

Safer Streets Priority Finder

Free Web Based Safety Analysis Tool

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Outline

1. Background
2. SSPF and it's evolution
3. Analysis – Inputs and Outputs
4. Tool workflow
5. Use Cases
6. Questions & Discussion

Traffic safety is a public-health crisis

39,000+

traffic deaths in the U.S. in 2024

2.42M

people injured in traffic crashes

Elevated

fatalities remain higher than a
decade ago

The common safety analysis process

The usual safety toolkit

- Crash summaries
- Hotspot analysis
- High Injury Networks (HIN)
- Systemic crash-risk analysis

What it usually takes

- Complete, reliable local crash data
- GIS capacity to build the network
- Statistical expertise for risk models
- Staff time to pull it all together

SSPF lowers the barrier - putting all of these analyses within reach of any agency, in one free tool.

What SSPF is

A free, open-source web application that lets any agency screen its road network for safety risk without requiring advanced GIS, analysis, and statistical modelling skills.

Version 1.0 · 2021

- Model focused on pedestrians (bicyclists added post-hoc)
- Used a tract level pedestrian fatality model
- Limited user customization
- Funded by USDOT Safety Data Initiative



Version 2.0 · 2026

- Model includes pedestrian, bicycle, and motor vehicle modes.
- Updated block group fatal crash model
- More user customization and faster analysis
- Funded by SS4A grant

What's new in Version 2.0



Broader modal coverage

One consistent framework now covers pedestrian, bicycle, and motor-vehicle risk across the full KABCO severity scale.



Updated risk model

The model aligns with current safety-research practice - empirical Bayes methods from the Highway Safety Manual.



Minutes, not hours

A redesigned engine replaces slow simulations; analyses that once took hours now finish in minutes, in your browser.



More user control

Severity weights, window lengths, crash costs, and more are now configurable - each with a sensible default.

Two main analysis

Sliding Windows Analysis

“Where have severe crashes already occurred?”

- Moves a window along each corridor, weighting crashes by severity
- Fast, intuitive, and grounded in observed data
- Only as reliable as the crash record behind it

Safer Streets Model

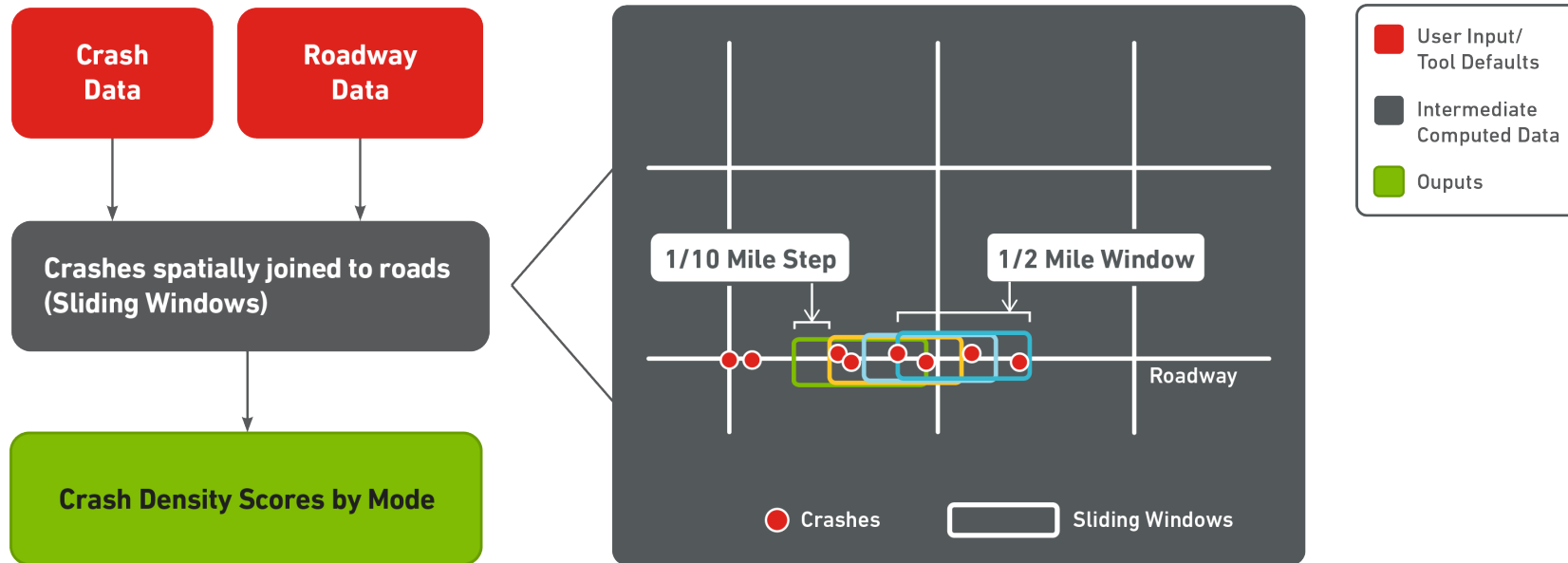
“Where are the conditions for severe crashes present?”

- Blends a national risk model with local crash history
- Surfaces risk even where crashes aren't recorded yet
- Reveals what crash history alone would miss

Use them together: high on both = strong investment candidates · high on the model only = systemic opportunities others miss

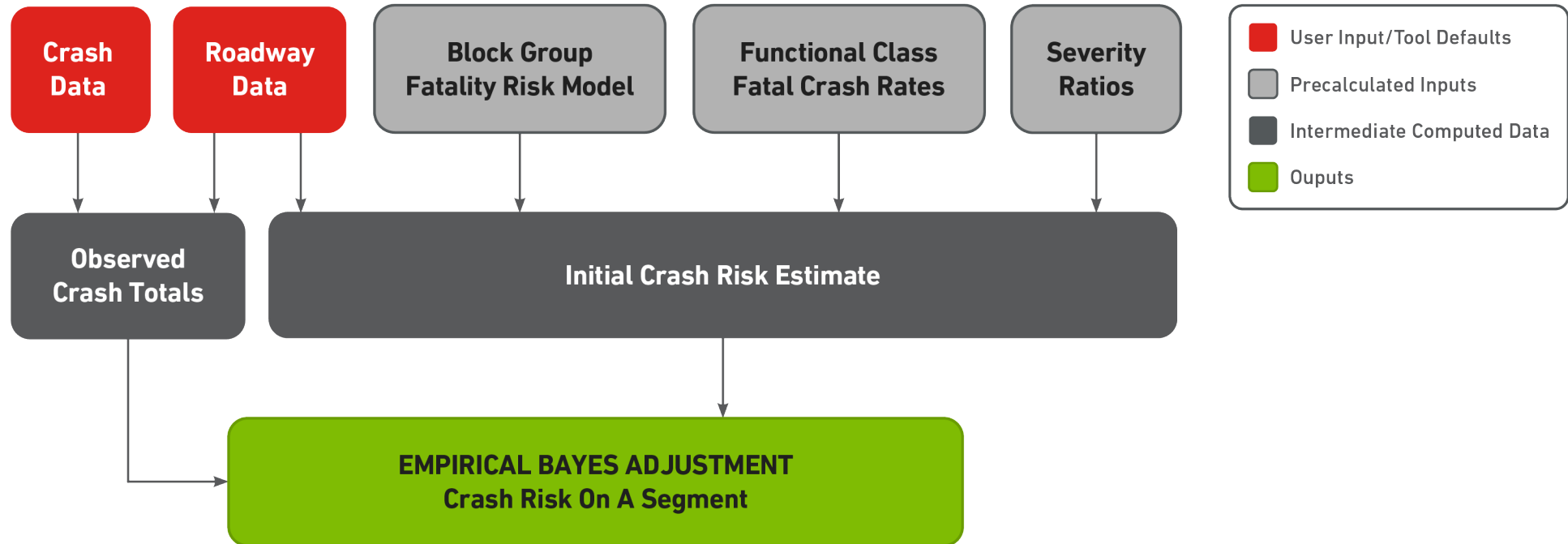
Crash Density

Sliding Window Analysis

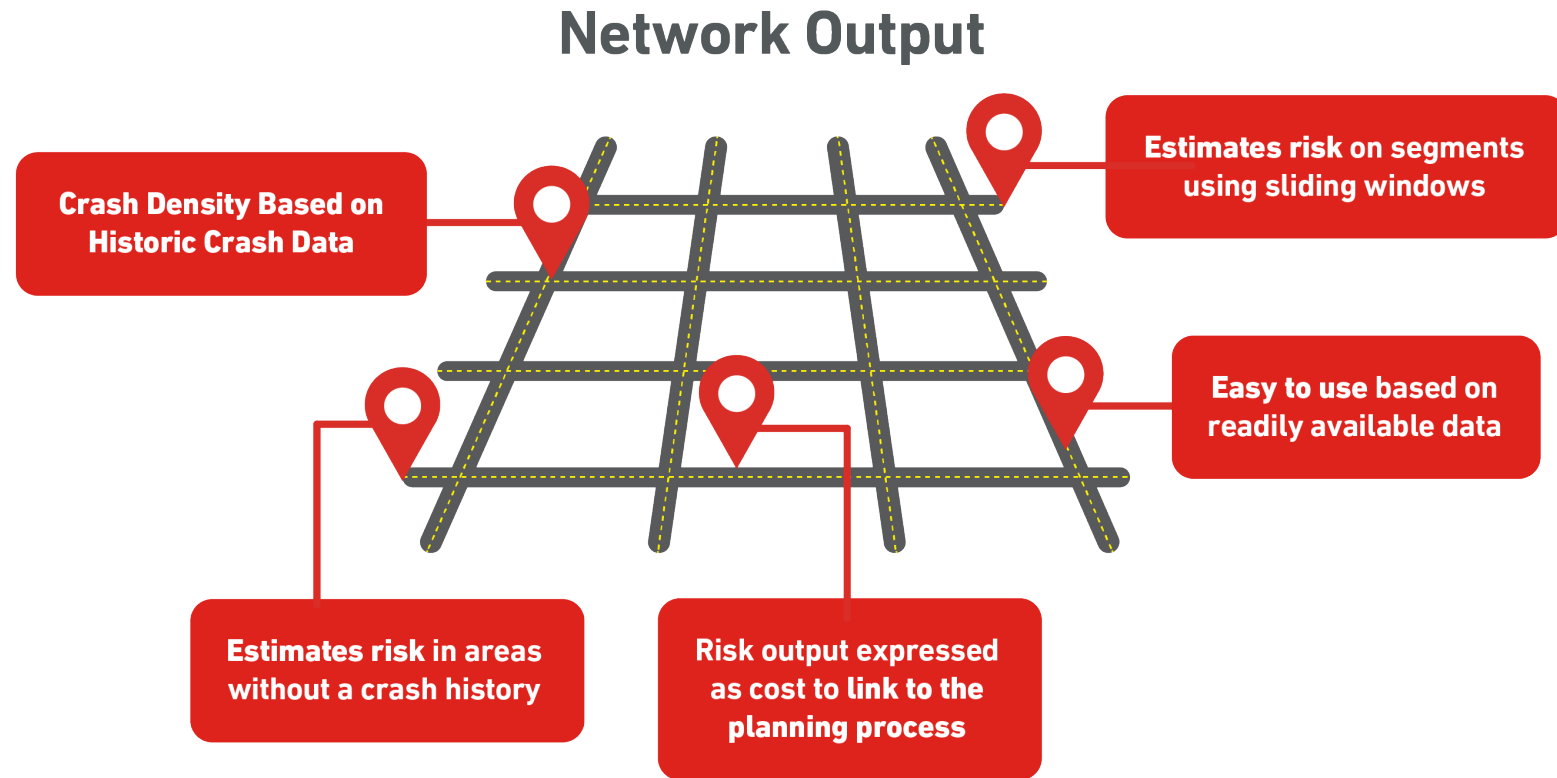


Crash Risk

Safer Streets Model



Network-based Output



What goes in, what you can tune

What you provide

- Study area - a county/parish, or your own boundary
- Road network - OpenStreetMap by default, or upload your own
- Crash data - your local 5-year, all-severity records, or pre-loaded FARS data

Six national datasets come pre-loaded.

What you can tune

- Severity weights - how much each injury level counts
- Window length & spatial resolution
- Crash costs - default to FHWA societal costs
- Join distance & number of corridors reported

Every parameter ships with a sensible default.

Run with the defaults, or substitute local data and adjust where local policy or crash patterns warrant.

What you get out



Interactive dashboard

Explore top corridors and crash patterns through interactive charts - filter and export as you go.



Map visualization

Overlay crashes, segment results, and block-group risk on a single interactive map.



Compiled PDF report

A shareable summary of inputs, settings, and key results - ready for stakeholders.



GIS data package

A GeoPackage of every input and output for your own GIS workflows and project pipelines.

Tool Workflow

1. Load Data
2. Set Analysis Parameters
3. Run Analysis
4. Explore Dashboard
5. Review Map Results
6. Download Outputs

Step 1: Load Data

- Study Boundary
 - Select county or upload a shapefile
- Roads
 - Select built-in OSM roads or upload a shapefile
 - Fields: Functional Class and Name
- Crashes
 - Select built-in FARS data or upload a shapefile
 - Fields: Crash mode, severity, year

Safer Streets Priority Finder v2.0 Study: new_orleans theja

Load Study Area → Load Roads → **Load Crashes →** Review Input Data

Load Crashes

- If you have previously uploaded crashes data for this study that you wish to continue using, you can skip this step and use the existing crashes data.
- Use the buttons above to navigate to update your study boundary, roads, or to review your data
- You can either choose from FARS data or upload your own crashes data as a shapefile ZIP.
- The model needs 5 years of crash data to run. If you have more than 5 years of data, only the most recent 5 years will be used.
- Your crashes data will be clipped to your study area for analysis.
- See the [instructions page](#) for more details.

☐ Use FARS crashes ☒ Upload my own crashes (shapefile ZIP)

Upload a single ZIP containing .shp, .shx, .dbf, .prj files. The maximum file size allowed is 20 Mbs.

Drag and drop or select a file

Loaded urban_crash_2019-2023.zip (~1,707 KB). Make your column selection

Step 2: Set Analysis Parameters

- Severity weights
- Window lengths
- Crash Costs
- Crash join distance
- Number of corridors in output
- Use the defaults or update based on study needs

[Welcome](#)
[Overview](#)
[Instructions](#)
[My Studies](#)
[Load Data](#)
[Analysis Settings](#)
[Run Analysis](#)
[Dashboard](#)
[Map Visualization](#)
[FAQ](#)
[Crash Data Sources](#)
[Resources and Case Studies](#)

Sliding Windows Analysis Settings

Severity Weights

These weights control how much each severity contributes to the crash density score in the sliding windows analysis. Weights must be integers between 0 and 100. At least one weight should be greater than zero. Weights must maintain ordinality ($K \geq A \geq B \geq C \geq O$).

Severity	Default	Current	New Value
Fatality (K)	3	3	3
Serious Injury (A)	3	3	3
Non Serious Injury (B)	1	1	1
Possible Injury (C)	0	0	0
No Injury (O)	0	0	0

Window Lengths

These lengths control how long the sliding and short windows (step length in sliding windows analysis) are (in miles). Sliding window length must be in increments of 0.05 miles between 0.25 and 2 miles. Sliding Window to Short Window Length Ratio must be an integer between 1 and 10. The ratio determines your short window length which is used as the unit of analysis.

	Default	Current	New Value
Sliding Window Length (miles)	0.5	0.5	0.5
Sliding Window to Short Window Length Ratio	5	5	5

Step 3 · Run Analysis

- Run Sliding Windows
- Run Safer Streets Model
- Review both outputs in the same page

The screenshot shows a software interface with a sidebar on the left and a main content area on the right. The sidebar contains a list of navigation items: Welcome, Overview, Instructions, My Studies, Load Data, Analysis Settings, Run Analysis (highlighted in blue), Dashboard, Map Visualization, FAQ, Crash Data Sources, and Resources and Case Studies. The main content area has two tabs at the top: Sliding Windows Analysis (active) and Safer Streets Model. Below the tabs, there is a text instruction: 'Click on the navigation buttons above to switch between the sliding windows and safer streets model analysis pages.' The Sliding Windows Analysis section contains a list of bullet points explaining the methodology and a 'Run Sliding Windows Analysis' button. At the bottom of this section, a green notification box states: 'Sliding Windows Analysis has been run successfully. Click the visualize button to see the results on the map.'

Welcome

Overview

Instructions

My Studies

Load Data

Analysis Settings

Run Analysis

Dashboard

Map Visualization

FAQ

Crash Data Sources

Resources and Case Studies

Sliding Windows Analysis Safer Streets Model

Click on the navigation buttons above to switch between the sliding windows and safer streets model analysis pages.

Sliding Windows Analysis

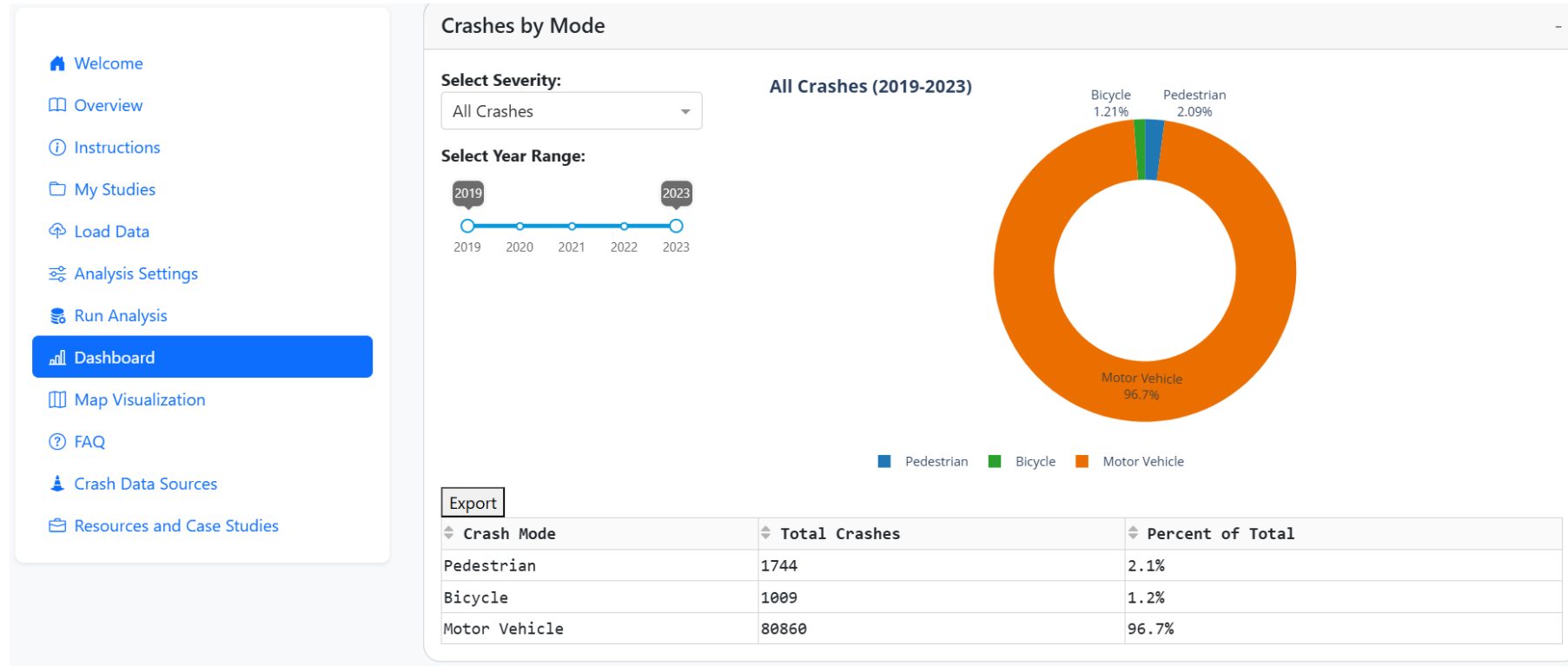
- Analyze crash patterns using sliding windows methodology.
- This analysis divides your study area into overlapping windows and calculates crash statistics for each window.
- Clicking the run analysis button below will overwrite existing results. If you have previously run this analysis, you can load existing results on the map using the visualization button.
- Depending on the size of your study area and the amount of data, this analysis may take a few minutes to complete. For a large study area we tested with ~44,000 miles of roadway and ~200,000 crash records, the analysis took approximately 2 minutes. Please do not navigate away from this page while the analysis is running.

Run Sliding Windows Analysis

Sliding Windows Analysis has been run successfully. Click the visualize button to see the results on the map.

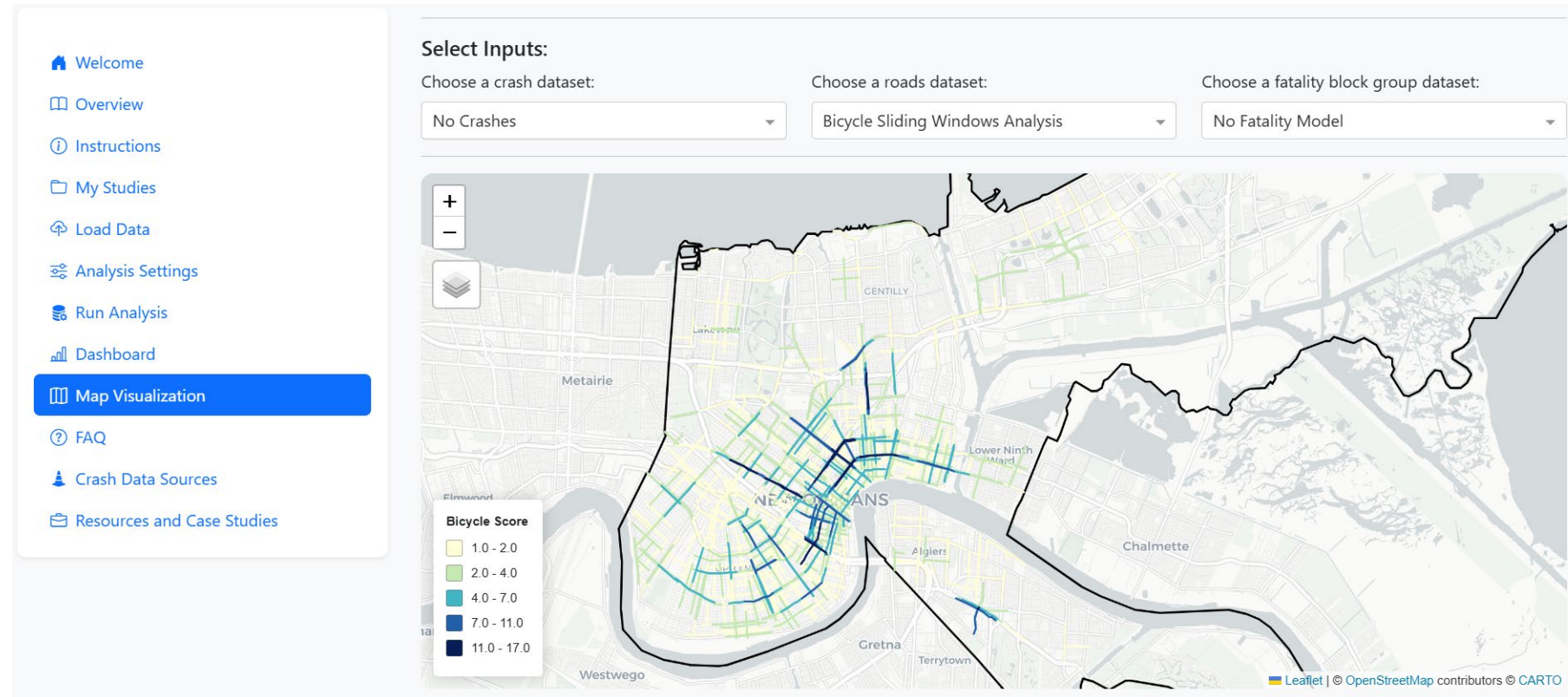
Step 4 · Explore Dashboard

- Descriptive Statistics
- Interactive charts
- Highest crash density corridors
- Model fit charts



Step 5 · Review Map Results

- Visualize
 - Crashes
 - Sliding Windows or Model outputs
 - Block Group Fatal Crash Model
- Interactive Map
- Click features for details



Step 6 · Download Outputs

- Download in dashboard page
- Study data as a GIS layers
- Study outputs as a compiled PDF

The screenshot displays the application's dashboard interface. On the left is a vertical navigation menu with the following items: 'Welcome' (home icon), 'Overview' (book icon), 'Instructions' (info icon), 'My Studies' (folder icon), 'Load Data' (upload icon), 'Analysis Settings' (gears icon), 'Run Analysis' (play icon), 'Dashboard' (bar chart icon, highlighted in blue), 'Map Visualization' (map icon), 'FAQ' (question mark icon), 'Crash Data Sources' (truck icon), and 'Resources and Case Studies' (book icon). The main content area on the right contains a bulleted list of instructions and two functional panels. The instructions detail how to view summaries, clip data to the study area, compile or download PDF reports, compile or download GIS data packages, and note the periodic purging of old data. The 'PDF Report' panel provides instructions on compiling or downloading the most recent report, with buttons for 'Compile PDF Report' and 'Download PDF Report'. The 'Study Data Package' panel provides instructions on compiling or downloading the most recent data package, with buttons for 'Compile Study Data' and 'Download Study Data'.

- View summaries and visualizations of your crash and roadway data.
- Crashes and roadways are clipped to your study area. Crashes are also limited to the latest five years of data available in your dataset.
- Compile or download a PDF summary report of your study area and analysis results. If you have a previously compiled report, you can download it directly by clicking the 'Download PDF Report' button. If you have not yet compiled a report, or re-run your analysis, you can compile a new report by clicking the 'Compile PDF Report' button.
- Compile or download the data (input and output GIS layers, tables, etc) associated with your study. The GIS layers will be compiled as a GeoPackage file which can be opened in any GIS software. If you have a previously compiled data package, you can download it directly by clicking the 'Download Study Data' button. If you have not yet compiled the data package, or re-run your analysis, you can compile a new data package by clicking the 'Compile Study Data' button.
- The application periodically purges previously compiled reports and data packages to save storage space. If you attempt to download a report or data package that has been purged, you will receive a message to compile a new one.

PDF Report

Compile a fresh PDF report, or download the most recently compiled report. If you have not compiled a report yet, please do so before attempting to download.

[Compile PDF Report](#) [Download PDF Report](#)

Study Data Package

Compile a full study data export package, or download the most recently compiled package. If you have not compiled a package yet, please do so before attempting to download.

[Compile Study Data](#) [Download Study Data](#)

Tested across three contexts

New Orleans, LA

Dense urban

Albany, OR

Small-mid suburban

Knox County, OH

Low-density rural

Model Validation and Calibration

The model is validated using 10 years of crash data split into two 5-year testing and validation dataset.

Using SSPF well

Use it for

- Early-stage screening and quick risk overviews
- Building and prioritizing a project pipeline
- Supporting a Safety Action Plan
- Comparing corridors within a single analysis

Not a substitute for

- Detailed engineering studies or calibrated SPFs
- Site-specific crash diagnosis and countermeasure selection
- Treating modeled counts as exact crash forecasts

SSPF is the entry point - it shows where deeper analysis should focus, not a replacement for it.

Get started - it's free and open-source

Use the tool <https://sspf.tooledesign.com/>

Resources & Case Study Data <https://sspf.tooledesign.com/resources>

Source code <https://github.com/tooledesign/Safer-Streets-Priority-Finder>

Contact saferstreetspriorityfinder@tooledesign.com