



BIKE Passaic County

Existing Conditions Summary Memorandum

June 30, 2022



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Existing Conditions

The existing conditions analysis identifies existing bicycle facilities, evaluates safety risks and the suitability of the roadway network for bicycle travel, and creates the resources to support identification and selection of the proposed county bicycle network. The existing conditions assessment includes a crash analysis, trip destinations and attractions, and barriers and constraints to cycling, including the Bicycle Level of Stress (LTS) metric.

Bicycle Crashes and Hotspots

Crash data was collected using NJDOT's Safety Voyager platform for bicycle crashes the most recent six years of data (2014-2019). Many studies have found that crashes involving pedestrians and cyclists are frequently underreported. Therefore it should be noted that although the actual crash numbers and severity findings for Passaic County may be higher than noted in this plan, this assessment is limited to the available and reported crash data.

Passaic County bicycle crash data are summarized in Table 1. During the six-year period (2014-2019), 620 bicycle crashes were reported; 16 of these resulted in serious injuries and three fatalities; two of the three fatalities occurred in Paterson. The data and hotspots maps indicate more frequent crash occurrence in the urbanized areas of Passaic County. Paterson, for example, accounts for 29.2% of county population but almost 36% of all reported bicycle crashes.

Passaic County's total of 620 bicycle crashes during the 2014-2019 period was 5.7% of the statewide total of 10,856 crashes. Passaic accounted for 5.6% of statewide population during this period, so overall the County is about average for its share of total bicycle crashes in New Jersey.

Table 1: Bicycle Crash Data Summary, (2014-2019), , NJDOT Safety Voyager

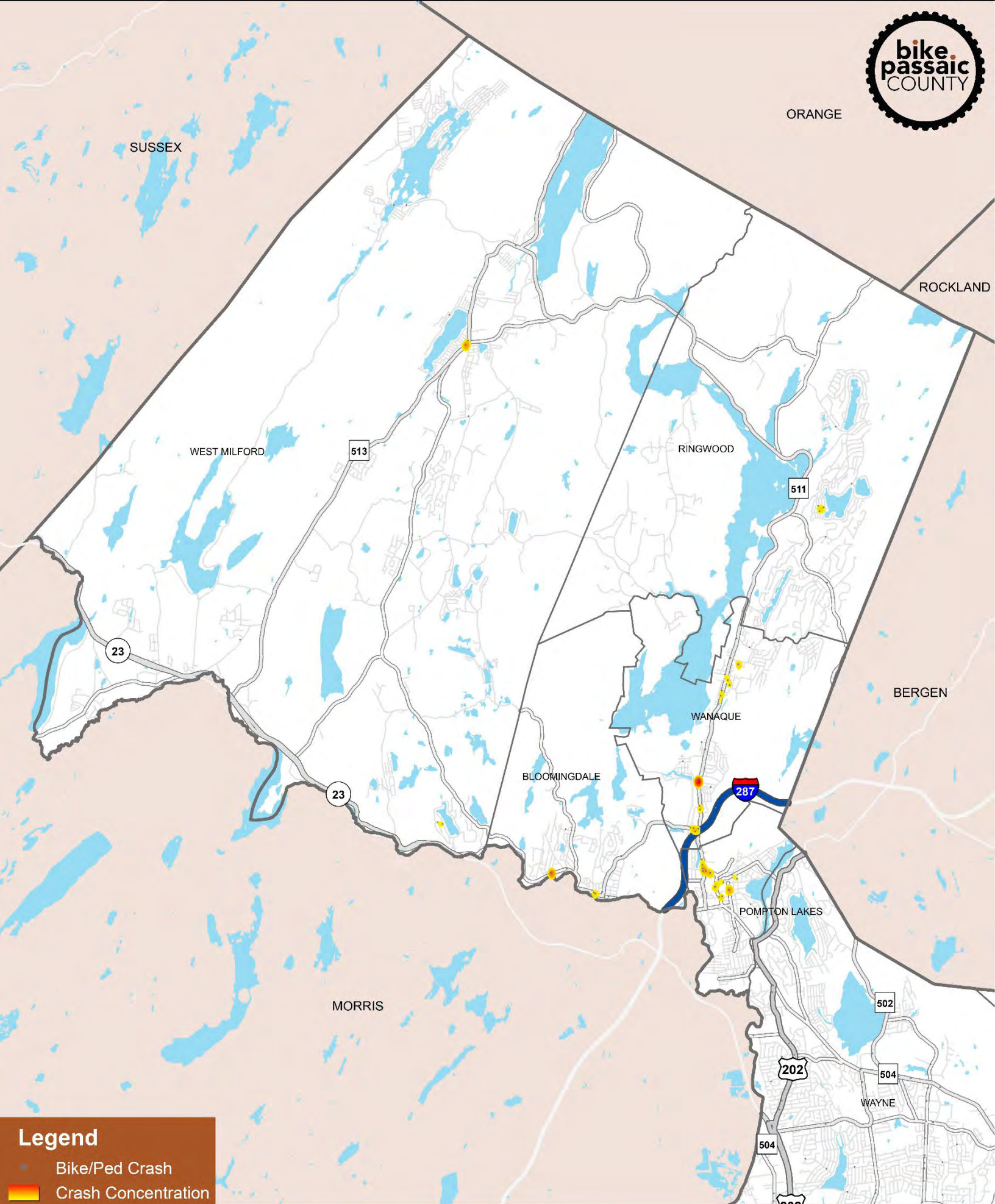
Comparison of Bicycle Related Crashes (2014-2019)				
Severity	Passaic County		New Jersey	
	Count	% of Total	Count	% of Total
Fatal	3	0.5%	85	0.8%
Suspected Serious Injury	16	2.6%	293	2.7%
Suspected Minor Injury	152	24.5%	3,304	30.4%
Possible Injury	315	50.8%	4,895	45.1%
Property Damage Only	134	21.6%	2,279	21.0%
Total	620	100.0%	10,856	100.0%
Roadway Network				
	Count	% of Total	Count	% of Total
County Road	295	47.6%	3,898	35.9%
Municipal Road	312	50.3%	5,198	47.9%
State Highway	13	2.1%	1,598	14.7%
Other	-	0.0%	162	1.5%
Total	620	100.0%	10,856	100.0%
Crash Location				
	Count	% of Total	Count	% of Total
At Intersection	382	61.6%	6,174	56.9%
Not at Intersection	238	38.4%	4,682	43.1%
Total	620	100.0%	10,856	100.0%
Roadway Condition				
	Count	% of Total	Count	% of Total
Dry	565	91.1%	9,808	90.3%
Wet	50	8.1%	966	8.9%
Snowy	3	0.5%	21	0.2%
Icy	-	0.0%	7	0.1%
Other	-	0.0%	13	0.1%
Unknown	2	0.3%	41	0.4%
Total	620	100.0%	10,856	100.0%
Light Condition				
	Count	% of Total	Count	% of Total
Daylight	452	72.9%	8,011	73.8%
Dusk	21	3.4%	352	3.2%
Dawn	7	1.1%	102	0.9%
Dark (no streetlights)	10	1.6%	203	1.9%
Dark (street lights off)	7	1.1%	79	0.7%
Dark (street lights on, Cont)	104	16.8%	1,649	15.2%
Dark (Street lights on, Spot)	19	3.1%	413	3.8%
Unkown	-	0.0%	47	0.4%
Total	620	100.0%	10,856	100.0%
Environmental Condition				
	Count	% of Total	Count	% of Total
Clear	559	90.2%	9,691	89.3%
Overcast	23	3.7%	400	3.7%
Rain	34	5.5%	658	6.1%
Snow	3	0.5%	26	0.2%
Other	-	0.0%	30	0.3%
Unkown	1	20.0%	51	0.5%
Total	620	100.0%	10,856	100.0%

Reported bicycle crashes in Passaic County occur more frequently at intersections than statewide averages (61.2% vs. 56.9%) and therefore less frequently away from intersections than statewide (38.4% vs. 43.1%).

Dedicated bicycle facilities at intersections and fully separated facilities are among the improvements that may lessen bicycle crash risk at intersections. Sparse roadway networks and high intersection turning volumes may also be among the factors that contribute to increased risks for bicycle travel at Passaic County intersections.

Greater percentages of reported Passaic County bicycle crashes occur on county and municipal roadways than statewide averages, heightening the responsibility for addressing bicycle safety for Passaic County and its constituent municipalities, compared to NJDOT-owned roadways.

Reported bicycle crashes and hotspots are illustrated in Figures 1 and 2. Although distributed across the county as a whole, the most significant hotspots occur in the urbanized areas of Paterson and Passaic and in the less densely populated Pompton Lakes, with lesser concentrations in Clifton and Wayne. In the northwest, the hotspots are reflective of the sparse population and roadway network, and occur mostly along the few major regional roadways and at significant intersections. Paterson is home to 29.2% of the county population and Passaic is 16.8%; together 46% of county residents live in these two cities.

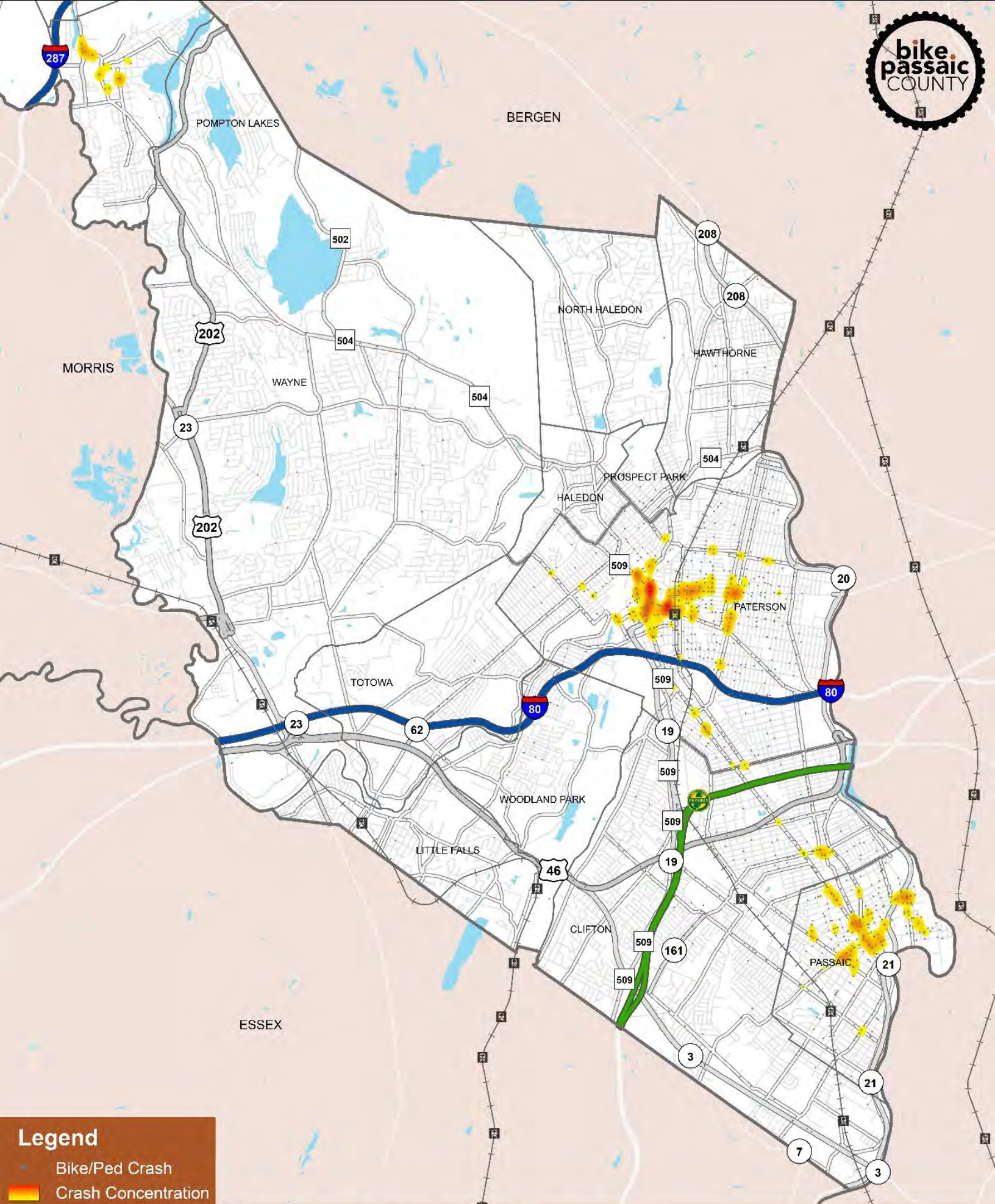


Legend

- Bike/Ped Crash
- Crash Concentration

Figure 1: Bicycle Crashes and Hotspots, Northwest

0 1 2 Miles



Legend
● Bike/Ped Crash
■ Crash Concentration

Figure 2: Bicycle Crashes and Hotspots. Southeast



Speed and Crash Occurrence & Severity

Many studies including the New Jersey Complete Streets Design Guideⁱ have shown that slower motor vehicle speeds exponentially increase the survival rates for both pedestrians and bicyclists who are involved in a collision with a motor vehicle. Studies have also suggested that not only can bicycle infrastructure help slow motorists travel speeds but increasing the presence of cyclists and pedestrians has a traffic calming effect as well.ⁱⁱ

As figure 3 below illustrates, a crash that takes place at 30 miles per hour is 800% more likely to result in a fatality than a crash at 20 miles per hour. Consequently, 20 mile-per-hour speed limits are ideal for roadways heavily travelled by pedestrians (and bicycles).

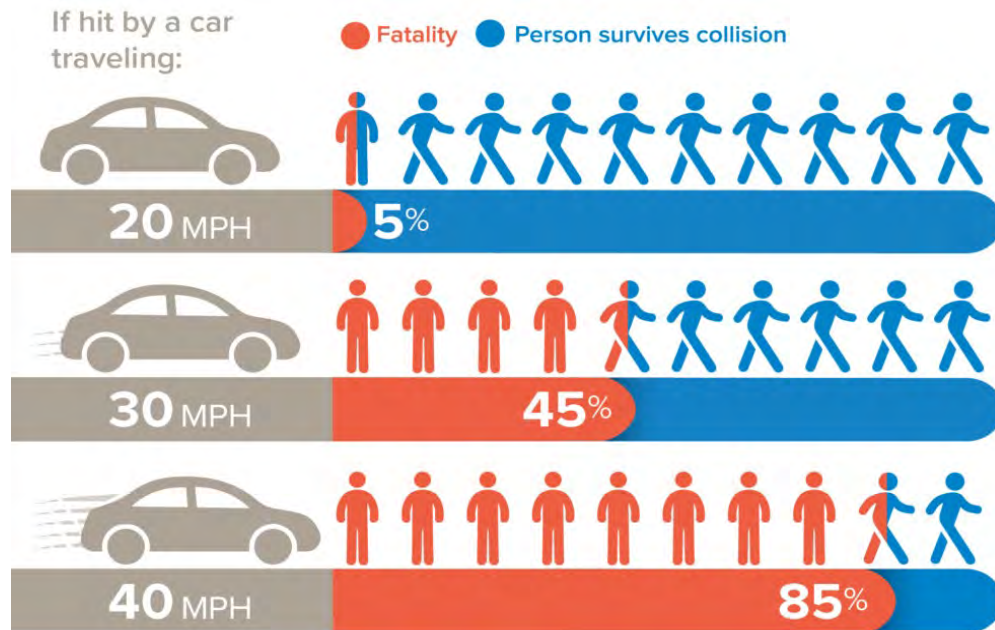


Figure 3 - Risk of Fatality and Serious Injury to Pedestrians vs Vehicle Speed.
National Traffic Safety Board (2017)ⁱⁱⁱ

Bicycle Level of Stress (LTS) and Island Effect

Bicycle Level of Traffic Stress (LTS) evaluates a bicyclist’s potential comfort level given the current use and design of the roadway, and has proven influential in the advancement of bicycle planning in the United States. The LTS metric is based on the Dutch concept of low-stress bicycle facilities and advanced in the U.S. by research supported by the Mineta International Institute for Surface Transportation.^{iv} See Figure 4 below.

In general, lower stress facilities have increased separation between cyclists and vehicular traffic and/or have lower speeds and lower traffic volumes. Higher stress environments generally involve cyclists riding in close proximity to vehicular traffic, multi-lane roadways, and higher speeds or traffic volumes.

Four levels of traffic stress were used to evaluate the Passaic County’s road network:

- Level of Traffic Stress 1: The level most users can tolerate (including children and seniors). Often called ‘ages 8 to 80’
- Level of Traffic Stress 2: The level tolerated by most adults
- Level of Traffic Stress 3: The level tolerated by “enthusiastic” riders who might still prefer dedicated space but able to mix with vehicular traffic
- Level of Traffic Stress 4: The level tolerated only by the most experienced riders

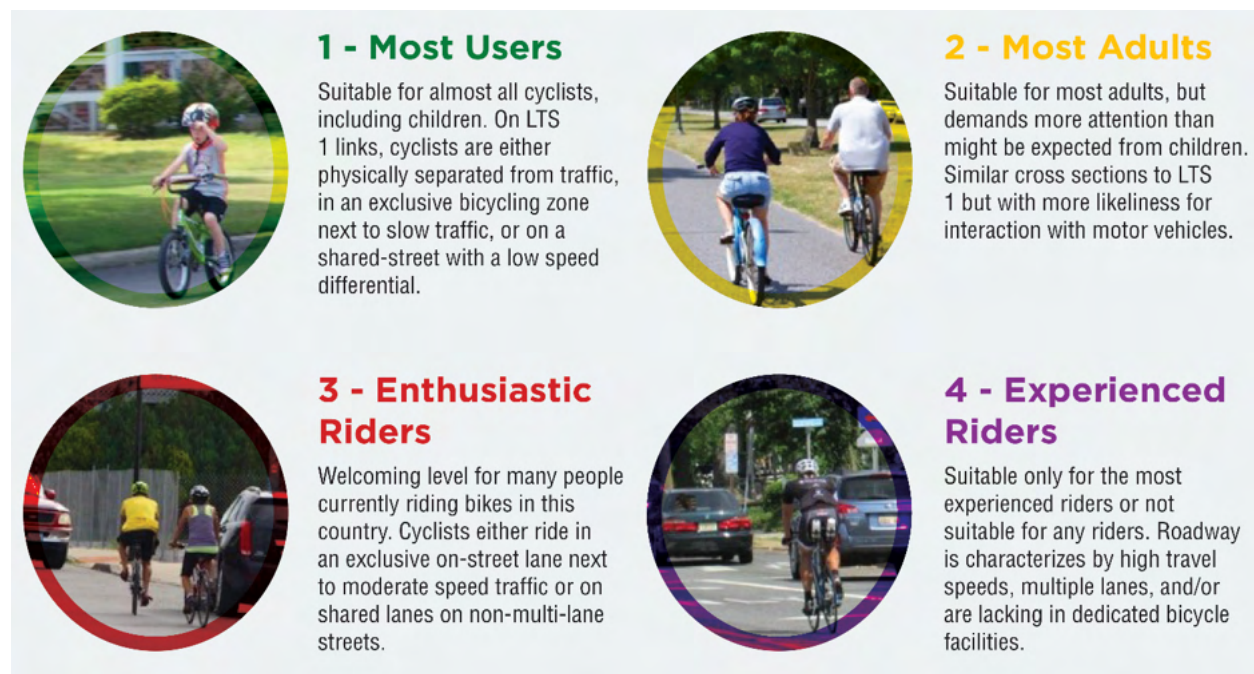


Figure 4: The Four Types of Bicyclists by Level-of-Traffic-Stress (LTS)

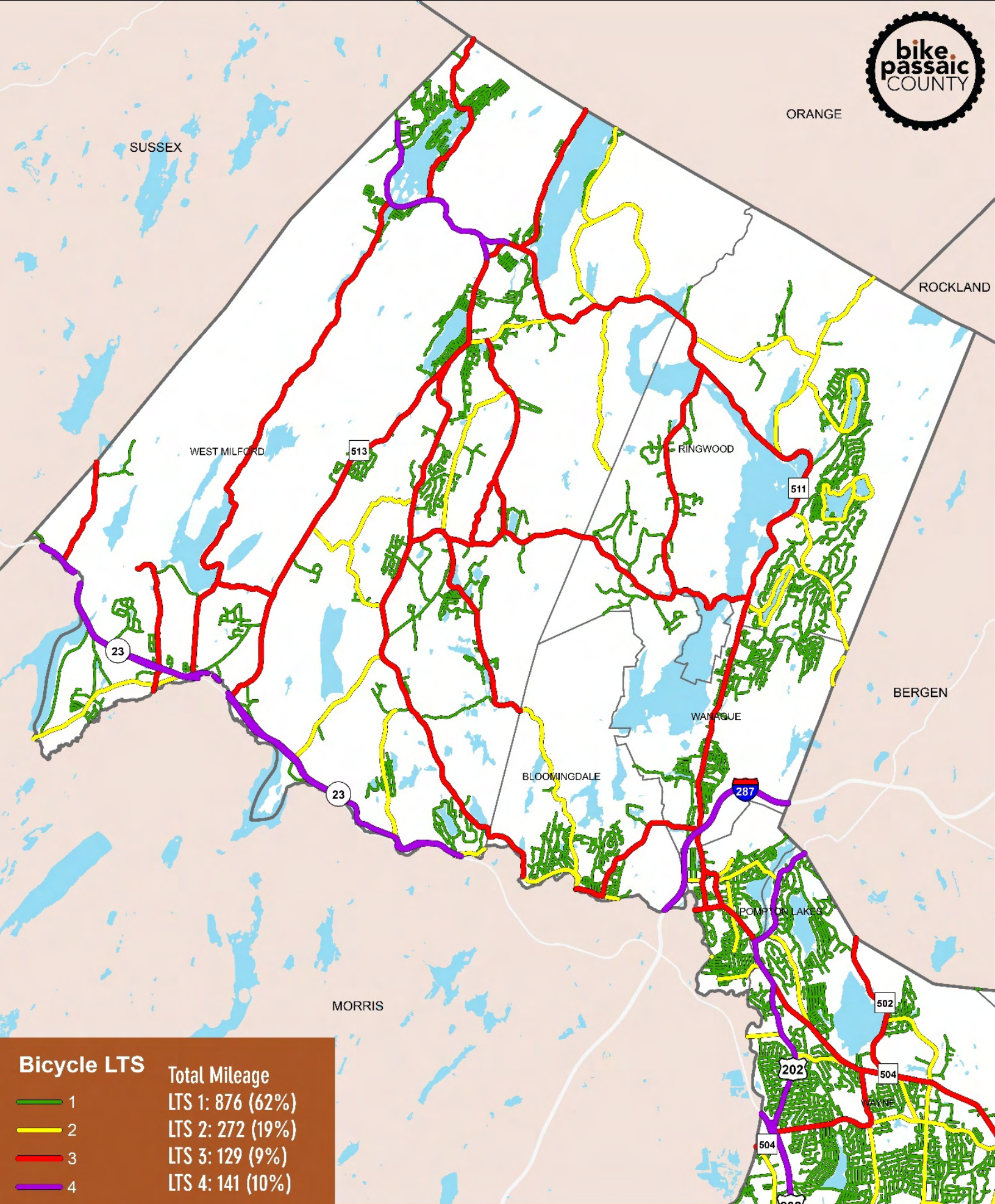
The LTS metric was evaluated for the Passaic County roadway network using a variety of data sources, including base mapping, GIS data files, traffic data from NJDOT, and roadway dimension data from Google Earth and Maps. Supplemental virtual field evaluations to take measurements and verify various roadway features, character, parameters, and user behavior. For most of the local roads in the study area, basic assumptions were made of their typical characteristics where to data availability was limited.

From the perspective of low stress (LTS 1 and 2) cyclists, such as children bicycling to school or most adults riding in their neighborhoods or to the local park or main street, Passaic County has many accessible roadways. LTS 1 and 2 roadways comprise about 81% of the total countywide network.

Overall, however, the LTS analysis shows that Passaic County's roadway network presents a very stressful environment for many bicycle trips, with the low-stress network heavily fragmented and isolated by higher-stress LTS 3 and 4 roadways, introducing significant barriers and gaps in mobility and access.

In the northwest (see Figure 5), the roadway network is sparse with few regional roadways and very limited connectivity and roadway capacity. Many of the primary routes were evaluated as high stress roadways, including Clinton Road, Union Valley Road, Macopin Road, Westbrook Road, Otterhole Road, Stonetown Road, Greenwood Lake Turnpike, and Ringwood Avenue. The low stress network is mostly limited to neighborhood streets that provide local access but limited regional connectivity.

In the southeast (see Figure 6), the roadway network is more developed but still dominated by high stress roadways, including many County Routes and municipal roadways, including Berdan Avenue, Hamburg Turnpike, Ratzler Road, Belmont Avenue, Ling Hill Road, Rifle Camp Road, and large portions of the densely population and traffic heavy cities of Paterson, Passaic, and Clifton. Interstate-80, U.S. 202, and NJ Routes 3, 7, 19, 20 21, 23, 46, 62 and others all create significant barriers to bicycle and pedestrian mobility. Many New Jersey state and county roadways provide very limited or no bicycle access.



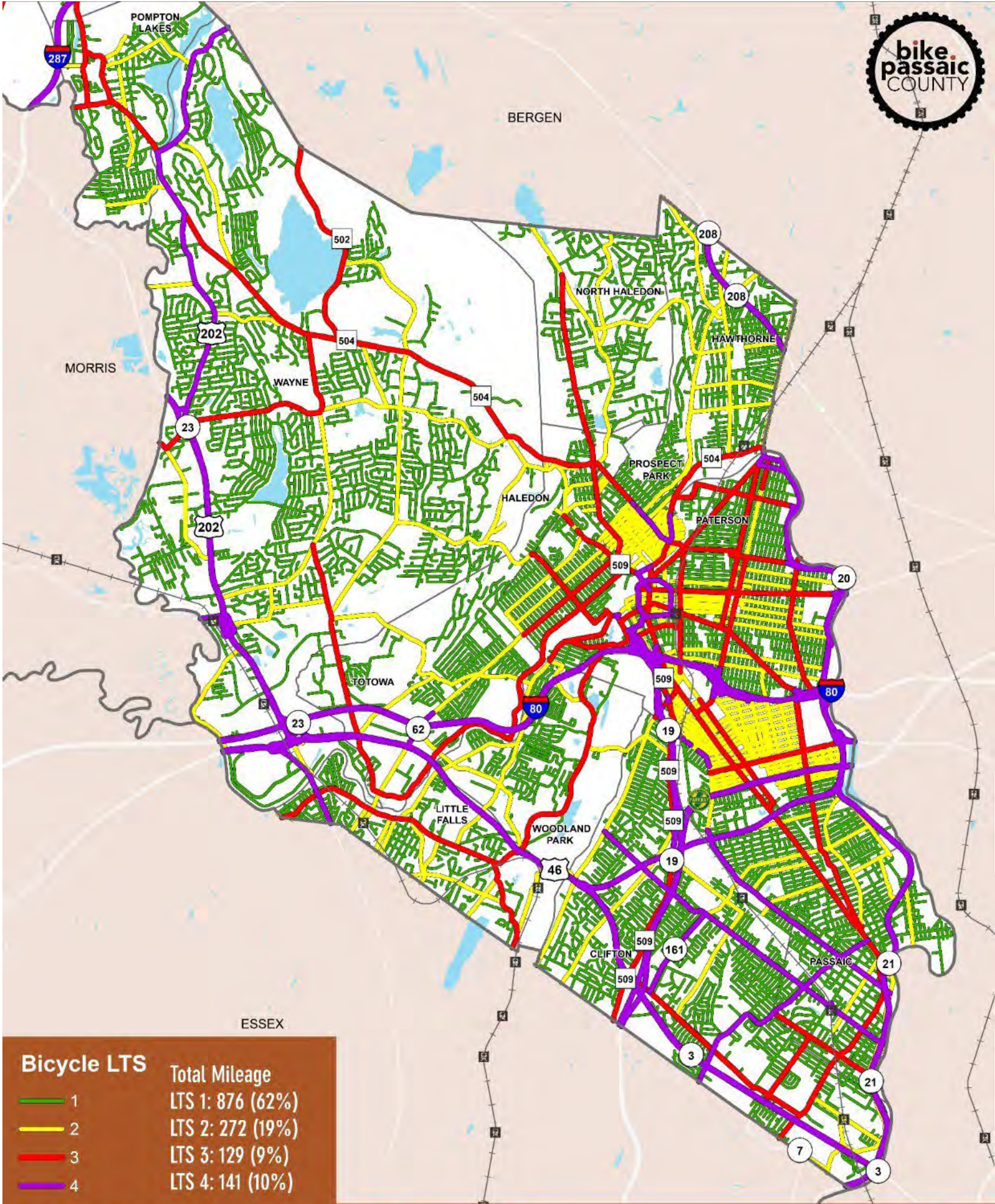
Bicycle LTS

- 1
- 2
- 3
- 4

Total Mileage
LTS 1: 876 (62%)
LTS 2: 272 (19%)
LTS 3: 129 (9%)
LTS 4: 141 (10%)

Figure 5: Existing Bicycle LTS, Northwest

0 1 2 Miles



Bicycle LTS	Total Mileage
1	LTS 1: 876 (62%)
2	LTS 2: 272 (19%)
3	LTS 3: 129 (9%)
4	LTS 4: 141 (10%)

Figure 6: Existing Bicycle LTS, Southeast



These conditions create an island effect, with numerous small but isolated low-stress “islands” of local mobility frequently disconnected from adjacent areas and neighborhoods, with the net effect of containing residents within their neighborhoods, and limiting access to key destinations and attractions.

This is consistent with comments and observations from the community engagement effort; many respondents indicated they are unable or uncomfortable to range beyond their own streets and neighborhoods by bicycle due to safety concerns, exposure to high traffic volumes, speeds, large trucks and busses, and aggressive and inattentive driving behaviors.

In northwest Passaic County, the roadway network is sparse with few regional roadways and very limited connectivity and roadway capacity. (See Figure 7) Many of the primary routes were evaluated as high stress roadways, including Clinton Road, Union Valley Road, Macopin Road, Westbrook Road, Otterhole Road, Stonetown Road, Greenwood Lake Turnpike, and Ringwood Avenue. The low stress network is mostly limited to neighborhood streets that provide local access but limited regional connectivity. The island effect, presented in the following paragraphs, is severe in the northwest.

The unique topography, severe terrain, and prevalence of lakes and water bodies of the northwest also play a significant role in the island effect, magnifying traffic stress and isolation, and creating additional barriers to mobility.

In the southeast, the roadway network is more developed but still predominated by high stress roadways, including both County Routes and municipal roadways, among them Berdan Avenue, Hamburg Turnpike, Ratzler Road, Belmont Avenue, Ling Hill Road, Rifle Camp Road, and large portions of the densely population and traffic heavy cities of Paterson, Passaic, and Clifton. Interstate 80, U.S. 202, NJ Routes 3, 7, 19, 20, 21, 23, 46, 62, and others all create significant barriers to bicycle and pedestrian mobility. Many state and county roadways function as de facto highways with very limited or no bicycle access provided.

In the southeast of the County, the island effect is less severe, although barriers and gaps are common across the region. (See Figure 8) The islands are effectively larger, and the barriers and gaps become more pronounced and inhibiting. Regardless of the size and extent of an island, it still has the net effect of containing residents within their neighborhoods, limiting access, mobility, and opportunity.

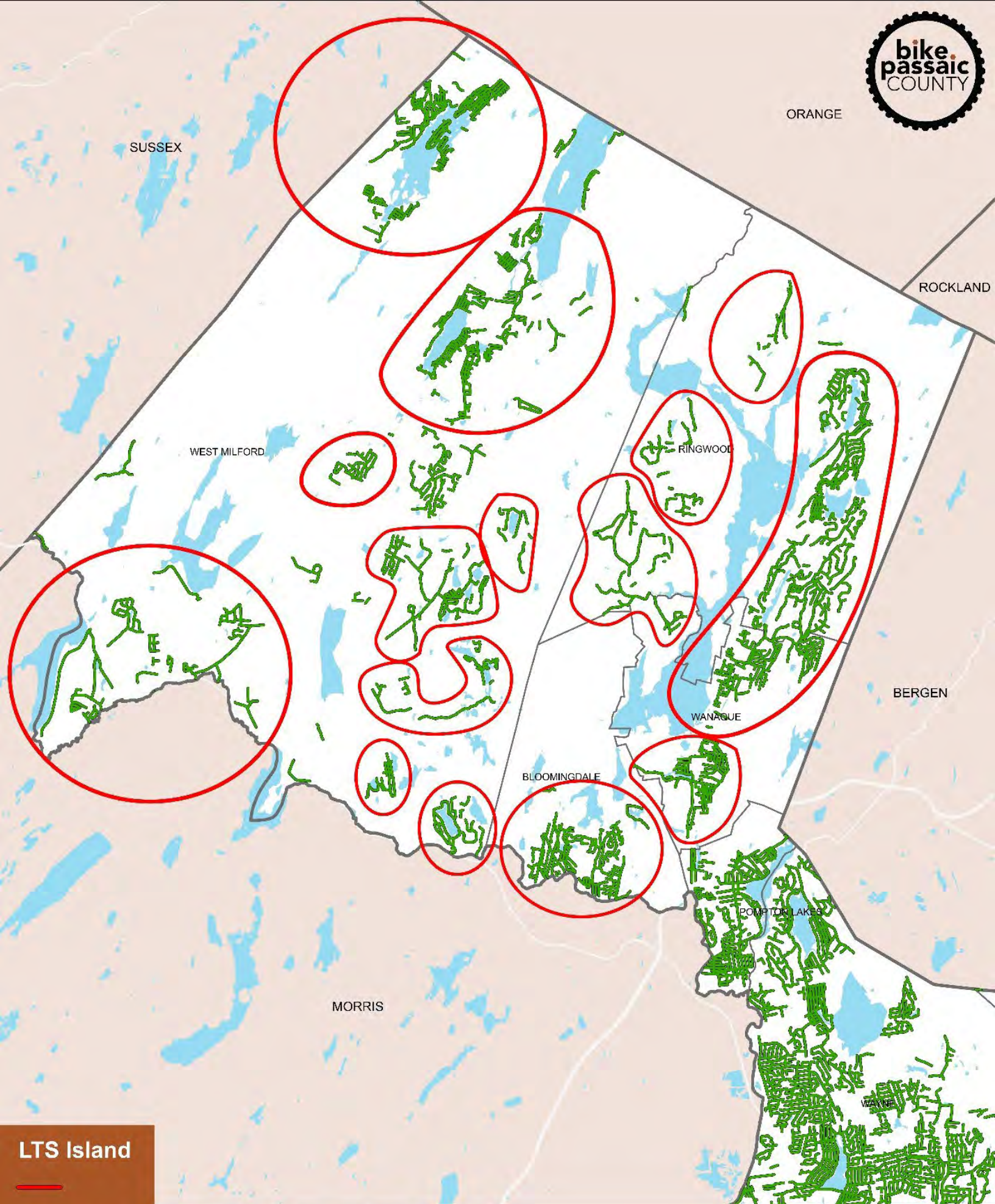
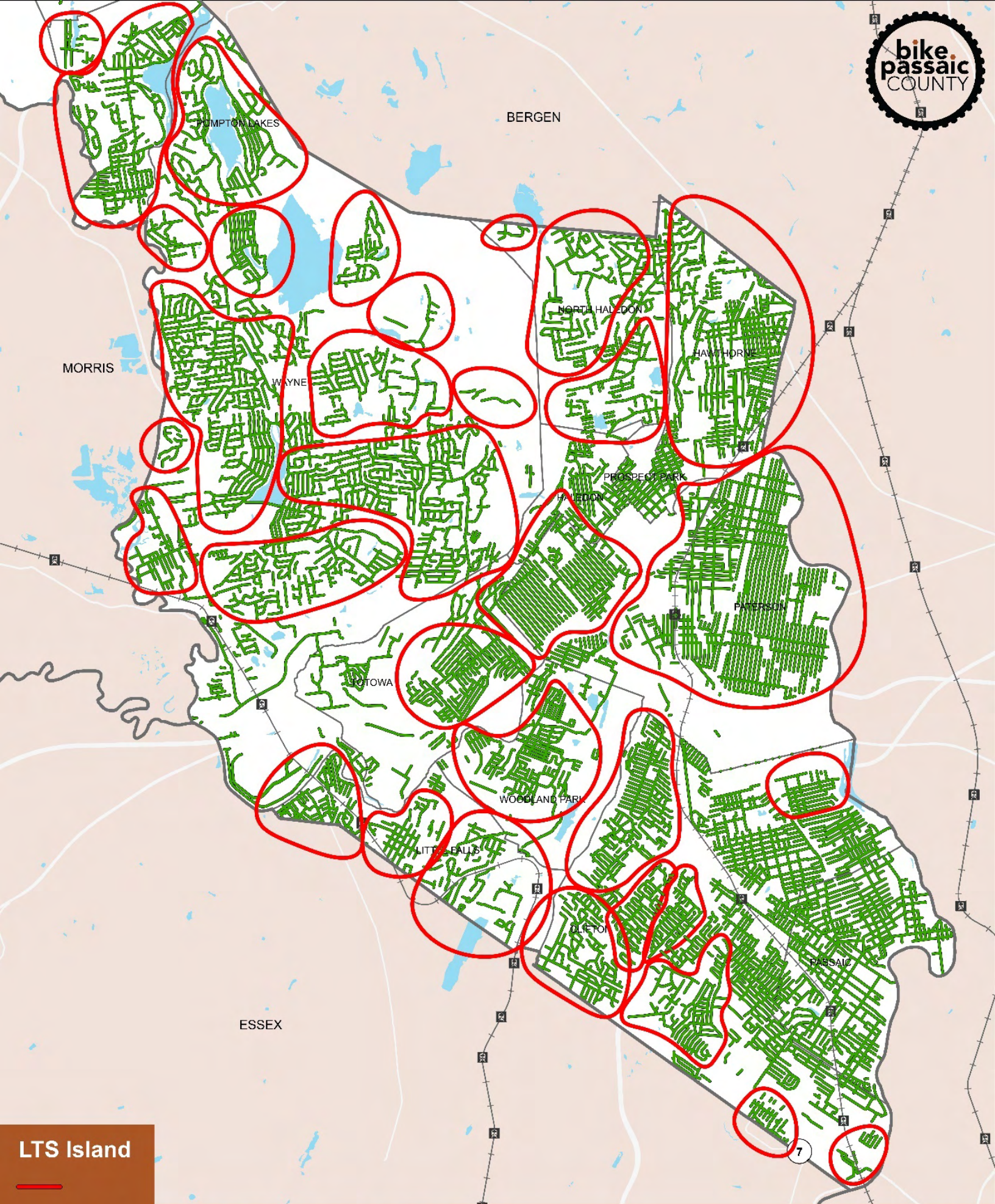


Figure 7: Island Effect, Northwest





LTS Island

Figure 8: Island Effect, Southeast

0 0.5 1 Miles



Roadway Network

As noted in *Moving Passaic County*,^v one third of the lane miles of higher level roadway system (Passaic County-owned, State/U.S. roadways, and Interstate highways) is on County roadway which provide most of the connectivity between higher functional classification roadways and local residential areas and destinations, making the county network essential in providing mobility and access for people and goods in Passaic County. This finding is even more pronounced in the northwest, which is skewed even more heavily to the county system and where the county network makes up the majority of the lane mileage. This makes the county network an essential component of bicycle mobility in Passaic County.

Much of the higher level roadway network in Passaic County was also found to be “congested” as defined in *Moving Passaic County*. This includes portions of the principal New Jersey Routes (3, 19, 20, 21, 23, 46) and others, and County roadways (including Paterson-Hamburg Turnpike (CR 504), Haledon Avenue, Union Boulevard and Totowa Road, McBride Avenue, Market Street, Grand Street, Broadway, Main Street/Main Avenue, Getty Avenue, Straight Street, and Allwood Road).^{vi}

This finding is supported by the LTS assessment and Island Effect analysis, which show that many Passaic County roadway are high-stress and not accessible to most bike riders.

Trip Destinations and Attractions

Passaic is a diverse county, with a complex and challenging geography, home to many lakes and water bodies, and a long and rich history. Passaic features a wealth of trip destinations and attractions, many of which have the potential to be accessible to travel by bike and foot. Destinations and attractions typical include land uses attractive to bike riding such as school, parks, downtowns, etc.

Figures 9 and 10 illustrate the location of key destinations and attractions, many of which are dispersed throughout the county.

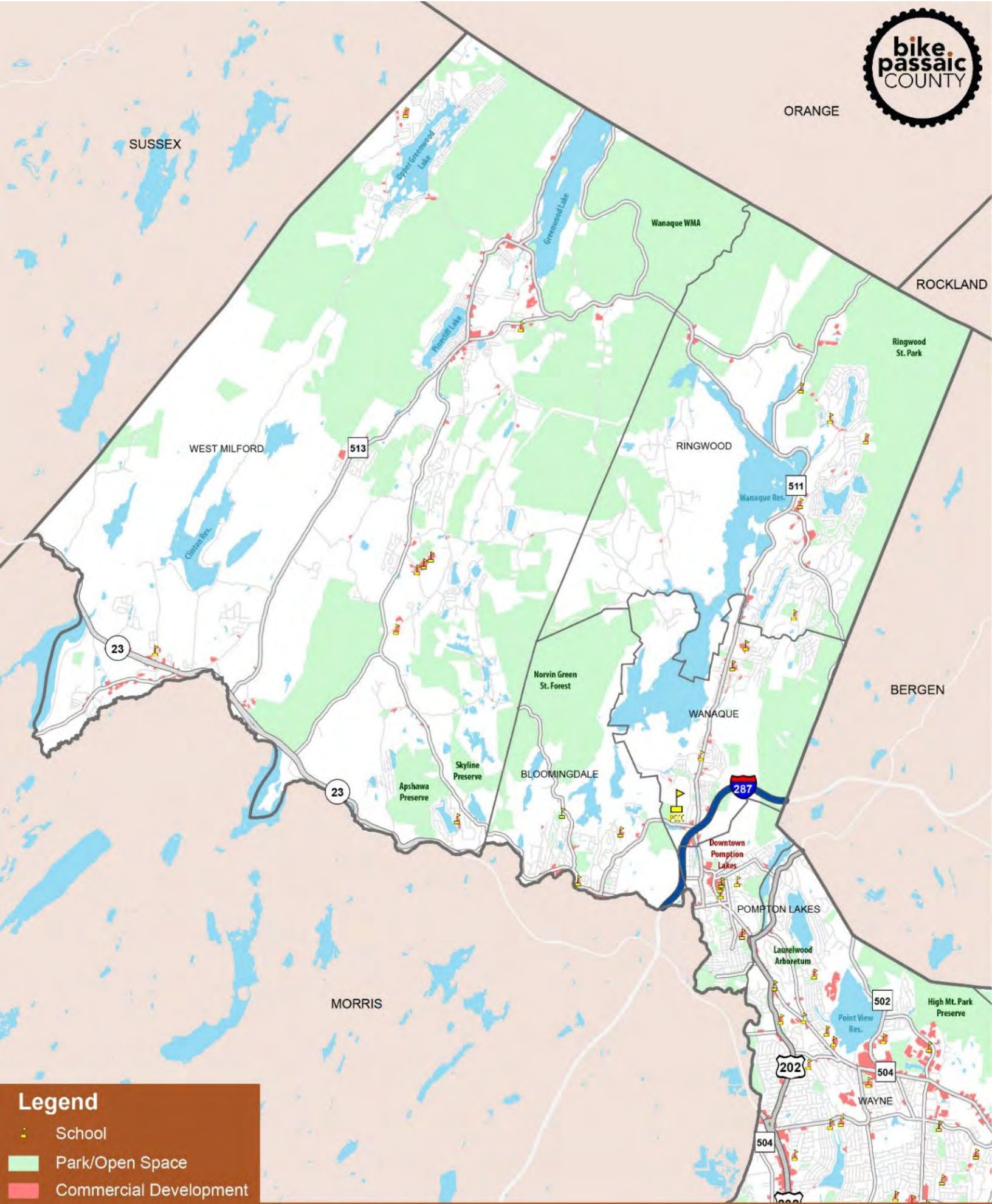
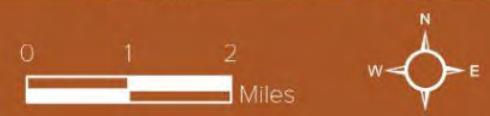


Figure 9: Trip Destinations and Attractions, Northwest



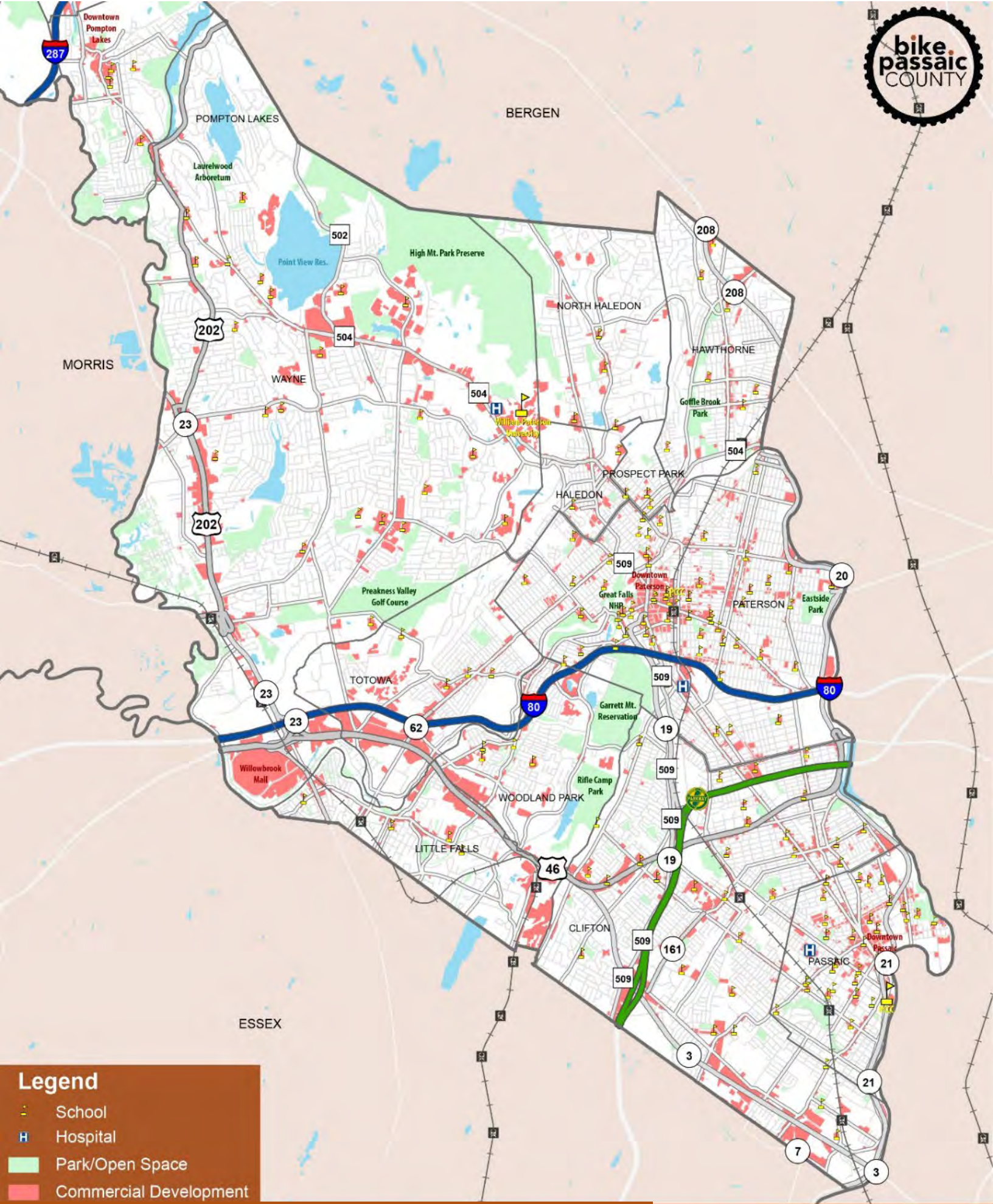


Figure 10: Trip Destinations and Attractions, Northwest

End Notes

ⁱ New Jersey Complete Streets Design Guide Page 60

ⁱⁱ Jacobsen and Rutter, Cycling Safety, 2012

ⁱⁱⁱ National Traffic Safety Board (2017) Reducing Speeding-Related Crashes involving Passenger Vehicles

^{iv} <https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity>

^v Moving Passaic County -Transportation Element of the Passaic County Master Plan, October 2012

^{vi} Moving Passaic County, Section 6, page 54