

## Pedestrian & Bicycle Audit

### Borough of Madison

12 June 2020

#### Summary

In 2019, the Borough of Madison Green team successfully submitted a bicycle audit to Sustainable Jersey. For 2020, we have expanded our study to include both pedestrian and bicycle components. A complete map of sidewalk locations in the Borough was digitized. The Borough of Madison collaborated with TransOptions, our Transportation Management Association (TMA), to conduct a pedestrian safety education and outreach campaign in fall of 2019. The results of the Street Smart Madison Campaign are summarized and attached as supporting documentation. Our combined pedestrian and bicycle audit, the recent activities of the town's Complete Streets committee and Safe Routes to Schools initiatives demonstrate Madison's commitment to improving pedestrian safety and access to alternative transportation.

#### Background

In 1989, the New Jersey Department of Transportation passed a policy on Complete Streets, which provided definitions and established guidelines for implementation of complete streets statewide.<sup>1</sup> The idea behind complete streets is to improve the safety and wellbeing of pedestrians and bicyclists and to encourage the design of communities in ways that improve health and environmental outcomes for all through elevating multi-modal transportation options. Though the addition of new development presents the opportunity to design well, with pedestrians and cyclists in mind, the task of retrofitting older, established and historical community designs presents a number of challenges that continue to be addressed thirty years after NJ DOT's Complete Street Policy.

In 2013, the Borough of Madison published a Complete Streets Policy Manual to support the mission of NJDOT policy.<sup>2</sup> The historic character of the city is evident in this document and in borough code pertaining to transportation. For example, the first 24 roads paved in Madison in 1896 are listed. And borough code prohibits blocking crosswalks as follows:

§ 166-6 Obstruction of crosswalks prohibited.

No person shall place or stop his or her horse, cart or other vehicle upon or across any crosswalk or in any other manner obstruct such crosswalks.<sup>[1]</sup>

[\[1\]](#)

Editor's Note: Original Section 9, which immediately followed this section and pertained to the deposit of dirt, waste materials and wastewaters on streets and sidewalks, was deleted and repealed at time of adoption of Code; see Ch. [1](#), General Provisions, Art. I. For current provisions on this subject, see Ch. [120](#), Littering; Handbills; Brush and Trash.

There are now 234 local roads, and residents are concerned about the safety of the roads, particularly because of a few recent pedestrian accidents, one of which was fatal,<sup>3</sup> and one involving a child on a bicycle, where the mayor of Madison witnessed the vehicle leaving the scene.<sup>4</sup>

In August 13, 2012 minutes of a regular meeting of the mayor and council of the Borough of Madison, Carmen Pico "asked if the Borough has an ordinance regarding parking in bicycle lanes and asked that parking regulations be enforced." Seven years later, the author of this report was asking the same question, so communication and education on bicycle use is ongoing. A complete streets priority plan in town documents identifies improvements and ranks

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<sup>1</sup> Miller, "Department of Transportation: Complete Streets Policy."

<sup>2</sup> Borough of Madison, "Complete Streets Policy Manual."

<sup>3</sup> CBS New York, "Woman Struck, Killed By Hit-And-Run Driver In NJ – CBS New York."

<sup>4</sup> Lee, "UPDATED."

actions up to 2023. Furthermore, appendices for the complete streets plan include bicycle routes, which were drafted in 2005 and updated in 2009. Current updates are in progress, based in part on the new Complete and Green Streets model policy and guide, and are happening alongside a rewrite of the Madison Master Plan. The original bicycle plans have been uploaded as supplemental documents.

## **Pedestrian Audit**

### **[Applying for Approval, 2020, 5 points]**

The pedestrian audit is a compilation of materials assembled by Green Team volunteers, which includes an inventory of sidewalks, crosswalks (by type), curb ramps, and pedestrian signals. Also summarized here are observations and suggestions made by Madison Borough staff, TransOption coordinators, and Susan Blickstein, a licensed professional planner, related to pedestrian safety in Madison.

#### **Survey of Existing Infrastructure Conditions**

##### *Locations of Sidewalks*

Figure 1 illustrates the locations of 58.5 miles of sidewalk that are found in Madison, New Jersey. Geographic data identifying sidewalks was digitized using aerial photographs from the New Jersey Office of Department of Environmental Protection (2017). Additional sidewalks were found using high resolution Bing imagery for 2020. The digitizing process took place between September 2019-June 2020. Locations of sidewalks were uploaded to Open Street Maps by Sustainable Madison volunteer, and Madison High School student, Jacob Jordan. Locations that were difficult to verify using satellite and aerial imagery were verified with site visits.

##### *Location of Curb Ramps*

Pedestrian accessibility for youth, elders, and anyone needing mobility assistance, using walkers, wheel chairs, or strollers, is made easier through frequent placement of curb ramps, particularly at crosswalks. Figure 2 identifies the locations of 531 curb ramps across Madison Borough. Most of the curb ramps were identified through the use of aerial and satellite imagery on Google Maps. However, where tree cover obscured visualization of walkways, volunteers relied on Google Street View and site visits to identify curb ramps. Volunteers Lisa Jordan and Jacob Jordan completed this inventory of curb ramps in June 2020. Locations were identified on a shared Google Map, then imported to ArcGIS Pro software to visualize in relation to sidewalks.

# Borough of Madison - Inventory of Sidewalks and Crosswalks

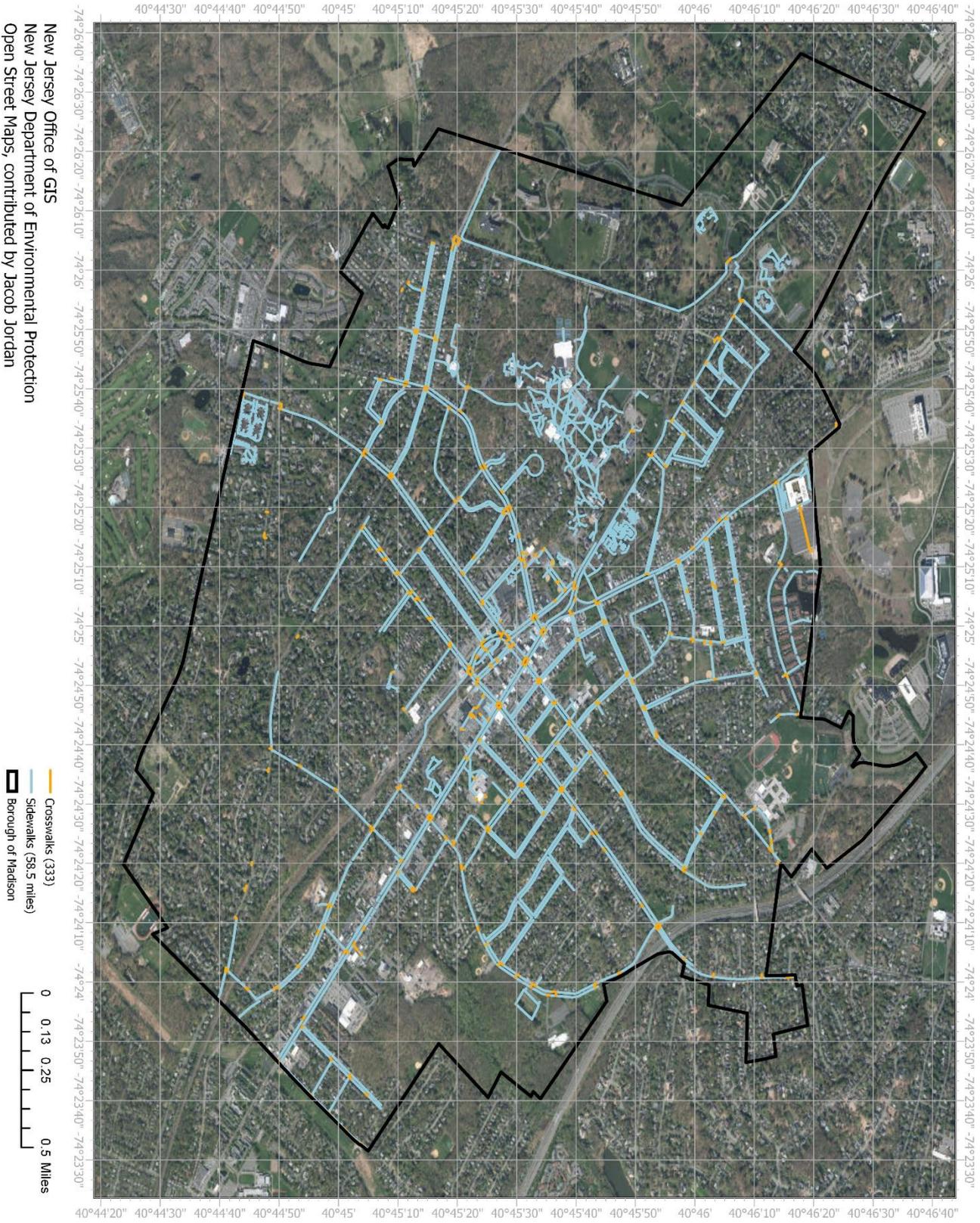


Figure 1. Inventory of Sidewalks in Madison Borough

# Borough of Madison - Inventory of Curb Ramps

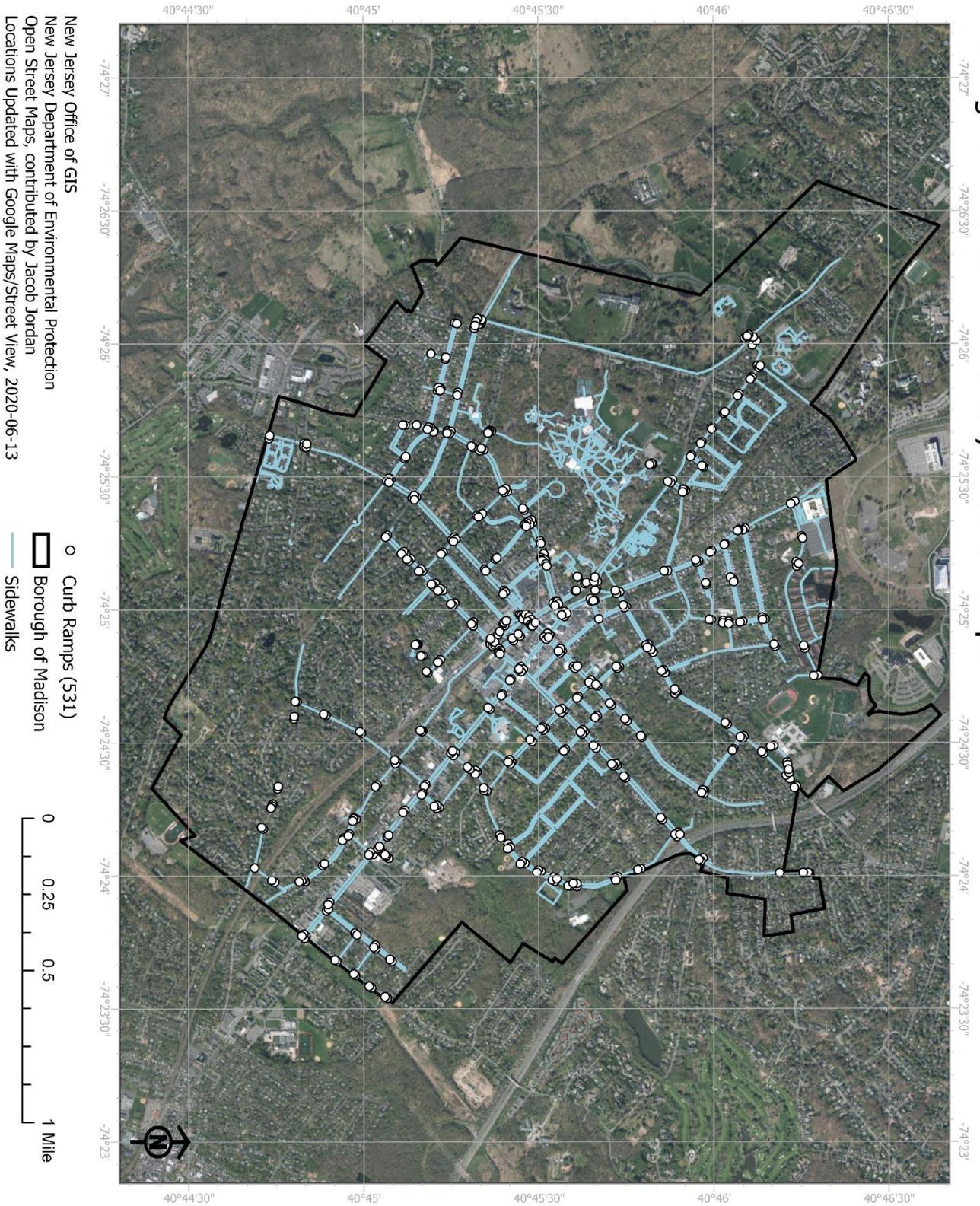


Figure 2. Inventory of Curb Ramp Locations in Madison Borough

## Pedestrian Traffic Signals

An inventory of pedestrian traffic signals was created simultaneously with the curb ramp inventory. It was necessary to verify locations and accessibility of all traffic signals on Google Street View and in site visits. The 58 locations of pedestrian signals are shown in Figure 3 below. In addition to the pedestrian signals show, Madison installed a Rectangular Rapid Flash Beacon (RRFB) at Kings Road and Maple Ave in fall 2019. As of spring 2020, five RRFBs were installed at critical crosswalk locations, and three more are planned.<sup>5</sup>

### Borough of Madison - Locations of Pedestrian Signals

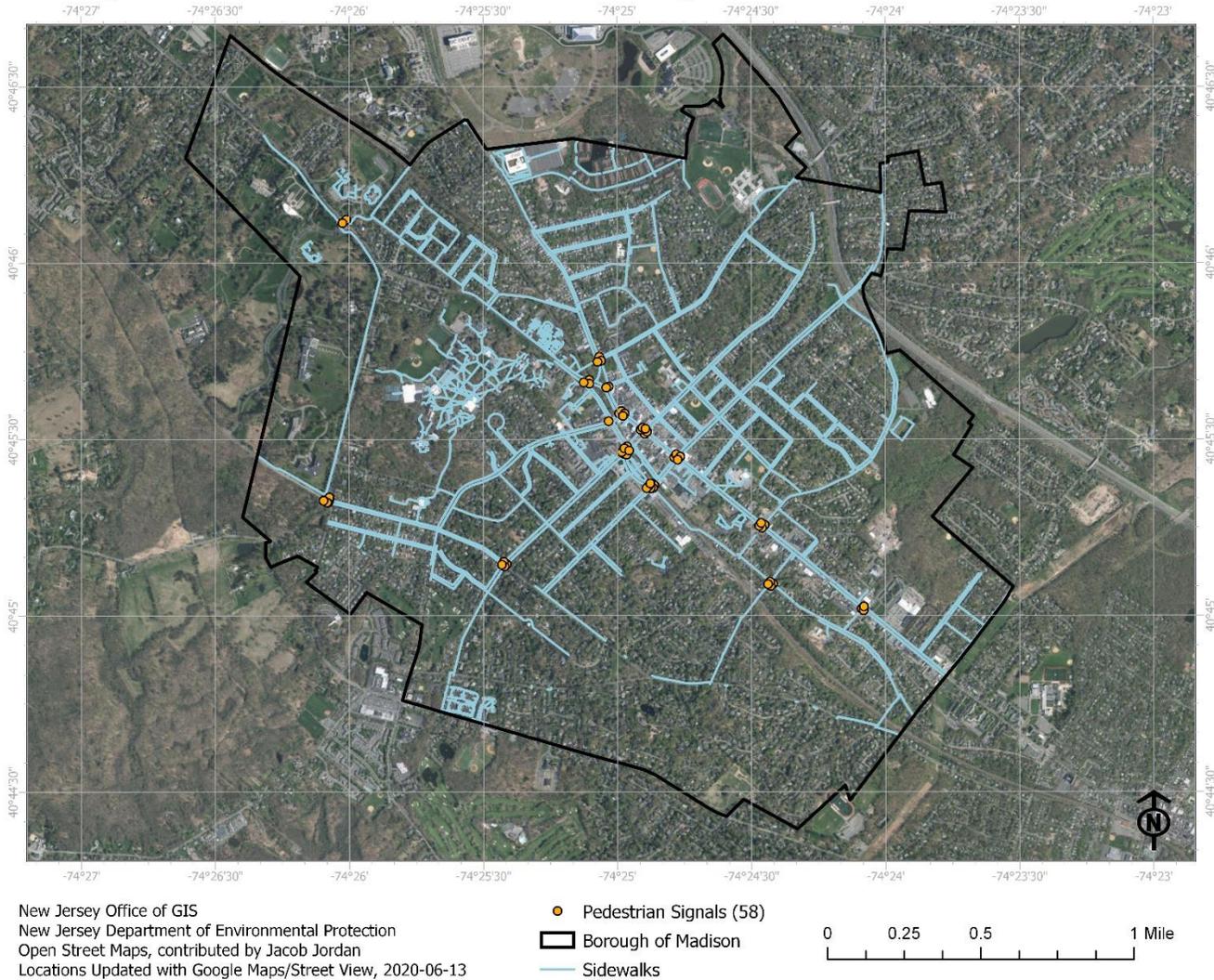


Figure 3. Inventory of Pedestrian Signals in Madison Borough

## Crosswalk Inventory

Lastly, the locations of crosswalks were identified at the same time that sidewalk locations were digitized (Figure 4). Once sidewalk and crosswalks were inventoried, all crosswalks were re-examined with 2020 Bing imagery to identify the current Federal Highway Administration (FHWA) type of marking: solid (one filled line), standard (two solid lines, no fill), continental (thick horizontal lines), dashed (two dashed lines, no fill), zebra (two solid lines, filled with diagonal hatch),

<sup>5</sup> Cerutti, L. 2020. "Street Smart Madison 2019 Campaign." TransOptions.

and ladder (two solid lines, filled with horizontal hatch). The completed inventory identified 332 crosswalks. All types were found: continental (9), dashed (2), ladder (37), solid (2), standard (41), and zebra (241).

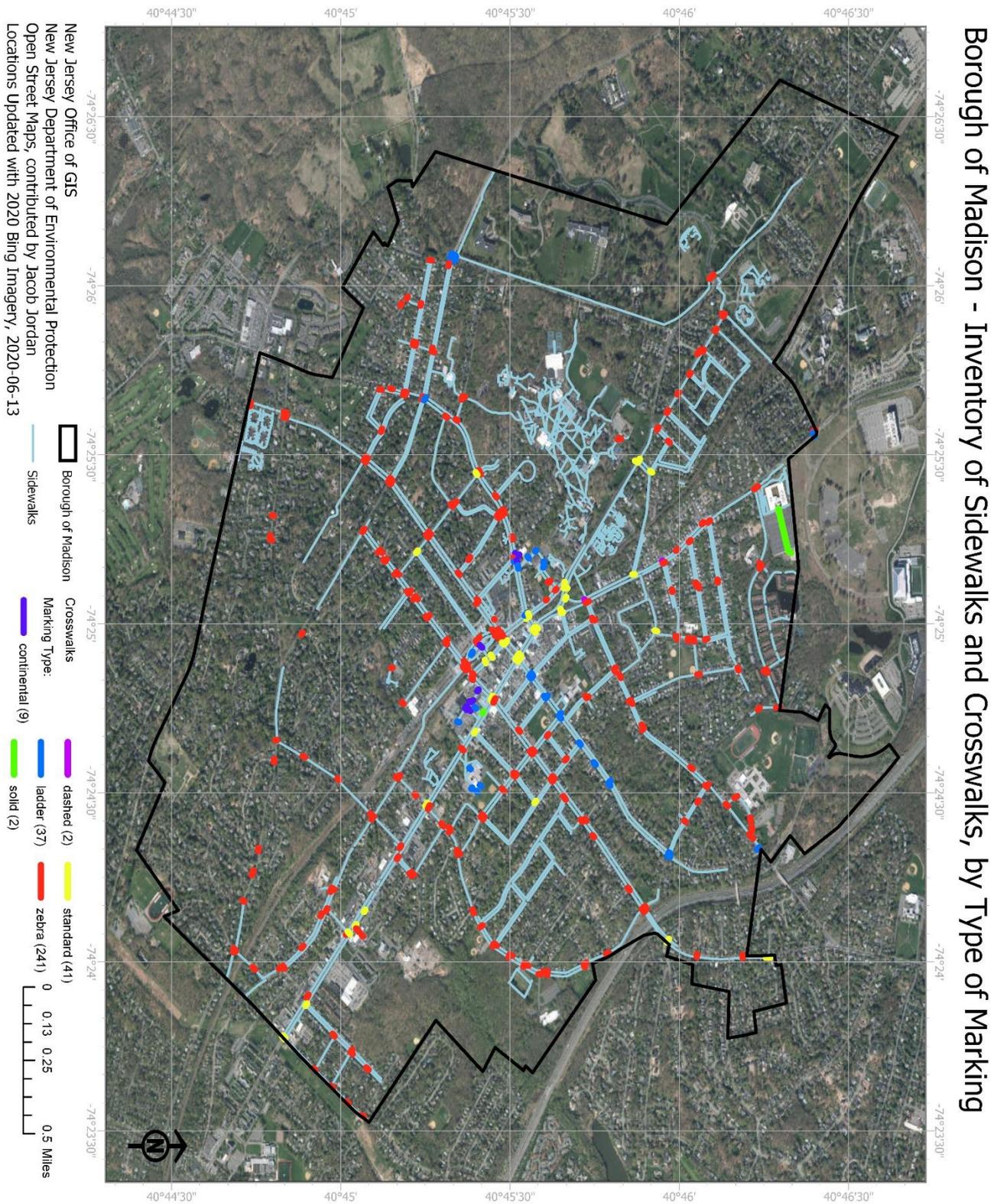
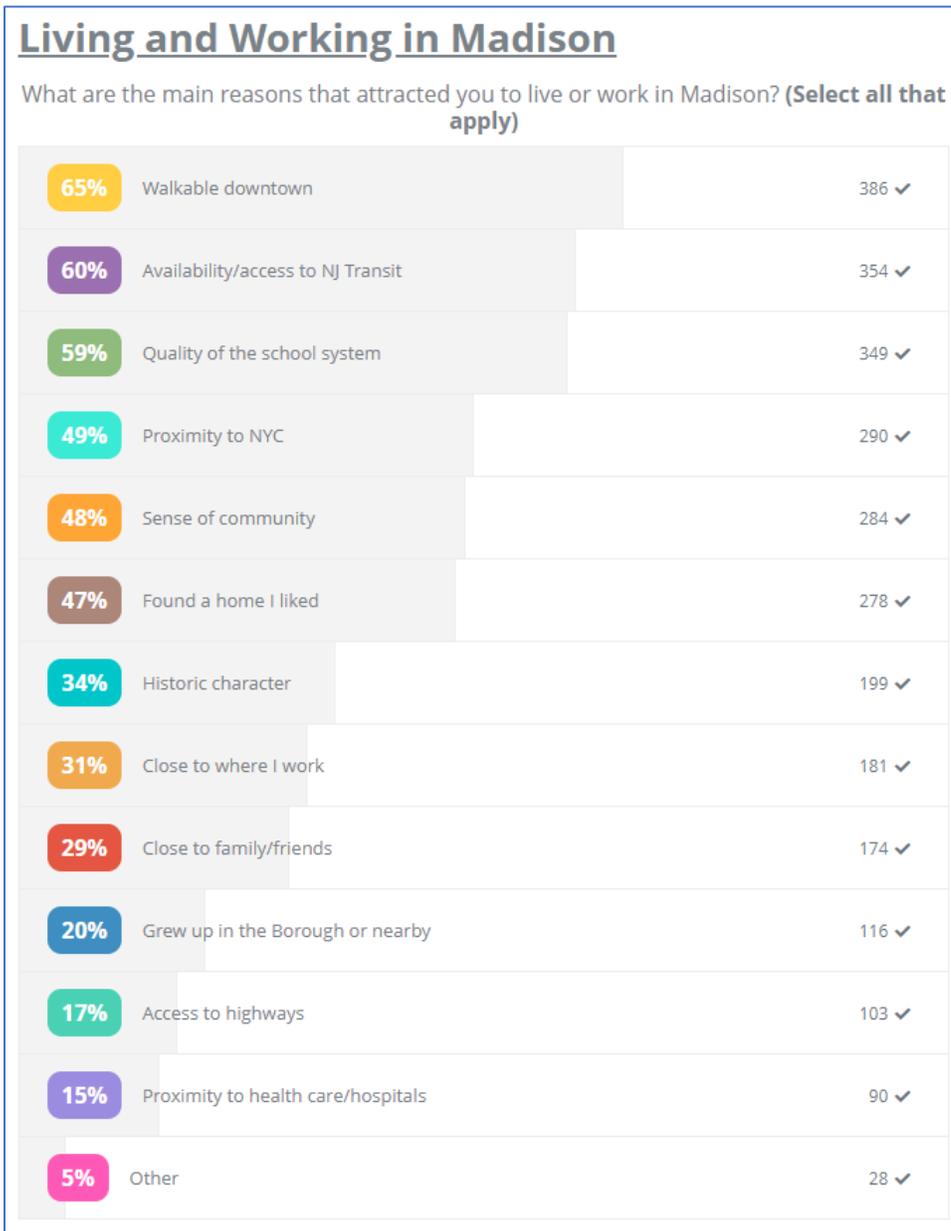


Figure 4. Inventory of Crosswalks by Type in Madison Borough

## Opportunities and Constraints

The topic of opportunities and constraints is one that is currently under consideration by the Complete Streets Committee and a rewrite of the Madison Master Plan. The Street Smart Madison 2019 Campaign summary document also explored opportunities and constraints. We summarize contemporary findings and attach supporting documents to this action.

It was also found by the Madison Master Plan Survey, which involved 669 participants, that a walkable downtown was the most common reason residents were attracted to live in Madison, followed by availability and access to NJ transit.<sup>6</sup>



However, keeping these two important attractions accessible and safe is a challenge for the town. According to the Street Smart recommendations, Madison residents benefited from education and outreach interventions performed by

<sup>6</sup> Borough of Madison. 2020. "Madison Master Plan Survey 1 Report." Available online: <https://publicinput.com/Report/ffcsxliomma>

TransOptions coordinators, but there is more work to be done. For example, pre- and post- intervention pedestrian crossing mid-block was observed in over half of street crossings. And, driver non-compliance with yielding to pedestrians was identified in about half of observations. Enforcement, education and engineering strategies can all contribute to strengthening pedestrian safety. Continued participation and progress toward Complete Streets is recommended and an important goal for the Borough of Madison.

Work by Susan Blickstein<sup>7</sup> found that seventy-three percent of Madison residents drive to work, but she also noted that 7 percent of residents walk to work: a number higher than the county (5 percent) and state (3 percent). This suggests an opportunity to expand our town's walkability. In working on sidewalk availability, some of the neighborhoods with larger parcel sizes and homes had fewer sidewalks. However, it may be that some of these neighborhood roads are less traveled, and used for driving, bicycling and walking. Involving residents in Complete Streets discussions is important, because there may not be the need or desire to build sidewalks on every street.

According to a survey of 141 participants, distributed by the town as part of the Madison Master Plan Open House and summarized by Susan Blickstein<sup>8</sup>, improving traffic and pedestrian and bicycle safety was among the top five goals that residents felt were missing from the town master plan.

In the open-ended comment section, participants provided input on what is missing from the 1992 Master Plan Goals. Sustainability/resiliency (ex. renewable energy, lower carbon footprint, green infrastructure, preservation of shade trees/native plants, protection of aquifer, clean energy, reduction of waste, etc) was mentioned by the most participants as an important goal that needs to be addressed. Some participants commented that the '92 goals are still relevant but need to be updated to take into consideration recent trends and changes that have occurred in Madison.

The following list includes the top five items that were mentioned by participants:

1. Sustainability/Resiliency
2. Improve traffic safety and ped/bicycle infrastructure to promote public transit ridership and more non-motorized transportation modes
3. Ensure equity and socio-economic diversity
4. Diversity and affordability of housing
5. Sensible development in the downtown and in residential areas to preserve neighborhood character and prevent overdevelopment (Take into consideration the changing retail landscape)

Additionally, 68 percent of respondents felt that filling “missing gaps in the sidewalk network” would most improve pedestrian and bicyclist safety and comfort.”

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<sup>7</sup> Blickstein, S. 2020. “Mobility Open House Boards, Prepared for Madison Borough.”

<sup>8</sup> Borough of Madison. 2020. “Madison Master Plan Virtual Open House Results.” Available online:

<https://publicinput.com/Report/uyvyp42njqx>

According to the survey, 92% of respondents indicated that the ability to safely walk and bicycle in the community was important or very important to ensuring a healthy and vibrant future for Madison. However, the survey results showed that 25% of people felt Madison streets were unsafe for pedestrians and 33% felt streets were unsafe for bicyclists. From the list below, select up to five improvements (or fewer) that you think would most improve pedestrian and bicyclist safety and comfort?

68%	Fill in missing gaps in the sidewalk network	76 ✓
61%	Implement an extended bikeway/trail network over time	68 ✓
51%	Modify walk signals at intersections so people get a head start crossing streets before cars get a green light	57 ✓
47%	Install high visibility crosswalks at key intersections	53 ✓
45%	Reduce speeding and cut-through traffic on residential streets	50 ✓
32%	Implement No Turn on Red at high crash intersections	36 ✓
30%	Add roadway markings ("sharrows") to indicate shared-use by motorists and bicyclists on key downtown streets	34 ✓
30%	Improve pedestrian lighting for better visibility	34 ✓
18%	Other	20 ✓

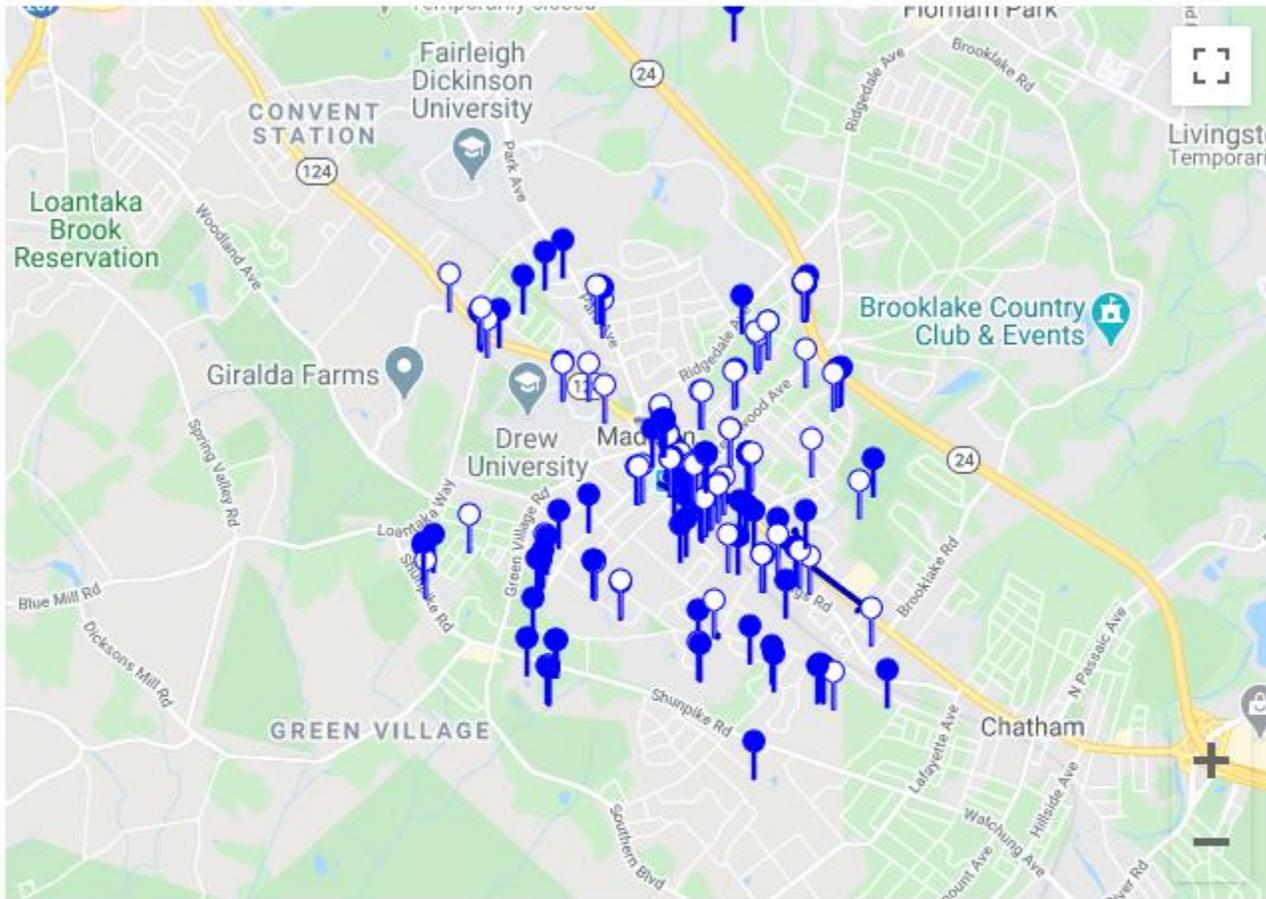
The sidewalk inventory is only the beginning to considering ways to move forward. The complete streets committee identified areas around schools, particularly major school crossings as important for sidewalk and bicycle route connectivity, as well as safety. The sidewalk inventory can be used to examine the walkway networks and paths in which children travel to school, and the ways in which their paths are interrupted by obstacles or lack of access.

### Challenging Roadways and Intersections

Kings Road, across from the train station, was identified by TransOptions as an area of concern. The sidewalk audit identifies clear sidewalks, curb ramps, and pedestrian signals along the route. However, because it is so widely used, additional educational, design, and enforcement interventions really need to continue to focus here.

During surveys conducted in preparation for the Master Plan rewrite, the pedestrian crossings on Main Street, between Ridgedale, all the way to Prospect, were identified as areas of concern by residents. Again, many crossings are actively maintained, and include pedestrian signals, but more could be done. Areas around schools were also observed as problematic. Routine staffing of crossing guards helps to support child safety, despite proximity of busy roads to schools.

Identify the top three **intersections** in Madison where you feel unsafe, either as a driver, pedestrian, or bicyclist.



In addition to the intersections identified on the map, the following list includes the top five intersections that were mentioned in the comments:

1. Kings & Prospect
2. Main & Samson (Whole Foods)
3. Main & Waverly
4. Prospect & Woodland
5. Greenwood & Main (Walgreens); Green Village & Woodland (same number of mentions)

## Crash Data Summaries

Crash data are reviewed in both the Street Smart Madison 2019 Campaign and Master Plan Planning Documents (attached as supporting documents). To summarize, between 2016 and 2018, there were 16 pedestrian reported to be involved in crashes.<sup>9</sup> One of the injuries was fatal, eight involve possible injuries, and five involved suspected minor injuries. Seven of the crashes involved pedestrians crossing marked crosswalks. In ten of the pedestrian crash incidences the driver failed to yield the right of way to the pedestrian.

However, between 2014 and 2018, a general downward trend in crashes was observed.<sup>10</sup> Also, while 80 percent of all crashes resulted in no injury, the two fatal crashed involved pedestrians. 60 percent of bicycle and pedestrian crashes occurred at intersections.

## Moving Forward

This documents marks a starting point to share and evaluate the access of sidewalks, curb ramps, signals, and crosswalks in relation to important destinations, such as schools, civic centers, the library, recreation (like the YMCA), parks, retail, and businesses. Having an inventory will help us complete future analysis that looks at how people travel to school, work, and other destinations important in their everyday lives.

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<sup>9</sup> Cerutti, L. 2020. "Street Smart Madison 2019 Campaign." TransOptions.

<sup>10</sup> Blickstein, S. 2020. "Mobility Open House Boards, Prepared for Madison Borough."

## **Bicycle Audit [Approved 2019, 5 Points]**

### **Summary**

Using Cycle Map from Open Street Map, Green Team members and cycling volunteers contributed to this bicycle audit for the Borough of Madison. We inventory three major off-road bicycle paths in our area, including the Traction Line connecting Madison with Morristown, and we identify bicycle lanes on the most heavily trafficked roads. We generated an online Google My Map locating public, accessible bicycle parking. We also explored opportunities and constraints given existing urban design. The bicycle audit demonstrates that modest changes can improve connectivity and use of valuable recreation areas in our community.

### **Review of Existing Bike Routes against 2005 plan.**

The 2005 plan divided its proposed bike lane and signage implementation into three categories: streets with striping, stenciling and signage both sides of road; streets with stenciling and signage only; and streets with signage only. Streets to be included in this program were selected to provide access to downtown by bicycle. The first two categories were implemented as proposed; only some of the streets in the third category were implemented.

### **Analysis of the Efficacy of the Plan and Its Continued Implementation**

Basically, those streets originally designated for stenciling have been maintained as such even when streets were repaved. Some streets have stenciling that has faded over time and is barely visible (notably Woodland). Some streets have stencils that use an image of a rider with a helmet and some use only a bicycle. The introduction of traffic calming bump-outs on streets such as Greenwood Ave. and Prospect St. causes the bike lanes to become narrower at the point of the bump-out, thus squeezing the cyclist closer to other traffic. Perhaps the weakest part of the on-road system is a lack of consistent, meaningful wayfaring directions for the cyclists. There is an instance on Danforth Road where signs point in multiple directions. There are places where a bike route sign is on one side of a street but not on the other, and there are instances where a bike route/downtown sign is placed at one end of the street but there is no sign at the other end telling the cyclist which way to turn. Going forward, the Green Team will present an inventory of such instances to Borough staff, recommending modest improvements.

Additionally, one of the first tier roads – Rosedale Avenue passes parkland, with playing fields, a picnic area and a community pool along its eastern flank. Notably missing from these areas are any bike racks. The original proposal included signage for an off-road path that runs from Memorial Park on Rosedale to Delbarton Park on Delbarton Ave. This trail can be accessed from several points along Rosedale but there is no signage.

After the bike plan was created, Madison acquired 49 acres from Florham Park to use as a recreation complex, with playing fields, wooded trails, meadows and a Community Garden. Connectivity to this complex needs to be improved. It lies just to the east of the intersection of Central Ave. and Ridgedale Ave. The bike lanes end abruptly here, at the end of Central Ave. There is a pedestrian crosswalk, which could be used by cyclists heading to the high school, just to the left of the intersection, but Ridgedale is an unsigned fairly narrow, almost shoulderless busy road and even though it widens in front of the recreation complex, there are no bike lanes or signage. There are no bike lanes on the long drive into the complex and no bike racks in evidence around the playing field parking lots. A wood-chipped path by the Community Garden can be ridden to connect the complex to Burnet St. just down from a right turn onto Chateau Thierry. There is no bike signage until a cyclist turns onto Chateau Thierry and coming in the other direction the Bike Route sign on Burnet near the gate to the pathway has no directional arrow to point to the path instead of a dead-end street.

*Off-road bicycle paths*

There are three primary off-road bicycle paths within the borough of Madison limits. An essential, connective pathway unites Madison from Danforth, to Morristown, New Jersey, via multi-purpose paths next to the NJTransit line (Figure 1).

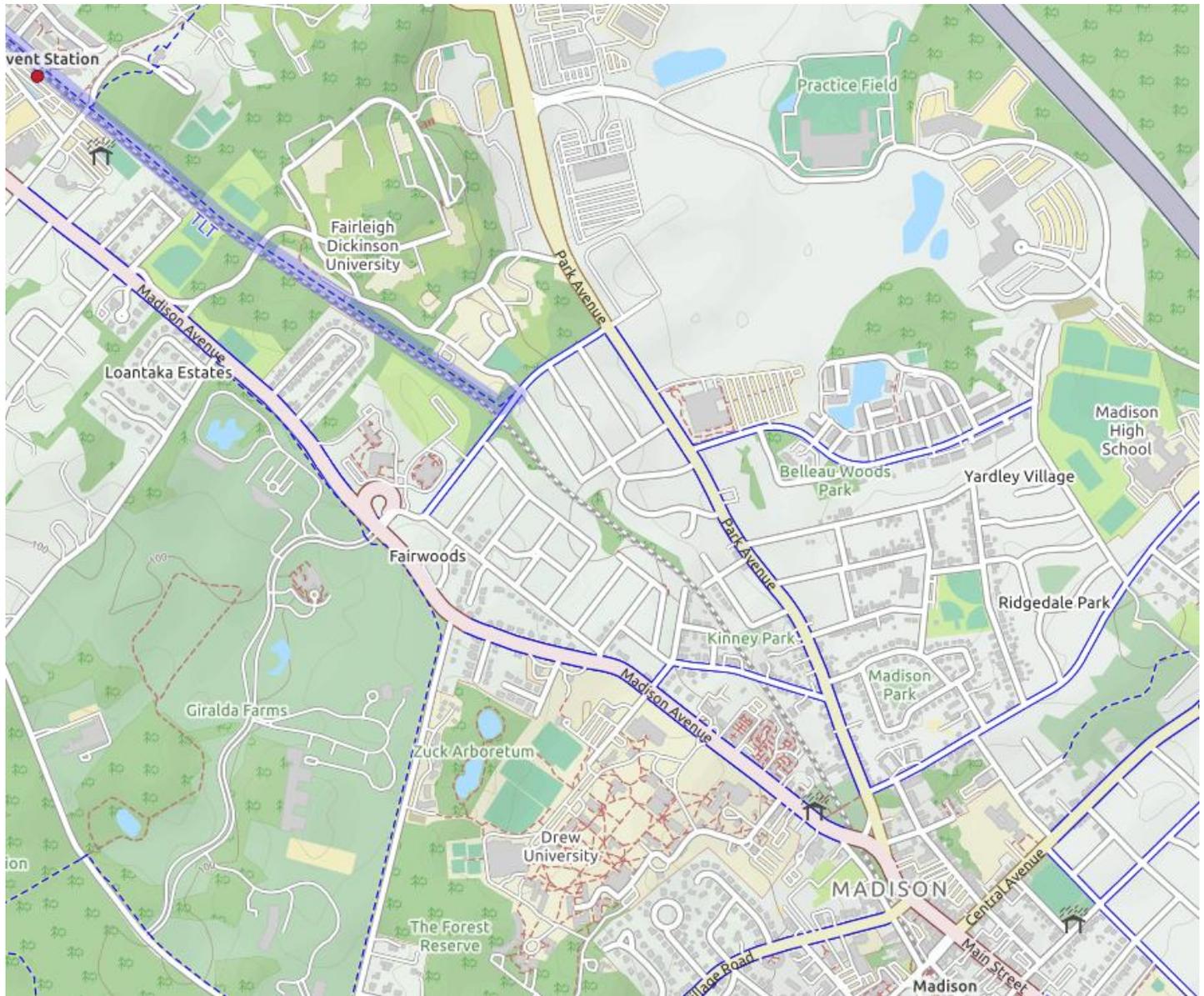


Figure 1. Open Street Maps: Cycle Map depicting the Traction Line Highlighted in Blue, North of Madison Avenue

Another important and established multi-use path partially encompasses the Giralda Farms corporate park. On the north side, this pathway extends along Madison Avenue to Tredwell Ave, and runs North-South on Loantaka Way from Madison Ave. to Woodland Ave. On the South side, the path goes from Loantaka Way, slightly past the South entrance into Giralda Farms (Figure 2). Though not completely included in the Borough of Madison, this multi-use path provides an important connection to the extensive multi-use trails in Morris County's Loantaka Brook Reservation.

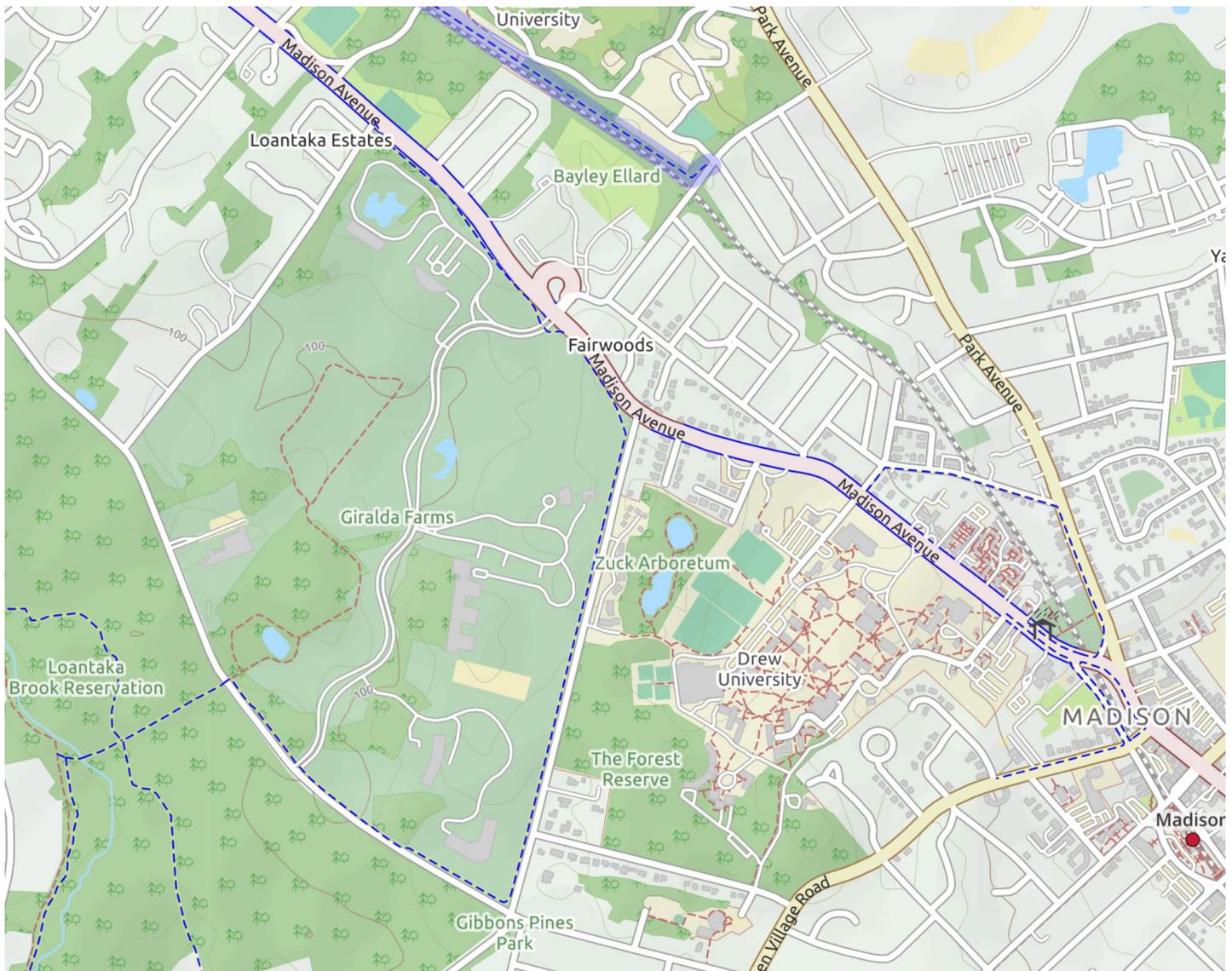


Figure 2. Open Street Map: Cycle Map Depiction of Giralda Farms Multi-use Path

The third off-road bicycle and pedestrian path in Madison recently opened up in Summerhill Park (Figure 3). This 1.5 miles of trail was sponsored by a grant from the Morris County Planning and Preservation Trail Construction Grant Program, and opened June 1, 2019.<sup>11</sup> The trail connects Dehart Place, which borders Central Avenue Elementary School, to Ridgedale Avenue, across from Madison High School. Please also note that the trail has a loop that is not shown on this map. Also, the northwest exit of Summerhill Park leads to Ridgedale, almost directly across from Burnet Rd, a side entrance to the high school.

<sup>11</sup> Borough of Madison, "Summerhill Park Trail Ribbon Cutting Ceremony | Madison Borough, NJ."

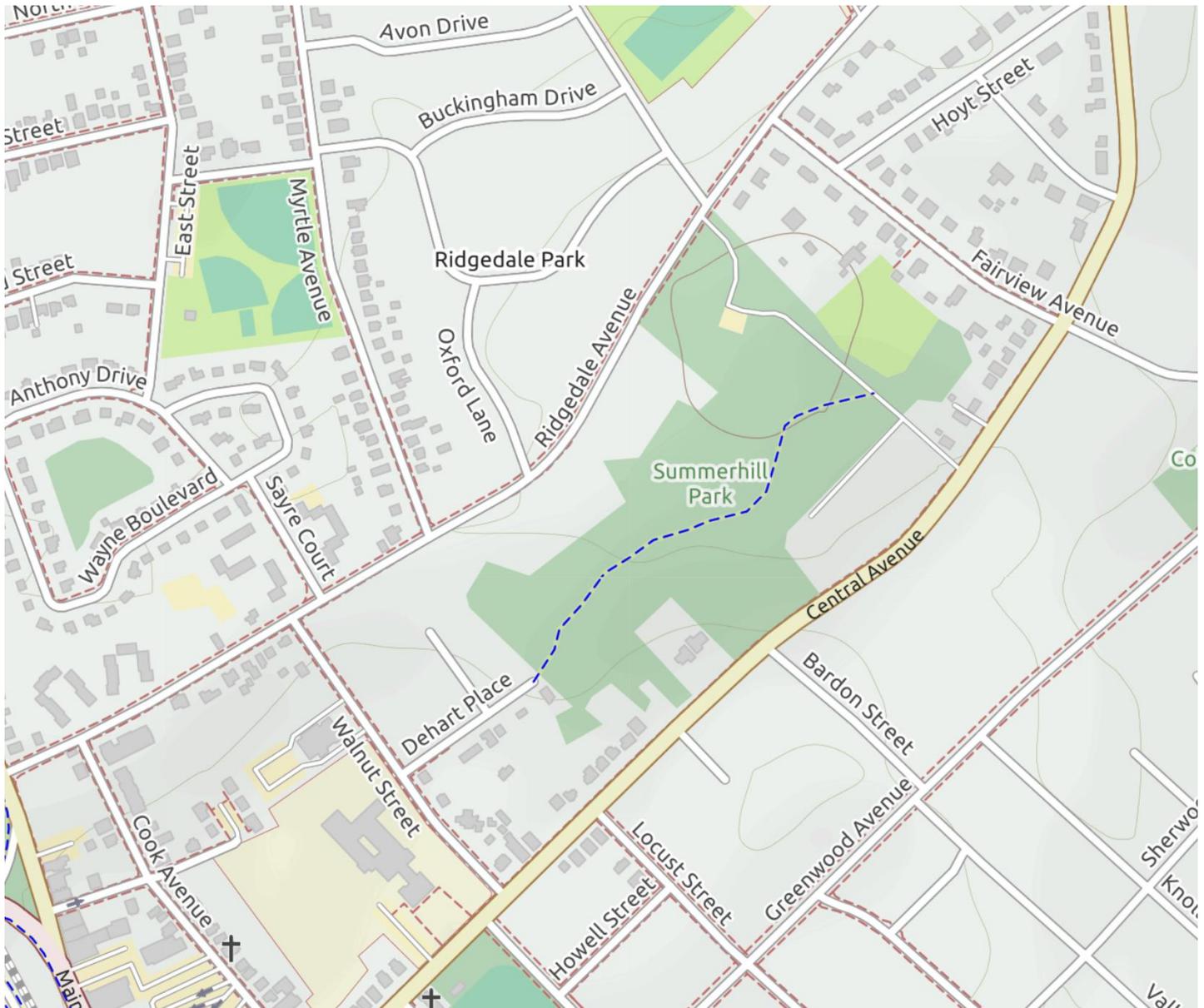


Figure 3. Open Street Map: Cycle Map Depiction of Multi-use Trail through Summerhill Park

*Bike lanes*

On the west end of town, bike lanes appear on both north and south sides of Madison Avenue between downtown, where Park Ave. intersects Madison Ave, on the east side and Loantaka Way, on the west side (Figure 4). This connects Drew University to downtown Madison. Cyclists can access the Fairleigh Dickinson campus via Danforth Road and the Traction Line, although this route is not as straightforward and signage could be improved.

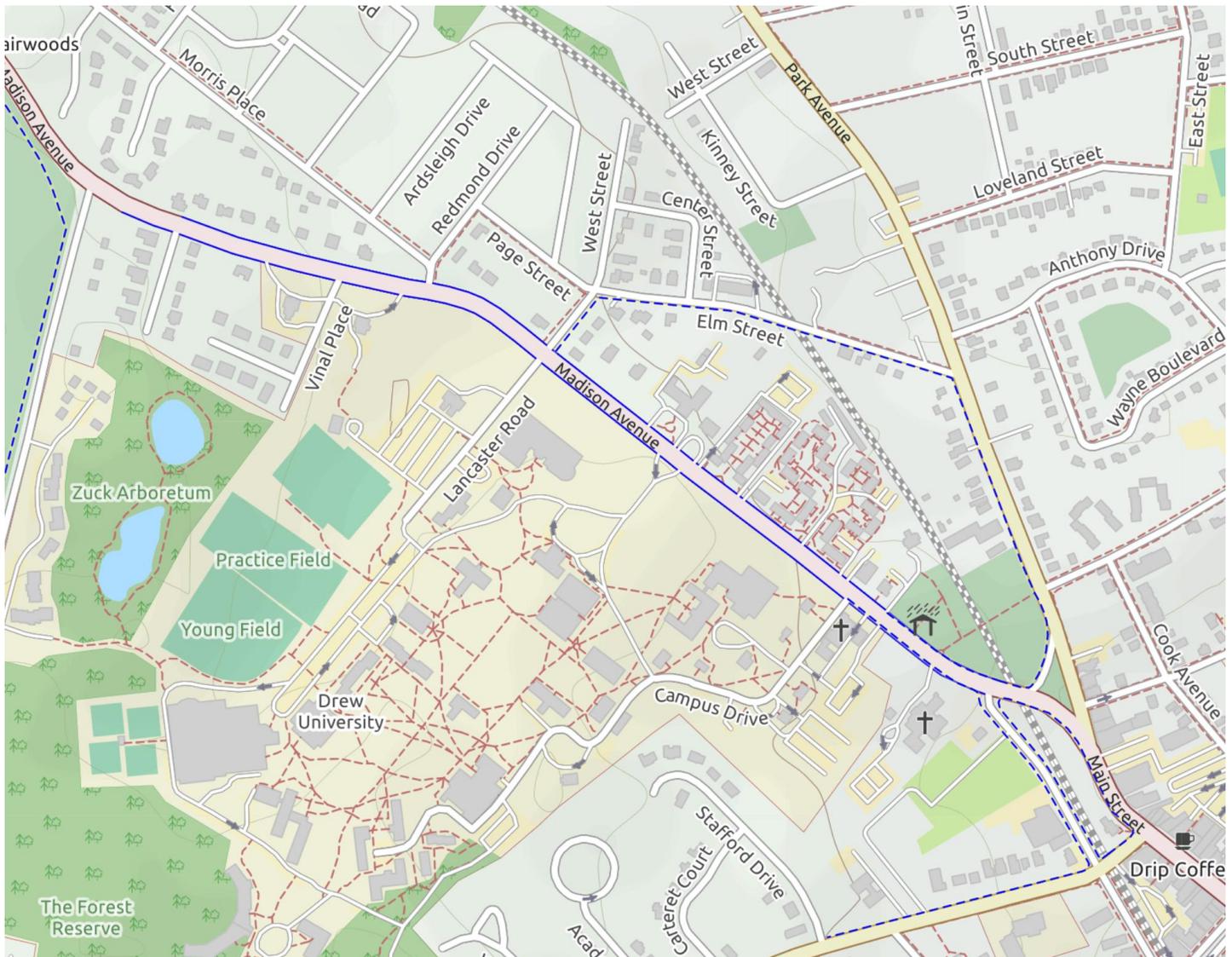


Figure 4. Open Street Map: Cycle Map depicting bicycle lanes on Madison Ave.

Several through streets in town that lead from town borders to downtown are stenciled, striped and signed. These include Rosedale, Greenwood/Prospect, Central/Green; also Chateau Thierry, at the west edge of town, Woodland, which parallels Main Street, -and a portion of Green Village Road (between Wilmer and Woodland) are stenciled, striped and signed. Portions of other streets have shoulder striping and/or Share the Road or Bike Route signs (e.g., Kings Road (passes by Kings Rd. Elementary School), Cedar St. (connects Park Ave. to Danforth and the Traction Line), Morris Place (connects Danforth & Traction Line to Madison Ave.), Brittin (passes by the back of Madison Junior School)). Some such as Elm St. (a connector between Park Ave. and Madison Ave.) have only shoulder striping but no bike route or Share the Road signage.

### *Bicycle parking*

Using Google MyMaps and a location-enabled cell phone, we identified over 25 racks next to NJTransit (there are also three in the train station tunnel near the elevator and the ticket kiosks), and an additional four bicycle racks in the downtown shopping areas (Figure 5, and Figures 7-8). There are also about a dozen bicycle racks at the new Rose Hall complex on Kings Rd., which includes the Madison Community Arts Center, and an old cement bicycle station at the

Madison Public Library on Keep St. Whole Foods Market on Main St. has bike racks inconveniently located at the rear of the building where they are often obstructed by shopping carts. We also observed many people leaning unlocked bicycles next to trees or buildings, suggesting the trusting nature of pedestrians who visit these businesses (Figure 6).

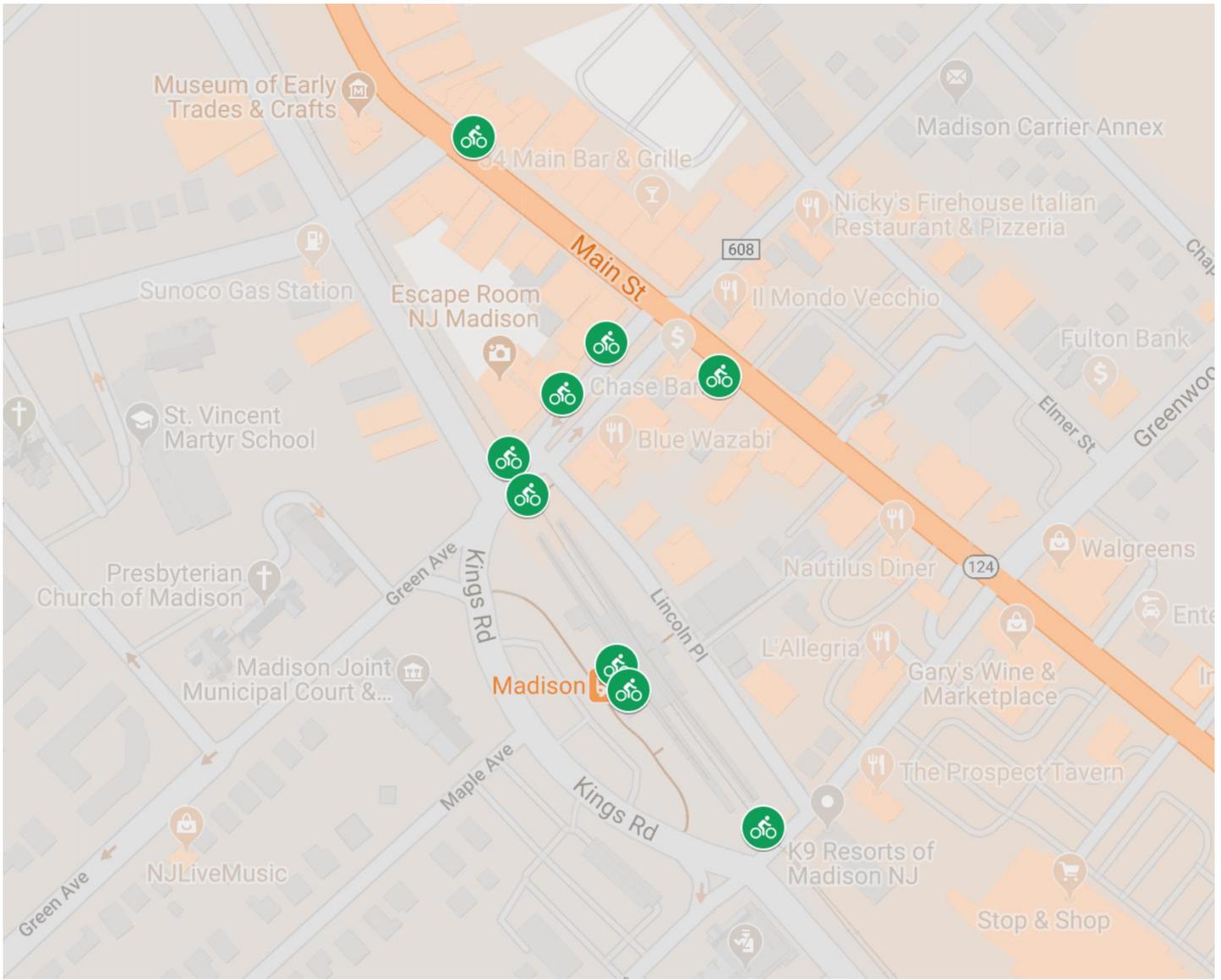


Figure 5. Map of Downtown, Madison Borough Bicycle Parking, available [online, http://bit.ly/MadisonNJBikeRacks](http://bit.ly/MadisonNJBikeRacks)



Figure 6. Unattended bicycles



Figure 7. Madison Bicycle Racks by Local Businesses



Figure 8. Extensive Parking by NJTransit

*Shared lanes marked with signs or shared-use arrows*

The bicycle lanes described above include a hard line, not dashed, that suggests a separate lane. However, these are shared lanes. As explained in the frequently asked questions in the Complete Streets Policy guide published by the borough:

“Treat a bicycle lane the same as other traffic lanes.” Also, “You may park in a bicycle lane if your vehicle does not block a bicyclist and/or there is not a ‘No Parking’ sign posted.”

**Opportunities and Constraints**

*“Missing link” in the bicycle network on a specific street*

At the intersection of Madison Ave. and Loantaka Way, the bicycle lanes merge into the traffic lane. Also notable is the poor connectivity to the vitally important traction line. To have contiguous multi-use path from Madison to Morristown is outstanding, but it is not easily accessed by Drew University students or downtown travelers. Additional signage may help the flow of cyclists trying to follow the established bike routes.

*Area with limited facilities*

While the access and quantity of storage for bicycles near NJTransit is laudable, the deteriorating conditions of the exterior of the underpass may present users, particularly women, with safety concerns. Improved lighting and

beautification (e.g. street art or murals) around the storage may increase its desirability, and call attention to existing bicycle infrastructure in a positive way.

#### *Challenging roadway or intersection crossing*

Though bicycle lanes are present along Madison Avenue, so is dangerous traffic. Borough complete street records include average daily traffic volumes, using 1988 data. The busiest road, Main Street, east of Rosedale, experienced an average daily traffic volume of 29,000 vehicles. It is reasonable to assume that these numbers have increased over the past thirty years. Additional signage, speed signs, may slow traffic and alert drivers to the frequent pedestrian and cyclist use of this roadway.

#### *Wide travel lanes*

Though ideas for improvements are easy to find, major roadways in Madison are only two lanes. Frequently bicycle lanes are used by motorists to pass other motorists, particularly when turning.

### **Conclusion**

The Borough of Madison is a small area with relatively little traffic compared to many places in New Jersey. However, pedestrians and cyclists still face risks when traveling, due to problems of design and poor recognition by motorists. Furthermore, valuable multi-use pathways may be made much more accessible by improvements in connectivity and wayfaring signage. The expansion of Summerhill trails is a welcome addition for both pedestrians and cyclists.