

6.0 COUNTY/BOROUGH CONGESTION ANALYSIS

This section provides a county-level summary of congestion estimates for the 2014 Base Year and the 2040 Build Scenario. As discussed in the Methodology section, the 2040 Build Scenario includes all transportation improvements NYMTC has programmed in the TIP and the fiscally constrained element of the Plan 2040 RTP.

For each of the ten counties (five boroughs of New York City and five suburban counties) in the NYMTC planning area, an overview is provided, including background information and travel characteristics for the 2014 Base Year and 2040 Build Scenario. Background information includes population (2014 Base Year, 2040 Build Scenario, and percent change), major portals and roadways. The travel characteristics are derived from the NYBPM (K-Series) as received from NYMTC, and include:

1. **Vehicular Travel** – vehicle miles of travel for the 2014 Base Year and 2040 Build Scenario and the percent change.
2. **Traffic Congestion** – vehicle hours of delay for the 2014 Base Year and 2040 Build Scenario, and the percent change.
3. **Origins and Destinations** – forecasted intercounty (two-directional) vehicular trips for the year 2040 based on the NYBPM.
4. **Performance Measures** – the tables summarize the performance measures, as described in the Methodology section, disaggregated by functional class. The first table in each section presents performance measure data for the 2014 Base Year in the AM peak, PM peak, and daily periods. The next table presents performance measure data for the 2040 Build Scenario for the same time periods and the third table presents the percentage difference between the two.
5. **Congestion Patterns and Bottlenecks** – these maps identify congested corridors and bottlenecks for the 2040 Build Scenario. As further described in the Methodology section, using output data from the NYBPM, demand-to-capacity ratio congestion levels are represented for individual links in the roadway system. To account for the levels of areawide congestion, other factors such as length of the congested segment, traffic volume and importance of the roadway were used to identify congested corridors. Congested corridors are shown for the 2040 Build Scenario AM and PM peak periods. Also shown are potential bottleneck locations. Roadway links that experience a D/C ratio greater than 1.0 for a four hour peak period are shown in red, while those with a ratio between 1.0 and 0.8 are shown in blue. Only roadway links that experience a D/C ratio of 0.8 or greater are identified as congested. Using the NYBPM derived measures of congestion, together with our familiarity with the NYMTC regional highway network, and data from the 2011 Texas Transportation Institute Congested Corridors Report (TTI Report), a list of approximately 50 roadway sections were used to develop the top regional congestion hot spots. These roadway sections are listed and discussed below (and in Appendix B) by county/borough. **(Please note that the order is arbitrary and does not imply a ranking.)**

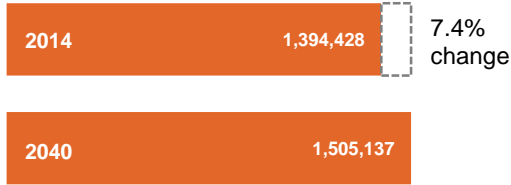
6.1 Bronx

Major Portals and Roadways

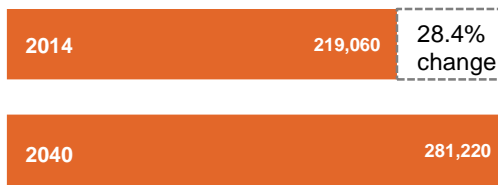


Population and Travel Characteristics

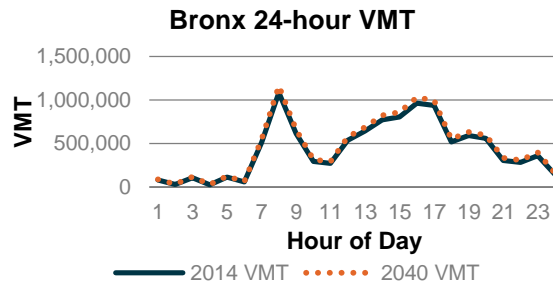
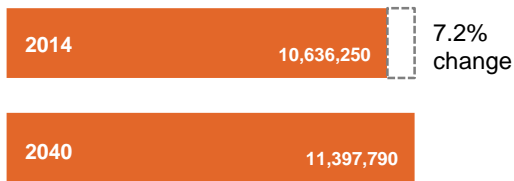
Population



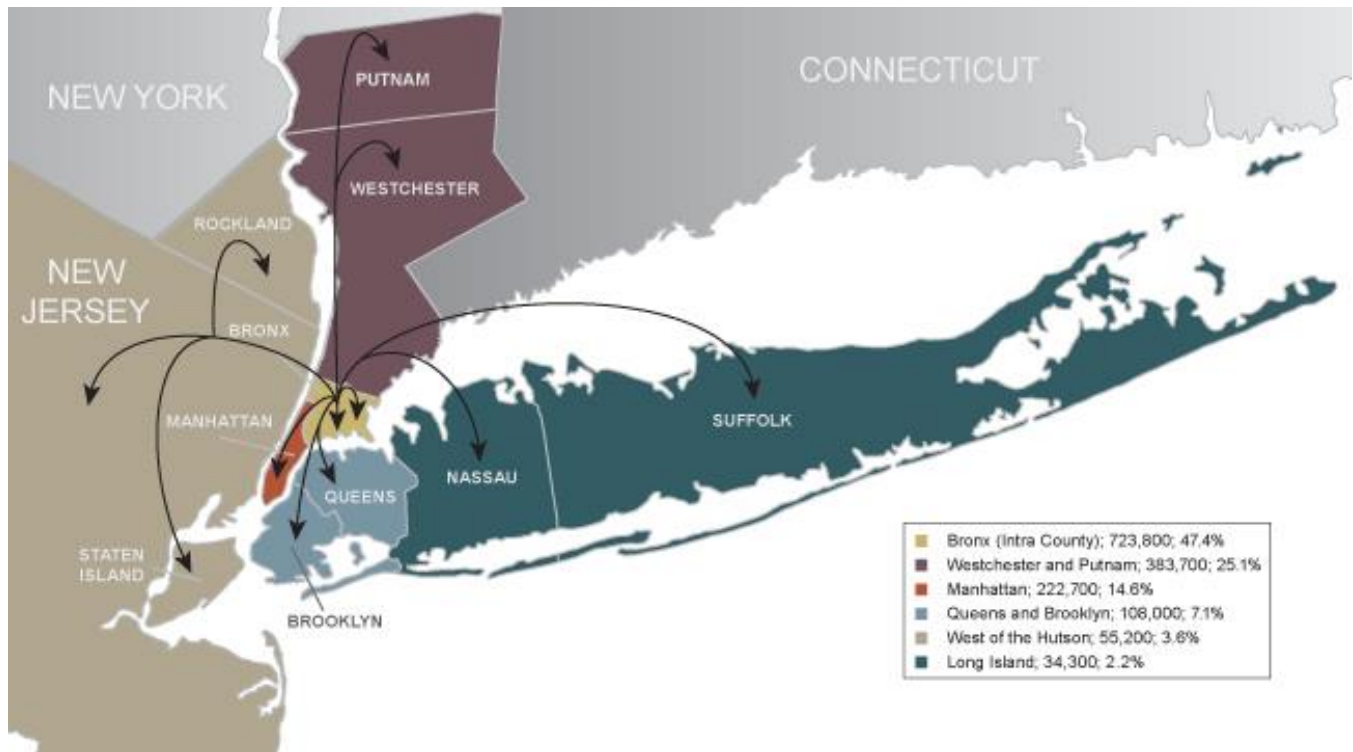
VHD Daily Totals



VMT Daily Totals



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County (Borough): Bronx (Bronx)

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.60	9%	16%	254.1	1.44	41.4	24,206	35,824	1,330,448
Arterial	0.33	3%	4%	93.1	1.55	16.6	48,361	71,575	594,398
Local	0.20	1%	2%	7.9	1.03	21.2	9,721	14,388	583,424
PM Period (4 to 8 PM)									
Freeway	0.22	2%	3%	46.9	1.06	46.4	1,237	1,831	857,104
Arterial	0.10	0%	0%	10.8	1.11	20.5	6,645	9,835	321,832
Local	0.06	0%	0%	1.7	1.00	21.5	548	811	337,974
Daily Total									
Freeway	0.45	7%	10%	843.5	1.23	43.8	56,120	83,057	5,436,084
Arterial	0.25	2%	3%	318.6	1.35	17.9	145,507	215,350	2,560,066
Local	0.16	1%	1%	25.6	1.01	21.3	17,432	25,800	2,640,103
Total							219,059	324,207	10,636,253

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.63	8%	18%	280.0	1.50	40.1	28,826	42,663	1,402,989
Arterial	0.36	4%	6%	124.9	1.65	15.8	64,525	95,496	651,659
Local	0.22	0.02	2%	9.1	1.05	20.8	14,840	21,963	631,011
PM Period (4 to 8 PM)									
Freeway	0.24	2%	3%	68.3	1.07	45.7	2,070	3,063	964,616
Arterial	0.11	0%	0%	14.1	1.12	19.9	7,756	11,479	340,606
Local	0.07	0%	0%	1.8	1.00	21.3	1,163	1,721	358,938
Daily Total									
Freeway	0.48	8%	11%	980.6	1.27	42.9	69,189	102,400	5,822,740
Arterial	0.27	3%	3%	411.1	1.41	17.3	186,477	275,985	2,758,590
Local	0.17	1%	1%	28.7	1.02	21.1	25,553	37,818	2,816,457
Total							281,219	416,204	11,397,786

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

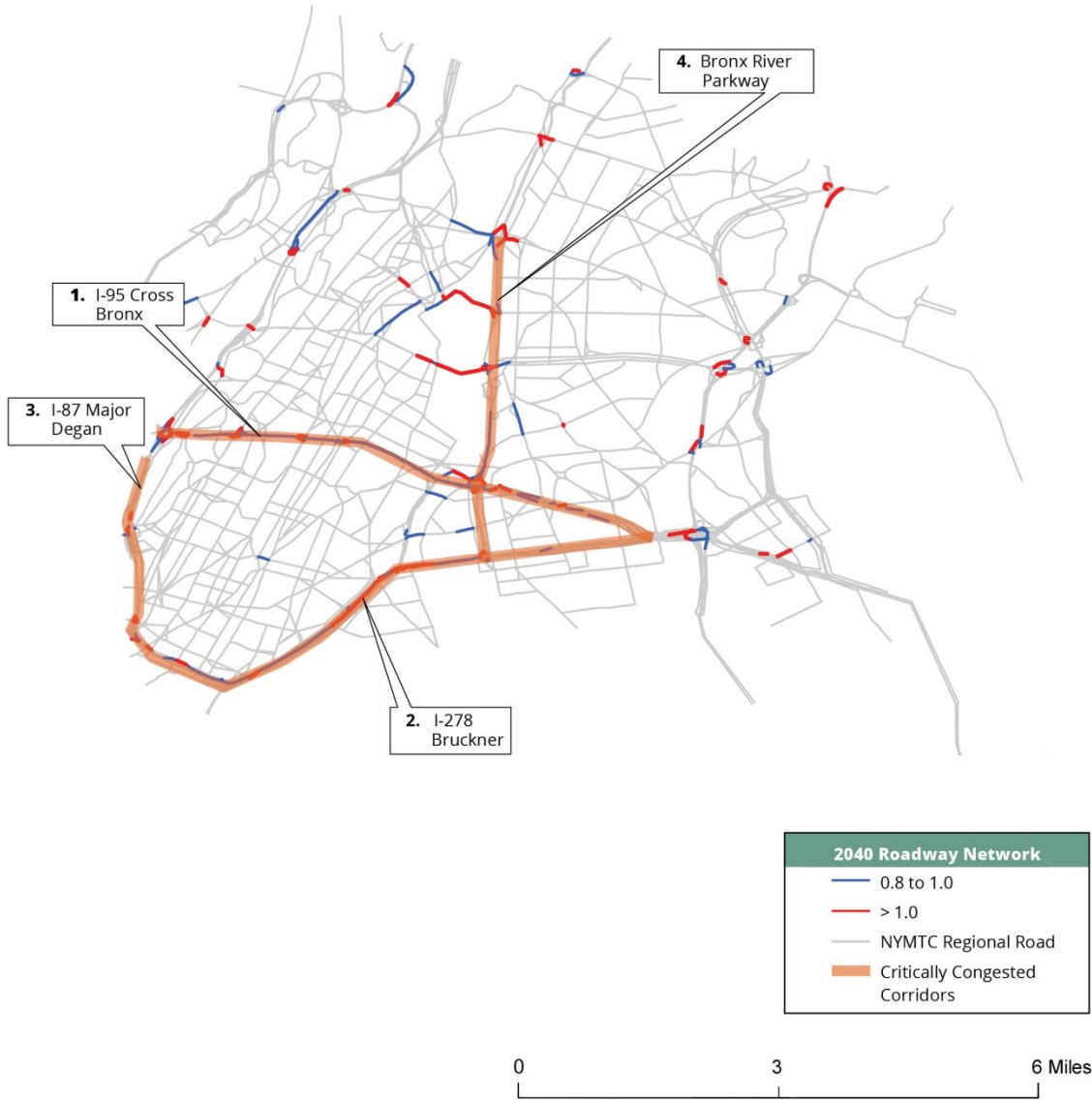
Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
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AM Period (6 to 10 AM)									
Freeway	5%	–	–	10%	4%	-3%	19%	19%	5%
Arterial	9%	–	–	34%	6%	-5%	33%	33%	10%
Local	10%	–	–	14%	2%	-1%	53%	53%	8%
PM Period (4 to 8 PM)									
Freeway	9%	–	–	46%	1%	-1%	67%	67%	13%
Arterial	10%	–	–	30%	1%	-3%	17%	17%	6%
Local	17%	–	–	11%	0%	-1%	112%	112%	6%
Daily Total									
Freeway	7%	–	–	16%	3%	-2%	23%	23%	7%
Arterial	8%	–	–	29%	4%	-4%	28%	28%	8%
Local	6%	–	–	12%	1%	-1%	47%	47%	7%
Total							28%	28%	7%

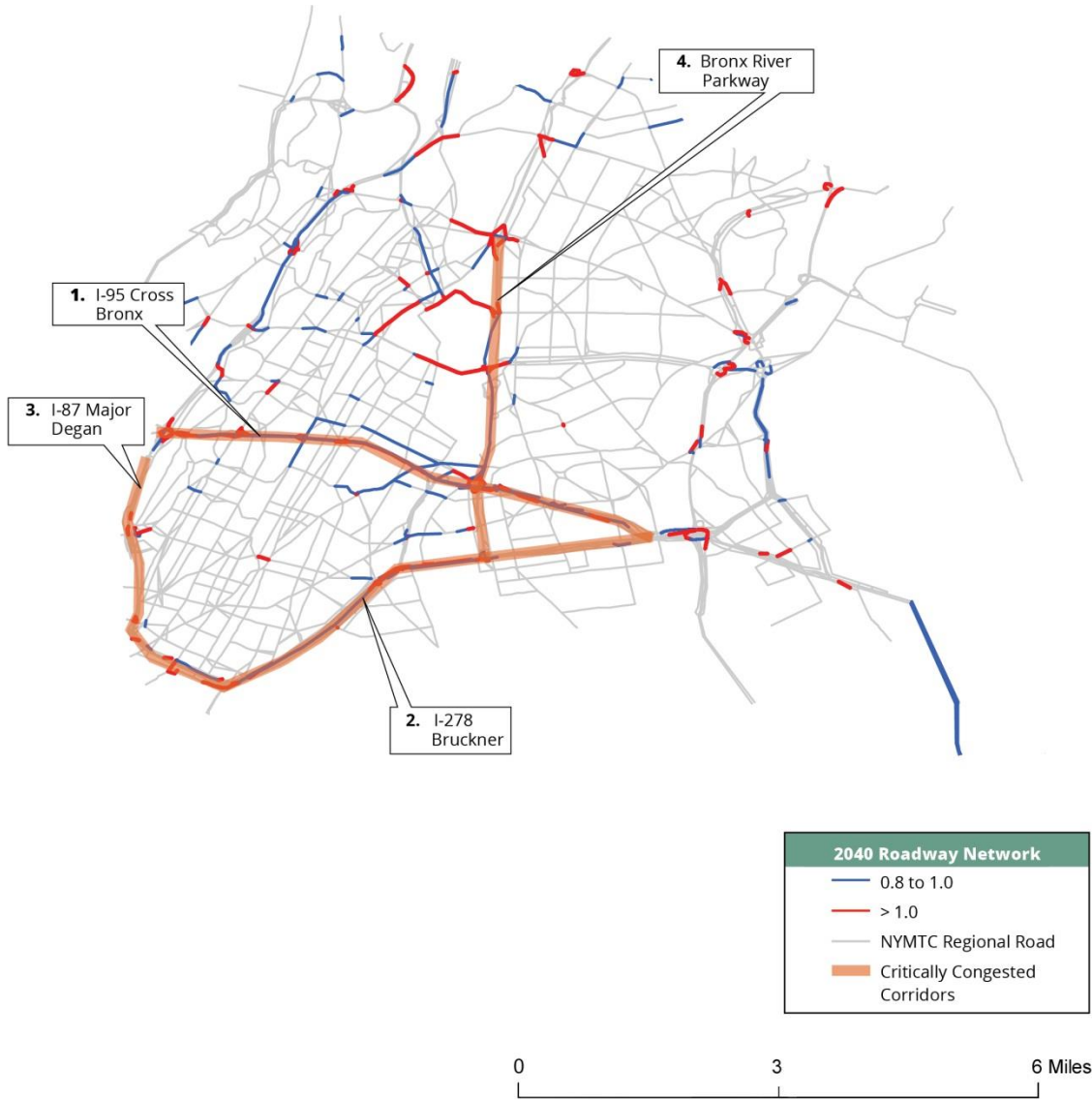
Bronx – Congested Corridors

- I-95/Cross Bronx Expressway from Harlem River/Alexander Hamilton Bridge to Hutchinson River Parkway/Bruckner Interchange** – This is the “heart” of the 7th highest-ranked corridor in the United States for Congestion Cost in the TTI Report. Congestion is most significant in the westbound direction during both peaks due to sheer volume heading toward Manhattan in the AM and trucks headed toward the George Washington Bridge (GWB) in the PM (exacerbated since 9/11 by the need for trucks entering from I-87/Major Deegan Expressway to immediately weave to the left side for the Upper Level of the GWB, and further since December, 2012 by the rehabilitation work on the Alexander Hamilton Bridge). In addition, there are various choke points in both directions of this highway at various times due to heavy merges and weaves and steep grades. The heavy usage of this road by trucks makes its congestion especially detrimental to the region’s economy in terms of both time loss and fuel consumption.
- I-278/Bruckner Expressway from the RFK Bridge to the Bruckner Interchange** – This is a major commuter route between Manhattan and Bronx/Westchester/Connecticut. It has several choke points due to heavy merging and weaving at various times, as well as substandard design in sections, including a sharp curve on a section with no shoulders at the I-895/Sheridan Expressway interchange. It also carries high truck volumes as it provides access to/from the Hunts Point Market complex. Congestion occurs mostly southbound in the evening peak and northbound in the morning peak.
- I-87/Major Deegan Expressway from the RFK Bridge to I-95/Highbridge Interchange** – In the northbound direction, this is the 32nd highest-ranked corridor in the United States in terms of delay per mile in the TTI Report. It is one of the three main approaches from Manhattan to the GWB. The main problem is the ramp to southbound I-95 (GWB approach), which backs up onto the I-87 mainline every evening. See 1 above for exacerbating factors. Congestion also occurs on southbound I-87 on the approach to the I-95 interchange in the morning peak. This highway section also abuts Yankee Stadium, which produces heavy congestion in both directions, particularly approaching the Stadium for weeknight Yankee home games (roughly 55 per year, plus postseason games).
- Bronx River Parkway from I-95/Cross Bronx Expressway to Westchester County Boundary** – Problems occur at entry and exit points, particularly at I-95, where direct ramp connections are not provided and traffic must mix with local traffic on the service roads. Congestion occurs mostly southbound in the evening peak and northbound in the morning peak.

Bronx: Congested Corridors and Hot Spot Areas (AM Period)

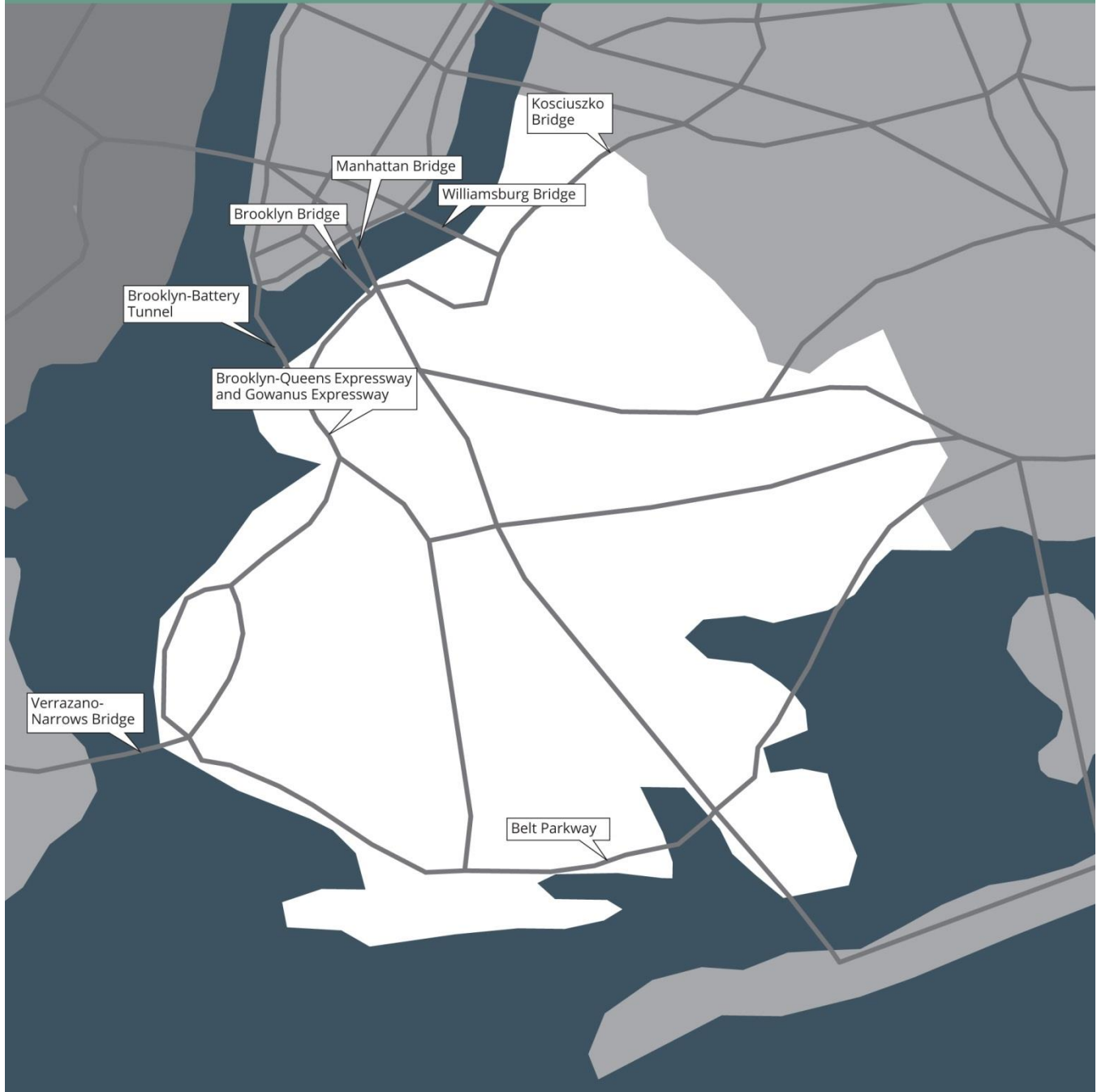


Bronx: Congested Corridors and Hot Spot Areas (PM Period)



6.2 Brooklyn

Major Portals and Roadways

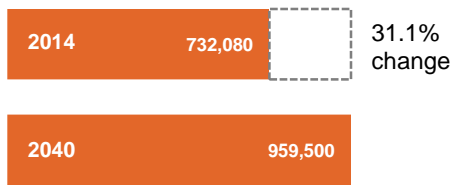


Population and Travel Characteristics

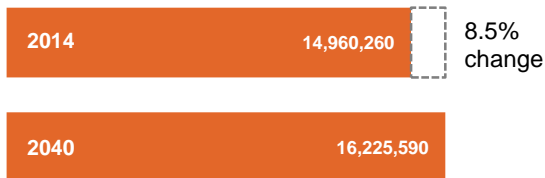
Population



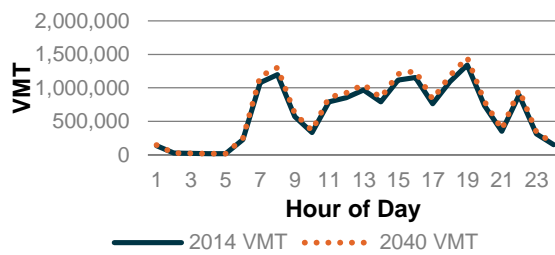
VHD Daily Totals



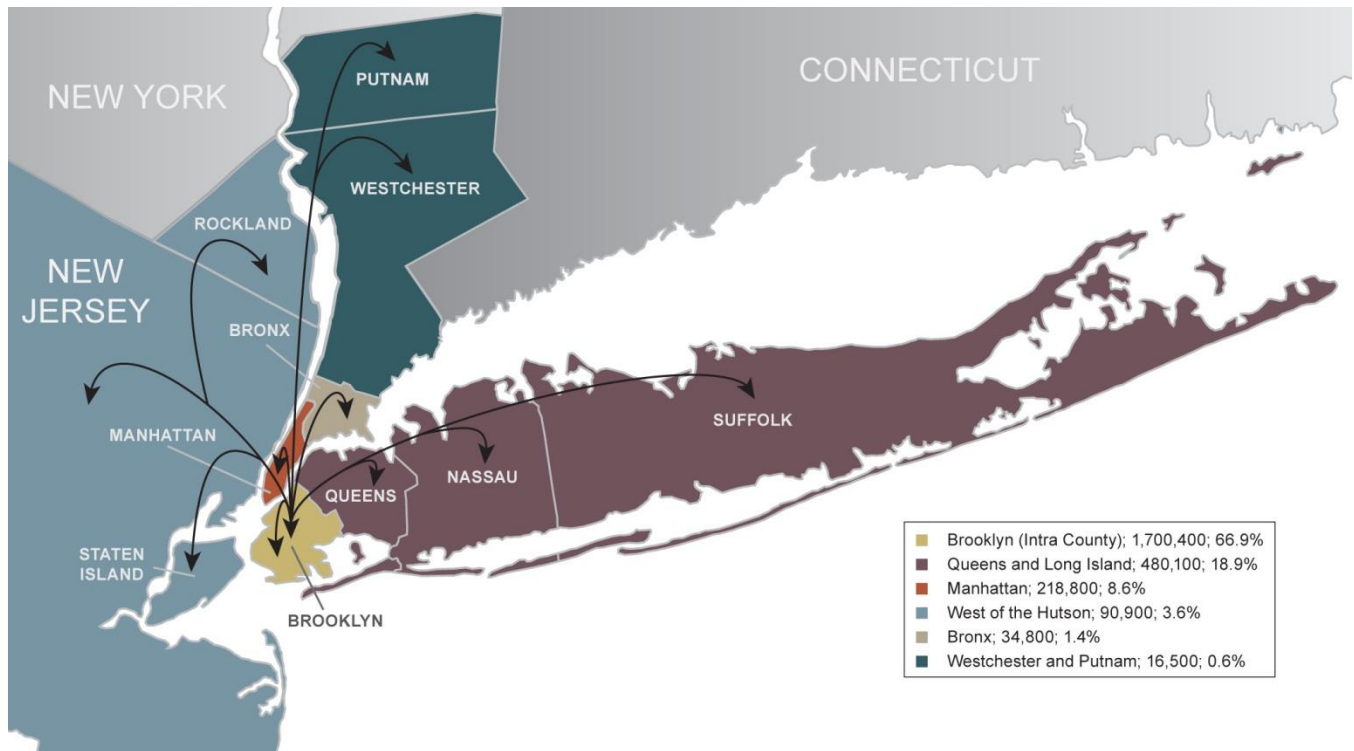
VMT Daily Totals



Brooklyn 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County (Borough): Kings (Brooklyn)

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.66	13%	21%	242.3	1.46	35.3	14,576	21,573	889,438
Arterial	0.46	7%	9%	562.7	1.73	13.9	141,654	209,648	1,756,137
Local	0.39	8%	3%	9.0	1.11	17.7	5,103	7,552	539,740
PM Period (4 to 8 PM)									
Freeway	0.29	2%	7%	106.2	1.20	38.7	13,771	20,381	641,146
Arterial	0.17	1%	3%	358.6	1.35	18.2	170,351	252,119	1,250,458
Local	0.11	1%	0%	2.5	1.02	18.8	1,490	2,206	269,221
Daily Total									
Freeway	0.55	10%	15%	837.3	1.32	36.6	51,351	75,999	3,985,265
Arterial	0.39	6%	7%	2579.0	1.60	15.1	656,372	971,431	8,393,651
Local	0.32	6%	2%	39.6	1.09	17.9	24,356	36,048	2,581,344
Total							732,079	1,083,477	14,960,259

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.70	12%	24%	279.9	1.55	34.0	18,888	27,955	981,158
Arterial	0.52	8%	12%	708.8	1.88	12.8	189,349	280,237	1,882,335
Local	0.47	12%	7%	17.2	1.15	16.0	8,719	12,904	599,355
PM Period (4 to 8 PM)									
Freeway	0.32	3%	7%	125.8	1.22	38.0	16,068	23,780	743,891
Arterial	0.18	1%	3%	406.7	1.41	17.2	212,093	313,898	1,314,241
Local	0.12	1%	1%	3.5	1.03	17.5	3,065	4,536	293,529
Daily Total									
Freeway	0.59	11%	18%	1053.4	1.39	35.5	67,451	99,828	4,447,938
Arterial	0.43	8%	9%	3328.2	1.72	14.0	853,391	1,263,018	8,938,915
Local	0.38	7%	5%	69.3	1.12	16.4	38,655	57,210	2,838,740
Total							959,497	1,420,056	16,225,594

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	6%	–	–	15%	6%	-4%	30%	30%	10%
Arterial	13%	–	–	26%	9%	-8%	34%	34%	7%
Local	21%	–	–	91%	4%	-9%	71%	71%	11%
PM Period (4 to 8 PM)									
Freeway	10%	–	–	18%	2%	-2%	17%	17%	16%
Arterial	6%	–	–	13%	4%	-6%	25%	25%	5%
Local	9%	–	–	39%	1%	-7%	106%	106%	9%
Daily Total									
Freeway	7%	–	–	26%	5%	-3%	31%	31%	12%
Arterial	10%	–	–	29%	7%	-7%	30%	30%	6%
Local	19%	–	–	75%	3%	-8%	59%	59%	10%
Total							31%	31%	8%

Brooklyn – Congested Corridors

5. **I-278/Brooklyn-Queens Expressway, and**
6. **I-278/Gowanus Expressway from the Belt Parkway to the Queens County Boundary** – The eastbound and westbound directions of these roadways are the 11th and 13th highest-ranked corridors in the United States, respectively, in terms of Delay per Mile in the TTI Report. In the morning, the main issue is eastbound, where Manhattan-bound traffic runs into several choke points in downtown Brooklyn which are caused by heavy merging and weaving as well as substandard design. The queue formed by this spills back for several miles onto the Gowanus Expressway almost to the Verrazano-Narrows Bridge. According to the TTI report, average travel times are roughly 2.5 times free flow, with travel times over 3 times free flow once per week and 4.8 times free flow once a month.

In the evening, the main eastbound choke points are the point where traffic from the Williamsburg Bridge merges in, and merging and weaving that takes place east of that point (as the road approaches the steep incline to the peak of the Kosciuszko Bridge and the nearby exit to the Long Island Expressway). The main westbound choke points in the evening are the point where traffic from the Hugh L. Carey (Brooklyn-Battery) Tunnel merges in, and merging and weaving that takes place between that point and the exit for the Prospect Expressway.

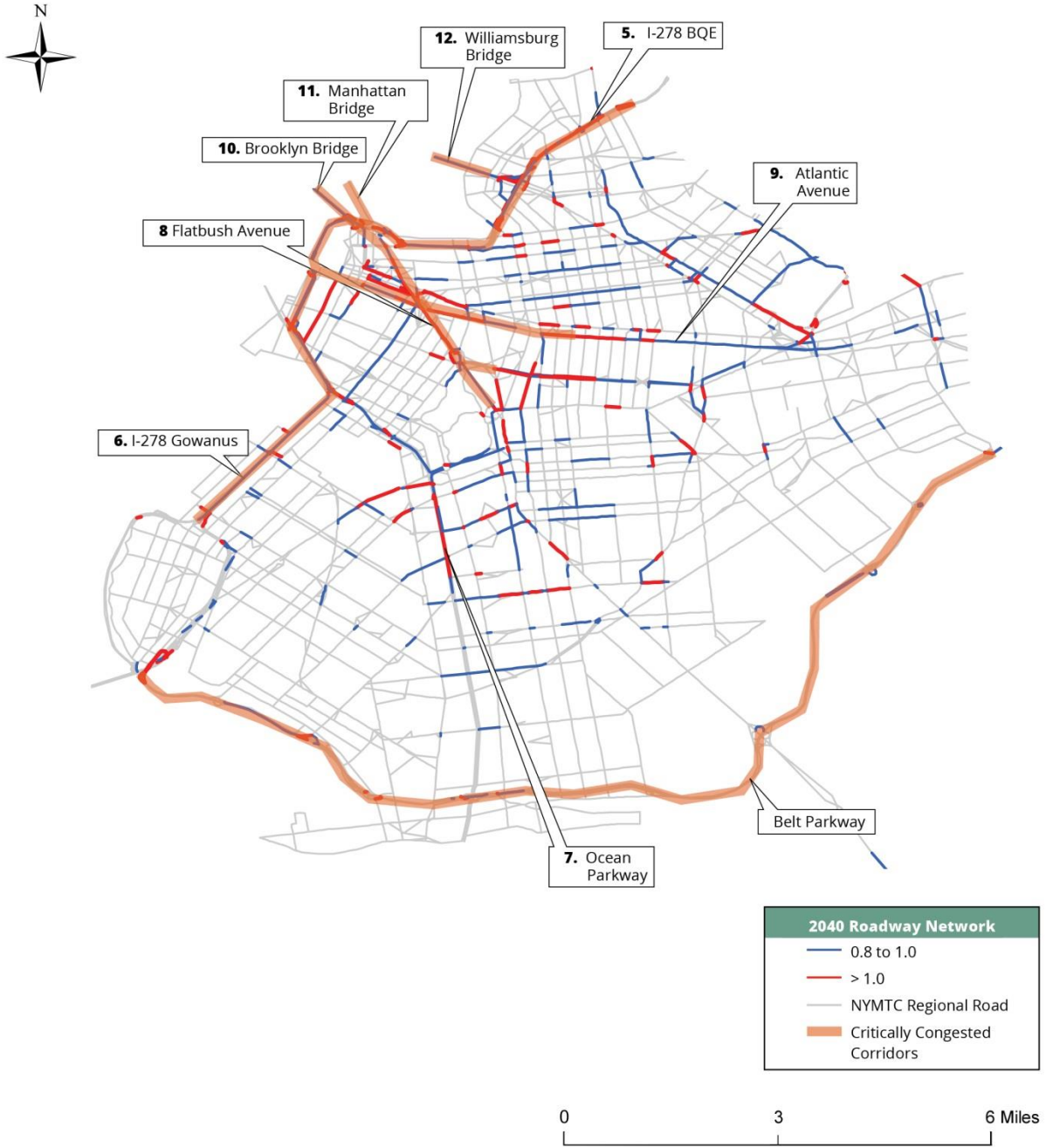
As I-278 is the only limited-access highway traversing Brooklyn that is open to through trucks, it plays a very important role in the regional flow of goods between the ports in New Jersey/Brooklyn and consumers and businesses in Queens and Long Island. Consequently, the economic cost of the congestion on I-278 is very high.

7. **Ocean Parkway from Avenue J to Church Avenue** – This is a six-lane arterial with many signalized intersections, carrying large volumes of traffic between southern Brooklyn and downtown Brooklyn and the bridges to Manhattan. Congestion occurs northbound in the morning peak and southbound in the evening peak.
8. **Flatbush Avenue from Eastern Parkway/Grand Army Plaza to I-278/Brooklyn-Queens Expressway** – This is a six-lane arterial with many signalized intersections, carrying large volumes of

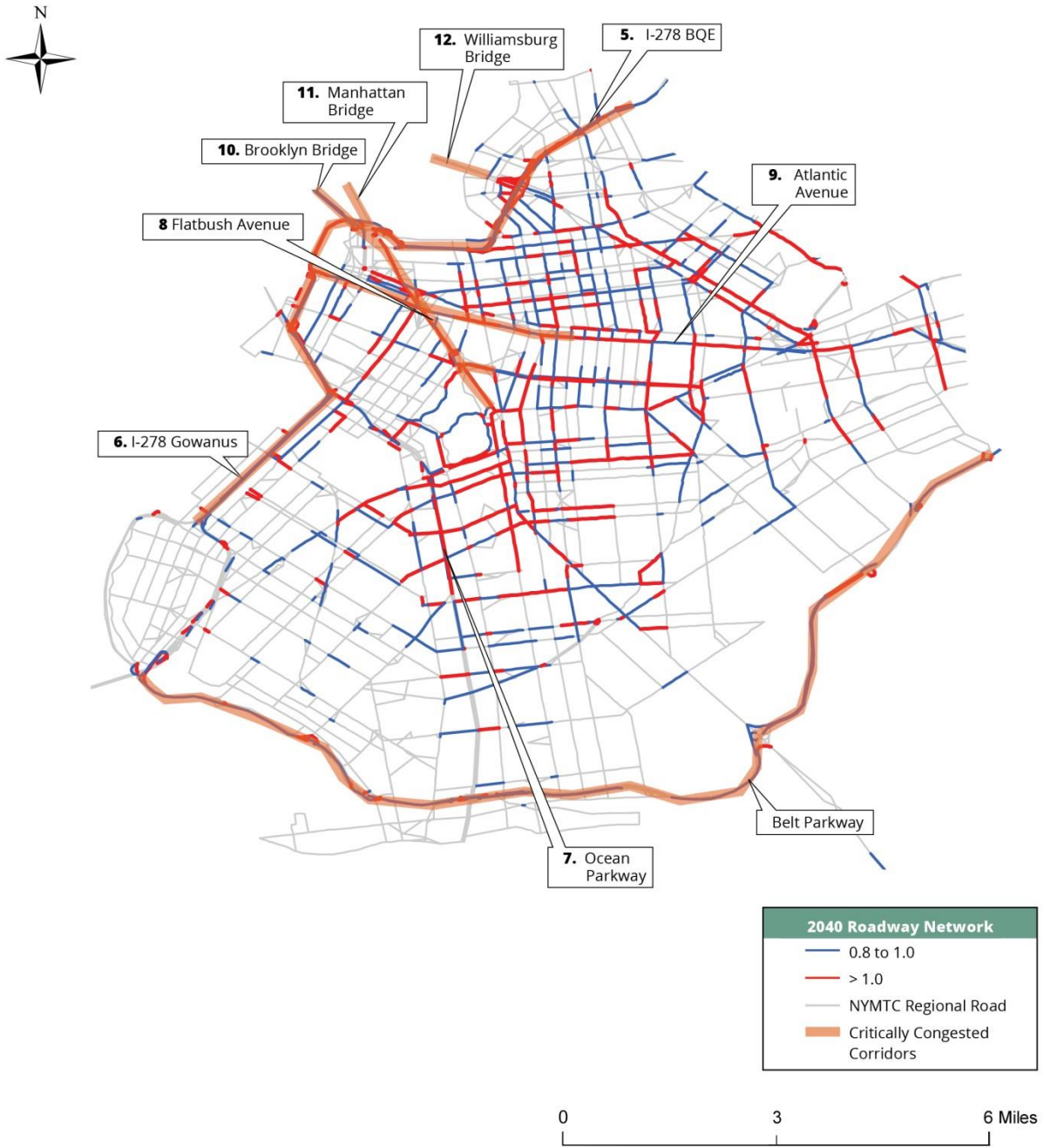
traffic between central Brooklyn and downtown Brooklyn and the Manhattan Bridge. There is a major chokepoint in the morning where traffic from eastbound I-287 (and westbound I-287 via Tillary Street) merges into the Manhattan-bound flow. Flow is also restricted by interactions with major generators along the northern half of this roadway section, such as the Barclays Center, the Brooklyn Academy of Music, and the Long Island University campus. Pedestrian crossings are a significant congestion-causing factor. Congestion occurs mostly southbound in the evening peak and northbound in the morning peak.

9. **Atlantic Avenue from I-278/Brooklyn-Queens Expressway to Utica Avenue** – This is a six-lane arterial with many signalized intersections, carrying large volumes of traffic between eastern Brooklyn and downtown Brooklyn and (via connecting roadways) the bridges to Manhattan. Again, pedestrian crossings are a significant factor, as Atlantic Avenue traverses several densely developed residential areas. Congestion occurs westbound in the morning peak and eastbound in the evening peak.
10. **Brooklyn Bridge** – The southernmost bridge across the East River connecting Brooklyn with lower Manhattan, it carries 6 lanes of traffic (3 in each direction). These lanes are heavily utilized because the bridge is toll-free and due to the direct or semi-direct connections that exist between the Bridge and I-278 in Brooklyn and the FDR Drive in Manhattan. Congestion occurs at the points where traffic merges onto and off of the Bridge from/to these highways, as well as at other points where Bridge traffic interacts with the Brooklyn and Manhattan street network. Congestion occurs inbound (toward Manhattan) in the morning peak and outbound (toward Brooklyn) in the evening peak.
11. **Manhattan Bridge** – This bilevel, toll-free bridge has greater peak period carrying capacity than the Brooklyn Bridge, with two lanes in each direction available at all times plus three reversible lanes to carry peak flows inbound in the morning and outbound in the afternoon. The bridge is part of a direct connection between the Holland Tunnel and Brooklyn. The bridge connects directly to Flatbush Avenue and other major surface arterials in Brooklyn, and it links to major east-west streets and north-south avenues in Manhattan. Most connections to I-278 must be made indirectly via surface streets, and there are no direct connections with the FDR Drive in Manhattan. Consequently, congestion occurs at points where Bridge traffic interacts with the street systems in both boroughs, but normally not on the bridge itself. Congestion occurs inbound (toward Manhattan) in the morning peak and outbound (toward Brooklyn) in the evening peak.
12. **Williamsburg Bridge** – This bridge carries 8 traffic lanes (and a subway line) across the East River. In Brooklyn, it has excellent connections with I-278 to/from the east, but is accessible only via Delancey Street in Manhattan, causing long backups on the Bridge approaching Manhattan in the morning, and heavy delays on Manhattan streets leading to the Bridge in the evening.

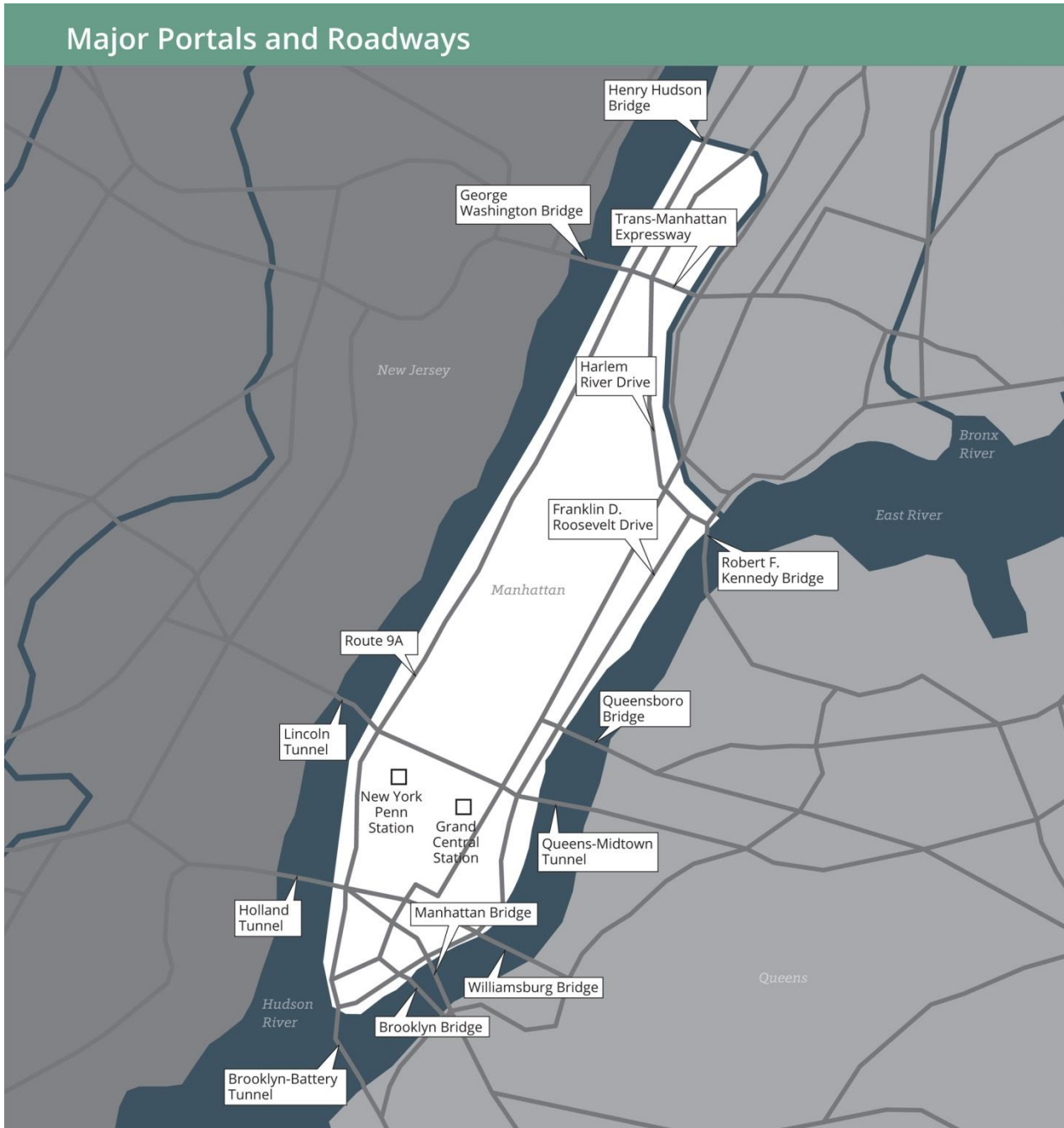
Brooklyn: Congested Corridors and Hot Spot Areas (AM Period)



Brooklyn: Congested Corridors and Hot Spot Areas (PM Period)



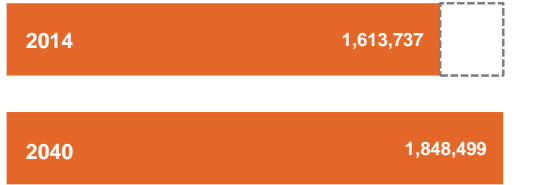
6.3 Manhattan



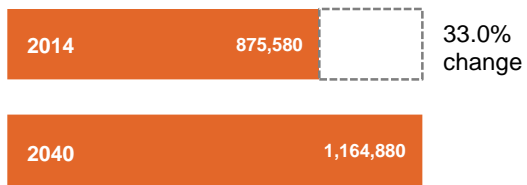
New York Metropolitan Transportation Council

Population and Travel Characteristics

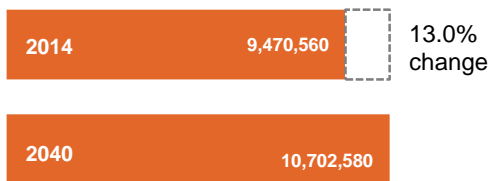
Population



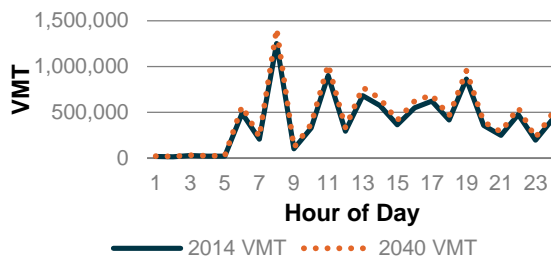
VHD Daily Totals



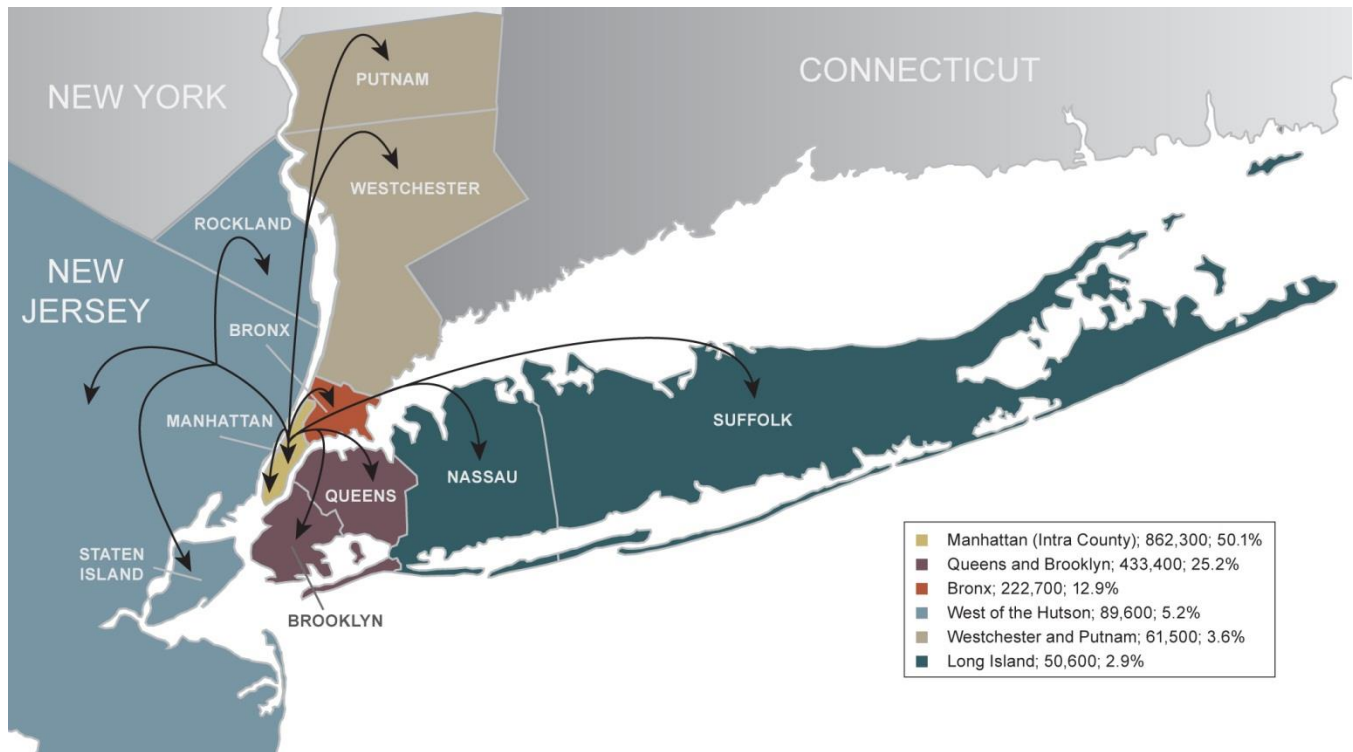
VMT Daily Totals



Manhattan 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County (Borough): New York (Manhattan)

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.45	3%	14%	154.6	1.64	29.8	25,766	38,134	612,524
Arterial	0.33	3%	9%	361.2	2.34	14.2	340,320	503,673	847,616
Local	0.25	4%	4%	15.5	1.53	12.4	106,274	157,286	432,493
PM Period (4 to 8 PM)									
Freeway	0.30	3%	9%	190.2	1.37	32.9	20,508	30,351	690,411
Arterial	0.18	3%	2%	244.2	1.35	16.4	72,123	106,742	921,095
Local	0.11	1%	1%	3.0	1.14	13.8	26,341	38,984	341,050
Daily Total									
Freeway	0.42	6%	11%	667.7	1.51	30.4	82,553	122,178	3,091,744
Arterial	0.29	4%	4%	1188.2	1.65	14.5	594,832	880,351	4,315,343
Local	0.21	2%	2%	30.3	1.27	12.8	198,192	293,324	2,063,469
Total							875,577	1,295,854	9,470,556

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.49	4%	15%	171.3	1.73	29.3	30,795	45,576	673,824
Arterial	0.36	3%	11%	401.8	2.72	13.8	461,661	683,258	920,385
Local	0.29	3%	7%	20.6	1.67	11.9	146,522	216,853	538,718
PM Period (4 to 8 PM)									
Freeway	0.33	3%	11%	235.2	1.43	32.4	24,776	36,668	772,864
Arterial	0.20	3%	3%	345.9	1.38	16.1	84,161	124,558	1,006,826
Local	0.14	1%	2%	6.4	1.17	13.3	37,940	56,152	471,237
Daily Total									
Freeway	0.46	6%	13%	818.5	1.59	29.8	102,460	151,641	3,429,586
Arterial	0.32	5%	5%	1577.0	1.77	14.1	784,873	1,161,612	4,694,240
Local	0.25	3%	3%	46.7	1.34	12.3	277,546	410,768	2,578,749
Total							1,164,879	1,724,021	10,702,575

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	9%	–	–	11%	5%	-2%	20%	20%	10%
Arterial	9%	–	–	11%	16%	-3%	36%	36%	9%
Local	16%	–	–	33%	9%	-4%	38%	38%	25%
PM Period (4 to 8 PM)									
Freeway	10%	–	–	24%	4%	-2%	21%	21%	12%
Arterial	11%	–	–	42%	2%	-2%	17%	17%	9%
Local	27%	–	–	109%	3%	-3%	44%	44%	38%
Daily Total									
Freeway	10%	–	–	23%	5%	-2%	24%	24%	11%
Arterial	10%	–	–	33%	7%	-3%	32%	32%	9%
Local	19%	–	–	54%	6%	-4%	40%	40%	25%
Total							33%	33%	13%

Manhattan – Congested Corridors

Manhattan’s traffic congestion patterns are distinctly different from all of the other counties, as the result of two factors:

- Manhattan contains the region’s Central Business District and an extremely high concentration of other trip generators.
- Manhattan is an island that can be accessed using a limited number of bridges and tunnels, which tend to constrain the flow of traffic into Manhattan in the morning and out of Manhattan in the evening.

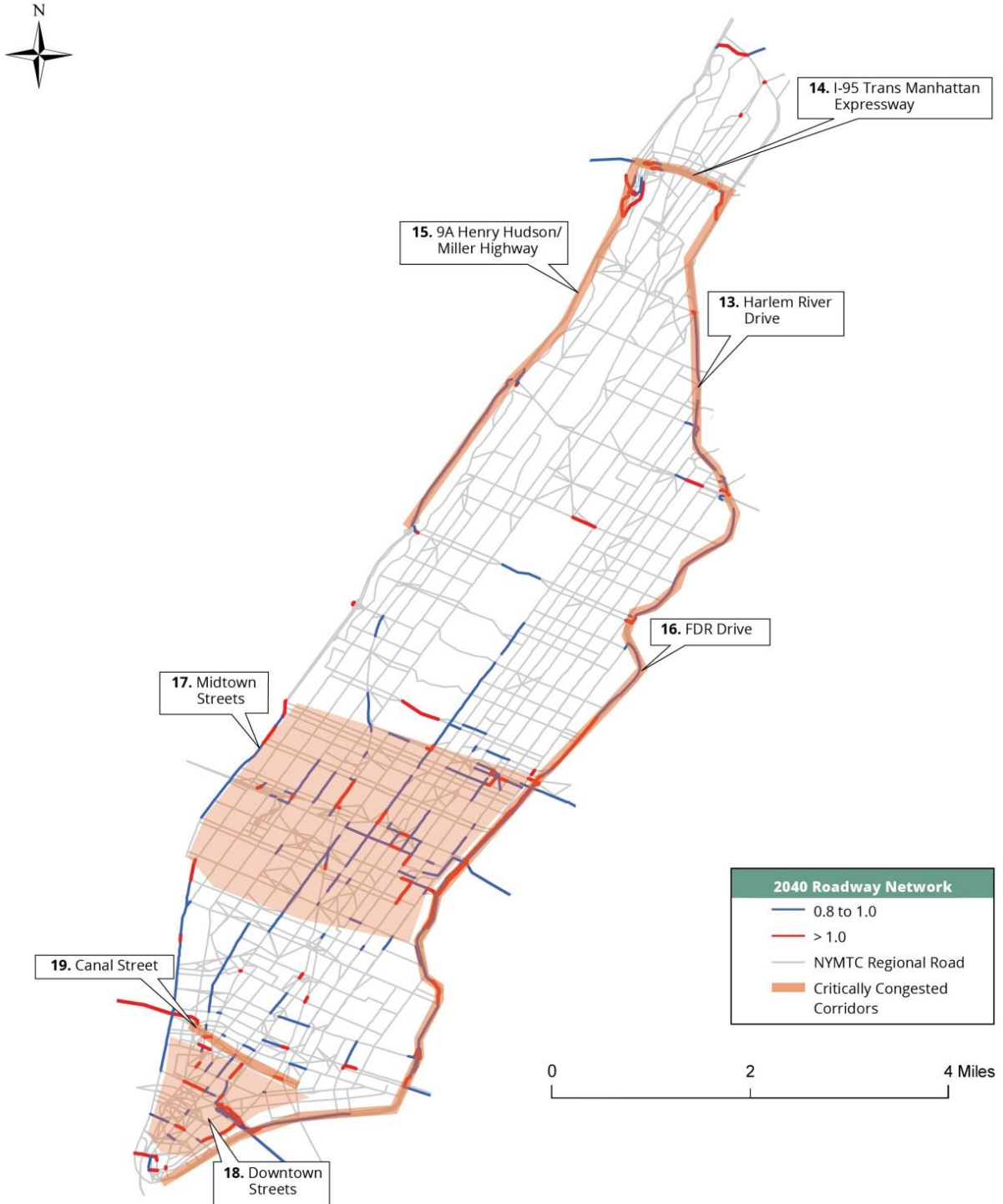
Therefore, there is relatively little traffic congestion within Manhattan in the morning, because entering flows are constrained by the river crossings. Traffic on streets serving major intra-Manhattan traffic flows experience congestion in the middle of the day. In the evening, congestion is present on the main routes leading to the most heavily used exit points from Manhattan (as well as at major evening entertainment and tourism locations – particularly Times Square and the adjacent Theater District).

Key congested locations include;

- 13. Harlem River Drive (HRD) from the RFK Bridge to I-95/Trans-Manhattan Expressway** – In the morning, this road is congested southbound approaching the point where traffic flows from the Third Avenue and RFK Bridges merge in and continue south onto the FDR Drive. The traffic queue from these choke points regularly spills back almost to I-95/Trans-Manhattan Expressway. In the evening, the pattern is reversed, with the choke point being where traffic from the HRD merges onto southbound I-95 (approach to the George Washington Bridge). There is also a southbound evening traffic queue at the same location as the morning queue, but much less severe.
- 14. I-95/Trans-Manhattan Expressway from the George Washington Bridge (GWB) to the Alexander Hamilton Bridge** – Both the inner and outer roadways are congested all day long due to merging and weaving at and between entrances and exits to/from several major connecting highways and well as local streets.

15. **NY-9A/Henry Hudson Parkway/Joe DeMaggio Highway from West 42nd Street to I-95/Trans-Manhattan Expressway/GWB** – In the morning, this largely elevated expressway is congested southbound approaching the end of the expressway at West 57th Street (at which point Route 9A continues as 12th Avenue, an eight-lane surface arterial with frequent signalized intersections) and the extremely high-volume intersection with West 42nd Street, after which 12th Avenue has only three southbound lanes. The traffic queues spilling back from these choke points regularly extend about two to three miles in the morning peak. In the evening, the choke point is at the ramps to I-95, causing a miles-long northbound queue.
16. **FDR Drive from the Battery to the RFK Bridge** – This expressway carries high volumes of traffic northbound and southbound for its entire length. It is the only limited access highway serving this entire stretch, and the only limited access highway of any kind on the East Side. It has many complex merging, weaving, and substandard sections that create choke points throughout the day. In the morning, southbound congestion eases considerably south of Midtown due to the large portion of traffic exiting in Midtown.
17. Midtown Streets, and
18. **Downtown Streets** – These are congested all day, but especially during the afternoon and evening periods when they are affected by both heavy pedestrian flows and spillbacks from bridges and tunnels leaving Manhattan.
19. **Canal Street from NY-9A/West Street to the Manhattan Bridge** – This downtown roadway is called out for special attention due to its functions as a connector to/from both the Holland Tunnel and the Manhattan Bridge, as well as serving trips within Manhattan. It is also an area of extremely high pedestrian activity, and is a commercial center in its own right that has more intense activity on weekends than on weekdays.

Manhattan: Congested Corridors and Hot Spot Areas (AM Period)

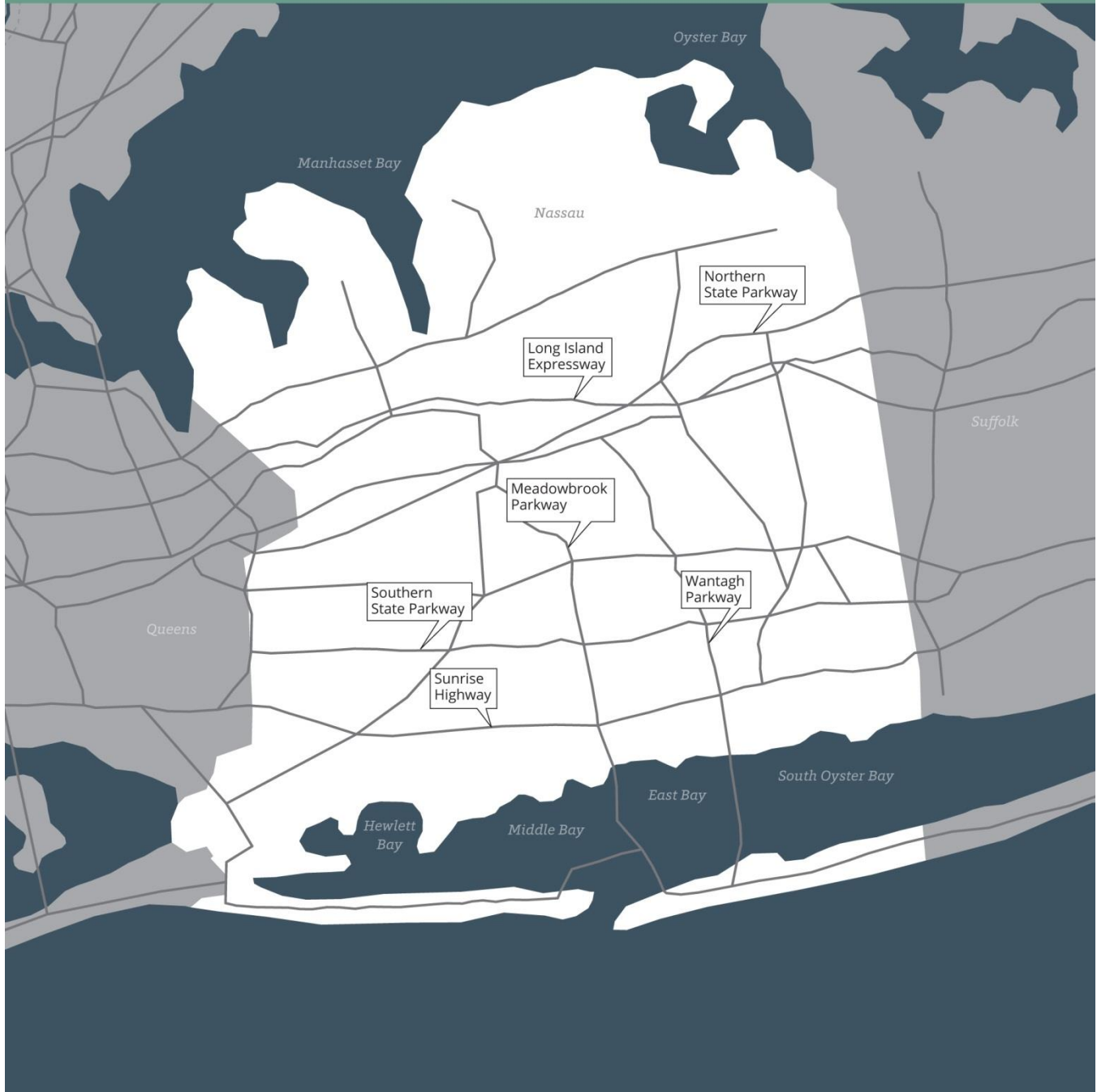


Manhattan: Congested Corridors and Hot Spot Areas (PM Period)



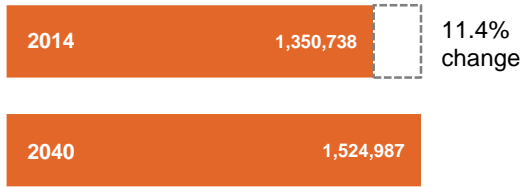
6.4 Nassau

Major Portals and Roadways

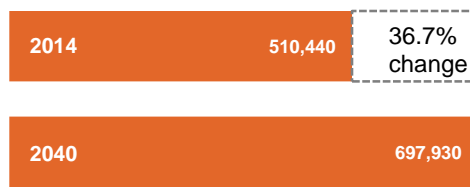


Population and Travel Characteristics

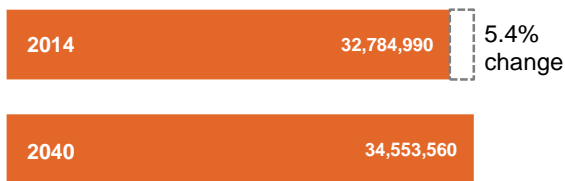
Population



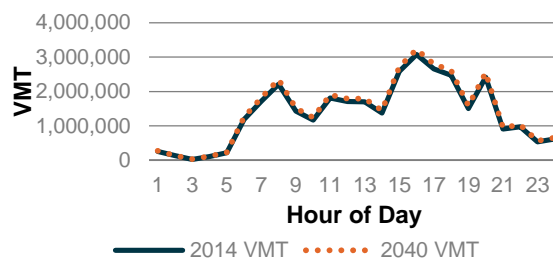
VHD Daily Totals



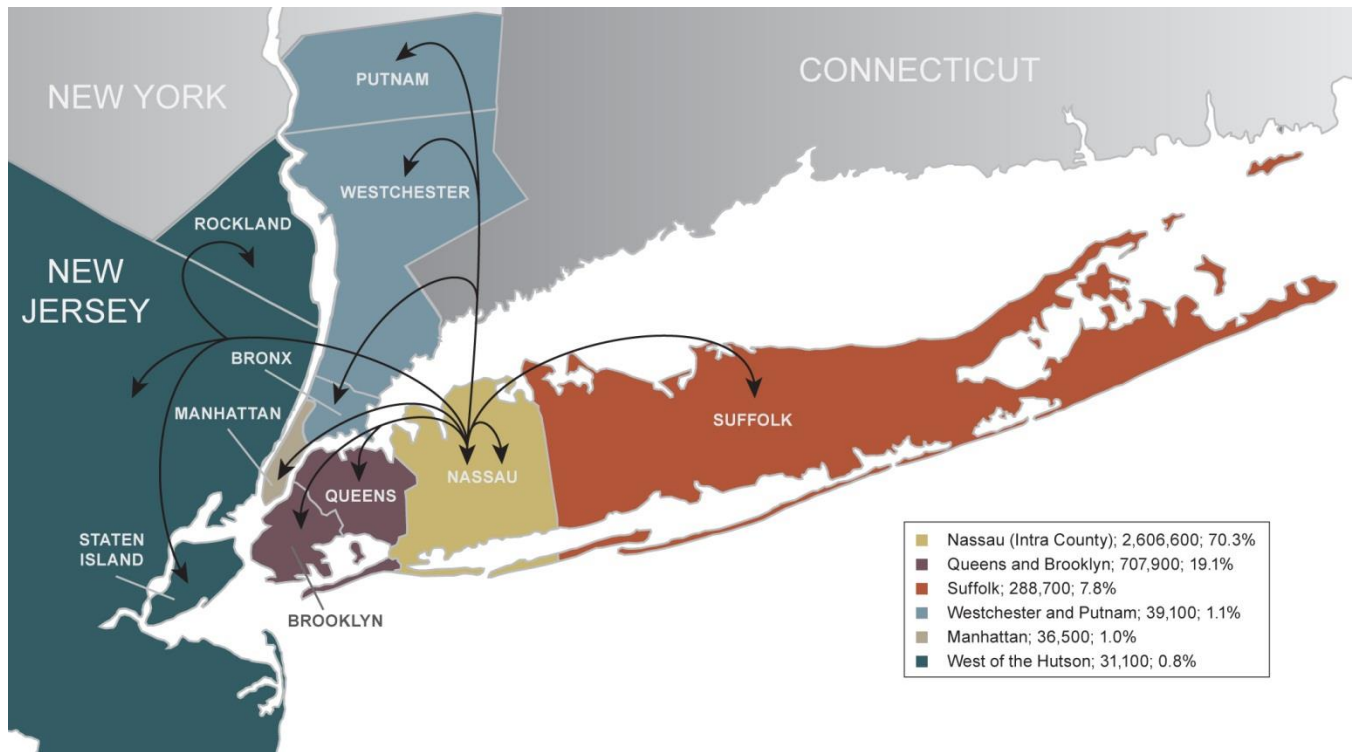
VMT Daily Totals



Nassau 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County: Nassau

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.54	11%	9%	383.6	1.22	43.1	14,050	24,587	2,524,246
Arterial	0.37	4%	3%	192.8	1.24	18.5	47,806	83,661	2,579,837
Local	0.24	1%	1%	7.7	1.01	24.5	2,618	4,582	1,416,813
PM Period (4 to 8 PM)									
Freeway	0.27	4%	5%	257.7	1.13	45.4	11,276	19,733	2,243,362
Arterial	0.14	1%	1%	64.3	1.09	22.4	22,491	39,360	1,796,016
Local	0.09	0%	0%	3.3	1.00	24.9	1,207	2,111	921,963
Daily Total									
Freeway	0.48	10%	12%	2355.3	1.28	42.6	119,404	208,956	12,345,835
Arterial	0.32	4%	4%	1742.1	1.26	19.5	362,728	634,774	13,007,431
Local	0.23	2%	2%	82.3	1.02	24.4	28,311	49,545	7,431,725
Total							510,443	893,275	32,784,992

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.56	12%	11%	435.1	1.28	41.3	20,316	35,553	2,588,195
Arterial	0.41	5%	4%	303.3	1.29	17.6	65,890	115,307	2,812,380
Local	0.27	2%	2%	8.9	1.02	23.9	3,476	6,083	1,522,269
PM Period (4 to 8 PM)									
Freeway	0.29	4%	6%	332.6	1.18	43.6	18,122	31,714	2,361,340
Arterial	0.15	1%	1%	103.7	1.11	21.6	29,327	51,322	1,904,471
Local	0.10	0%	0%	4.5	1.01	24.3	1,564	2,737	963,022
Daily Total									
Freeway	0.50	10%	13%	2674.3	1.34	40.9	154,401	270,202	12,668,093
Arterial	0.36	5%	5%	2414.1	1.32	18.6	506,509	886,390	13,985,225
Local	0.25	2%	3%	117.4	1.02	23.8	37,021	64,786	7,900,242
Total							697,930	1,221,378	34,553,560

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
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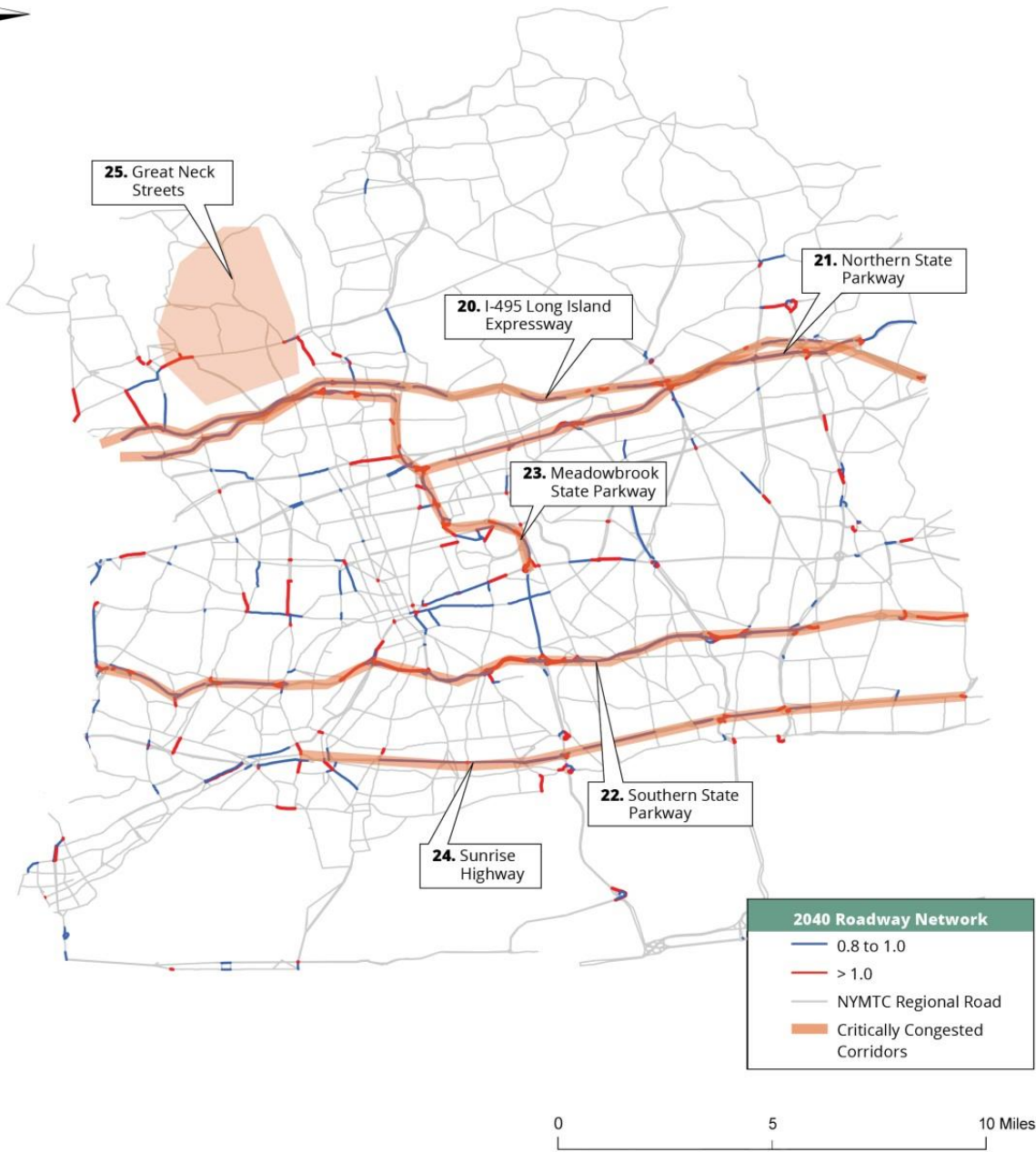
AM Period (6 to 10 AM)									
Freeway	4%	–	–	13%	5%	-4%	45%	45%	3%
Arterial	11%	–	–	57%	4%	-5%	38%	38%	9%
Local	13%	–	–	15%	1%	-2%	33%	33%	7%
PM Period (4 to 8 PM)									
Freeway	7%	–	–	29%	4%	-4%	61%	61%	5%
Arterial	7%	–	–	61%	2%	-3%	30%	30%	6%
Local	11%	–	–	35%	1%	-2%	30%	30%	4%
Daily Total									
Freeway	4%	–	–	14%	5%	-4%	29%	29%	3%
Arterial	13%	–	–	39%	5%	-4%	40%	40%	8%
Local	9%	–	–	43%	0%	-3%	31%	31%	6%
Total							37%	37%	5%

Nassau – Congested Corridors

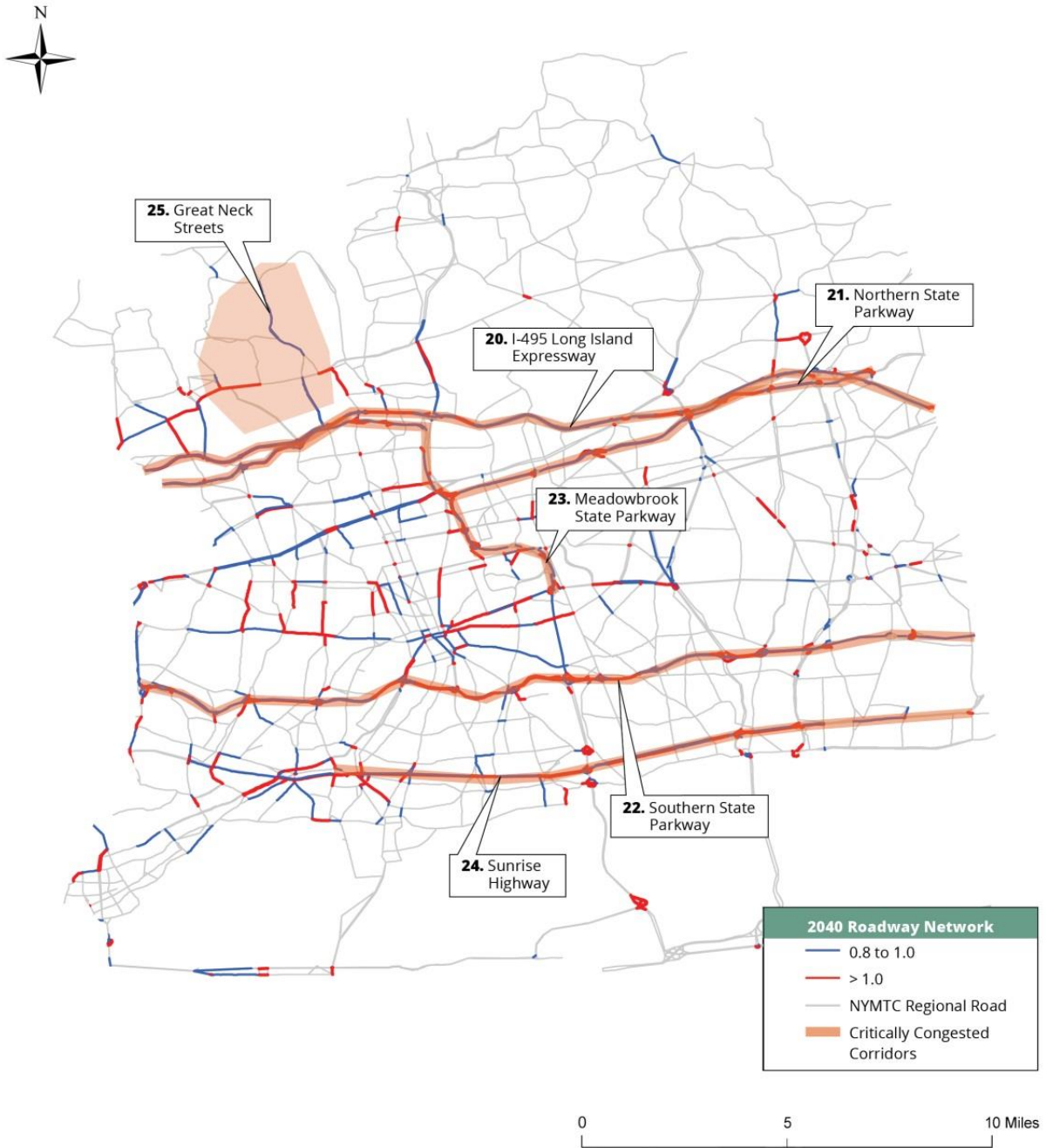
20. **I-495/Long Island Expressway from Queens County Boundary to Suffolk County Boundary** – The westernmost portion of this stretch of I-495 (from the Queens County Boundary to Mineola/Willis Avenue) is part of the 16th highest-ranked corridor in the United States in terms of Congestion Cost in the TTI Report. The entire length of I-495 in Nassau County regularly experiences severe congestion mostly (but not exclusively) during peak commuting periods and around summer weekends, due to insufficient mainline capacity, frequent merges and weaves, and heavy truck usage. The eastbound direction is generally heaviest in evening peaks and on summer Fridays. The westbound direction is generally heaviest in morning peaks and on summer Sundays. The heavy usage of this road by trucks (I-495 is the only east-west limited-access highway in Nassau County on which trucks are permitted) causes the economic cost of the congestion on I-495 to be very high.
21. **Northern State Parkway (NSP) from Queens County Boundary to Suffolk County Boundary** – Essentially the same story as 20, except that congestion is not quite as severe and trucks are not permitted on this road.
22. **Southern State Parkway from Queens County Boundary to Suffolk County Boundary** – Essentially the same story as 21.
23. **Meadowbrook State Parkway from Hempstead Turnpike to the Northern State Parkway** – Heaviest-traveled north-south road in the county. Abuts the Nassau “Hub” area containing Roosevelt Field, Nassau Community College, the Nassau Veterans Memorial Coliseum, Hofstra University, and other shopping centers and major generators. The northbound direction is generally heaviest in morning peaks and the southbound direction is generally heaviest in evening peaks.
24. **NY-27/Sunrise Highway from Peninsula Boulevard to the Suffolk County Boundary** – This heavily traveled six-lane arterial has frequent signalized intersections and abuts major retail and other commercial centers as well as active Long Island Rail Road (LIRR) stations. It also carries the second highest (after I-495) east-west truck volume among Long Island highways. The eastbound direction is generally heaviest in evening peaks. The westbound direction is generally heaviest in morning peaks. There is significant pedestrian activity, particularly in the vicinity of the LIRR stations.
25. **Great Neck/Manhasset Streets** – The Great Neck/Manhasset area is a large employment center with three main centers: first, the area around the Great Neck LIRR station, second, the North Shore University Hospital complex and surrounding medical buildings on Community Drive and Northern Boulevard, and third, the concentration of retail and office space along Northern Boulevard east of

Community Drive. Because this area is a peninsula with access only via a limited number of arterial streets, these streets experience heavy congestion during peak commuting periods (primarily northbound in the morning and southbound in the evening). In addition, NY Route 25A (Northern Boulevard) also traverses this area in an east-west orientation, providing access as well as carrying spillover traffic from I-495 and the NSP.

Nassau: Congested Corridors and Hot Spot Areas (AM Period)



Nassau: Congested Corridors and Hot Spot Areas (PM Period)



6.5 Putnam

Major Portals and Roadways

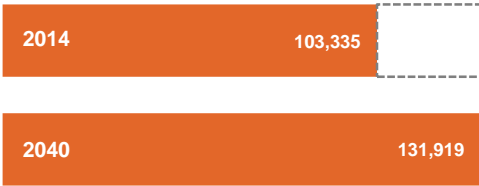


New York Metropolitan Transportation Council

Population and Travel Characteristics

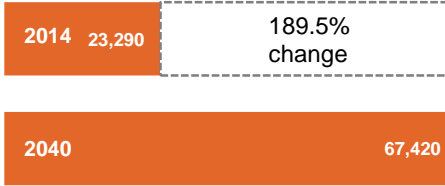
Population

21.7%
change



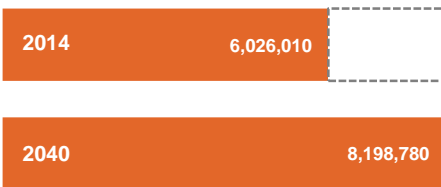
VHD Daily Totals

189.5%
change

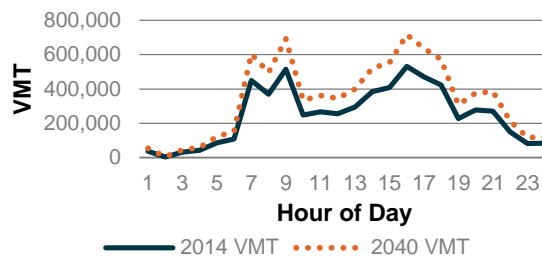


VMT Daily Totals

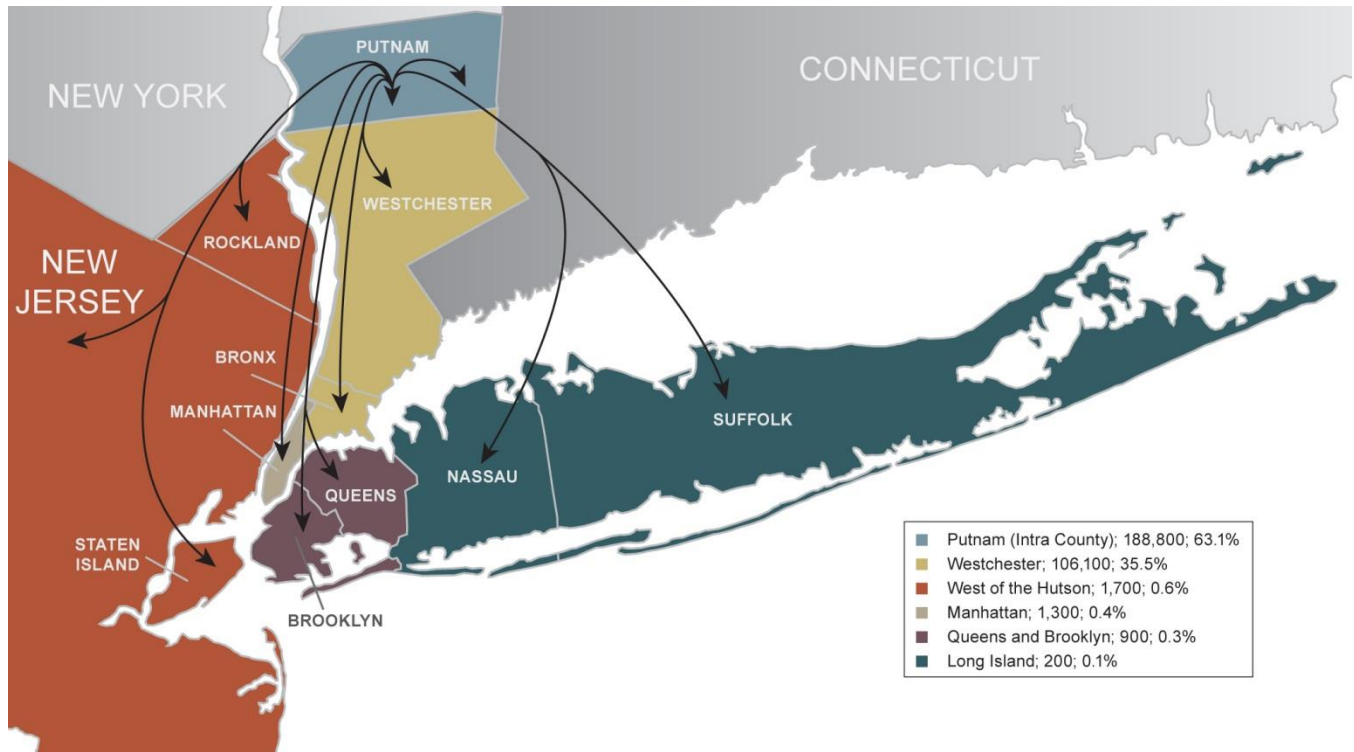
36.1%
change



Putnam 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County: Putnam

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.30	1%	2%	3.6	1.02	56.6	279	401	490,042
Arterial	0.33	3%	7%	57.5	1.13	27.7	9,941	14,314	393,460
Local	0.11	0%	0%	0.0	1.00	29.4	85	123	699,370
PM Period (4 to 8 PM)									
Freeway	0.09	0%	0%	1.8	1.01	57.3	71	102	318,287
Arterial	0.09	0%	0%	14.5	1.02	28.8	740	1,065	212,634
Local	0.03	0%	0%	0.0	1.00	29.5	5	7	368,879
Daily Total									
Freeway	0.19	1%	1%	12.8	1.01	57.0	810	1,166	1,845,303
Arterial	0.22	3%	3%	192.0	1.06	28.3	22,208	31,979	1,459,510
Local	0.08	0%	0%	0.0	1.00	29.4	270	389	2,721,193
Total							23,288	33,535	6,026,006

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.39	5%	2%	46.5	1.05	55.8	620	892	629,053
Arterial	0.43	5%	11%	117.0	1.34	26.7	29,203	42,053	536,602
Local	0.14	0%	0%	3.4	1.00	29.3	423	610	961,308
PM Period (4 to 8 PM)									
Freeway	0.14	1%	1%	7.8	1.01	56.9	202	290	485,399
Arterial	0.12	1%	1%	26.3	1.04	28.5	2,780	4,003	288,308
Local	0.04	0%	0%	0.0	1.00	29.4	22	31	507,102
Daily Total									
Freeway	0.26	2%	1%	64.1	1.03	56.5	1,739	2,504	2,542,414
Arterial	0.28	3%	6%	350.7	1.15	27.7	64,593	93,014	1,954,647
Local	0.10	0%	0%	3.4	1.00	29.3	1,083	1,560	3,701,723
Total							67,415	97,078	8,198,783

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
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AM Period (6 to 10 AM)									
Freeway	30%	–	–	1199%	3%	-2%	122%	122%	28%
Arterial	30%	–	–	104%	19%	-4%	194%	194%	36%
Local	27%	–	–	-	0%	0%	396%	396%	37%
PM Period (4 to 8 PM)									
Freeway	56%	–	–	333%	0%	-1%	185%	185%	53%
Arterial	33%	–	–	81%	2%	-1%	276%	276%	36%
Local	33%	–	–	-	0%	0%	358%	358%	37%
Daily Total									
Freeway	37%	–	–	399%	2%	-1%	115%	115%	38%
Arterial	27%	–	–	83%	8%	-2%	191%	191%	34%
Local	25%	–	–	-	0%	0%	301%	301%	36%
Total							189%	189%	36%

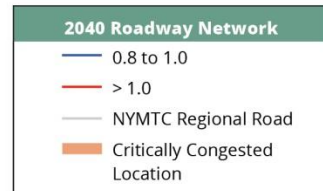
Putnam – Congested Location

- I-84/I-684 Interchange** – The NYBPM peak period assignments indicate that the ramps in this Interchange have insufficient capacity, causing queue spillbacks, particularly on northbound I-684 in evening peaks as well as on Fridays in both the winter ski season and the summer.

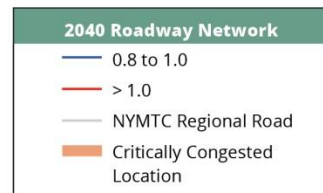
Putnam: Congested Location and Hot Spot Areas (AM Period)



26. I-84/I-684 Interchange

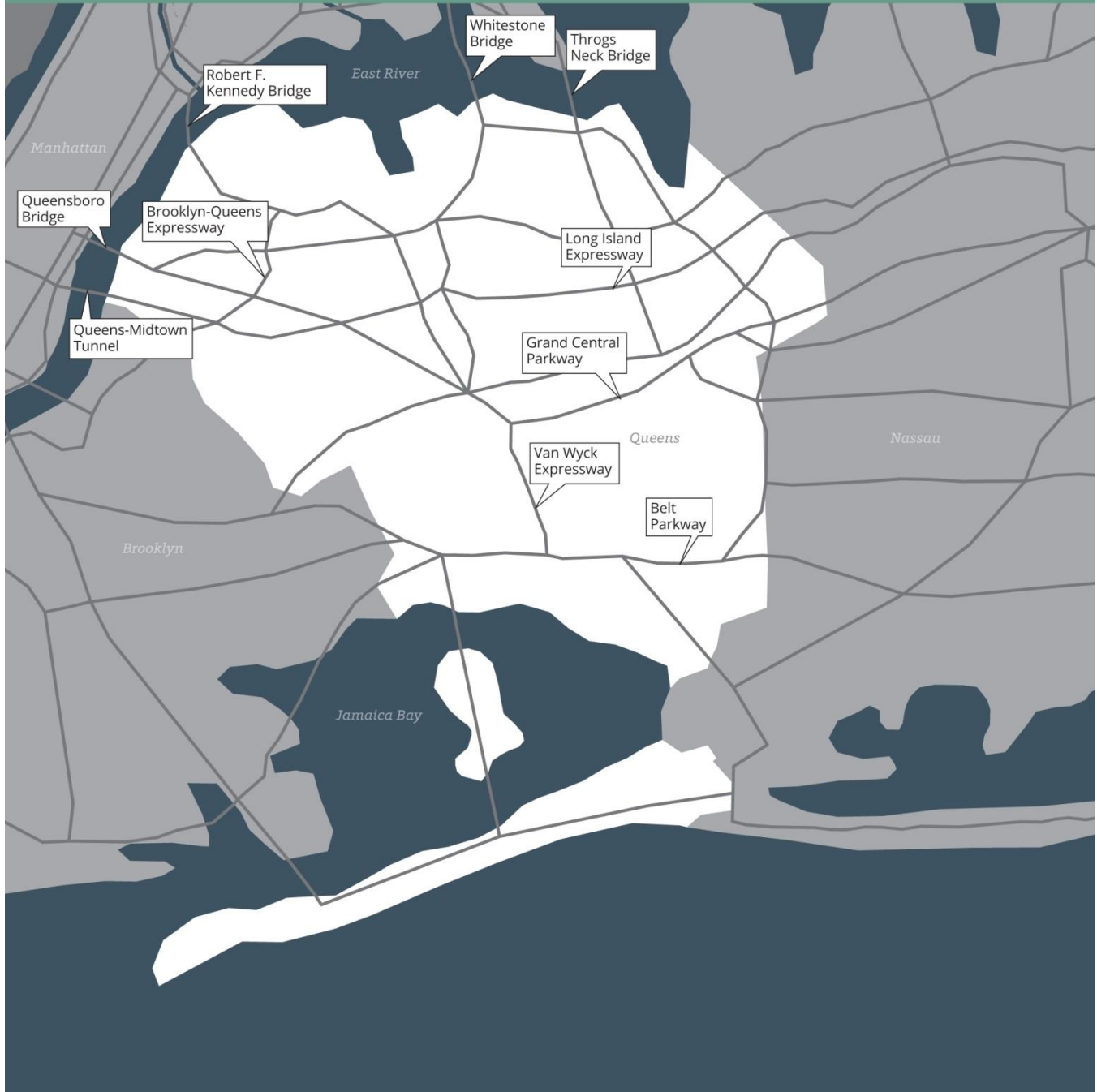


Putnam: Congested Location and Hot Spot Areas (PM Period)



6.6 Queens

Major Portals and Roadways



New York Metropolitan Transportation Council

Population and Travel Characteristics

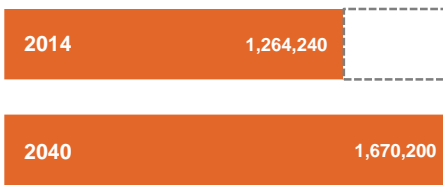
Population

13.9%
change



VHD Daily Totals

32.1%
change

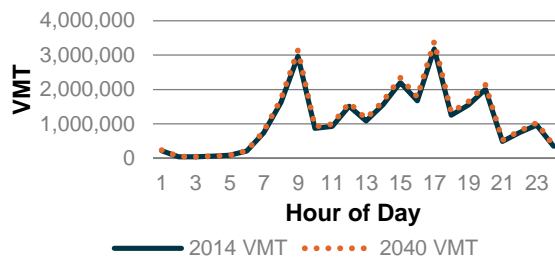


VMT Daily Totals

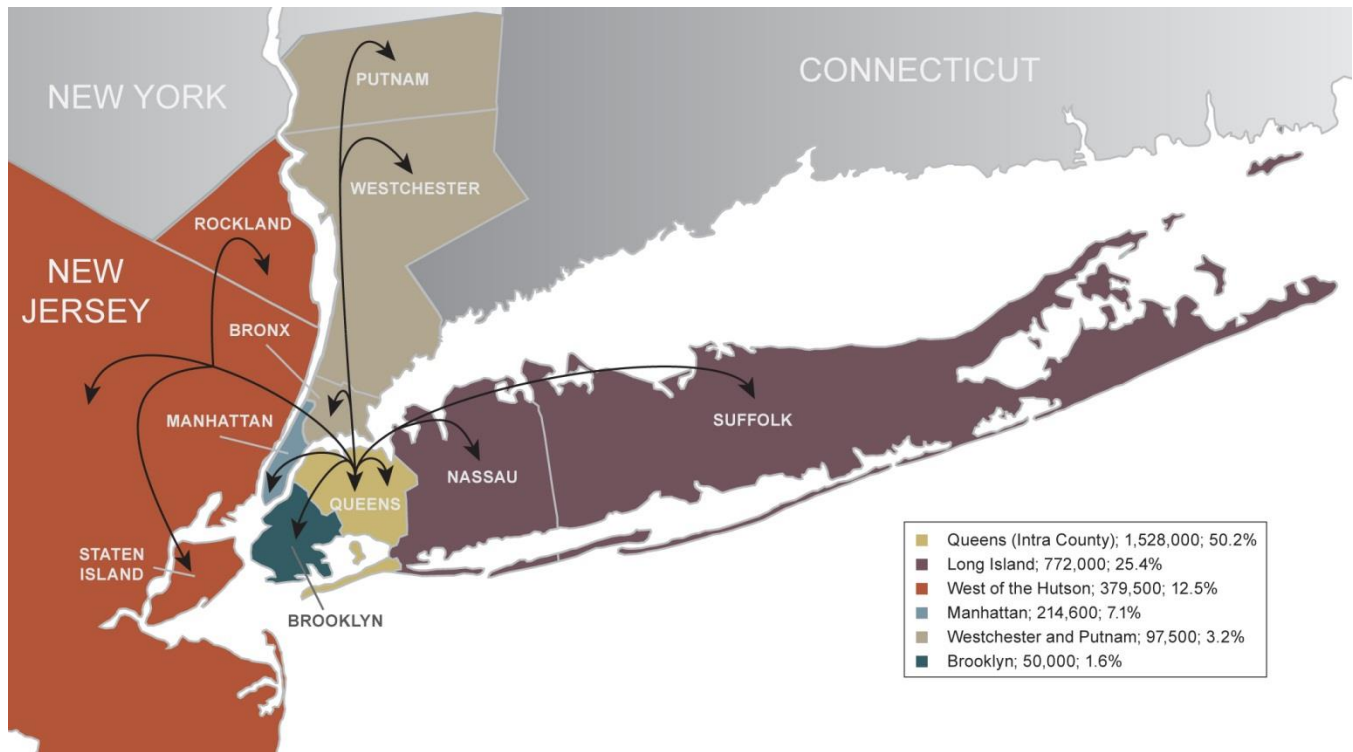
6.3%
change



Queens 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County (Borough): Queens (Queens)

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.73	8%	24%	640.8	1.78	35.0	94,157	139,353	2,732,257
Arterial	0.45	6%	10%	676.5	2.02	15.3	351,868	520,765	2,181,634
Local	0.47	4%	13%	3.4	1.11	19.6	33,433	49,481	1,289,120
PM Period (4 to 8 PM)									
Freeway	0.26	2%	5%	217.5	1.15	41.2	16,171	23,933	1,654,621
Arterial	0.12	1%	1%	101.9	1.13	20.2	31,636	46,821	1,056,487
Local	0.11	1%	0%	0.1	1.00	21.5	454	672	485,047
Daily Total									
Freeway	0.54	8%	16%	2388.8	1.44	37.8	237,948	352,164	11,248,583
Arterial	0.33	4%	6%	2377.4	1.57	17.0	930,727	1,377,476	9,298,150
Local	0.35	5%	8%	11.1	1.05	20.3	95,561	141,431	5,809,807
Total							1,264,237	1,871,070	26,356,540

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.75	8%	25%	683.5	1.82	34.1	102,230	151,301	2,863,377
Arterial	0.50	6%	12%	811.3	2.29	14.6	473,259	700,423	2,349,079
Local	0.51	4%	16%	3.6	1.12	19.1	37,118	54,934	1,353,760
PM Period (4 to 8 PM)									
Freeway	0.27	3%	6%	253.6	1.18	40.4	19,944	29,518	1,779,930
Arterial	0.13	1%	1%	139.5	1.15	19.7	39,175	57,979	1,125,141
Local	0.11	1%	0%	0.1	1.00	21.1	536	794	502,922
Daily Total									
Freeway	0.56	9%	17%	2633.1	1.48	36.9	269,418	398,739	11,843,305
Arterial	0.37	5%	8%	2941.5	1.72	16.4	1,258,794	1,863,015	9,984,903
Local	0.38	6%	10%	14.6	1.07	19.8	141,985	210,138	6,183,352
Total							1,670,197	2,471,892	28,011,559

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
---------------	-----	-----------------	-------	-----	-----	-----	-----	-----	-----

AM Period (6 to 10 AM)									
Freeway	3%	–	–	7%	2%	-3%	9%	9%	5%
Arterial	11%	–	–	20%	13%	-5%	34%	34%	8%
Local	9%	–	–	7%	1%	-3%	11%	11%	5%
PM Period (4 to 8 PM)									
Freeway	4%	–	–	17%	3%	-2%	23%	23%	8%
Arterial	8%	–	–	37%	2%	-3%	24%	24%	6%
Local	0%	–	–	0%	0%	-2%	18%	18%	4%
Daily Total									
Freeway	4%	–	–	10%	3%	-2%	13%	13%	5%
Arterial	12%	–	–	24%	10%	-4%	35%	35%	7%
Local	9%	–	–	31%	2%	-3%	49%	49%	6%
Total							32%	32%	6%

Queens – Congested Corridors

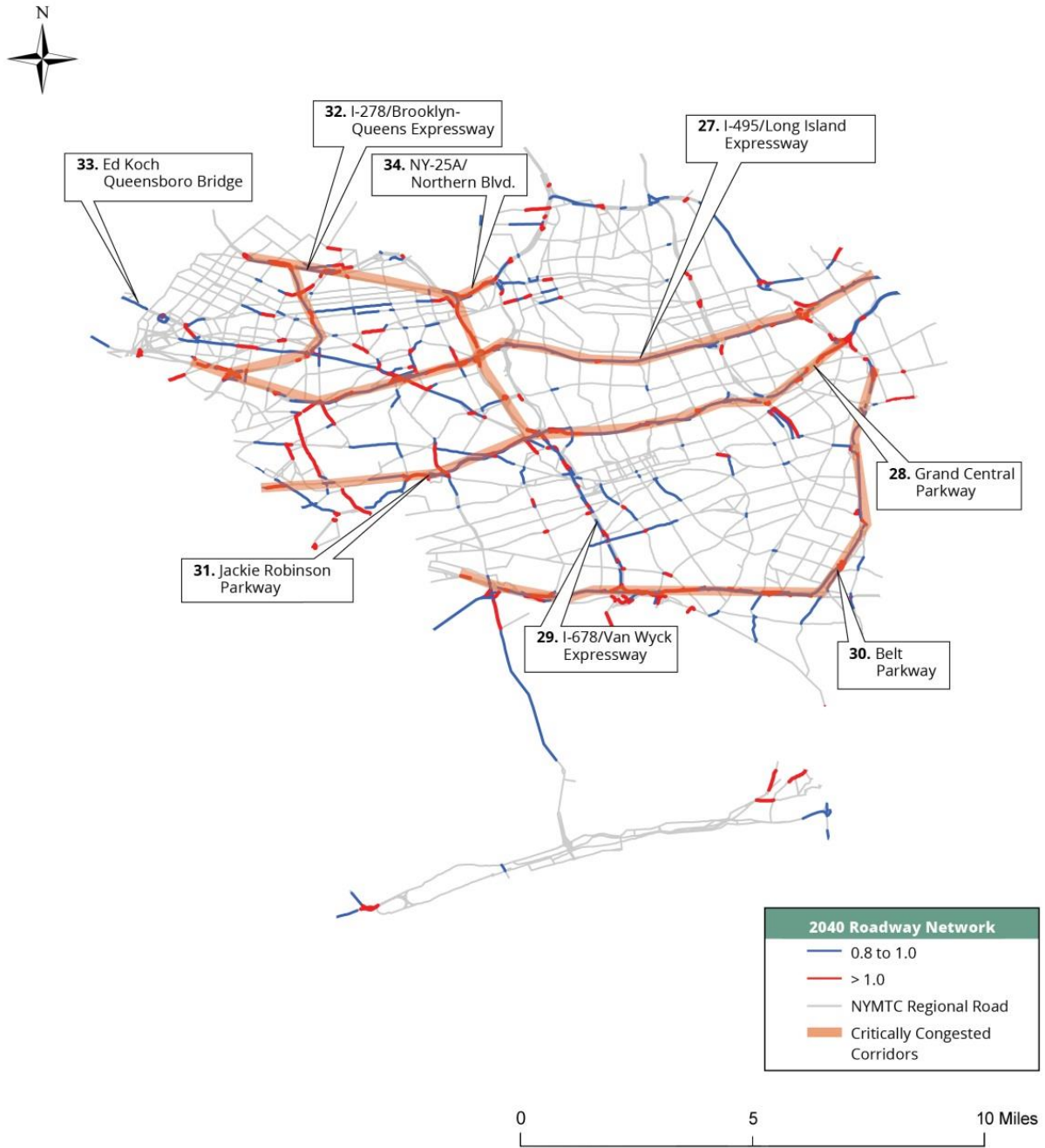
27. **I-495/Long Island Expressway from the Queens-Midtown Tunnel to the Nassau County Boundary** – The stretch of I-495 from Maurice Avenue/Exit 18 to the Nassau County Boundary is part of the 16th highest-ranked corridor in the United States in terms of Congestion Cost in the TTI Report. The entire length of I-495 in Queens County regularly experiences severe congestion mostly (but not exclusively) during peak commuting periods, due to insufficient mainline capacity, frequent merges and weaves, and heavy truck usage. The eastbound direction is heaviest in evening peaks. The westbound direction is heaviest in morning peaks. The heavy usage of this road by trucks (I-495 is the only east-west limited access Queens highway on which trucks are permitted) causes the economic cost of the congestion on I-495 to be very high.

28. **Grand Central Parkway (GCP) from the RFK Bridge to the Nassau County Boundary** – The entire length of the GCP regularly experiences severe congestion mostly (but not exclusively) during peak commuting periods, due to insufficient mainline capacity, and frequent merges and weaves. The eastbound direction is heaviest in evening peaks. The westbound direction is heaviest in morning peaks. Trucks are not permitted on this road.

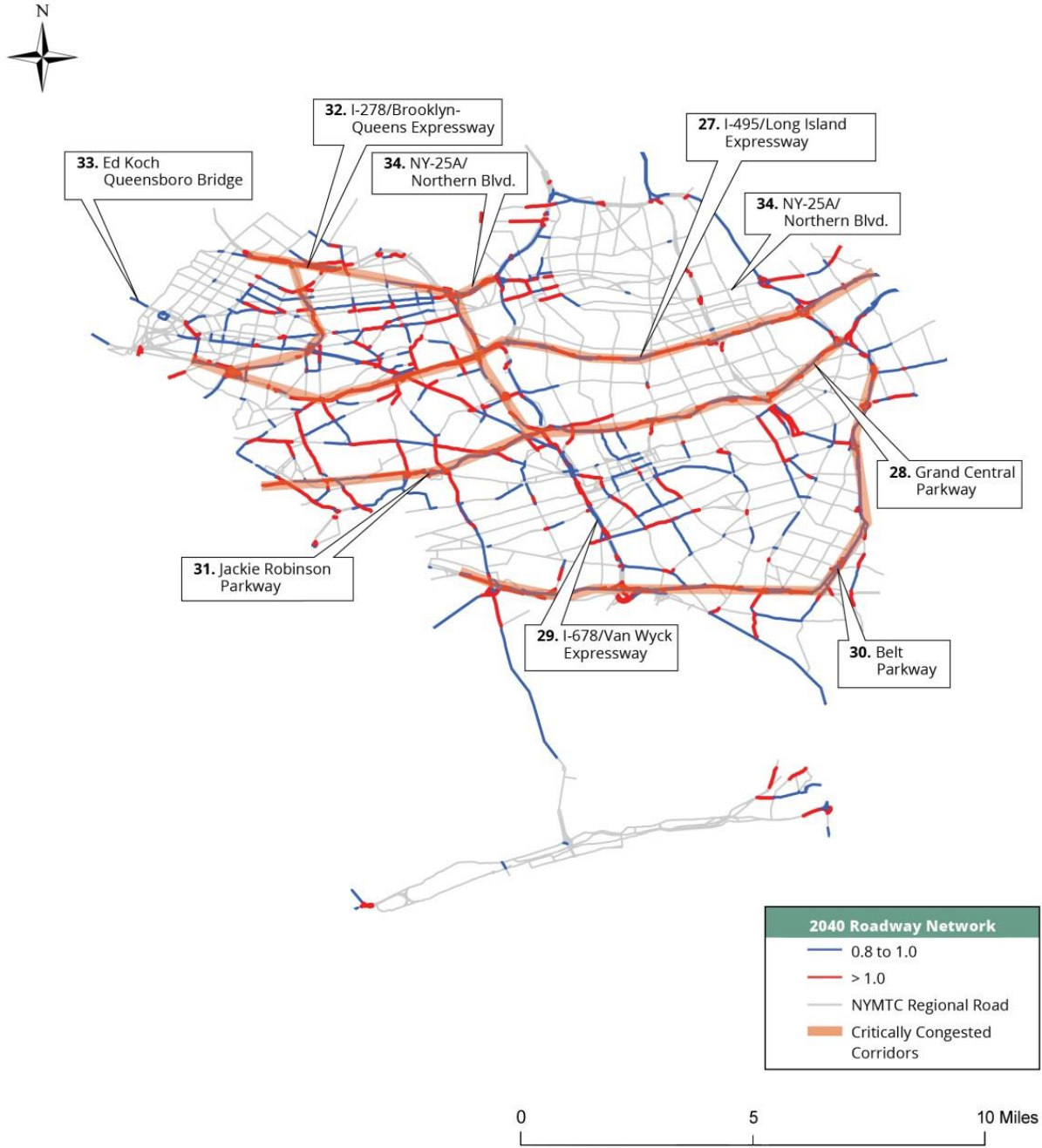
29. **I-678/Van Wyck Expressway from JFK Airport to the GCP** – In the northbound direction, this stretch of I-678 is the 4th highest-ranked corridor in the United States in terms of Delay per Mile in the TTI Report. In the southbound direction, it is the 19th highest-ranked corridor in the United States in terms of Delay per Mile. The only limited-access highway connecting JFK Airport (including its substantial air cargo facilities) and southern Queens/southwestern Nassau County with central Queens – where it connects with I-495, the GCP, Queens Boulevard, Union Turnpike, and the Jackie Robinson Parkway (JRP) – this portion of I-678 and its northbound Service Road experience severe congestion during many hours of the day due to insufficient mainline capacity, frequent merges and weaves, and heavy truck usage.

30. **Belt Parkway from Brooklyn Boundary to the Bronx-Whitestone Bridge** – The only east-west limited-access highway in southern Queens (primarily serving traffic to/from JFK Airport as well as through trips between Brooklyn and southern Nassau County) and the only continuous north-south limited-access highway in eastern Queens, the entire length of the Belt Parkway in Queens experiences severe congestion mostly (but not exclusively) during peak commuting periods, due to insufficient mainline capacity, and frequent merges and weaves. The eastbound direction in southern Queens and southbound direction in eastern Queens are heaviest in evening peaks. The westbound direction in southern Queens and northbound direction in eastern Queens are heaviest in morning peaks. Trucks are not permitted on this road.
31. **Jackie Robinson Parkway (JRP) from the Brooklyn Boundary to the GCP** – The only limited-access highway connecting eastern Brooklyn with central Queens – where it connects with the GCP, Queens Boulevard, Union Turnpike, and I-678/Van Wyck Expressway – the entire length of the JRP in Queens experiences severe congestion during peak commuting periods, due to insufficient mainline capacity, and frequent merges and weaves. The eastbound direction is heaviest in evening peaks. The westbound direction is heaviest in morning peaks. Trucks are not permitted on this road.
32. **I-278/Brooklyn-Queens Expressway from the Brooklyn Boundary to the RFK Bridge** – The southern portion of this stretch of I-278 (from the Kosciuszko Bridge to NY-25A/Northern Boulevard) is part of the 13th highest-ranked corridor in the United States in terms of Delay per Mile in the TTI Report. The only north-south limited access highway in western Queens, I-278 experiences heavy congestion during peak commuting periods due to insufficient mainline capacity, heavy merges and weaves, and heavy truck usage, and spillbacks from congestion on the GCP/RFK Bridge approach. The eastbound/northbound direction is heaviest in evening peaks. The westbound/southbound direction is heaviest in morning peaks.
33. **Ed Koch Queensboro Bridge** – The only toll-free East River crossing between Queens and Manhattan, this Bridge (also known as the 59th Street Bridge) experiences heavy congestion primarily (but not exclusively) during peak commuting periods due to insufficient mainline capacity, and interactions with the street systems on both ends (it has no direct connections with limited-access highways on either side). The eastbound (outbound) direction is heaviest in evening peaks. The westbound (inbound) direction is heaviest in morning peaks.
34. **NY-25A/Northern Boulevard from the GCP to I-678/Van Wyck Expressway/Whitestone Expressway** – This section of Northern Boulevard provides connections between the GCP (providing access to LaGuardia Airport, I-278, and the RFK Bridge), Northern Boulevard, and Astoria Boulevard on the west and I-678 (providing access to the Bronx-Whitestone Bridge), Northern Boulevard, and downtown Flushing on the east. It experiences heavy congestion during peak commuting periods due to heavy merging and weaving. The eastbound direction is heaviest in evening peaks. The westbound direction is heaviest in morning peaks.

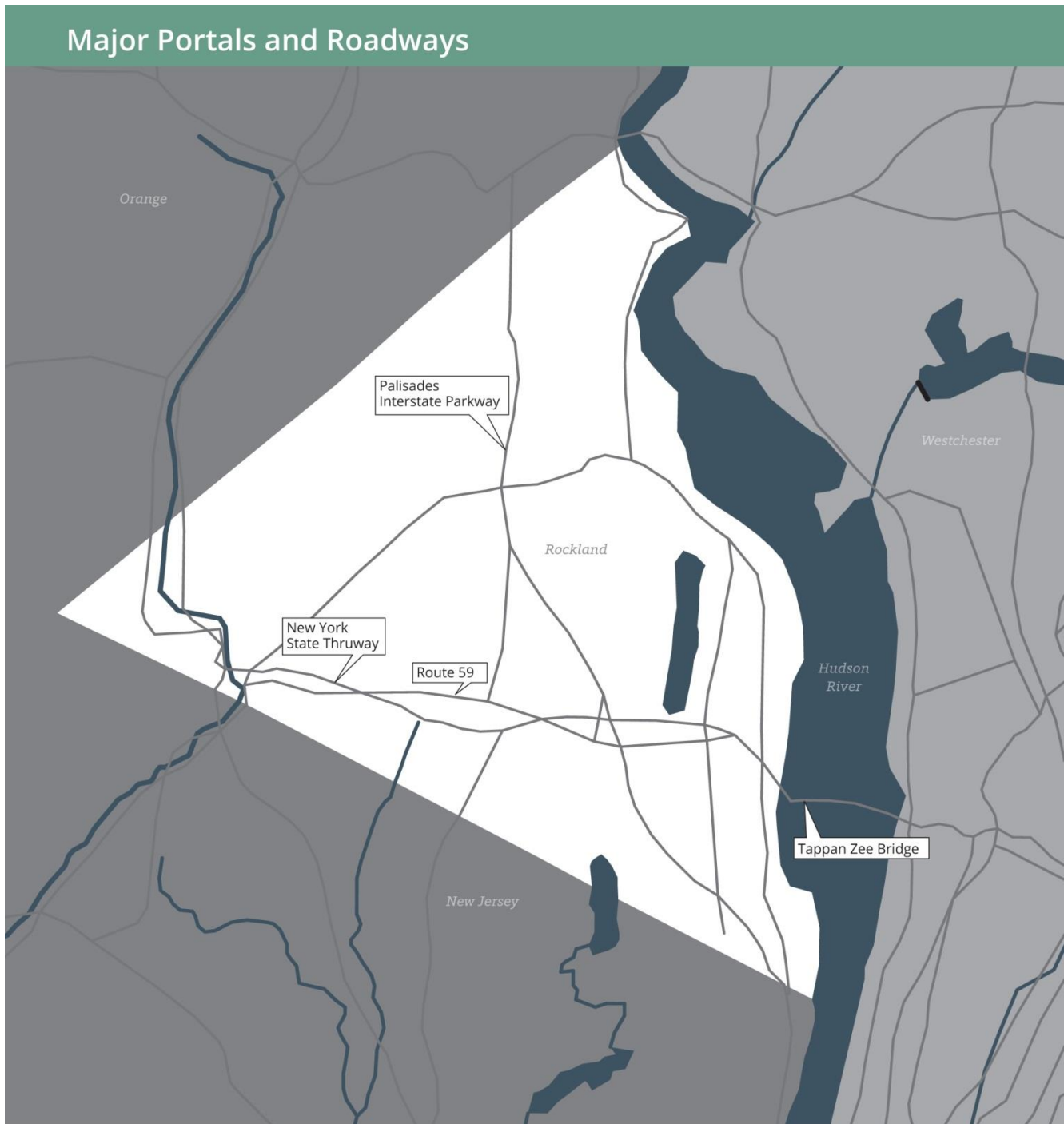
Queens: Congested Corridors and Hot Spot Areas (AM Period)



Queens: Congested Corridors and Hot Spot Areas (PM Period)

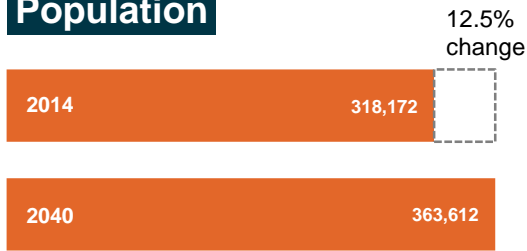


6.7 Rockland

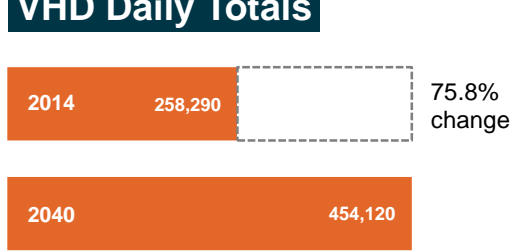


Population and Travel Characteristics

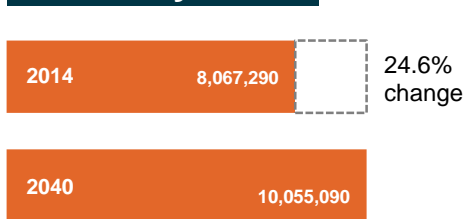
Population



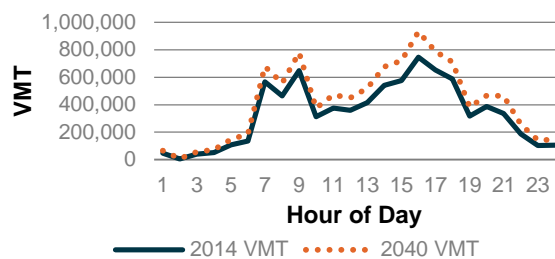
VHD Daily Totals



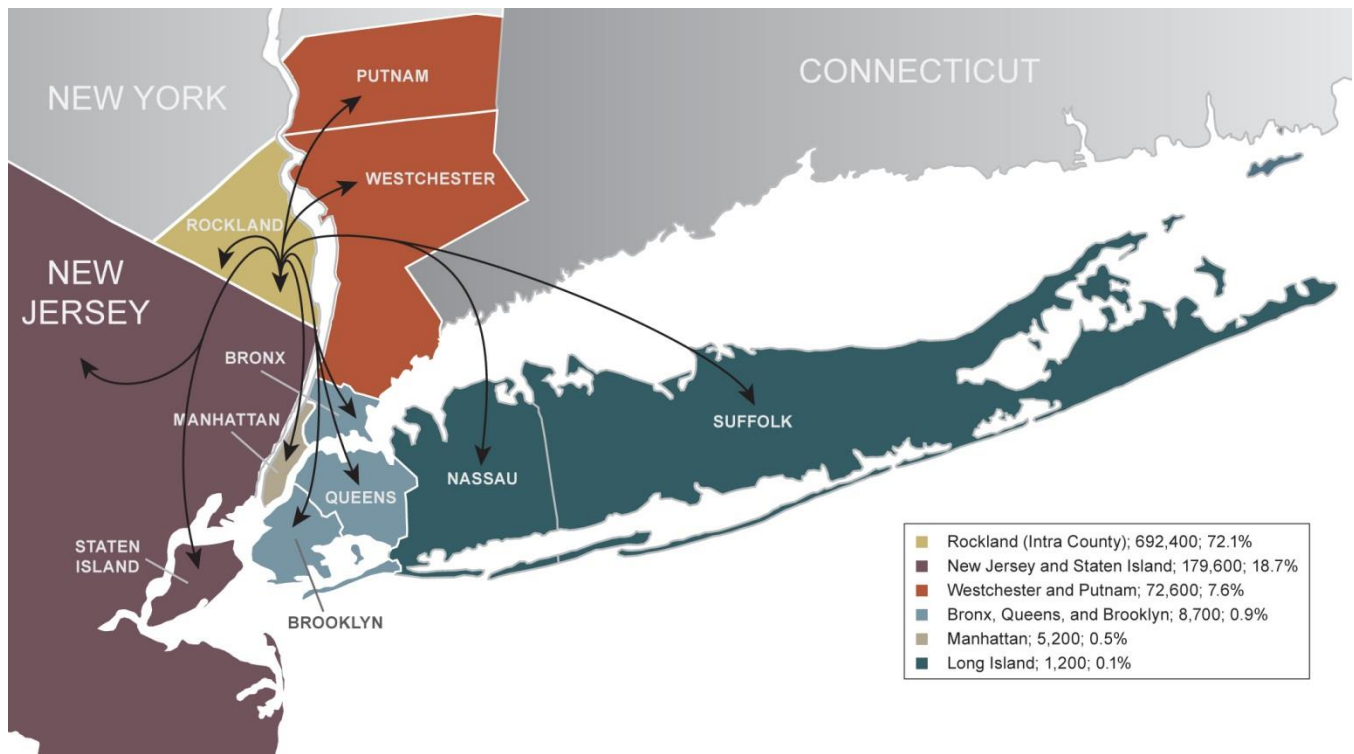
VMT Daily Totals



Rockland 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County: Rockland

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.50	7%	8%	67.0	1.21	44.8	2,573	3,705	934,089
Arterial	0.25	1%	1%	14.2	1.11	23.4	5,754	8,285	659,157
Local	0.20	0%	2%	3.3	1.24	22.1	40,758	58,692	397,200
PM Period (4 to 8 PM)									
Freeway	0.14	1%	1%	8.1	1.04	49.3	512	737	495,404
Arterial	0.08	0%	0%	7.0	1.04	26.4	2,060	2,967	387,404
Local	0.06	0%	0%	1.4	1.04	23.8	4,543	6,543	236,909
Daily Total									
Freeway	0.33	4%	4%	165.2	1.11	47.0	6,547	9,427	3,532,455
Arterial	0.18	1%	1%	81.6	1.09	24.6	25,845	37,217	2,776,494
Local	0.15	0%	2%	14.2	1.21	22.7	225,897	325,291	1,758,343
Total							258,288	371,935	8,067,292

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.60	14%	12%	160.9	1.32	42.8	6,275	9,036	1,144,913
Arterial	0.29	2%	2%	30.9	1.13	23.5	7,659	11,029	788,406
Local	0.23	0%	3%	3.3	1.42	21.0	91,445	131,680	456,258
PM Period (4 to 8 PM)									
Freeway	0.21	1%	2%	55.9	1.07	48.4	1,895	2,729	824,686
Arterial	0.09	0%	0%	10.6	1.04	26.6	2,663	3,835	453,152
Local	0.07	0%	0%	1.4	1.05	22.8	8,163	11,754	268,340
Daily Total									
Freeway	0.43	7%	7%	495.9	1.19	45.5	17,818	25,659	4,757,855
Arterial	0.21	2%	1%	143.6	1.10	24.7	33,625	48,421	3,268,144
Local	0.18	0%	2%	14.2	1.31	21.7	402,675	579,852	2,029,094
Total							454,119	653,931	10,055,092

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

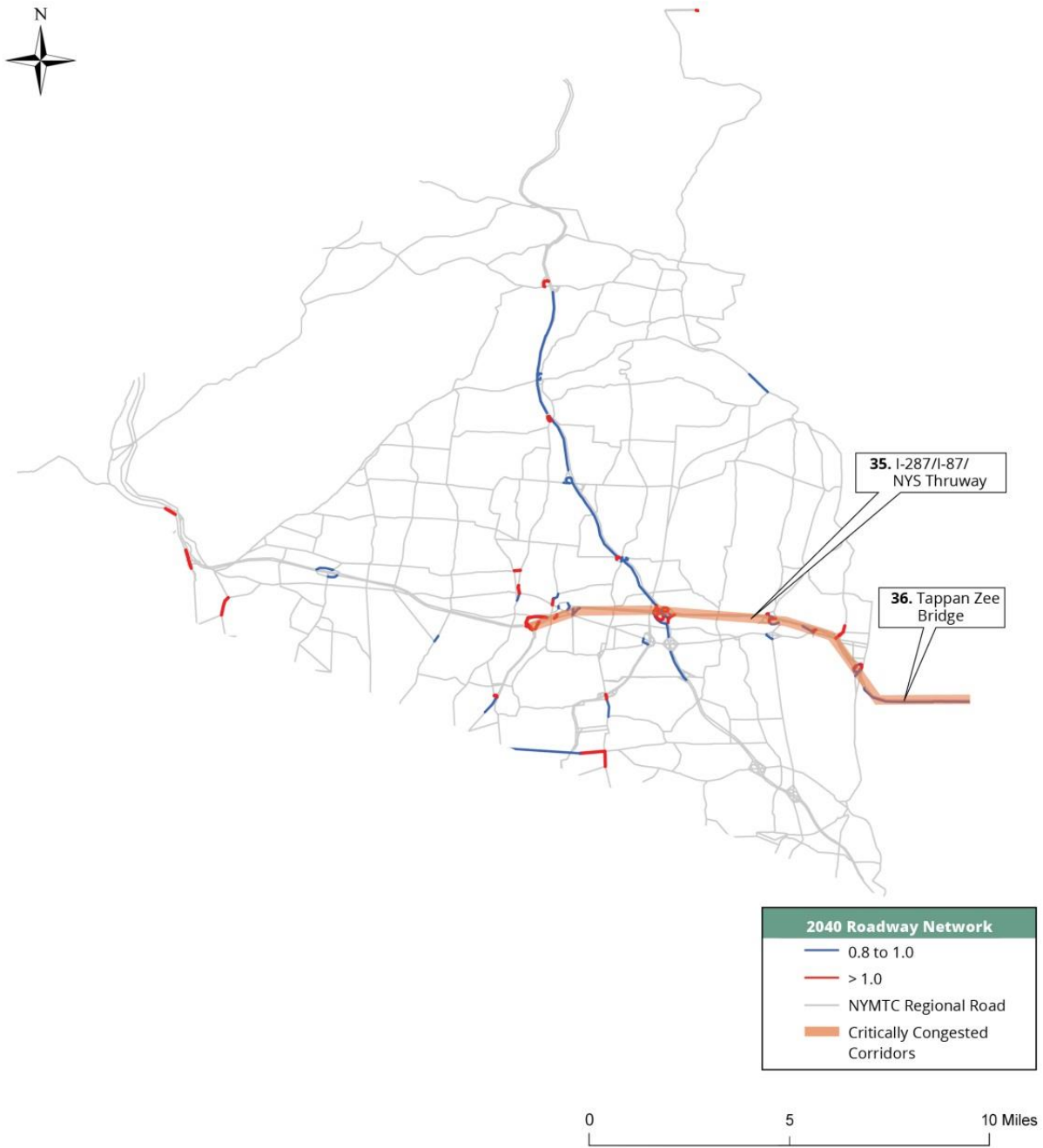
Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	20%	–	–	140%	9%	-4%	144%	144%	23%
Arterial	16%	–	–	118%	2%	1%	33%	33%	20%
Local	15%	–	–	0%	15%	-5%	124%	124%	15%
PM Period (4 to 8 PM)									
Freeway	50%	–	–	592%	3%	-2%	270%	270%	66%
Arterial	13%	–	–	51%	0%	1%	29%	29%	17%
Local	17%	–	–	0%	1%	-4%	80%	80%	13%
Daily Total									
Freeway	30%	–	–	200%	7%	-3%	172%	172%	35%
Arterial	17%	–	–	76%	1%	1%	30%	30%	18%
Local	20%	–	–	0%	8%	-4%	78%	78%	15%
Total							76%	76%	25%

Rockland – Congested Corridors

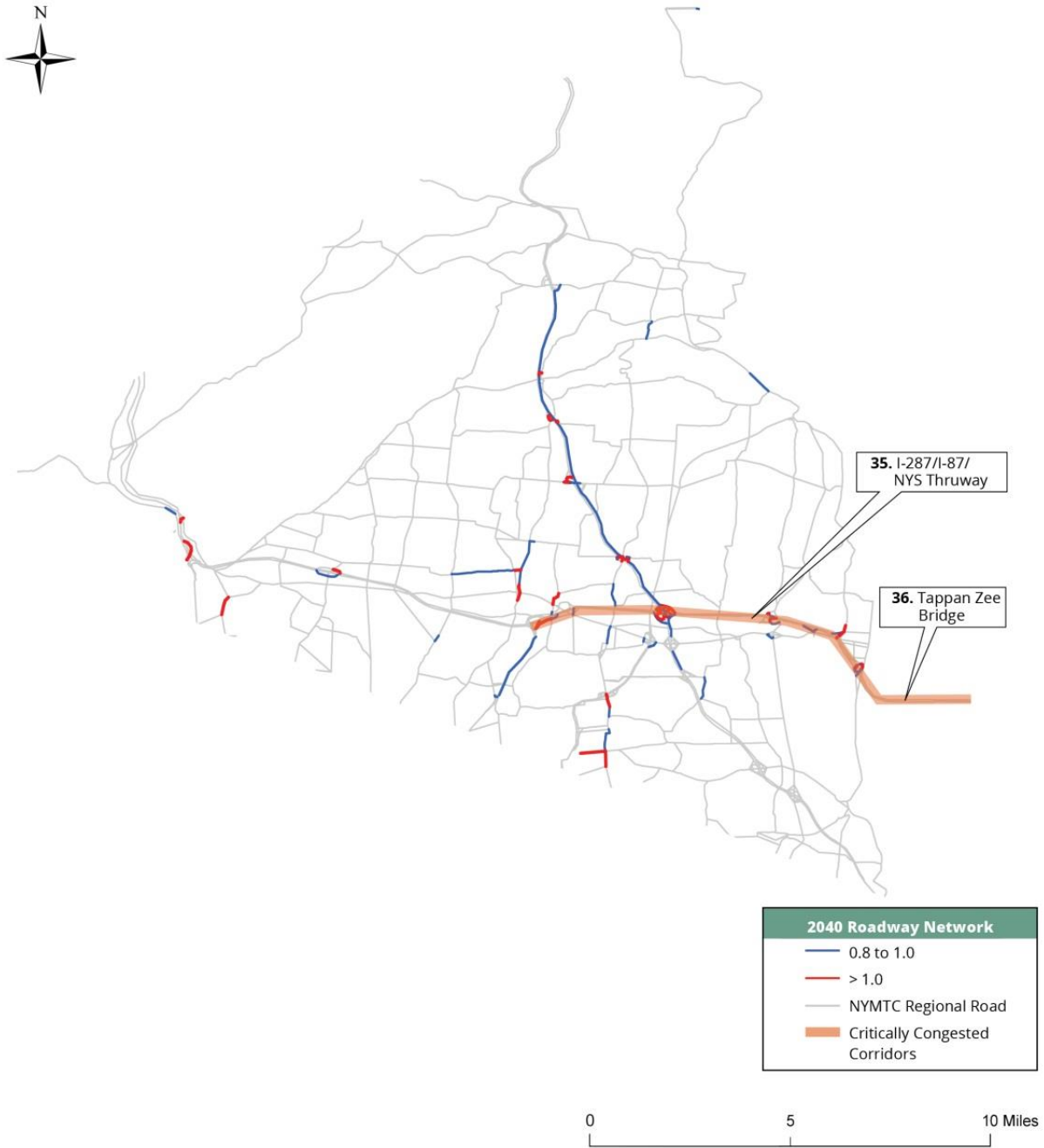
35. **I-287/I-87/NYS Thruway from the Garden State Parkway to the Tappan Zee Bridge** – I-287/I-87 is the only east-west limited-access highway in Rockland County. The subject section of this highway experiences heavy congestion during peak commuting periods and summer weekends due to insufficient mainline capacity, heavy merging and weaving, and steep grades. The eastbound direction is heaviest in morning peaks and on summer Sundays. The westbound direction is heaviest in evening peaks.

36. **Tappan Zee Bridge (TZB)** – The only relatively high-capacity crossing of the Hudson River in the northern part of the New York City region, this Bridge experiences heavy congestion during peak commuting periods and summer weekends due to insufficient mainline capacity and toll plaza area issues. The eastbound direction is heaviest in morning peaks and on summer Sundays. The westbound direction is heaviest in evening peaks. Construction of a replacement for the TZB is expected to start in early 2013, take five years, and cost about \$4 billion. Congestion may not ease substantially, however, as there will still be four travel lanes in the peak direction in peak traffic periods.

Rockland: Congested Corridors and Hot Spot Areas (AM Period)



Rockland: Congested Corridors and Hot Spot Areas (PM Period)



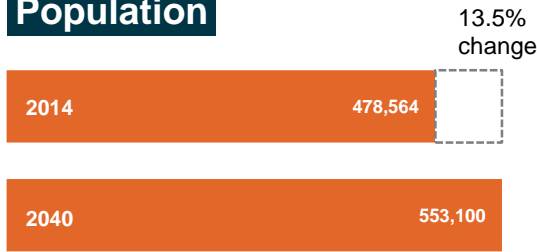
6.8 Staten Island

Major Portals and Roadways

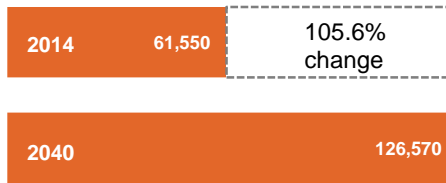


Population and Travel Characteristics

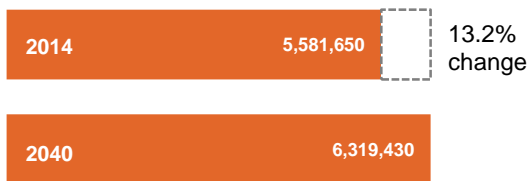
Population



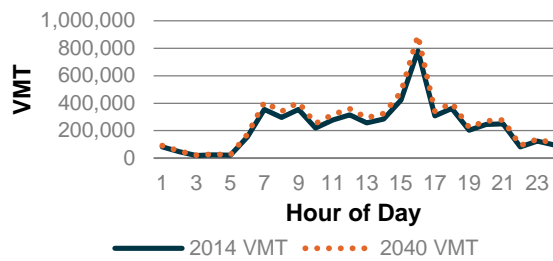
VHD Daily Totals



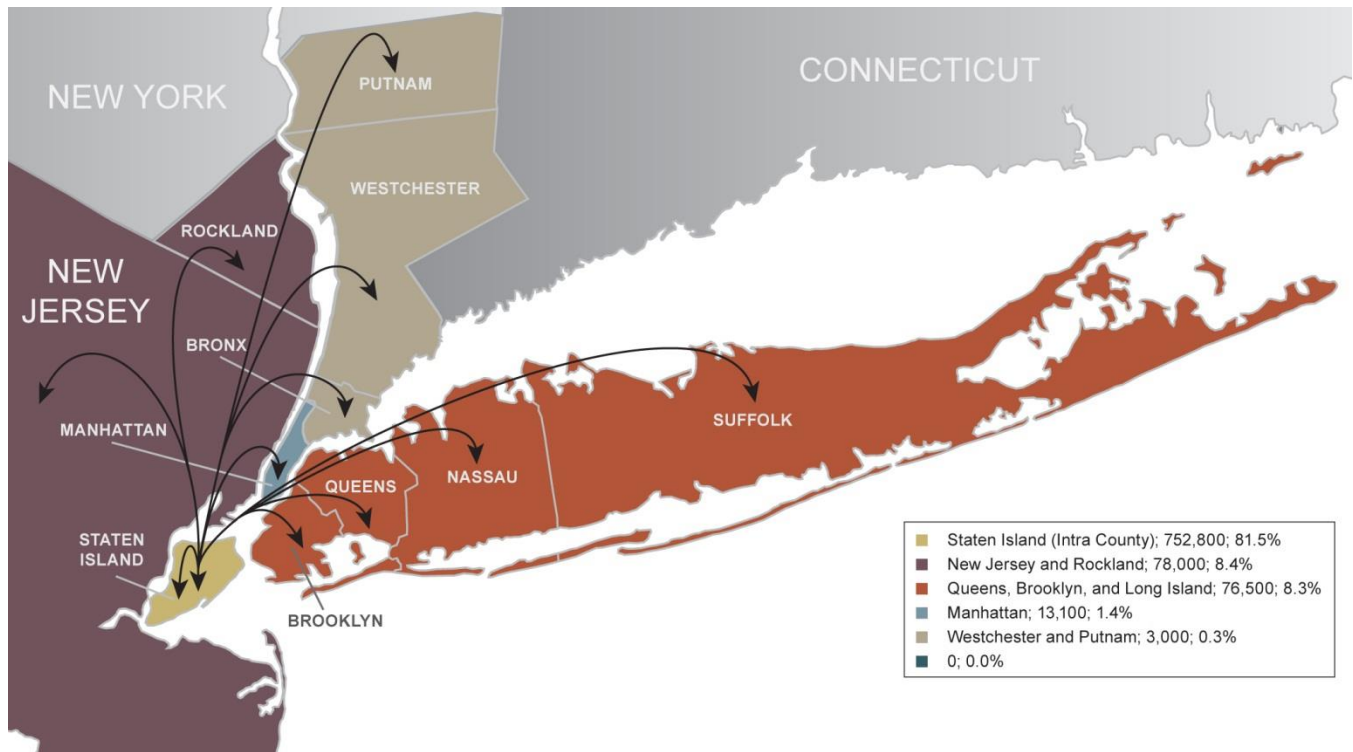
VMT Daily Totals



Staten Island 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures
County (Borough): Richmond (Staten Island)

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.48	8%	6%	50.9	1.11	44.3	1,103	1,632	447,242
Arterial	0.25	1%	0%	5.5	1.09	22.0	3,325	4,921	444,364
Local	0.28	3%	0%	0.0	1.01	24.2	241	357	334,336
PM Period (4 to 8 PM)									
Freeway	0.22	2%	2%	19.5	1.03	46.1	531	785	380,693
Arterial	0.10	0%	0%	5.1	1.04	23.5	1,782	2,637	321,668
Local	0.09	0%	0%	0.0	1.00	24.7	23	34	199,167
Daily Total									
Freeway	0.39	5%	6%	218.8	1.14	44.7	18,200	26,936	2,013,828
Arterial	0.22	1%	1%	154.5	1.11	22.3	40,424	59,828	2,069,443
Local	0.21	2%	1%	1.0	1.01	24.2	2,927	4,333	1,498,381
Total							61,551	91,096	5,581,652

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.52	12%	8%	60.6	1.14	42.0	1,897	2,808	487,926
Arterial	0.33	3%	1%	30.8	1.13	20.6	5,764	8,531	544,881
Local	0.35	3%	0%	0.0	1.02	22.6	681	1,007	372,069
PM Period (4 to 8 PM)									
Freeway	0.25	2%	3%	39.3	1.09	43.9	2,984	4,416	439,916
Arterial	0.12	0%	0%	14.8	1.05	22.5	2,755	4,078	363,742
Local	0.12	0%	0%	0.0	1.00	23.0	82	121	205,583
Daily Total									
Freeway	0.43	6%	7%	276.6	1.18	42.3	26,346	38,992	2,228,879
Arterial	0.27	2%	2%	282.1	1.18	21.1	84,916	125,676	2,447,091
Local	0.28	2%	2%	1.9	1.04	22.6	15,312	22,662	1,643,459
Total							126,574	187,330	6,319,429

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
---------------	-----	-----------------	-------	-----	-----	-----	-----	-----	-----

AM Period (6 to 10 AM)									
Freeway	8%	–	–	19%	3%	-5%	72%	72%	9%
Arterial	32%	–	–	462%	4%	-6%	73%	73%	23%
Local	25%	–	–	-	1%	-7%	183%	183%	11%
PM Period (4 to 8 PM)									
Freeway	14%	–	–	101%	6%	-5%	462%	462%	16%
Arterial	20%	–	–	191%	1%	-4%	55%	55%	13%
Local	33%	–	–	-	0%	-7%	254%	254%	3%
Daily Total									
Freeway	10%	–	–	26%	4%	-5%	45%	45%	11%
Arterial	23%	–	–	83%	6%	-6%	110%	110%	18%
Local	33%	–	–	90%	3%	-7%	423%	423%	10%
Total							106%	106%	13%

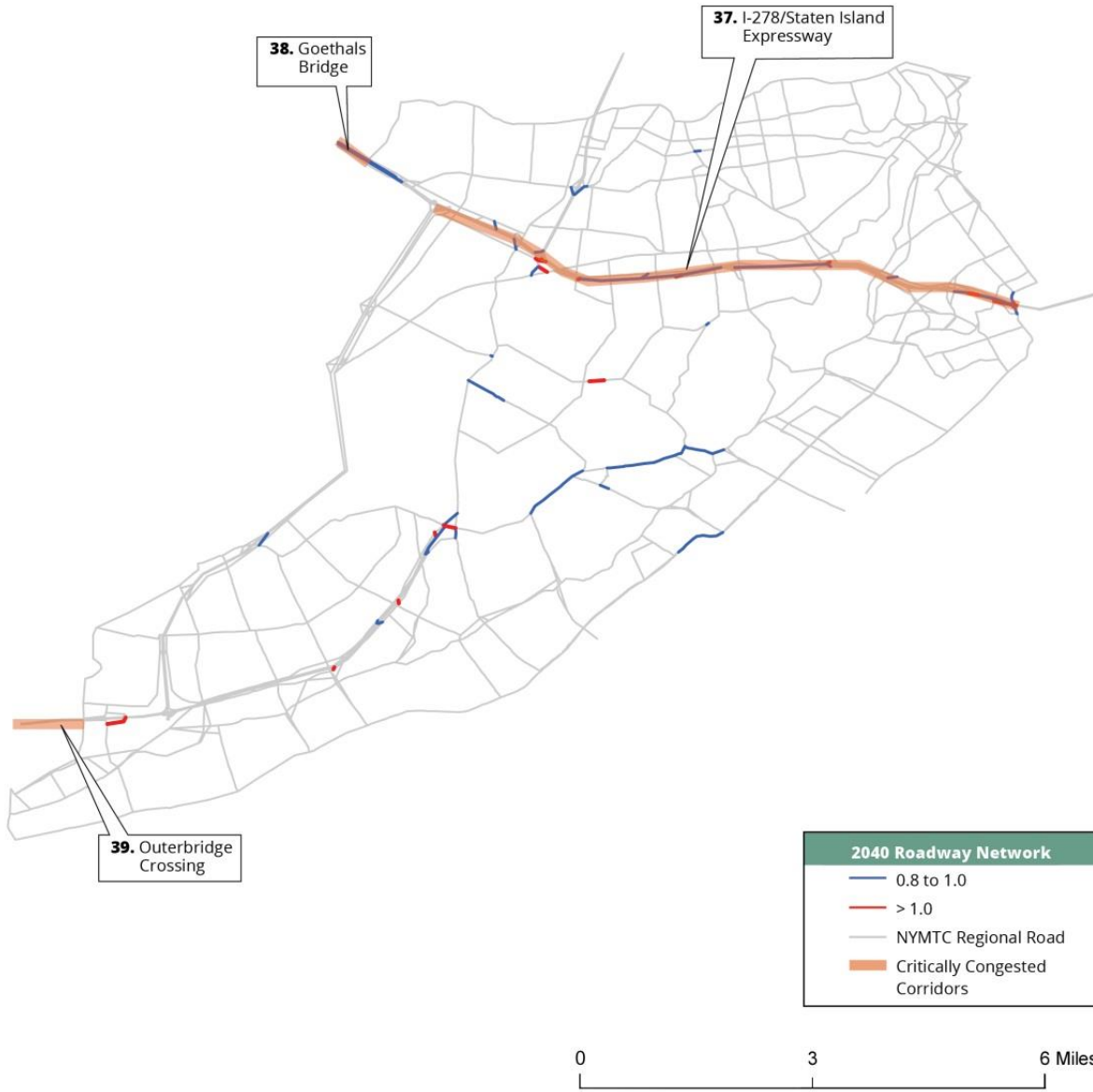
Staten Island – Congested Corridors

37. **I-278/Staten Island Expressway from the Goethals Bridge to the Verrazano-Narrows Bridge** – The western portion of this stretch of I-278 is tied for the 39th highest-ranked corridor in the United States in terms of Delay per Mile in the TTI Report. I-278 is the only east-west limited access highway on Staten Island, and also carries a high volume of through traffic between north-central New Jersey and Brooklyn. It is also the route used by trucks carrying cargo between Ports Newark and Elizabeth and Brooklyn, Queens, and Long Island. Consequently, I-278 experiences heavy congestion during peak commuting periods and on summer weekends due to insufficient mainline capacity, heavy merges and weaves, heavy truck usage, and steep grades. The eastbound direction is heaviest in both peaks and on summer Sundays, approaching the upgrade between Bradley Avenue and Clove Road. The westbound direction is heaviest on summer Fridays.

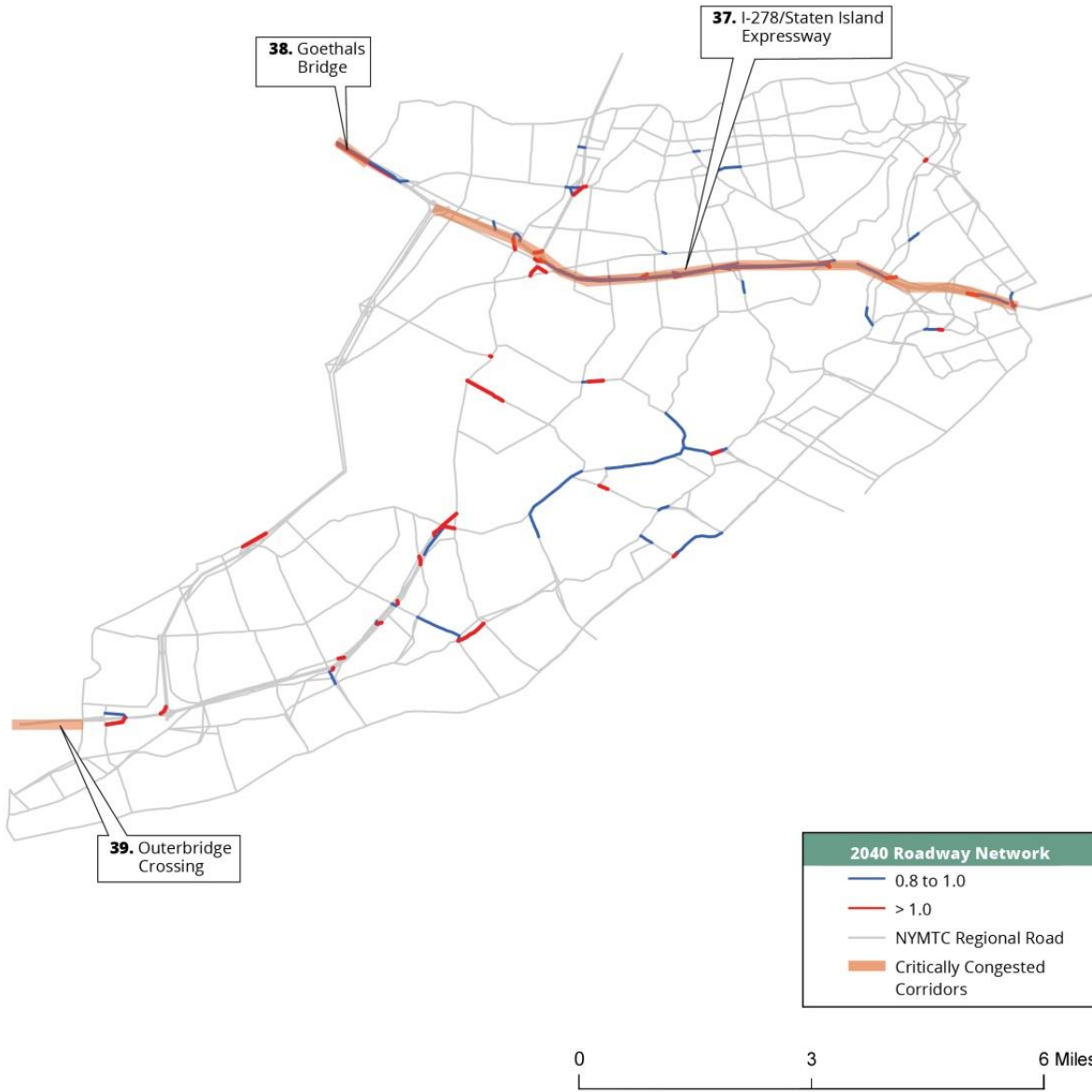
38. **Goethals Bridge** – One of the two bridges connecting north-central New Jersey and Staten Island (and points east), this Bridge experiences heavy congestion during peak commuting periods and on summer weekends due to insufficient mainline capacity (two 10-foot lanes per direction), and heavy truck usage. The westbound direction is heaviest in morning peaks and on summer Fridays. The eastbound direction is heaviest in evening peaks and on summer Sundays.

39. **Outerbridge Crossing** – Same as 38, but with substantially less truck usage.

Staten Island: Congested Corridors and Hot Spot Areas (AM Period)

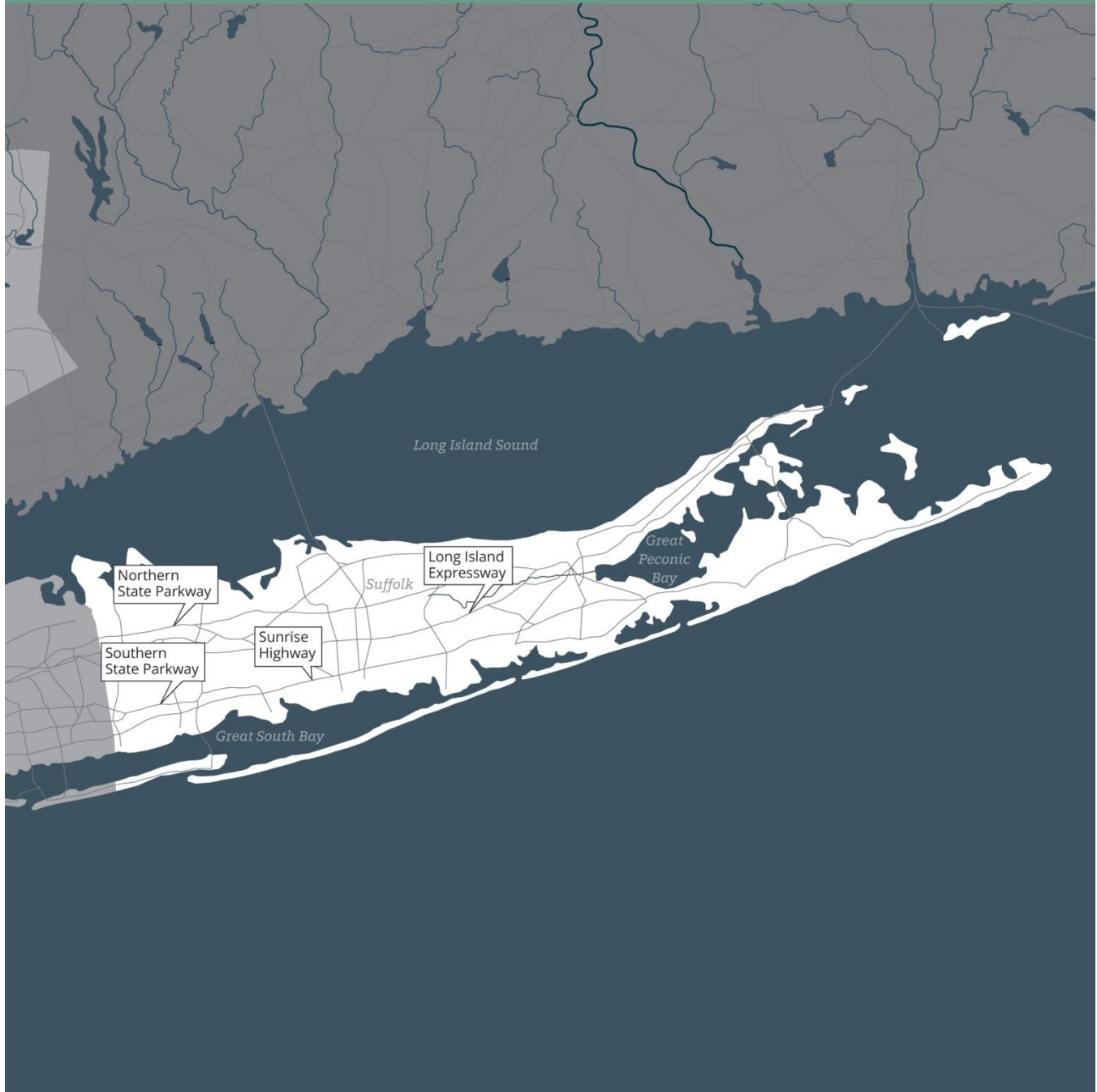


Staten Island: Congested Corridors and Hot Spot Areas (PM Period)



6.9 Suffolk

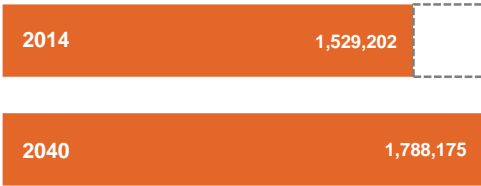
Major Portals and Roadways



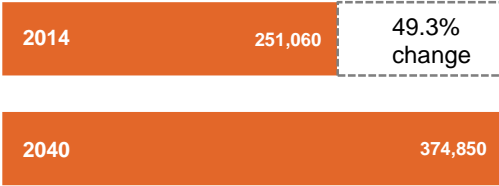
Population and Travel Characteristics

Population

14.5%
change

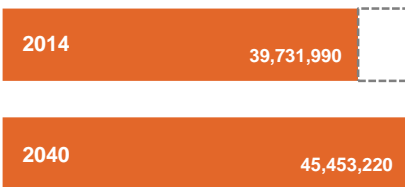


VHD Daily Totals

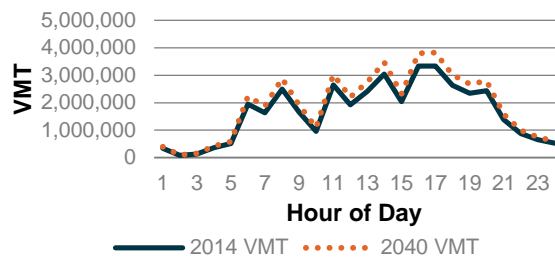


VMT Daily Totals

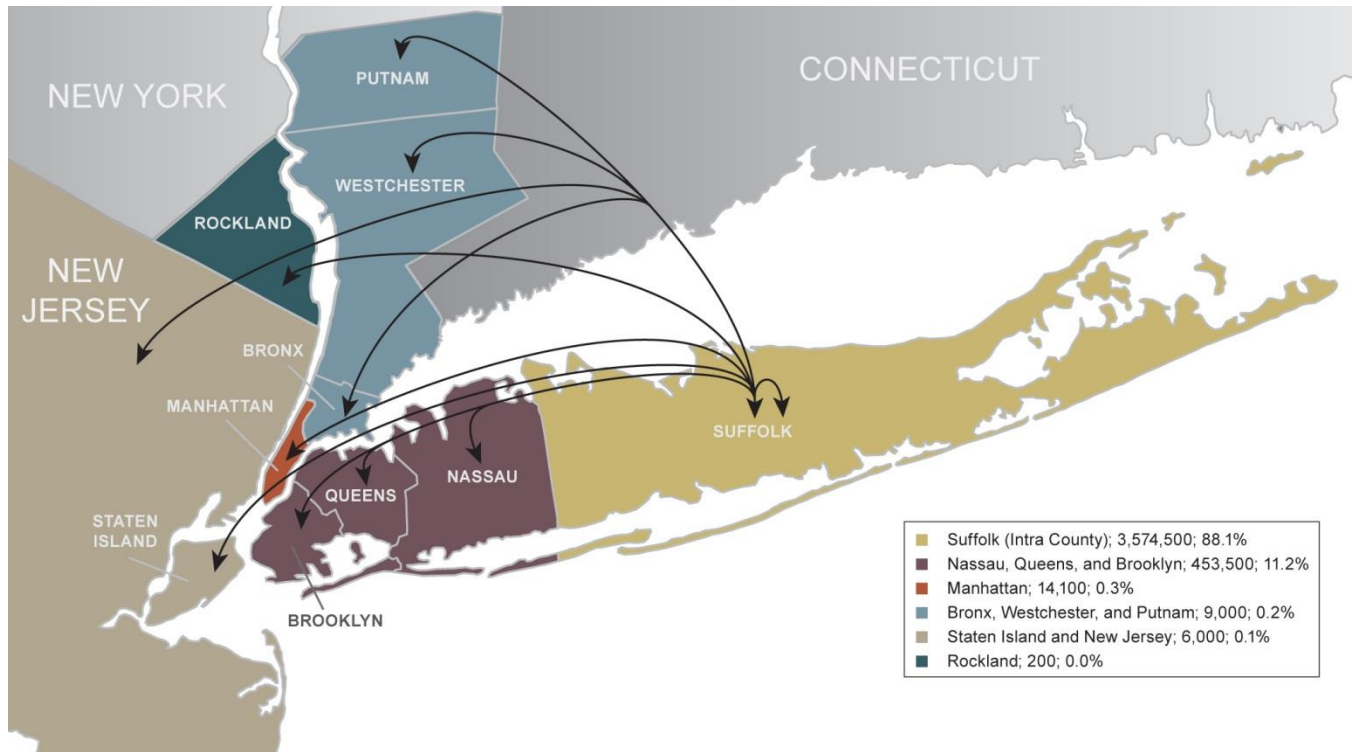
14.4%
change



Suffolk 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County: Suffolk

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.35	4%	3%	69.3	1.05	46.1	1,924	3,367	2,264,891
Arterial	0.23	1%	1%	69.9	1.11	22.6	23,451	41,040	2,672,237
Local	0.13	0%	0%	0.6	1.00	27.1	523	916	1,793,567
PM Period (4 to 8 PM)									
Freeway	0.22	2%	3%	158.2	1.08	46.2	11,073	19,378	2,346,218
Arterial	0.13	1%	1%	160.2	1.07	24.8	33,233	58,157	2,819,698
Local	0.07	0%	0%	3.0	1.00	27.1	871	1,524	1,688,471
Daily Total									
Freeway	0.36	5%	6%	799.9	1.10	45.3	29,531	51,678	12,653,227
Arterial	0.25	2%	2%	1031.0	1.13	22.7	213,338	373,341	16,066,272
Local	0.14	1%	0%	30.7	1.00	27.0	8,188	14,328	11,012,491
Total							251,056	439,348	39,731,989

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.38	5%	4%	130.9	1.06	45.3	2,733	4,783	2,499,579
Arterial	0.26	2%	1%	120.3	1.13	21.8	33,169	58,047	3,089,880
Local	0.16	1%	0%	3.9	1.00	26.7	1,420	2,485	2,175,657
PM Period (4 to 8 PM)									
Freeway	0.24	2%	4%	207.3	1.09	45.5	14,221	24,887	2,644,945
Arterial	0.15	1%	1%	244.1	1.08	24.2	45,198	79,096	3,193,168
Local	0.08	0%	0%	8.3	1.00	26.7	2,163	3,785	1,977,667
Daily Total									
Freeway	0.40	6%	7%	1191.9	1.12	44.4	42,109	73,690	14,016,245
Arterial	0.28	3%	2%	1590.0	1.16	21.9	311,325	544,819	18,316,293
Local	0.17	1%	0%	64.9	1.01	26.6	21,413	37,472	13,120,685
Total							374,847	655,982	45,453,222

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
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AM Period (6 to 10 AM)									
Freeway	9%	–	–	89%	1%	-2%	42%	42%	10%
Arterial	13%	–	–	72%	2%	-3%	41%	41%	16%
Local	23%	–	–	569%	0%	-1%	171%	171%	21%
PM Period (4 to 8 PM)									
Freeway	9%	–	–	31%	1%	-1%	28%	28%	13%
Arterial	15%	–	–	52%	1%	-3%	36%	36%	13%
Local	14%	–	–	176%	0%	-1%	148%	148%	17%
Daily Total									
Freeway	11%	–	–	49%	2%	-2%	43%	43%	11%
Arterial	12%	–	–	54%	3%	-3%	46%	46%	14%
Local	21%	–	–	111%	1%	-1%	162%	162%	19%
Total							49%	49%	14%

Suffolk – Congested Corridors

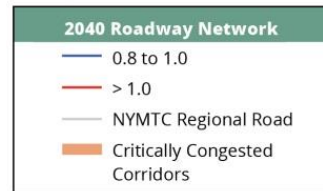
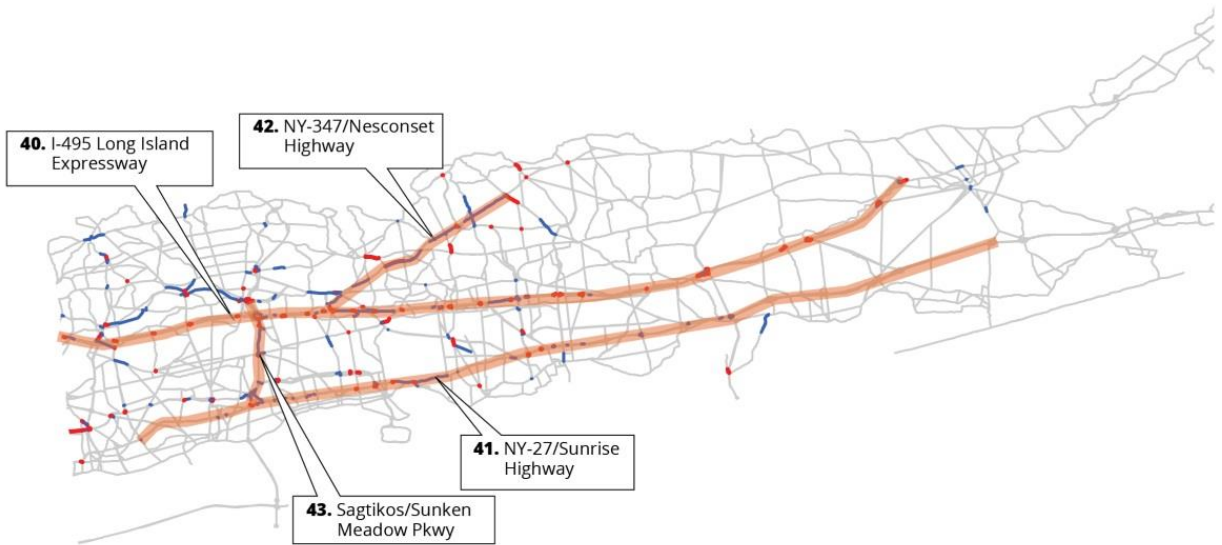
40. **I-495/Long Island Expressway from the Nassau County Boundary to the Eastern Terminus –** While not as severe as the sections of I-495 in Nassau and Queens Counties, I-495 in Suffolk experiences heavy congestion during peak commuting periods and around summer weekends, due to insufficient mainline capacity, frequent merges and weaves, and heavy truck usage. The eastbound direction is generally heaviest in evening peaks and on summer Fridays. The westbound direction is generally heaviest in morning peaks and on summer Sundays. The heavy usage of this road by trucks (I-495 is the only continuous east-west limited-access Long Island highway on which trucks are permitted) causes the economic cost of the congestion on I-495 to be very high.

41. **NY-27/Sunrise Highway from the Southern State Parkway (SSP) to Patchogue –** The only east-west limited-access highway in southern central Suffolk County, this road experiences heavy congestion during peak commuting periods and around summer weekends, due to insufficient mainline capacity, frequent merges and weaves, and relatively heavy truck usage. The eastbound direction is generally heaviest in evening peaks and on summer Fridays. The westbound direction is generally heaviest in morning peaks and on summer Sundays.

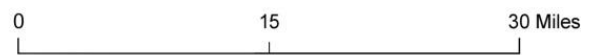
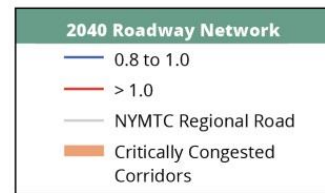
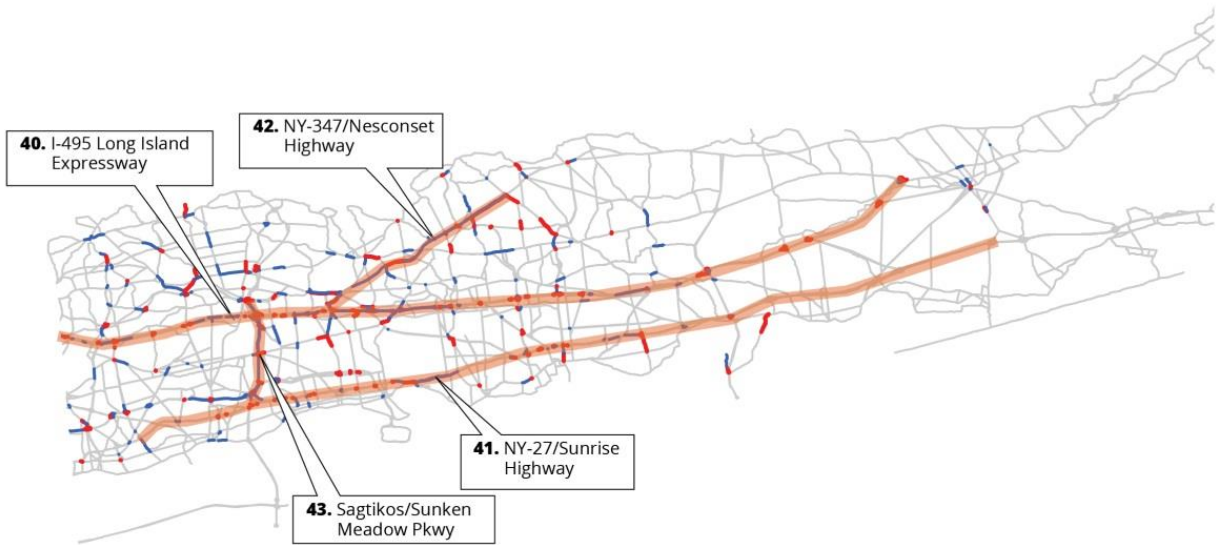
42. **NY-347 from Northern State Parkway (NSP) to Old Town Road –** This five-to-six-lane primary arterial is the main roadway connecting western Suffolk County and communities along the northern shore of central Suffolk County. It abuts several major traffic generators, including both County and State offices as well as the Smith Haven Mall. It also provides access to the SUNY at Stony Brook campus. It experiences heavy congestion during peak commuting periods due to insufficient mainline capacity and frequent signalized intersections. The eastbound direction is generally heaviest in evening peaks. The westbound direction is generally heaviest in morning peaks.

43. **Sagtikos Parkway/Sunken Meadow Parkway from NY-27/Sunrise Highway to NY-25/Jericho Turnpike –** The only north-south completely limited-access highway in Suffolk County, this highway provides connections between NY-27, the SSP, I-495, the NSP, and NY-25. It also abuts the Suffolk County Community College campus and various shopping centers and provides access to the Tanger Outlet Mall in Deer Park. It experiences heavy congestion during peak commuting periods primarily due to heavy merging and weaving sections as well as interactions with local streets and land uses.

Suffolk: Congested Corridors and Hot Spot Areas (AM Period)

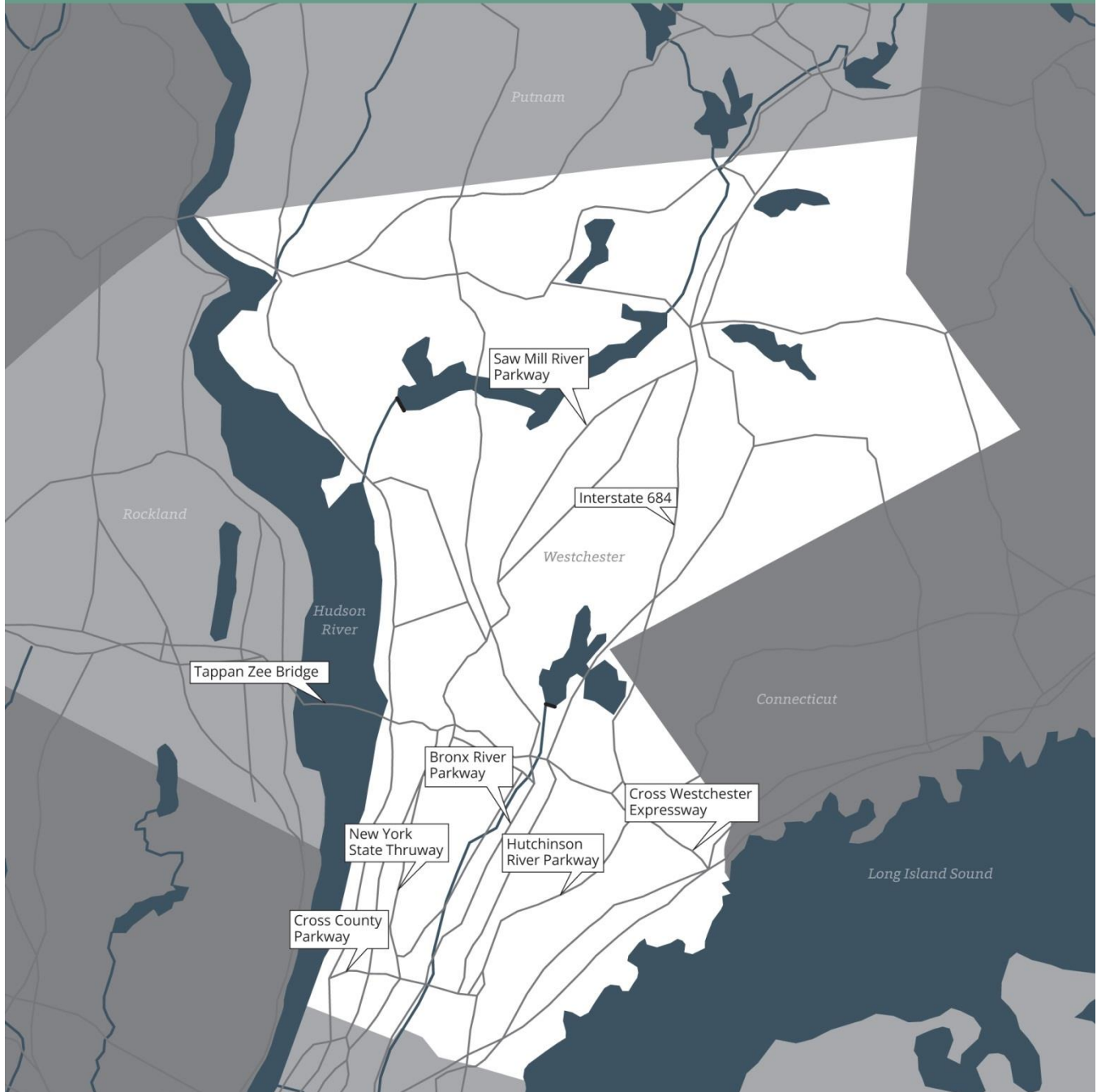


Suffolk: Congested Corridors and Hot Spot Areas (PM Period)



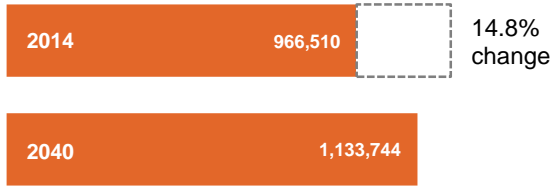
6.10 Westchester

Major Portals and Roadways

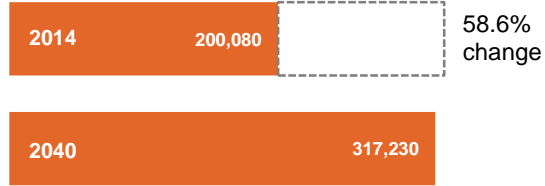


Population and Travel Characteristics

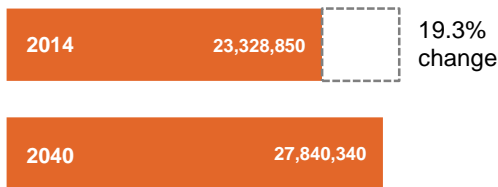
Population



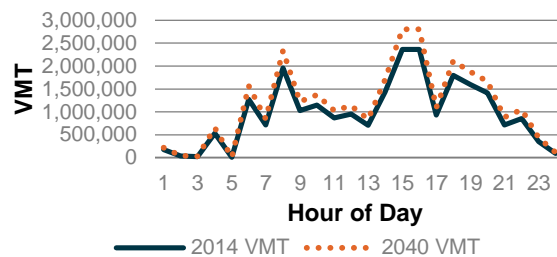
VHD Daily Totals



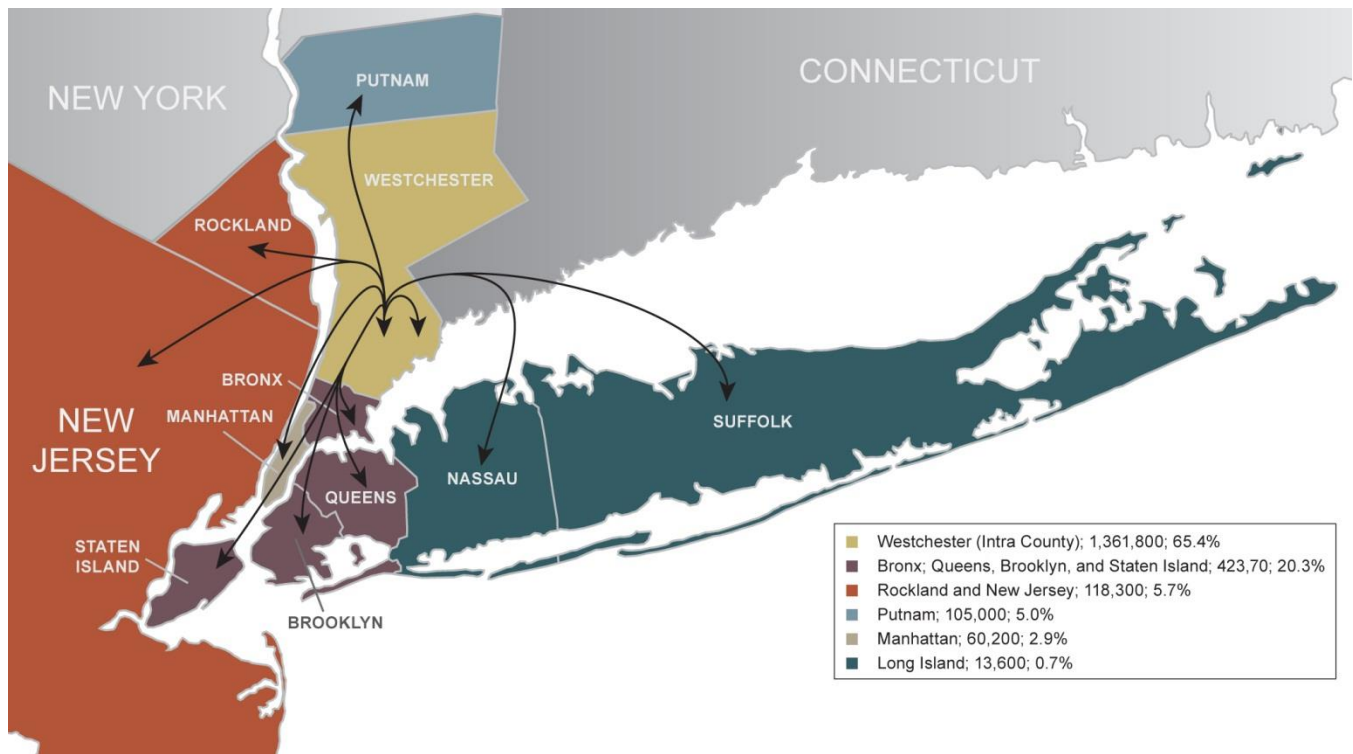
VMT Daily Totals



Westchester 24-hour VMT



Two-Way Trips between The Bronx and Other Counties in the New York Metro Area



New York Metropolitan Transportation Council

Performance Measures County: Westchester

Scenario 2014

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.37	4%	4%	159.0	1.14	41.4	10,302	14,835	2,659,216
Arterial	0.20	1%	1%	27.8	1.11	21.6	13,121	18,895	1,147,745
Local	0.13	0%	0%	0.1	1.04	22.8	4,369	6,292	1,040,245
PM Period (4 to 8 PM)									
Freeway	0.18	1%	2%	104.6	1.06	44.7	7,435	10,706	2,336,859
Arterial	0.10	1%	1%	44.2	1.06	23.7	16,177	23,295	940,122
Local	0.06	0%	0%	0.3	1.02	24.3	3,141	4,523	781,011
Daily Total									
Freeway	0.32	4%	5%	913.3	1.13	42.2	62,792	90,420	12,464,733
Arterial	0.19	1%	1%	286.5	1.12	22.0	107,675	155,052	5,700,448
Local	0.12	1%	0%	1.9	1.04	23.2	29,614	42,644	5,163,667
Total							200,080	288,116	23,328,847

Scenario 2040

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
AM Period (6 to 10 AM)									
Freeway	0.42	5%	5%	278.4	1.18	40.0	15,945	22,960	3,075,583
Arterial	0.24	2%	1%	52.3	1.14	20.7	18,728	26,968	1,376,737
Local	0.17	1%	1%	0.6	1.05	22.0	8,039	11,576	1,329,080
PM Period (4 to 8 PM)									
Freeway	0.22	2%	3%	290.5	1.10	43.3	17,962	25,866	3,029,428
Arterial	0.11	1%	1%	71.3	1.07	23.1	22,758	32,771	1,059,470
Local	0.07	0%	1%	1.5	1.03	23.7	6,835	9,843	912,202
Daily Total									
Freeway	0.37	5%	6%	1602.8	1.18	40.7	107,521	154,830	14,926,427
Arterial	0.22	2%	2%	471.9	1.14	21.3	150,364	216,524	6,605,602
Local	0.15	1%	1%	7.2	1.05	22.4	59,344	85,455	6,308,310
Total							317,228	456,809	27,840,339

D/C = Demand to Capacity; LMC = Lane Miles of Congestion; TTI = Travel Time Index; ATS = Average Travel Speed; VHD = Vehicle Hours of Delay; PHD = Person Hours of Delay; VMT = Vehicle Miles Traveled

Note: D/C = average Demand to Capacity for the particular facility type and period. The "0.8<=DC<=1" and "D/C>1" are the percent of travel that occurs in various conditions (somewhat congested and very congested).

Percentage Difference Between 2040 and 2014 Performance Measures

Facility Type	D/C	0.8<= D/C<=1	D/C>1	LMC	TTI	ATS	VHD	PHD	VMT
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AM Period (6 to 10 AM)									
Freeway	14%	–	–	75%	4%	-3%	55%	55%	16%
Arterial	20%	–	–	88%	3%	-4%	43%	43%	20%
Local	31%	–	–	455%	1%	-4%	84%	84%	28%
PM Period (4 to 8 PM)									
Freeway	22%	–	–	178%	4%	-3%	142%	142%	30%
Arterial	10%	–	–	61%	1%	-3%	41%	41%	13%
Local	17%	–	–	470%	1%	-3%	118%	118%	17%
Daily Total									
Freeway	16%	–	–	75%	4%	-4%	71%	71%	20%
Arterial	16%	–	–	65%	2%	-4%	40%	40%	16%
Local	25%	–	–	285%	1%	-3%	100%	100%	22%
Total							59%	59%	19%

Westchester – Congested Corridors

44. **Westchester Expressway from the Tappan Zee Bridge to I-95** – The only east-west limited-access highway in central Westchester, this highway provides connections between the Tappan Zee Bridge (and many points West of the Hudson River to both the north and south), I-87/New York State Thruway to the south and New York City, the Saw Mill River Parkway, the Sprain Brook Parkway, I-684, the Hutchinson River Parkway (HRP), and I-95 (and points north and east). In addition, it provides easy access to the Tarrytown Metro-North Railroad station (via U.S.-9), to central White Plains (via NY-119, NY-22, and Westchester Avenue) with its many major traffic generators (including Westchester County Center, the White Plains Metro-North Railroad station, White Plains Mall, The Galleria at White Plains, Pace Law School, The Westchester Mall, and New York-Presbyterian Hospital in Westchester), and to Manhattanville and SUNY-Purchase Colleges (via the HRP). Consequently, the entire length of I-287 in Westchester County regularly experiences severe congestion during peak commuting periods, due to insufficient mainline capacity, frequent heavy merges and weaves, and spillbacks from connecting roadways. The eastbound direction is heaviest in morning peaks. The westbound direction is heaviest in evening peaks.

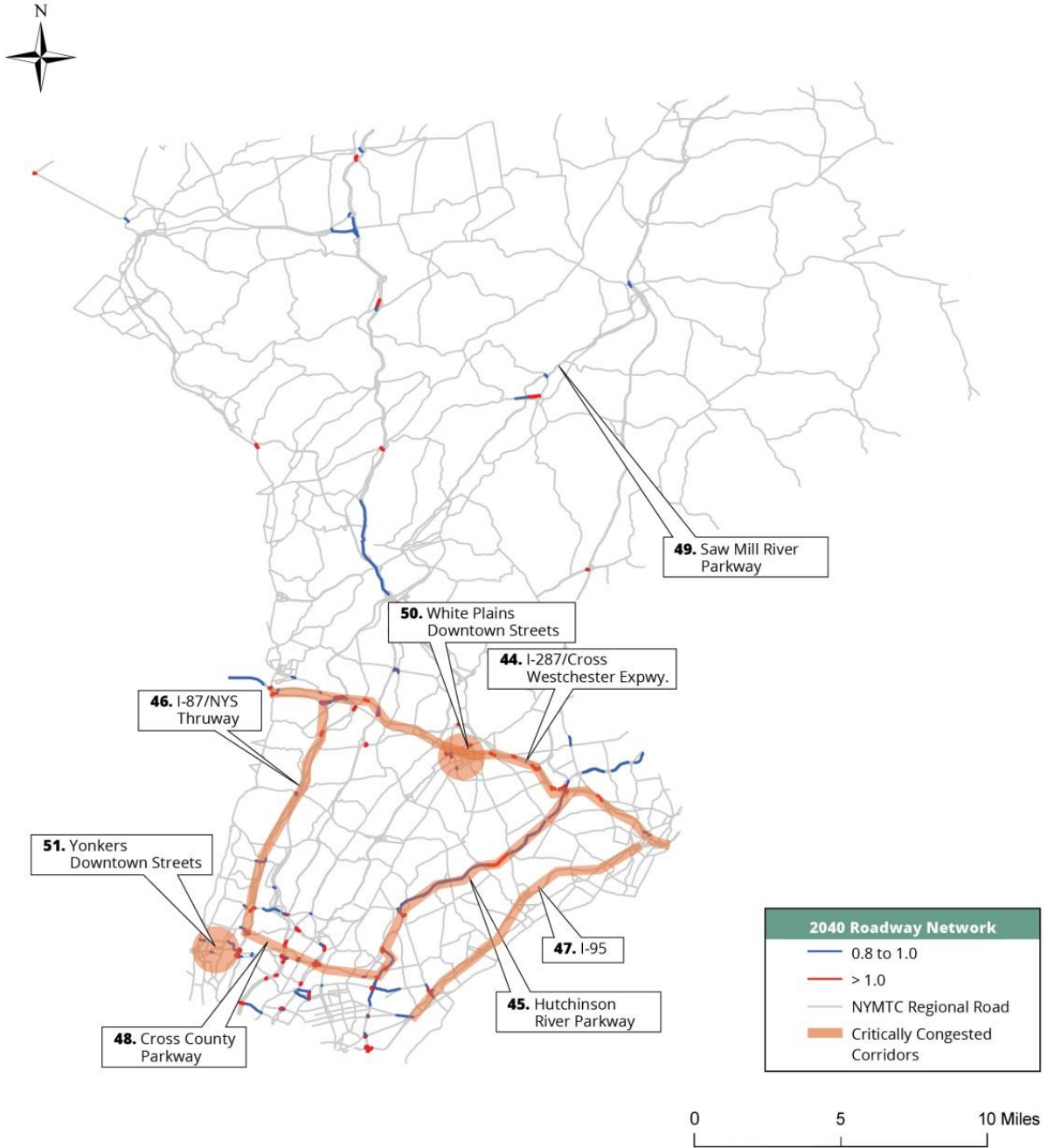
45. **Hutchinson River Parkway (HRP) from the Bronx County Boundary to I-287** – This is one of the two main north-south commuter highways (the other being I-95) in the eastern part of densely developed southern Westchester County. It also carries through traffic between New York City and Connecticut. It regularly experiences severe congestion during peak commuting periods and summer weekends, due to insufficient mainline capacity, frequent heavy merges and weaves (especially at the Cross County Parkway), and spillbacks from connecting roadways. The southbound direction is heaviest in morning peaks and summer Sundays. The northbound direction is heaviest in evening peaks and summer Fridays.

46. **I-87/New York State Thruway from the Bronx County Boundary to Tuckahoe Road** – The highest-quality north-south highway in the western part of densely developed southern Westchester. It regularly experiences congestion during peak commuting periods, due to insufficient mainline capacity and heavy merges and weaves (especially at the Cross County Parkway). The southbound direction is heaviest in morning peaks. The northbound direction is heaviest in evening peaks.

47. **I-95/New England Thruway from the Bronx County Boundary to the Connecticut State Line** – Same as 45., except that I-95 is also a major regional truck route, further adding to congestion, which bears a high economic cost.

48. **Cross County Parkway (CCP) from the Saw Mill River Parkway to the HRP** – The only east-west limited-access highway in southern Westchester, this highway provides connections between the Saw Mill River Parkway, I-87/New York State Thruway, the Bronx River Parkway (thereby providing access to the Sprain Brook Parkway), and the Hutchinson River Parkway (HRP). It also abuts the Cross County Shopping Center and adjacent major retail and entertainment sites. The entire length of the CCP regularly experiences severe congestion in both directions during peak commuting periods, due to heavy merges and weaves, and spillbacks from connecting roadways.
49. **Saw Mill River Parkway from the CCP to Tuckahoe Road** – The continuation of the Henry Hudson Parkway north of New York City, this narrow (2 lanes/direction) limited-access highway carries heavy commuter flows to/from New York City. The southbound direction is heaviest in morning peaks. The northbound direction is heaviest in evening peaks.
50. **Downtown White Plains Streets** – These are congested all day, but especially during the afternoon and evening periods when they are affected by heavy pedestrian flows and backups on roads leading to I-287.
51. **Downtown Yonkers Streets** – These are congested all day as they try to serve the many major traffic generators in downtown Yonkers, including the St. Joseph’s Medical Center, the City of Yonkers municipal offices, the Greenway Shopping Center, Westchester County offices, the Yonkers Metro-North Railroad station, the main Yonkers Post Office, and the New York State DMV office. Heavy pedestrian flows interfere with traffic flows.

Westchester: Congested Corridors and Hot Spot Areas (AM Period)



Westchester: Congested Corridors and Hot Spot Areas (PM Period)

