APPENDIX H: COMMUNITY ANALYSIS EXAMPLE

Community Analysis Example

In the Pioneer Valley region, the availability of sidewalks varies with respect to location, quality and function. Many communities realized the benefit of encouraging walking through providing pedestrian infrastructure improvements. The following are some brief examples of the various efforts that communities undertook to improve the pedestrian infrastructure.

As an example, the Town of Ludlow constructed sidewalks along side streets located within a mile of every elementary school. Getting children walking to school, the town revamped its crossing guard program and saved money on busing them to school. With local funding sources in short supply, many communities had to "get smart" when it came to pedestrian improvements. To lower costs, East Longmeadow developed a prioritized sidewalk infrastructure improvement plan and began incorporating the cost of sidewalk improvements into larger roadway re-construction projects. In Springfield's Forest Park neighborhood, public works officials replaced painted crosswalks with new long wearing thermoplastic designs. While these were more expensive than paint, the new thermoplastic crosswalks will last 5 times as long as painted crosswalks. The central business districts of Amherst, Northampton and Springfield offer good examples of downtowns sensitive to pedestrian circulation and access. Sidewalks and walkways are extensive; crosswalks are signalized and access points for people with disabilities are incorporated.

Following are highlights from the analyses undertaken by the City of Springfield's Complete Streets Plan Study in 2020. This appendix will serve as a sampling of types of analyses possible to conduct in the future on behalf of communities within our region. When there is interest in such analysis to support a community's complete streets initiatives, this type of planning effort can be scheduled into the Unified Planning Working Program UPWP via a formal request from a community's elected official. The main reference for the following material resources used in this appendix is from the Springfield Complete Streets 2020 Working Group Wiki Map example.

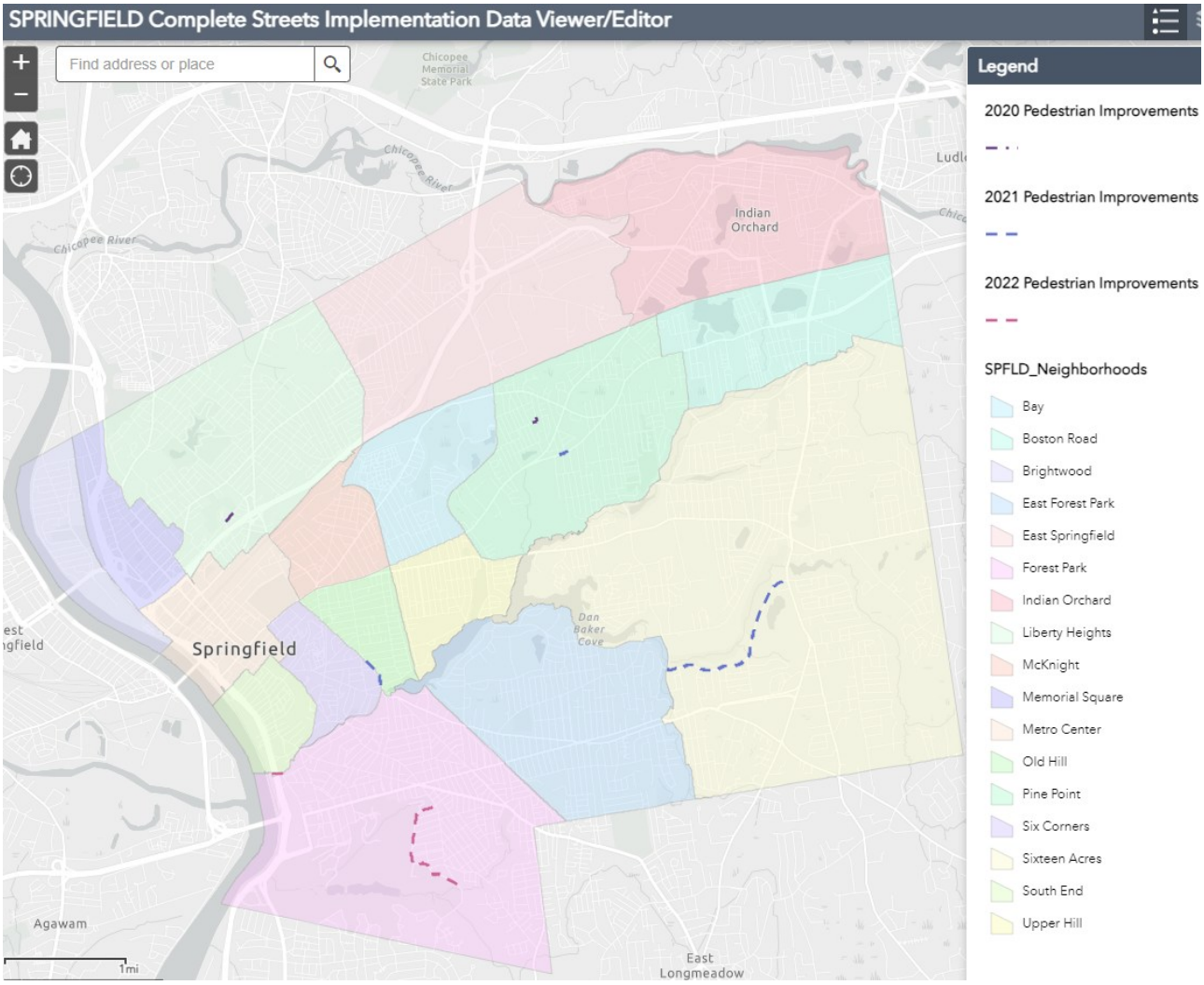
Springfield's Pedestrian and Bicycle Complete Streets Plan

At the local level, a complete streets analysis conducted by the PVPC staff on behalf of the City Springfield provided a detailed inventory of the existing bicycle and pedestrian network. A GIS data viewer was created as part of the 2020 City of Springfield Complete Streets Plan for the use of displaying various layers of data gathered about the pedestrian and bicyclist infrastructure both existing and needed.

A) Pedestrian Network Analysis

The first figure below shows a map of the 17-color coded neighborhood in the City of Springfield. It also displays locations of pedestrian improvement implementation planned for the three-year period of 2020, 2021, and 2022. Each of the phases of improvements implementation were color coded in the following order: 2020 (Mauve), 2021 (Purple), 2022 (pink).

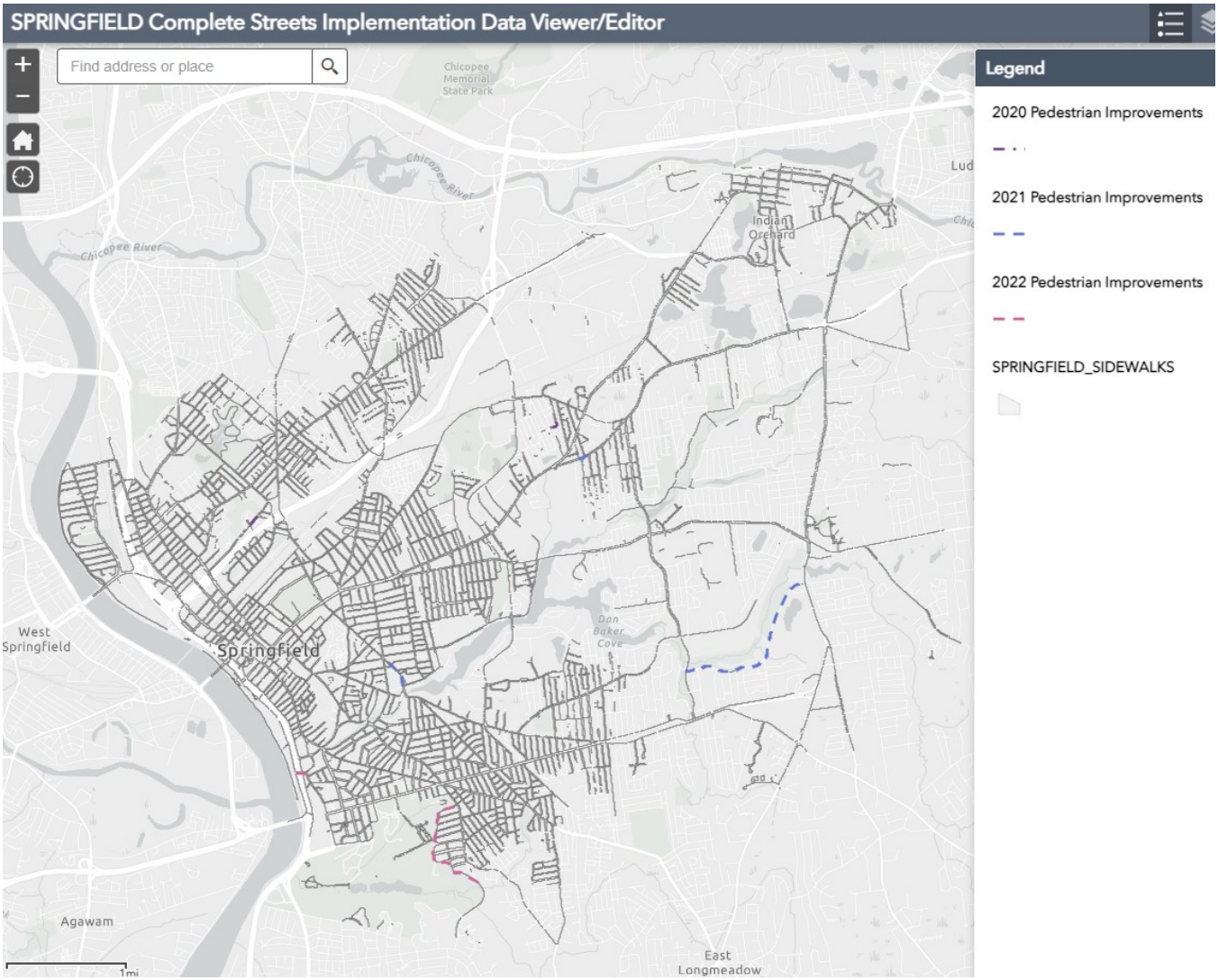
Pedestrian Improvements in Springfield Neighborhoods



Sidewalk Inventory at the Community Level:

A map of existing sidewalks in the City of Springfield displaying the identified improvements implementation during the three years period from 2020 to 2022. This map shows how the new sidewalks would connect to the existing sidewalks network to fill the identified gaps. The dark grey lines represent existing sidewalks.

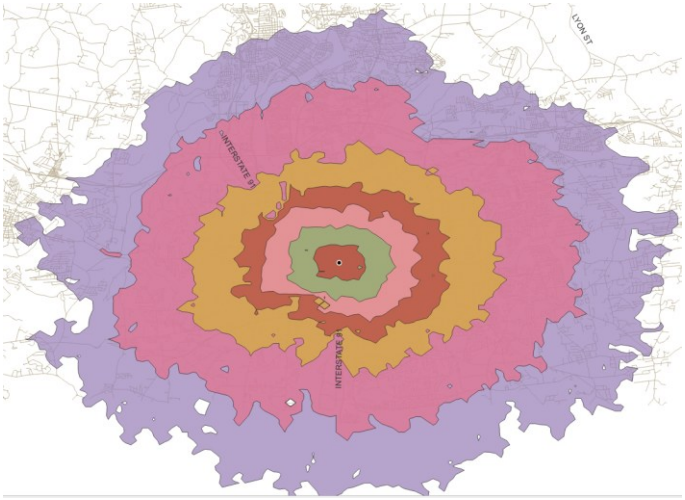
Springfield Sidewalk Inventory



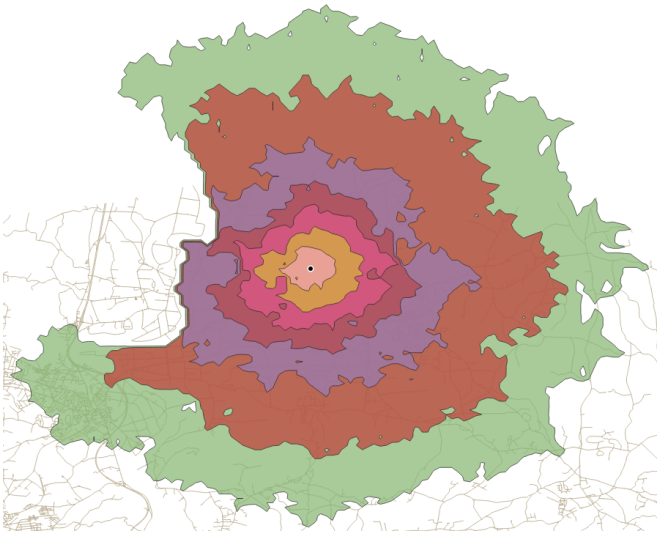
Walkability and Bikeability Analysis at the Community Level:

A digital measuring tool was used to quantify and qualify accessibility levels to the regional non-motorized network. A web-based analysis application called Conveyal was used to draw travel time contours for pedestrians and cyclists. For comparison, two locations were selected for such analysis: the Springfield Central Business District (CBD) and the UMass Amherst campus. The two locations were chosen for their proximity to off-road bicycle and pedestrian facilities, namely the CT Riverwalk in Springfield and the UMass connector to the Norwottuck Rail Trail. The two maps below show that non-vehicular travel becomes more and more feasible with the addition of bicycle and pedestrian amenities. Travel time is expected to continue to improve as supportive local and state policies are implemented to help provide access to non-motorized travelers.

Walking and Bicycle Travel Time Contours (Springfield)



Walking and Bicycle Travel Times Contours (UMass)



Identifying Activity Centers:

Identifying Springfield's major activity centers was important in designing the Complete Streets Network. This was a necessary step to easily connect people to the places they frequent. There were a wide range of activity centers collected as part of the public outreach process. Springfield residents listed the following as places they bicycle and walk to:

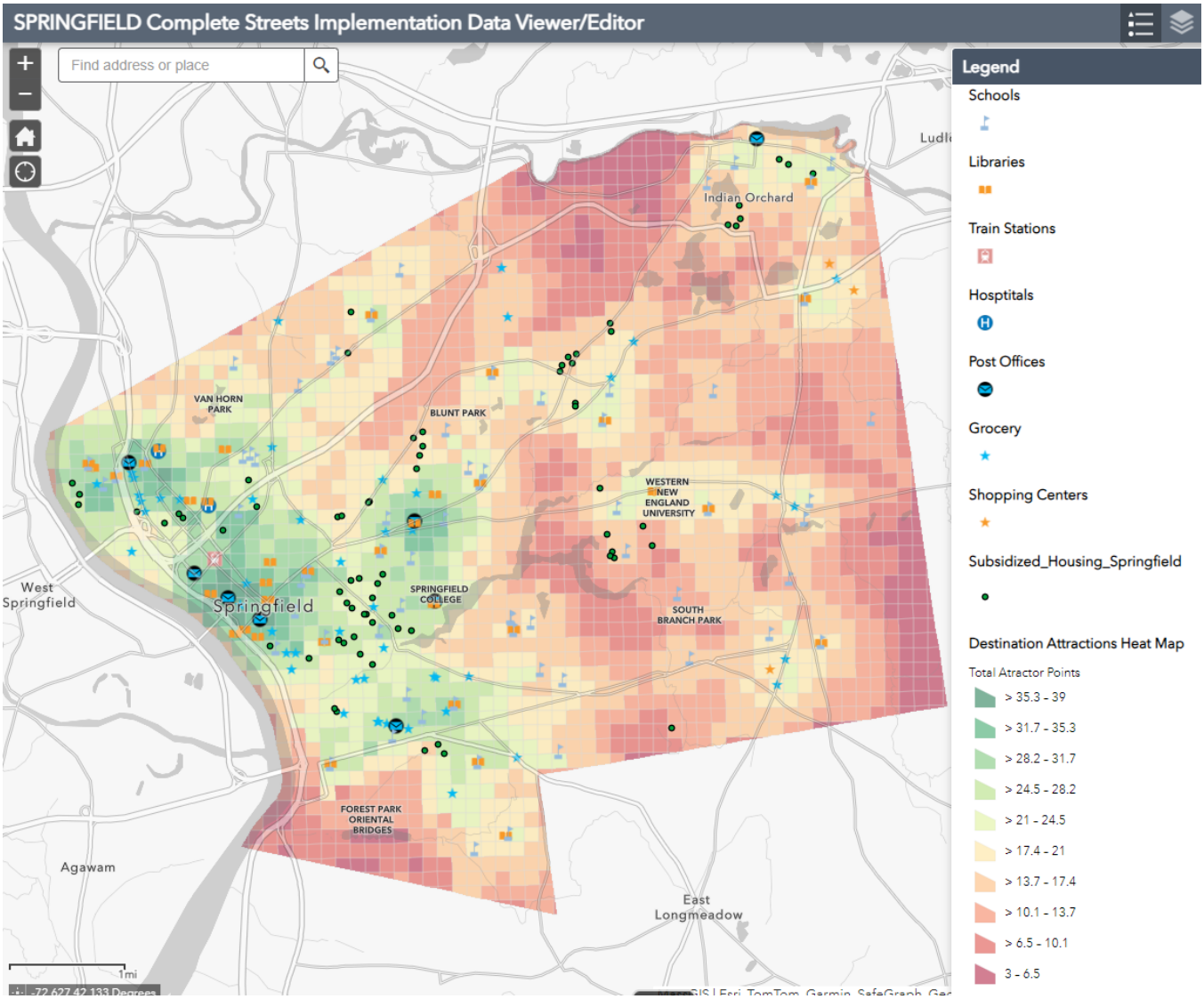
Schools	Post offices	Grocery Stores	Bike Trails
Colleges	Hospitals	Shopping Centers	Bus Lines
Libraries	Parks		Train Stations

A "heat map" was created to evaluate where the largest concentrations of these activity centers exist in Springfield. The heat map divided the city into a grid of equal sized squares, each of which are assigned a value based on the number of different activity types and proximity. Each type was assigned a numeric value based on the importance it was given during the public outreach process. Population and employment densities in each square were also factored into the analysis, since concentrations of people are generally associated with activity centers. Based on this methodology, squares are ranked highest if they have many activity centers nearby and have the highest population and employment densities. The highest attractor points score where color labeled green, while the lowest attractor points were color labeled red, and yellow color labeled areas receiving intermediate attractor points score.

The map on the next page shows the results of the heat map analysis. The major activity center in the city is in the older neighborhoods, which include Metro Center, Brightwood, Memorial Square, and South End. These neighborhoods are the location of several large employers, including Bay State Health, The Republican, the Springfield Police Department, and the MGM Casino and related businesses and restaurants. They also have the highest population densities, transit lines, and concentration of various activity types. Planned development in Springfield's downtown will further increase activity occurring there. The South End and the Metro Center neighborhoods are where the city projected future market---rate housing development.

In addition to Springfield's primary activity center, there are local activity centers located throughout the city. These represent neighborhood main streets and businesses districts, including Indian Orchard Main Street and Boston Road shopping strip. These activity centers are taken into consideration as a key component of the identified Complete Streets corridors is connecting different neighborhoods and business districts.

Springfield Destination Attractions



B) Bicycle Network Analysis

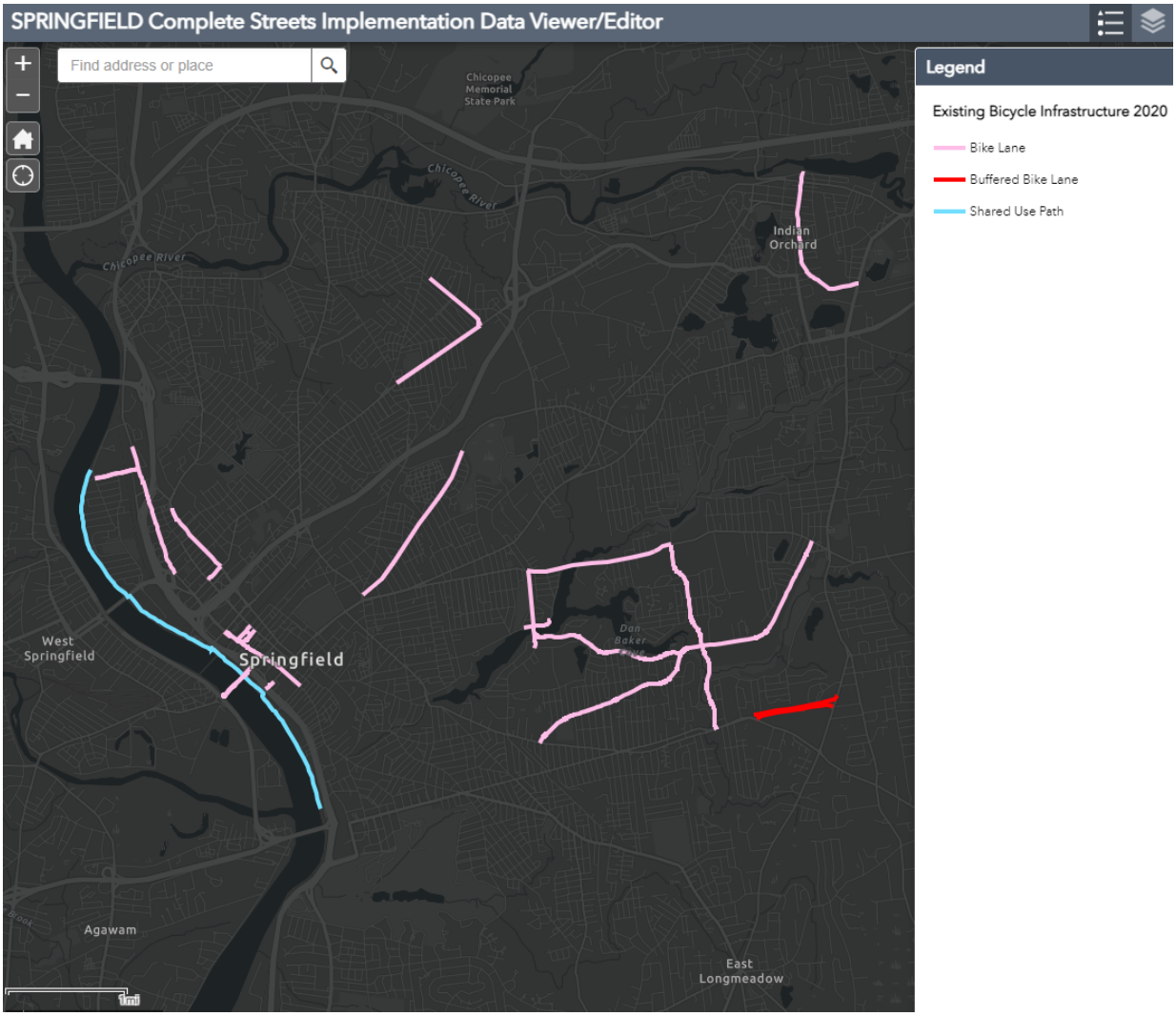
Bicycle Network Connectivity at the Community Level:

The online map viewer developed during the process of analyzing the non-motorized network captured the segments of the bicycle infrastructure facilities existing in 2020. A separate layer of data included suggested bicycle infrastructure. Both existing and proposed layers of the bicycle network were categorized by facility type and color coded during this analysis as explained below.

Existing Bicycle Infrastructure:

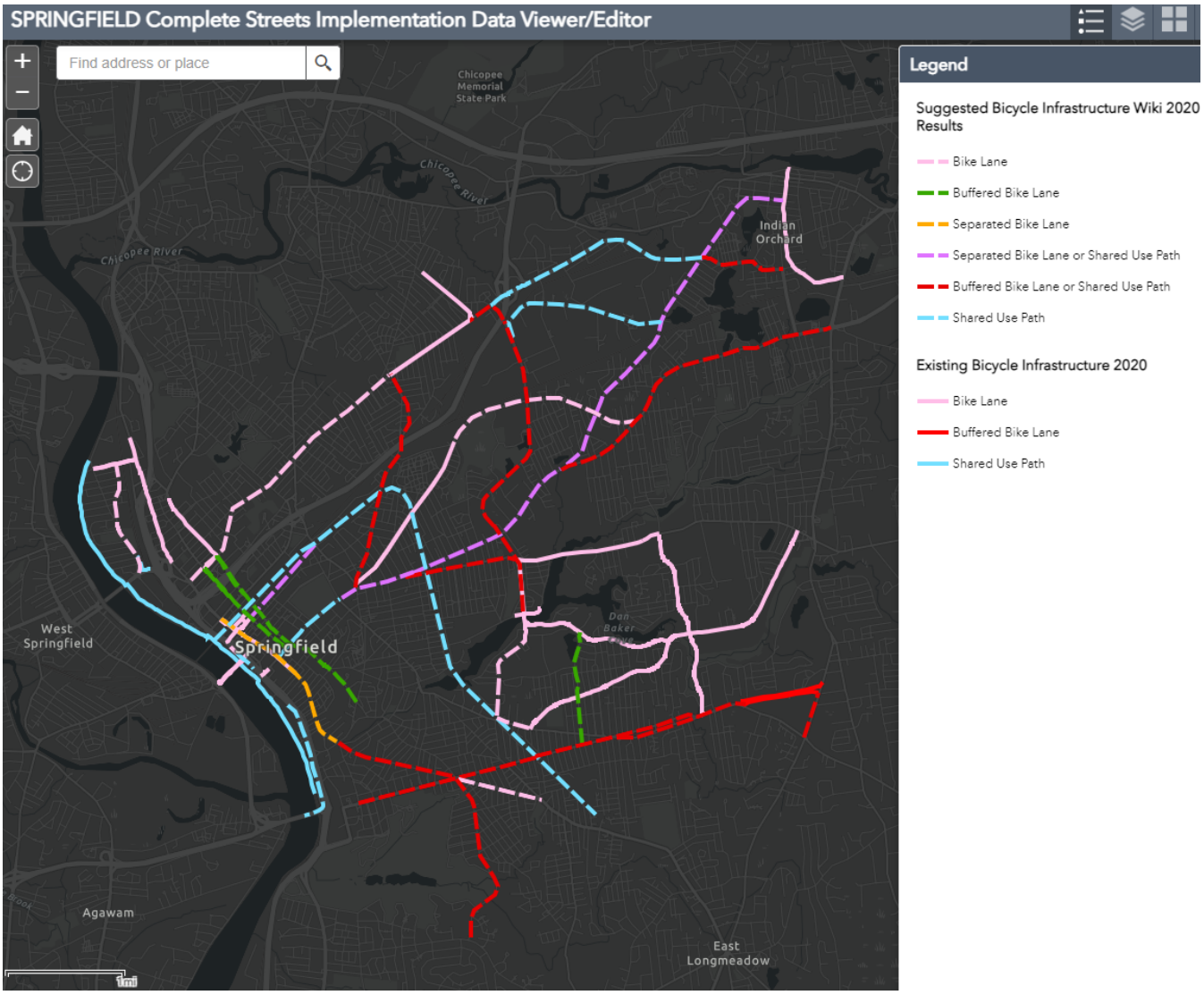
- Light Pink: Bike lane
- Red: Buffered bike lane
- Light Blue: Shared use path

Existing Bicycle Infrastructure in Springfield



Aside from the Connecticut River Walk and Bike Path, displayed in light blue color on the map, there were few bike lanes available in the city. The suggested bicycle infrastructure aims to bridge the gaps between the current facilities to provide users with connected and continuous safe network for non-motorized travel trips. This would increase access to non-motorized options for travel within the city.

Suggested Bicycle Infrastructure in Springfield

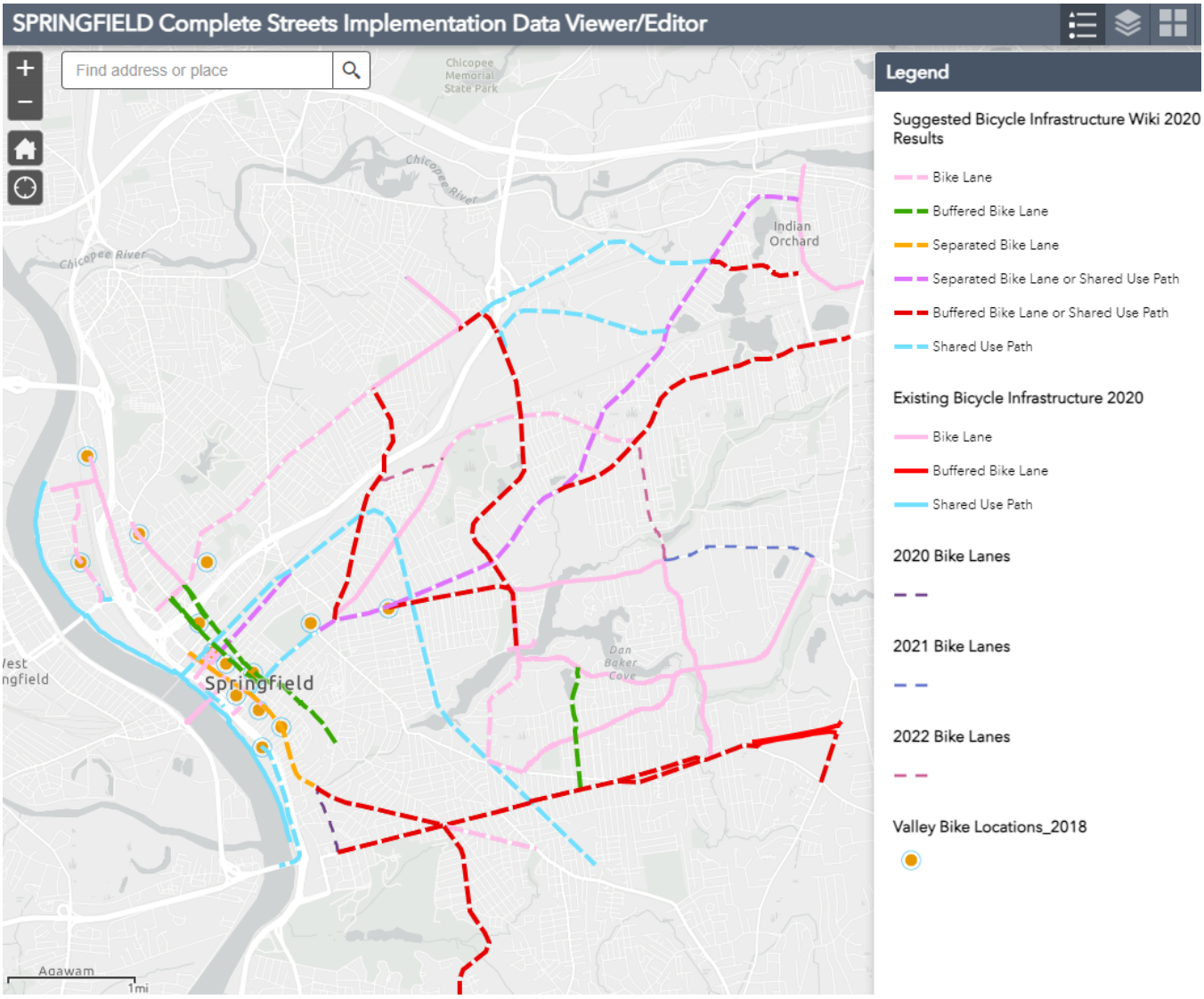


Suggested Bicycle Infrastructure:

- Light Pink: Bike lane
- Green: Buffered bike lane
- Orange: Separated bike lane
- Pink: Separated bike lane or shared use path
- Red: Buffered bike lane or shared use path
- Light Blue: Shared use path

The identification of gaps in the regional transportation system for all users is a critical task to locate and eliminate existing barriers that restrict travel options. Proper maintenance ensures the continued expansion of a complete transportation system that enhances future options for all travel modes. The map below shows the complete bicycle network infrastructure including the three layers of the network analysis: existing, suggested, and planned implementation.

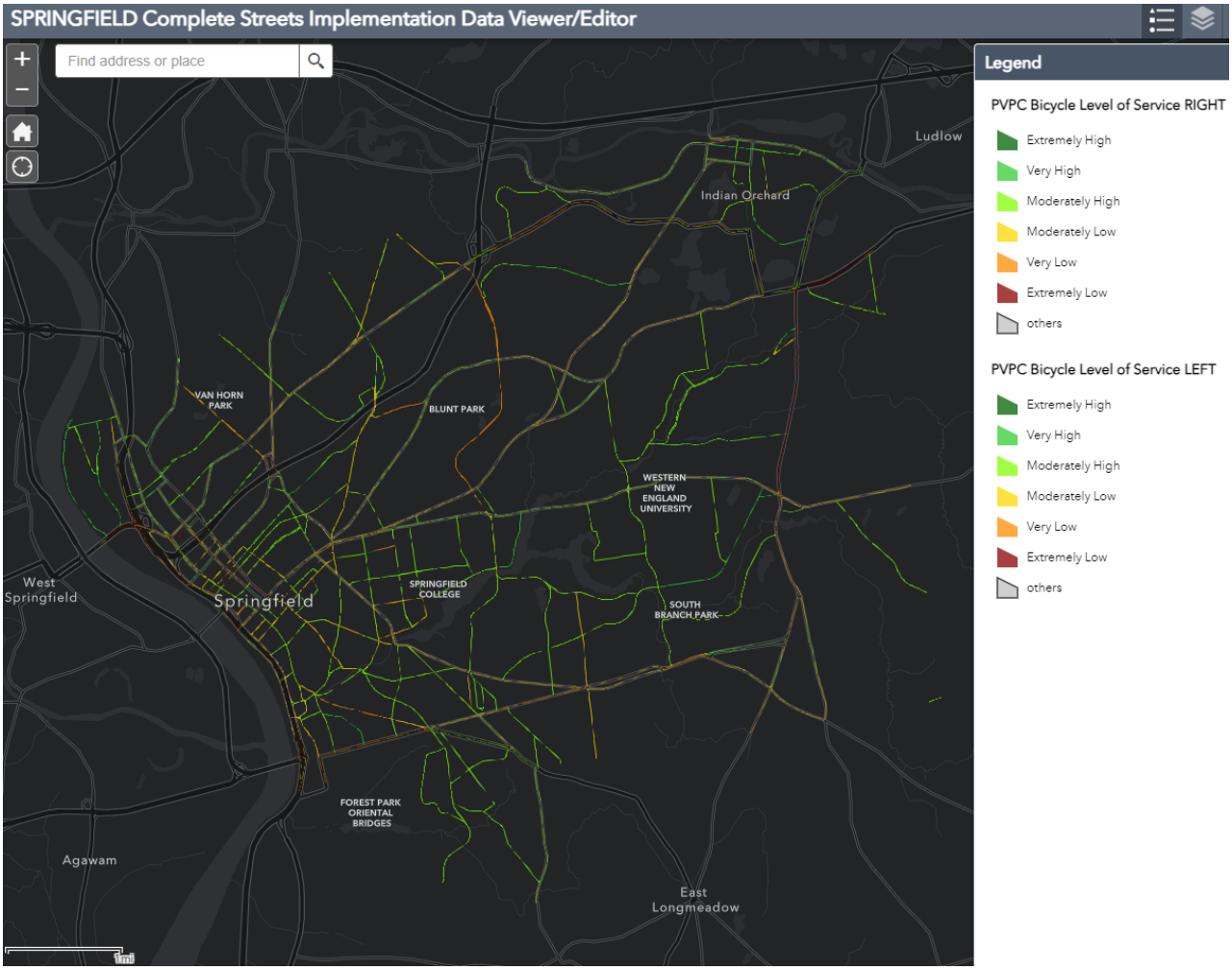
Suggested Bicycle Infrastructure in Springfield



Trip Potential at the Community Level:

A bicycle level of service analysis was conducted for the roadway network of the City of Springfield. The map below shows the color-coded roadway links representing a gradation between extremely high to extremely low bicycle levels of service. Roadway links with the green color represent the good end of the spectrum, while red color represents the bad end of the level of service spectrum. Bicycle level of service scores were divided into six main categories. Green color represented high scores, and red color represented lower score.

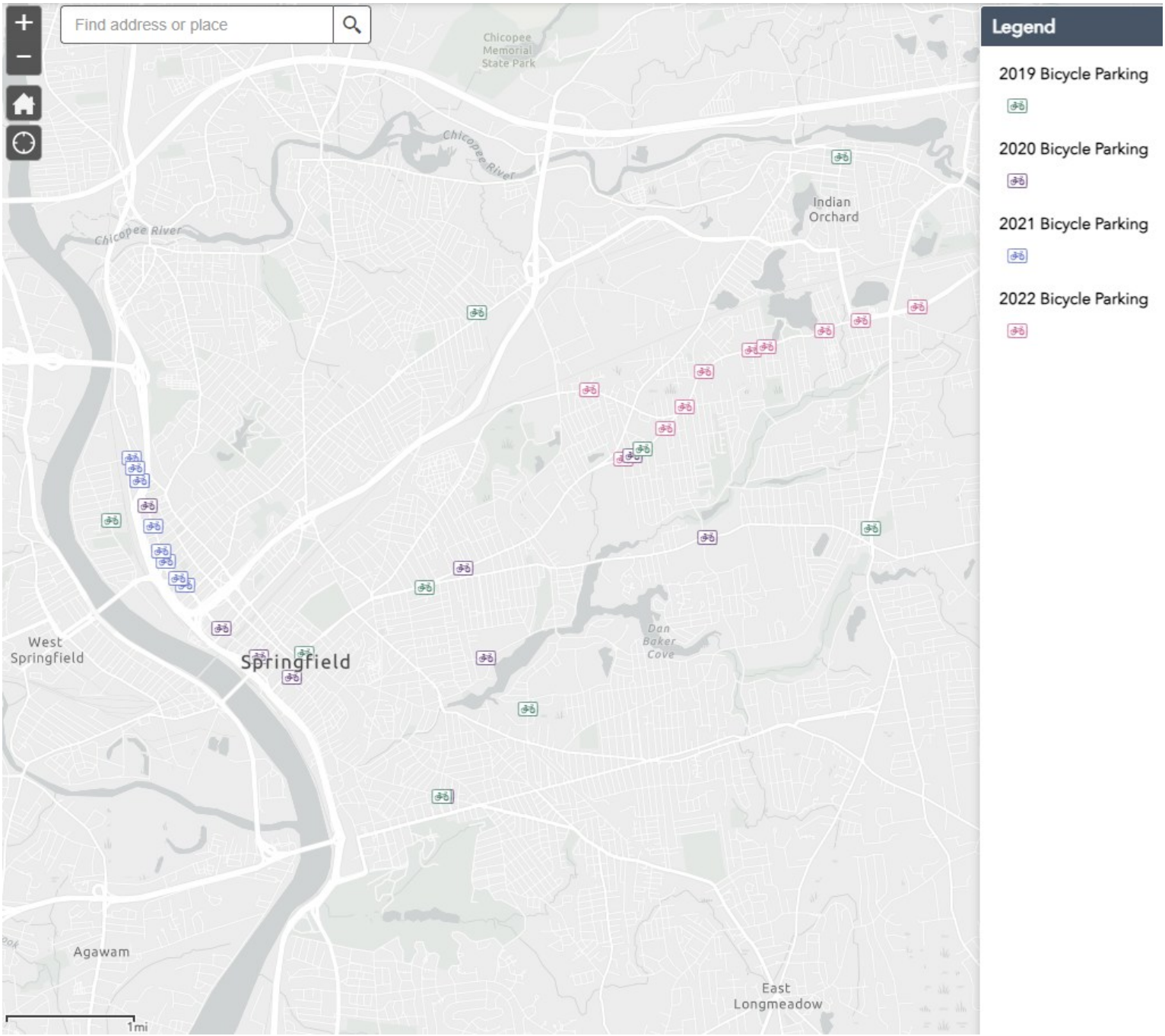
Bicycle Level of Service in the City of Springfield



Bicycle Parking Inventory at the Community Level:

The Springfield Complete Streets project included an inventory of bicycle parking facilities in the city. It included both existing and planned bicycle parking facility locations identified for implementation in 2020, 2021, and 2022 (See figure below).

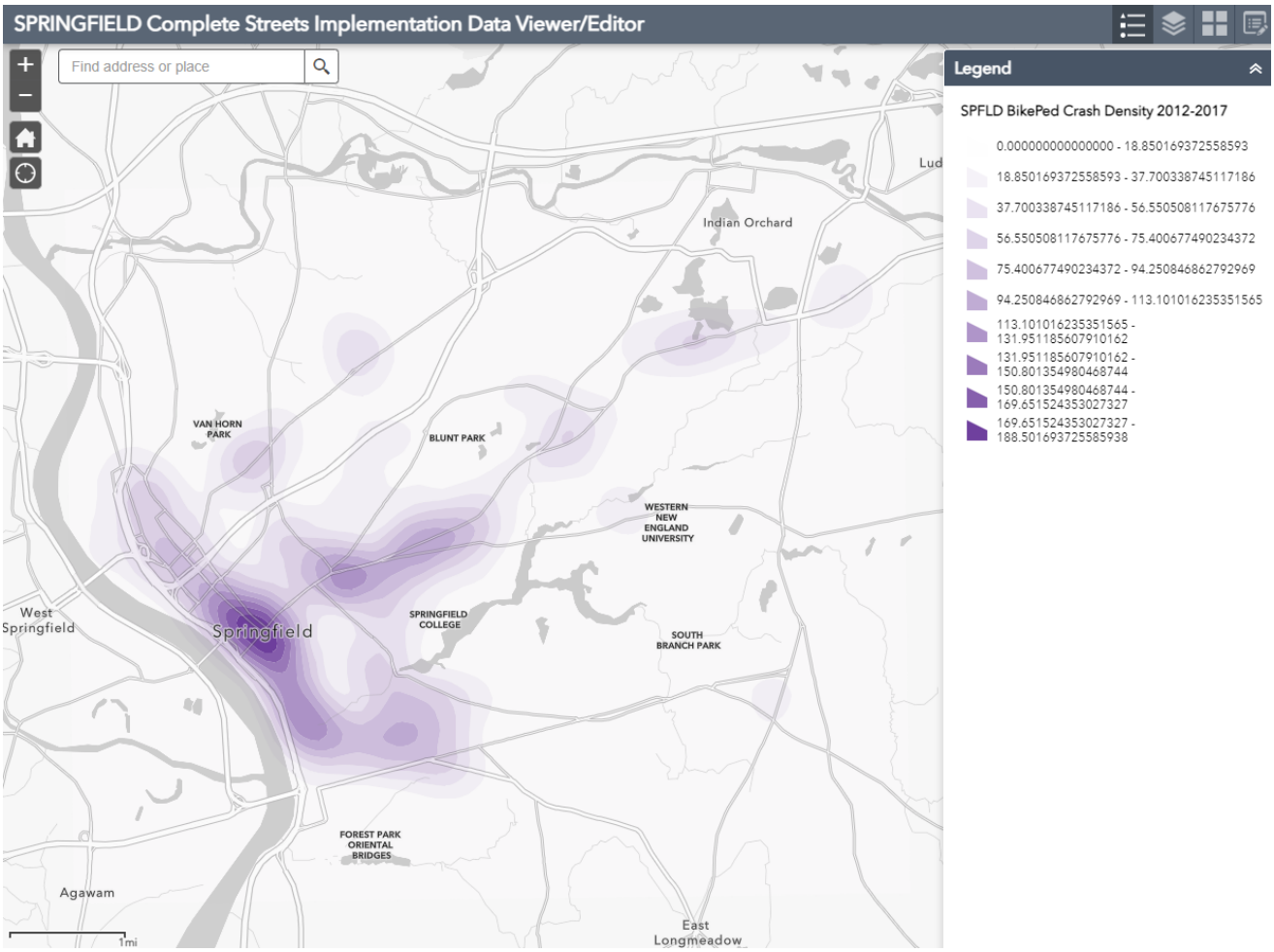
Bicycle Parking Inventory in Springfield



Crash Analysis at the Community Level:

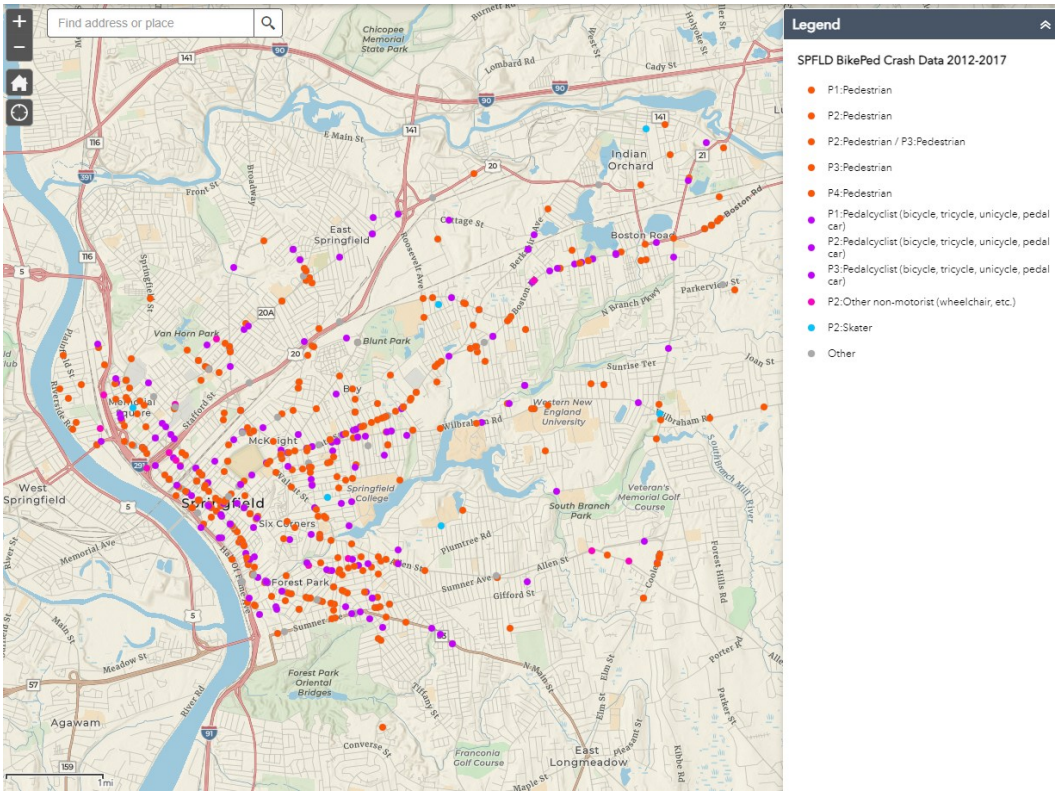
The map below highlights high crash density locations during a five-year period from 2012 to 2017 in the City of Springfield. The darker the hew of purple the higher the density of crashes.

Non-Motorized Crash Density in Springfield 2012-2017

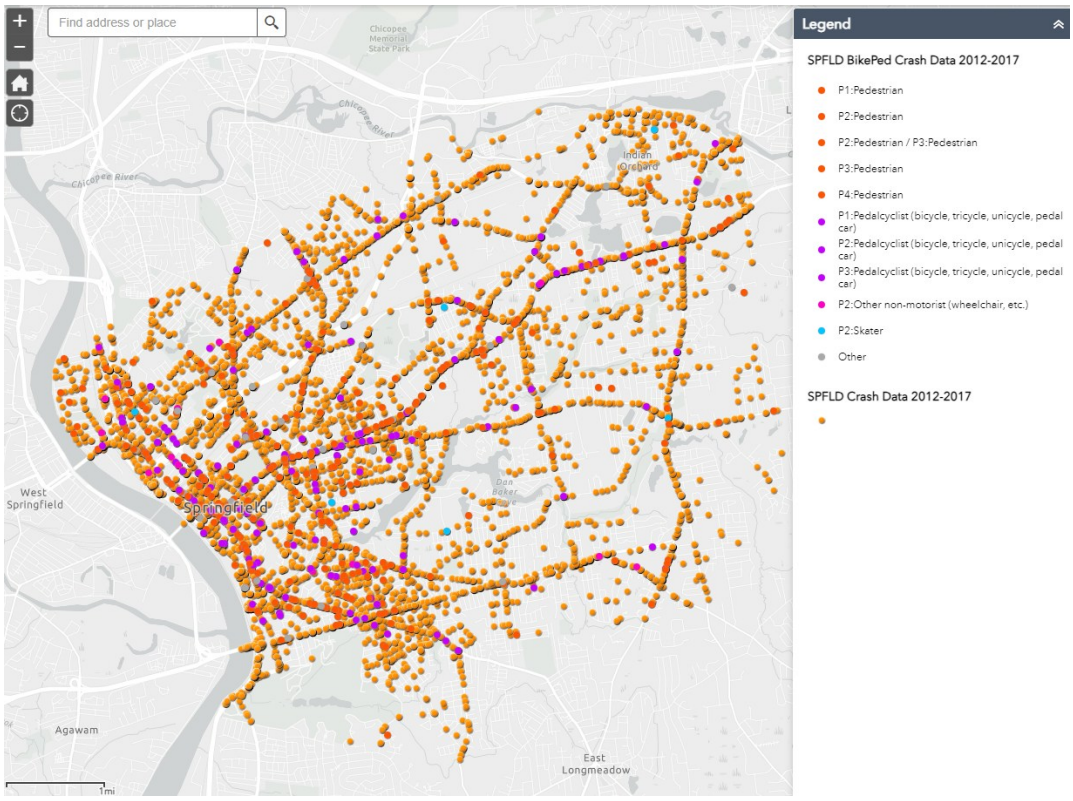


The two maps on the following page show non-motorized crash types in comparison to all crashes including both motorized and non-motorized crashes during the same period of analysis. Red circles represent a pedestrian crash, purple circles represent a bicycle crash, hot pink circles represent other non-motorized traveler such as a wheelchair crash, blue circles represent a skater crash, and orange circles represent motorized crashes. While non-motorized crashes appear to be a fraction of all crashes, they remain a considerable number of crashes involving vulnerable road users who often sustain severe or fatal injuries during a crash with a motorized vehicle. Thus reducing conflicts between roadway users by improving bicycle and pedestrian facilities and roadway safety features is very important.

Five Year Non-Motorized Crashes in Springfield 2012-2017



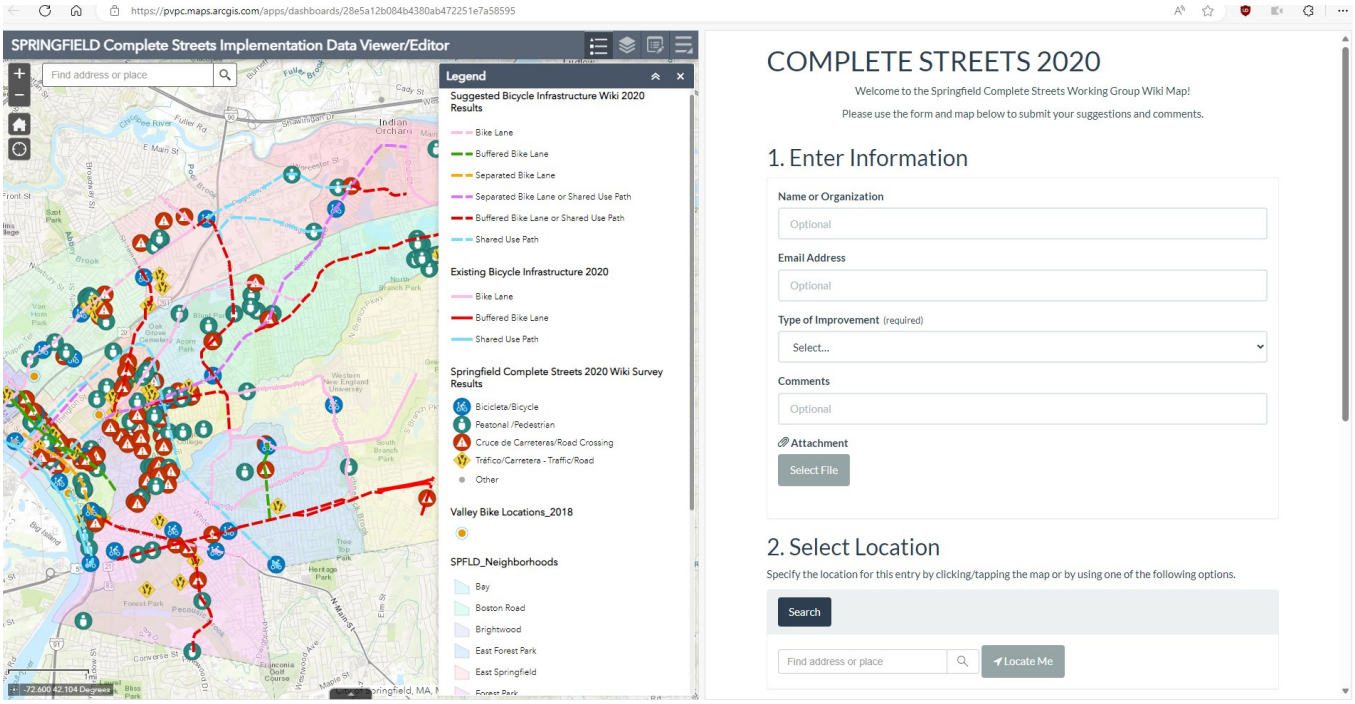
Five Year Crashes in Springfield 2012-2017



Springfield Complete Streets Wiki Map:

The Springfield Complete Streets Plan's working group developed an interactive online tool called a Wiki map (see Figure below). The online portal was open for public comments to encourage residents and users to identify needed improvements that help make the transportation system in the city meet the complete streets criteria. Improvements were grouped into four types: pedestrian, bicycle, road crossing and traffic/road. Entries were solicited in both English and Spanish to be inclusive of the high percentage of Spanish speaking public within the city.

Springfield 2020 Complete Streets Wiki Map



https://pvpc.maps.arcgis.com/apps/dashboards/28e5a12b084b4380ab472251e7a58595

Complete Streets Implementation:

The Complete Streets Plan Implementation long-term goals identified in 2020 are identified as types of modifications to various roadway corridors analyzed in this study. Modifications proposed include:

- One-Way Street
- Two-way Street
- Neighborhood Main Street
- Neighborhood Street
- Yield Street
- Boulevard
- Residential Boulevard
- Transit Corridor
- Off-Road Trail

The proposed changes are overlayed onto the existing roadway corridors analyzed: Downtown Two-Way, Neighborhood Street, and Off-Road Trail.

Complete Streets Long-Term Goals Year (2020)