NJ 2020 SHSP

Intersections Emphasis Area

Completed Priority Action 1.A.2.a.

Inventory of state and MPO practices for mapping high-risk pedestrian and bicyclist crash locations in underserved communities.

Driving Toward ZERO Deaths

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Mapping Practices for High-Risk Pedestrian and Bicycle Crash Locations in Underserved Areas

Introduction

As part of the New Jersey 2020 Strategic Highway Safety Plan, the Intersections Emphasis Area Team performed a review of the NJ state and MPOs' practices for mapping high-risk pedestrian and bicycle crash intersections in underserved areas. This document includes information on the specific mapping tools, data sources, and processes reviewed.

The Emphasis Area Team utilized the following three data sources in general for classifying high-risk pedestrian and bicycle crash intersections in underserved areas:

- Network Screening Lists
- NJ Crash Records Database
- NJ 2020 SHSP – Equity Approach and Parameters Guidance Document

Network Screening Lists: New Jersey's network screening process involves reviewing the New Jersey roadway network and creating a selection of lists capturing the segment and intersection locations ranking them with the greatest potential for safety improvement. Network screening lists developed for the state highway system include fixed object highway segments, corridor segments, and intersections. Network screening lists developed for the local roadway system (county/municipal) include pedestrian and pedestrian/bicycle corridors, regional corridors, intersections, pedestrian and pedestrian/bicycle intersections, and high-risk rural roadways.

The focus of the pedestrian and pedestrian/bicycle intersections network screening list is intersection sites on local roadways (County/Municipal) with the highest frequency of crashes related to pedestrians and bicycles resulting in a fatality, injury, or property damage, within a 5-year period. The most recent network screening lists for pedestrian and bicycle intersections were developed in year 2019 that utilized crash data for years 2012-2016. The information will be updated with the development of new lists in the following years.

NJ Crash Records Database: The New Jersey Crash Records Database consists of the crash data captured on the New Jersey Police Crash Investigation Report Form (NJTR-1). The crash data includes details on crash severity, type, and other information as noted in the NJTR-1. The database is used in developing safety programs, grant applications, resource allocation and statistical analysis by the New Jersey Department of Transportation (NJDOT) as well as many other agencies. The most recent crash data available is for the year 2019.

NJ 2020 SHSP – Equity Approach and Parameters Guidance Document: The NJ 2020 Strategic Highway Safety Plan (SHSP) places an emphasis on Equity to ensure that the needs of vulnerable members of our communities, including low-income residents, minorities, those with limited English proficiency, persons with disabilities, children, and older adults are considered. The Equity

Approach and Parameters Guidance Document developed for the NJ 2020 SHSP serves as a resource in equity analysis and provides guidance on the different sources, parameters, and thresholds to be used for considering an underserved area. The considerations in the document are consistent with federal guidance including, but not limited to, Environmental Justice; Title VI; Limited English Proficiency; and Individuals with Disabilities. Per the document, the geographic area level for equity analysis should be a US census block group and the required analysis indicator is a demographic index of 50% or more for a census block group (Data Source: USEPA EJSCREEN). Additional analyses may include other demographics and indicators as outlined in the document.

The following section provides information on NJ state and MPO practices, data sources, and mapping tools.

1. New Jersey State Mapping Practices

New Jersey state utilizes the Safety Voyager software application as their visualization and mapping tool for crash data. Safety Voyager offers a comparative view of crashes with a defined area, municipality or county as determined by the user for a selected time period. The software application provides various filters that allows the user to create detailed user defined queries.

The crash data within Safety Voyager include verified crash records from the NJDOT Crash Records Database. The crash data is updated as new information becomes available. In addition, software improvements for the tool are completed on a continuous basis based on feedback and comments provided by users. Safety Voyager is only available to federal, state, and local government agencies to help them with the crash analysis. Access to the application can be granted based on NJDOT approval. The application can be accessed at the following link: https://www.njvoyager.org/app/.

In order to map high-risk pedestrian and bicycle crash intersections obtained from Safety Voyager, the route and milepost information from network screening lists developed for the MPOs in an Excel format are used. The Excel format allows the layer to be utilized in the Voyager web application with ESRI's ArcGIS Server hosting the GIS map layer as a web service. This web service is referenced in the Safety Voyager web application.

The indicators and thresholds for identifying underserved areas as outlined in the NJ 2020 SHSP equity guidance were utilized to provide an overlay of the underserved areas on the high-risk pedestrian and bicycle crash intersections. A standard GIS format was utilized to map the equity layer. In order to serve the equity layer in the Voyager web application, ESRI's ArcGIS Server was used to host this GIS map layer as a web service. This web service is then referenced in the Safety Voyager web application.

Any data embedded in a map is only as accurate as the data provided. To achieve the highest level of consistency and accuracy for data within Safety Voyager, mapping practices are followed to support this continuously evolving process of mapping crash data.

2. North Jersey Transportation Planning Authority

NJTPA has developed a Strategic Highway Safety Plan Data Viewer mapping application that can be accessed at the following link: https://njtpa.maps.arcgis.com/apps/webappviewer/index.html?id=2739f17d127d4e23931167bbf4e85e69. The mapping application has an ESRI ArcGIS Server at the backend.

In order to map high-risk pedestrian and bicycle crash intersections within the NJTPA mapping app, the network screening lists for pedestrian intersections as well as pedestrian and bicycle intersections for NJTPA were added as GIS map layers. The USEPA EJSCREEN GIS layer was added to the mapping application that enables an overlap view with the high-risk pedestrian and bicycle intersections. The overlay can be selected through the layers button at the bottom of the application page.

The mapping application provides detailed information when a particular crash location or underserved area is selected. Mapping application functionality is inclusive of attribute tables, and filters for regional ranks for the intersections.

The mapping application has the following additional GIS layers added beyond the different network screening lists and the USEPA EJSCREEN layer:

- Fatalities and Serious Injury crashes at/near intersections
- Fatalities and Serious Injury crashes for Lane Departures
- Road Safety Audit locations

A guidance document that explains each map layer and the data source and provides information on how to use the tool is available at: __*Fill info when Christine completes document*_____. It will include details on the data source for each layer.

3. South Jersey Transportation Planning Authority

The Strategic Highway Safety Plan Data Viewer mapping application developed by NJTPA (https://njtpa.maps.arcgis.com/apps/webappviewer/index.html?id=2739f17d127d4e23931167bbf4e85e69) hosts data and map layers for SJTPO. The layers button at the bottom of the application page provides a selection for the following SJTPO layers:

- Existing Network Screening Lists
- Fatalities and Serious Injury crashes at/near intersections
- Fatalities and Serious Injury crashes for Lane Departures
- HSIP funded projects

An overlay of the high-risk pedestrian and bicycle crash intersections in the underserved areas for SJTPO can be viewed through the different layers in the mapping application.

4. Delaware Valley Regional Planning Commission

DVRPC has developed an ArcGIS application similar to that developed by NJTPA for mapping the high-risk crash locations. All of the network screening lists are mapped in the application along with the DVRPC Road Safety Audit locations. The application is available at the following link: https://www.arcgis.com/home/webmap/viewer.html?webmap=037695a5e0e949ba91c81d62c1b40ab3&extent=-75.6814,39.3857,-73.866,40.6008.

The high-risk pedestrian and bicycle crash intersections can be viewed through this application. The USEPA EJSCREEN GIS layer was added to the mapping application that enables an overlap view with the high-risk pedestrian and bicycle intersections. Details on each crash location and a demographic area are available when a particular crash location or area is selected.

DVRPC also has a crash data viewer standalone tool that provides crash data locations, crash statistics and trends. The tool is available at the following link: https://www.dvrpc.org/webmaps/crash-data/.

Summary

This document provides a review of the mapping tools, data sources, and processes followed by the New Jersey state and the three MPOs for identifying high-risk pedestrian and bicycle crash intersections in underserved areas. This information can be utilized as guidance for establishing parameters for classifying high-risk pedestrian and bicycle locations, especially in underserved areas. The document can be used as guidance when developing other visualization and mapping tools.