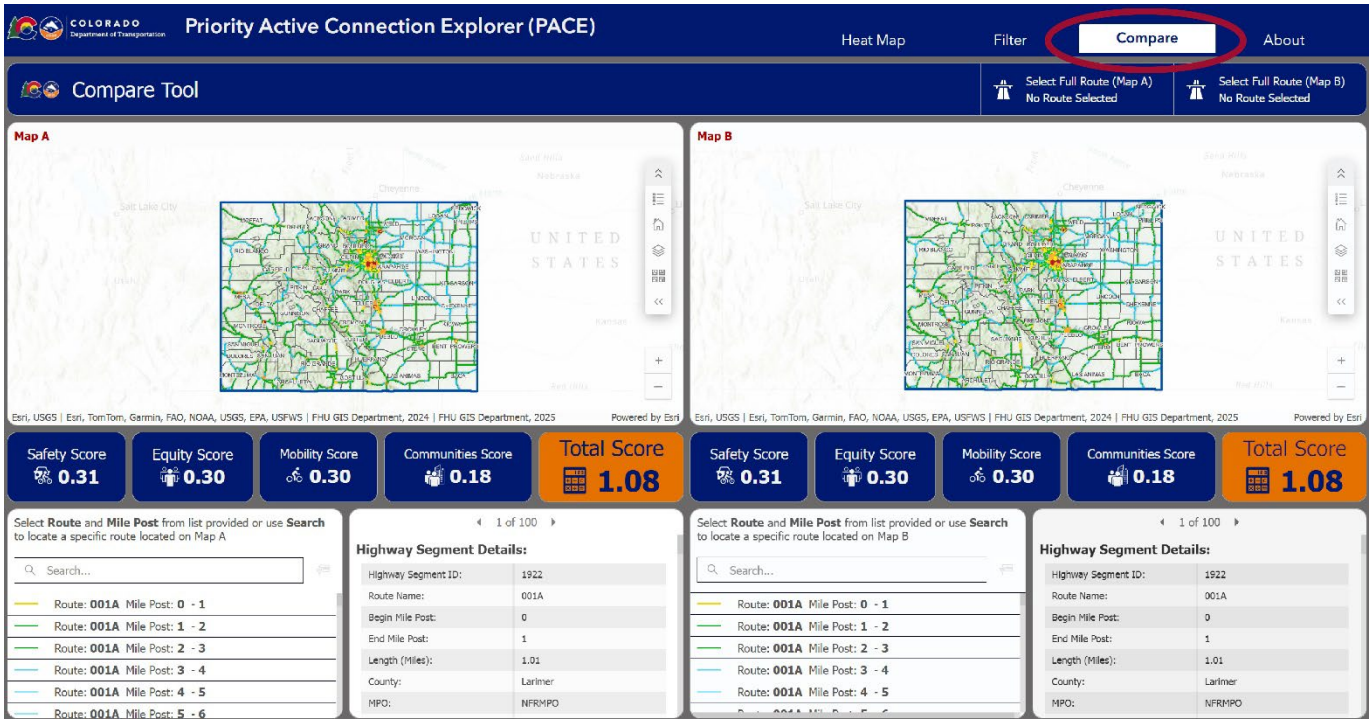
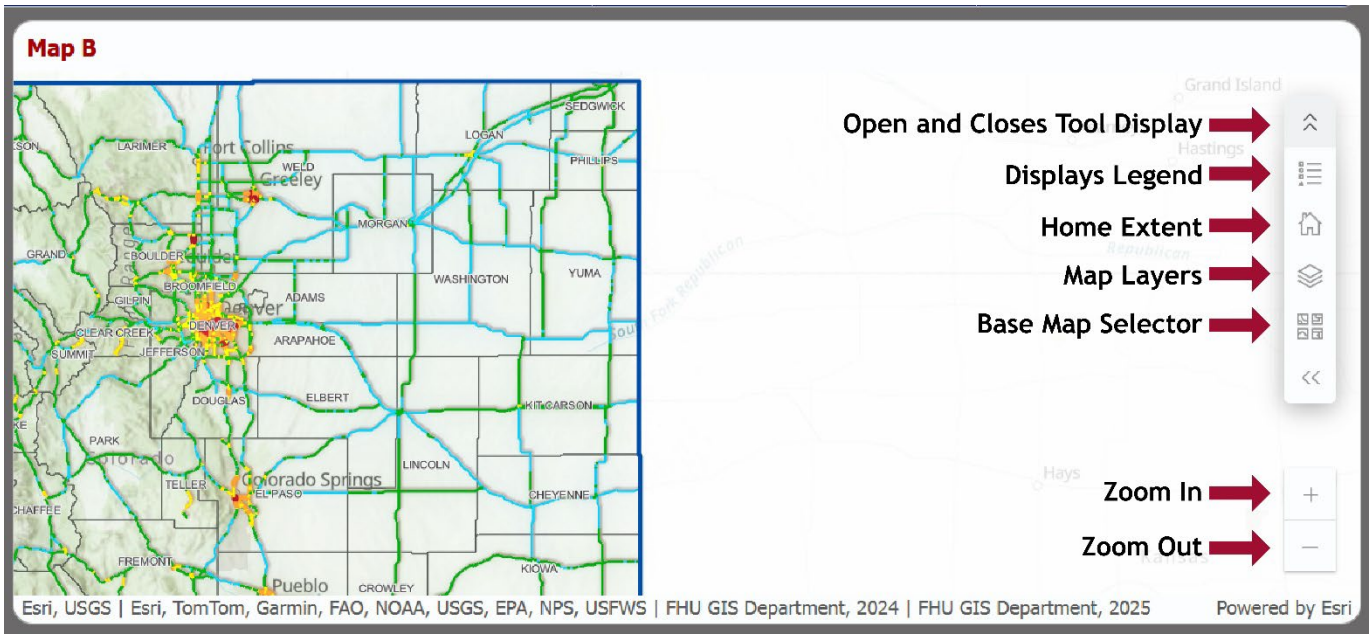


Figure 11 shows how to use the map tools. This is the same for both Map A and Map B.

Figure 11. Map Tools

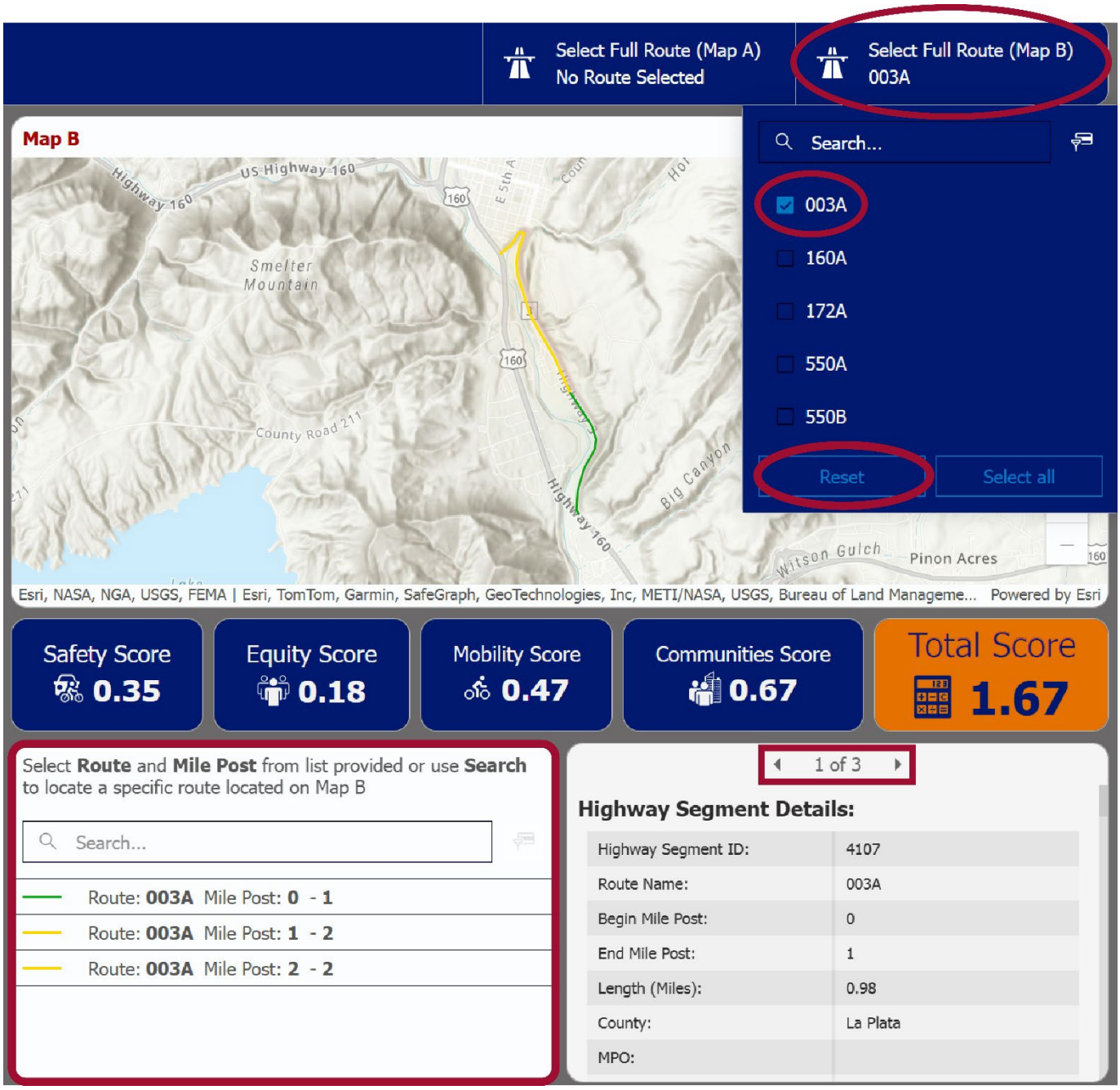


To see a full route, select the **Select Full Route** option for either Map A or Map B in the top right ribbon section of the dashboard (**Figure 12**). A dropdown list of available routes displays. Put a check mark next to the route of interest by clicking on the adjacent box, and the route displays on the map showing all the segments that make up that route.

To view the scoring results and attributes of the individual route segments, use the **Highway Segment Details** dialog box on the lower left. Use the arrows on the top of the **Highway Segment Details** pop-up dialog box to navigate through the highway segment routes. Scoring results dynamically update based on which highway segments are chosen.

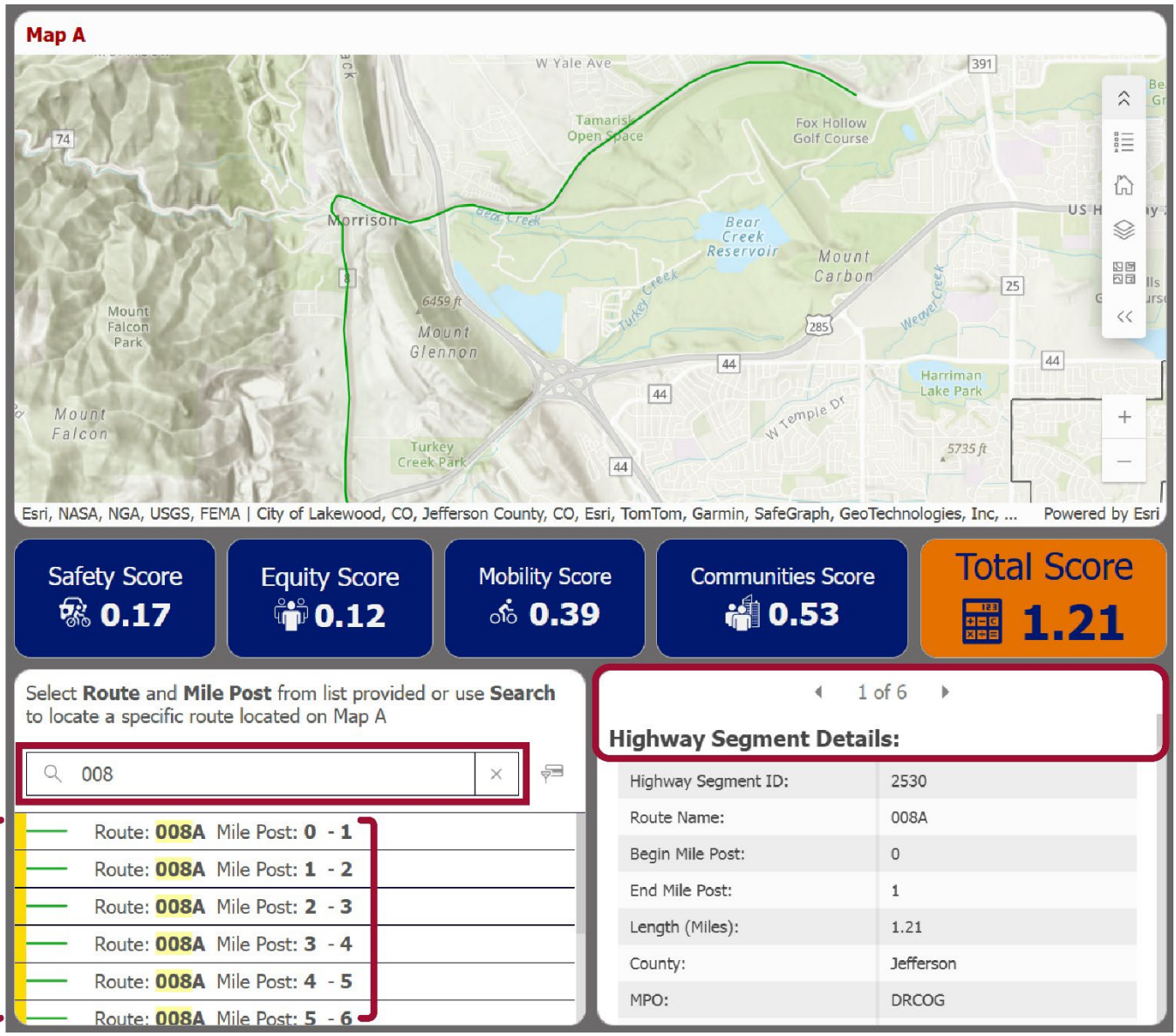
To clear the results, click **Reset** on the **Select Full Route** dropdown list, as shown on **Figure 12.**

Figure 12. Select Full Route



To view multiple highway segments, navigate to the highway route dialog box in the lower left. Scroll through the list of routes/mile posts to find the preferred segment or use the search box to type in a route name. All segments within that route display. The shift key can be used to select multiple segments. The "Highway Segment Details" box on the lower right shows the scoring results and additional attribute information for each segment. Use the arrows on the top of the **Highway Segment Details** pop-up dialog box, as shown on **Figure 13**.

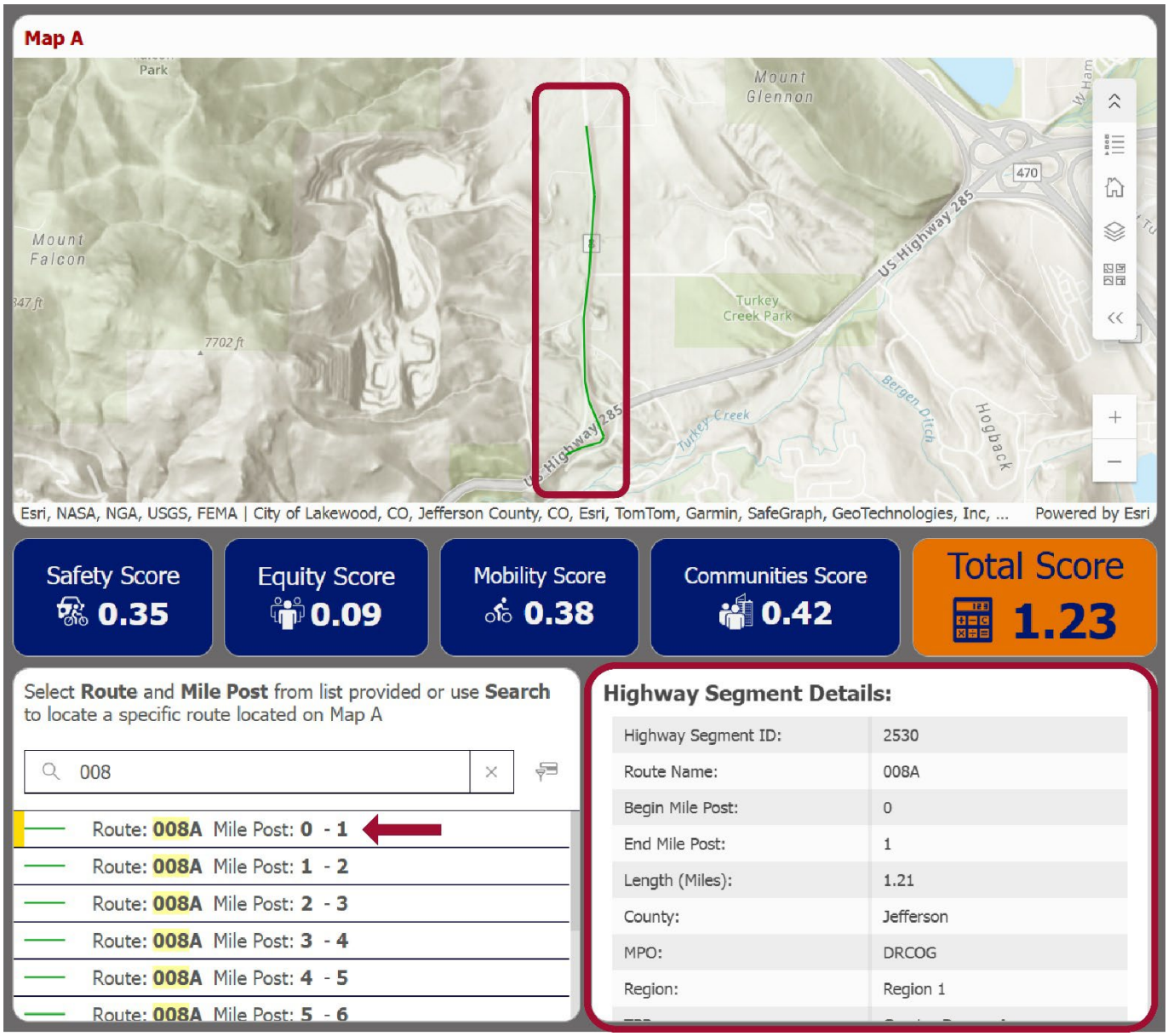
Figure 13. Multiple Highway Segments Display and Search Results



To clear the multiple highway segment results, click again on each selected route so that the yellow highlight goes away (far left side of route dialog pop-up box).

To view an individual highway segment on a map, select **Route** and **Mile Post** from the list shown in the lower left (with a red arrow next to it) on **Figure 14** or use **Search** to locate a specific route. Click on the desired route from the route list on the lower left and the highway segment displays on the map. To view the scoring results and associated attributes for that route, use the Highway Segment Details pop-up dialog box on the lower right, as shown on **Figure 14**.

Figure 14. Map View of an Individual Highway Segment



To clear the route selection, click on the selected route in the route/mile post list dialog box in the lower left and the map returns to full view with all available routes.