

New York City Red Light Camera Program Review

2021 Report



Executive Summary

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In 1988, the New York State (the State or NYS) Legislature and Governor enacted Vehicle and Traffic Law (VTL) §1111-a, which granted New York City (the City or NYC) the authority to establish a demonstration program imposing monetary liability on the owner of a vehicle for failure of an operator to comply with traffic control signals, and for NYC to install and operate traffic control signal photo violation monitoring devices at no more than 150 intersections. New York City used this authorization to launch the nation’s first Red Light Camera program in 1994 (the Program). The State Legislature has extended the Program eight times, with the current authorization set to expire in December 2024. This report is submitted to satisfy the requirements of VTL §1111-a. A sample of findings of this report include:

- The Program has been effective at deterring drivers from running red lights—the average daily number of red light running violations issued at each camera location has declined by over 84 percent.
- The Program, alongside other traffic safety initiatives like the speed camera program and street improvement projects, has helped prevent crashes associated with red light running. During the years 1991–1993, just prior to the launch of the Program, New York City saw an average of 13,819 right-angle crashes annually. In 2019, the most recent year of data available, that number had declined to 3,988—a decrease of 71 percent. In 1991–1993, there were an average of 12,283 rear-end crashes per year, but in 2019, this number had fallen by 41.5 percent to 7,181.

The Danger Posed by Red Light Running

According to the Insurance Institute for Highway Safety, red light running crashes caused 846 deaths nationwide in 2019, along with approximately 143,000 injuries. More than half of those killed were pedestrians, cyclists, and other drivers and passengers hit by the vehicle violating the signal. Red light running is particularly dangerous in American cities, where drivers who disobey red lights, stop signs, and other traffic devices are responsible for a large portion of injury crashes. Crashes caused by motorists who violate traffic signals are highly associated with fatal and severely injurious high speed right angle crashes.

Red light running unfortunately is very common, even though its dangers are well-known. In a 2014 study, while 94 percent of New York State drivers consider it unacceptable to drive through a traffic light that just turned red when they could have stopped safely, more than 42 percent of drivers admitted doing so within the previous month, and 3 percent admitted to doing so regularly or fairly often. A 2015 Hunter College study, which examined driver behavior at thirteen New York City intersections, found that nine percent of observed New York City drivers violated red lights.

Red Light Running Causes

Motorists who are speeding are much more likely to run red lights, because vehicles which are travelling faster need more time and take a longer distance to come to a complete stop. The amber phase is timed to provide drivers who are driving at the prevailing speed the opportunity to either continue at a consistent speed through the intersection before the light turns red, or to come to a complete stop before entering the intersection. Speeding drivers are therefore more likely to find themselves unable to come to complete stop without “stopping short” and risking a rear-end crash.

Drivers who are talking on cell phones, texting or using other electronic devices, or are otherwise distracted often fail to perceive traffic signals. Estimates indicate that drivers using cell phones “look but fail to see” up to 50 percent of the information in their environment; even looking through their windshield, it will take longer to notice and react to a traffic signal change when using a cell phone. In addition, distracted drivers make fewer glances at traffic lights, and some drivers fail to even look at traffic signals.

1. “Red Light Running” Insurance Institute for Highway Safety. Online available <https://www.iihs.org/topics/red-light-running>

2. AAA Foundation for Traffic Safety, 2014 Traffic Safety Culture Index (January 2015) available at <https://www.aaafoundation.org/sites/default/files/2014TSClreport.pdf>

3. Peter Tuckel, William Milczarski, James Rubin *For Many New York City Motorists A Red Light Does Not Mean Stop* Hunter College 2015

4. Understanding the Distracted Brain: Why Driving While Using Hands-Free Cell Phones is Risky Behavior. National Safety Council White Paper 2012

5. Understanding the Distracted Brain: Why Driving While Using Hands-Free Cell Phones is Risky Behavior. National Safety Council White Paper 2012



Enhancing Safety at Intersections

In New York City in 2020, 56 percent of traffic crash fatalities, and 58 percent of all pedestrian crash deaths, occurred at intersections. The New York City Department of Transportation (NYC DOT) takes a number of steps to promote safety at intersections, in addition to the Program.

Right on Red Prohibition

Unlike almost all other U.S. cities, right turns on red are severely restricted in New York City. Within the five boroughs, this movement is permitted only where posted, and has been most prevalent in Staten Island, where lower traffic and pedestrian volumes allow for the safe movement of both vehicles and pedestrians under this condition. Studies conducted after an array of states adopted laws which enabled right turn on red found marked increases in pedestrian and bicyclist collisions at intersections⁶. An analysis of intersection crashes in four states found that right turn on red crashes frequently involved pedestrians and bicyclists, and 93 percent of these crashes resulted in injuries to the pedestrians and bicyclists.

Enhanced Signal Visibility

Signal head visibility can be enhanced by increasing the size of traffic signal lenses from 8 to 12 inches. In order to advance Vision Zero, NYC DOT is upgrading traffic signal lenses on corridors with a speed limit of 30 MPH or above, or at other appropriate intersections. Studies indicate that these larger signal lenses may increase compliance, and thereby reduce the frequency of crashes, particularly right angle crashes.

All-Red Interval

An all-red interval is the portion of a traffic signal cycle where all approaches have a red-signal display. The purpose of the all-red interval is to allow time for vehicles that entered the intersection during the amber phase to clear the intersection before the traffic signal display for the cross street approaches turns to green. All traffic signals in New York City have an all-red interval.

6. Preusser, Leaf, DeBartolo, Blomberg *The Effect of Right Turn on Red on Pedestrian and Bicyclist Accidents* US Dept of Transportation National Highway Traffic Safety Administration 1981

How Red Light Cameras Work

When a vehicle runs through a red light at a camera-monitored intersection, sensors embedded in the roadway trigger a digital camera, which is situated approximately fifty to one hundred feet back from the stop-line. The camera captures a series of photographs showing the vehicle traveling through the intersection, with the traffic signal displaying a red light in each photo. The resulting photos show the vehicle, the intersection, and the traffic signal all in one frame.

The photos are inspected for quality and are then delivered to a specially trained team of NYC DOT Review Technicians who review each and every photograph and determine if they provide adequate evidence to issue a Notice of Liability (NOL).

An NOL includes three photos: the vehicle at the stop bar when the traffic signal is red, the same vehicle

after the stop bar and crosswalk while the traffic signal is still red, and a clear and readable enlargement of the vehicle's license plate. In addition, the NOL contains the name and address of the vehicle owner, the registration number of the vehicle involved in the violation, the location where the violation took place, the date and time of the violation, and the identification number of the camera which recorded the violation.

The NOLs are issued to the registered owner of the vehicle. An NOL, much like a parking ticket, obligates the vehicle owner to pay a fine, but does not cause points to be assessed against a driver's license, nor is the violation used for insurance purposes. The red light camera fine is \$50 per violation.

Red Light Cameras Deter Red Light Running Violations

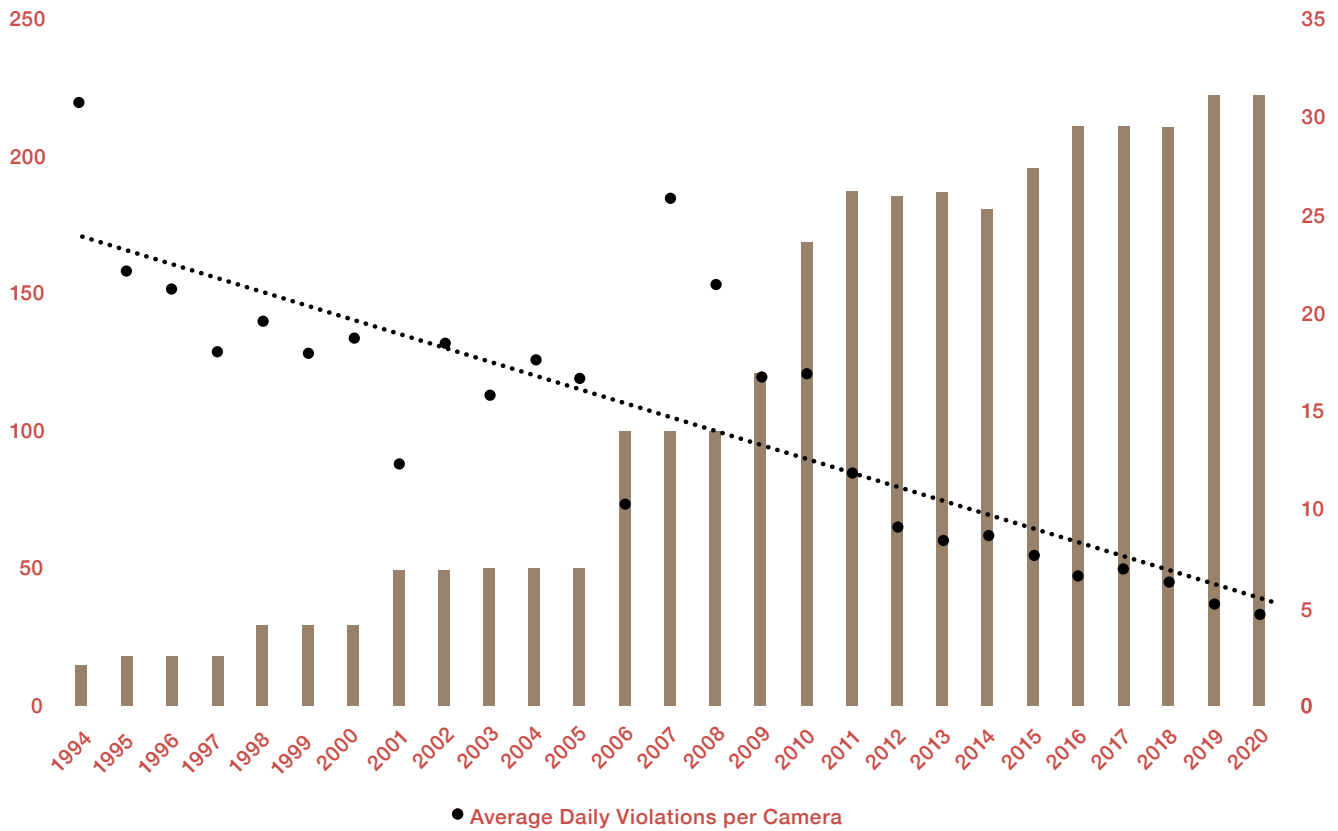
The purpose of the New York City Program is to deter motorists from running red lights. Accordingly, the more successful the Program is, the fewer red light violations should be observed over time.

In the first year of the Program, the average camera issued 30.8 NOLs on a daily basis. In 2020, the average camera issued 4.79 NOLs on a daily basis—a 84 percent drop. This data indicates that the Program has enhanced public safety by serving as an effective deterrent to red light running at active locations. Some of the year-to-year fluctuations in

the number of NOLs issued can be attributed to years in which the Program was expanded and new sites were installed. For the past several years, the number of sites has been relatively stable, as has the rate of decline in violations.

The daily average number of NOLs issued has declined as the Legislature has allowed the City to protect more intersections with red light cameras. This is an expected result and confirms that the consistent, predictable, citywide enforcement provided by red light cameras deters dangerous red light running.

Change in Daily Average NOL per Camera



Red Light Cameras: Description of Locations

Borough	Number of Red Light Camera Enforced Intersections*
Bronx	19
Brooklyn	48
Manhattan	15
Queens	58
Staten Island	21

Though the precise number of active cameras may vary on a daily basis due to maintenance, 223 red light cameras were available for operation at no more than 150 intersections at a time in New York City in 2020*.

Locations are selected based upon a review of several factors including crash history of the intersection, engineering judgment, and community and elected official requests. Red light cameras generally tend to be sited on or adjacent to major, multi-lane, arterial streets which carry high volumes of vehicles and display a high frequency of red light running violations.

* Sums to greater than 150, as not all intersections' cameras are active at the same time. State law limits the number of active intersections to 150

Red Light Cameras Prevent Serious Red Light-Related Crashes

When identifying crash-prone locations and evaluating a project's success, NYC DOT focuses on crashes which result in death or severe injury. Individuals who have been severely injured typically depart the crash scene in an ambulance and often experience life-changing injuries (e.g. skull fractures and internal bleeding). Many fatal and serious injury crashes can be prevented by increasing motorist compliance with traffic signals.

In compliance with VTL §1111-a(m), NYC DOT has analyzed the number, type, and severity of crashes at intersections where red light cameras are operating, organized into three time periods: The three years preceding the installation of the camera, the reporting year, and the three years prior to the reporting year.

All data utilized for this analysis originates in motor vehicle collision reports (MV-104) compiled by police officers at crash scenes. The individual hard copy crash reports are sent by the New York City Police Department to the NYS DMV and NYS DOT, who enter the information into electronic databases, attribute locations to the crashes, categorize traffic injuries by severity, and identify any errors. This reviewed and categorized data is provided to the City for planning and analysis purposes. The most recent complete transmission of data includes crashes which occurred in 2019 (the "reporting year").

Therefore, this data excludes red light camera locations installed in 2016 or later, in order to ensure that 2016–2018 data truly reflects situations after the implementation of automated enforcement for the entire time period. The data also excludes cameras for which an exact date of activation is not known, in order to maintain accuracy of the period of time three years prior to the installation of the camera.

Previous iterations of this report have included a historical breakdown of crash injuries by their severity. However, starting in 2019, the National Highway Safety Administration (NHTSA) mandated that all jurisdictions follow the Model Minimum Uniform Crash Criteria (MMUCC) 4th Edition guidelines for collecting Serious

Injury crashes. They did this to standardize what data is being collected across the country. Accordingly the New York State Department of Motor Vehicles (DMV) changed their definition of severe, "A"-type injuries. As a result of this change, some injuries not previously attributed to the serious injury classification are now included. This change has made data from that year difficult to compare to previous years. Any increase in severe injuries may reflect the change in the formula and not an actual change in the trend of severe injuries, and so year-on-year comparisons of these injuries are not included.

Right Angle Collisions

The goal of the Program is to deter drivers from violating traffic signals, and thereby prevent serious crashes which are associated with red light running — specifically right angle collisions, where the front of one vehicle impacts the side of another. Right angle crashes are particularly dangerous because the sides of vehicles have relatively little space to absorb the force of impact and shield occupants, unlike the fronts and rears of vehicles, which have substantial crumple zones. In addition, a vehicle which is involved in this type of crash may spin out of control or roll over, leading to secondary impacts.

The Program has been effective at reducing serious right angle crashes, even at a time when the numbers of motor vehicles, bicycles, and pedestrians in New York City have increased. NYC DOT compiled data for the three years prior to the installation of each red light camera, and compared the average of those years to the most recent year available, 2019. The data showed that right angle collisions causing injury declined at camera locations by about 58 percent, from an average of 239 per year before installation to 101 a year in 2019.

The following chart compares the number of right angle collisions which occurred at camera-enforced intersections during the three years prior to a red light camera's installation, as compared to the time periods of 2016-2018 and 2019.



Right Angle Injury Collisions at Intersections with Red Light Camera (RLC) Enforcement

	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	75	320	25	258	40	718
<i>Average per year</i>	<i>25</i>	<i>107</i>	<i>8</i>	<i>86</i>	<i>13</i>	<i>239</i>
2016–2018	40	111	11	122	15	299
<i>Average per year</i>	<i>13</i>	<i>37</i>	<i>4</i>	<i>41</i>	<i>5</i>	<i>100</i>
2019	12	42	2	39	6	101
Change	-13	-65	-6	-47	-7	-138

* Change is calculated as difference between 2019 and the average year within the three years prior to camera installation (three-year total divided by three), rounded to the nearest whole number.



Rear-End Collisions

Drivers who do not expect traffic signals to be enforced are more likely to run red lights, and are also more likely to collide with a car in front of them where the driver is complying with the law. Some studies which evaluate the initial period following camera installation find that rear-end crashes may rise even as severe injuries fall, particularly in the weeks and months immediately after camera enforcement commences at the site.

New York City’s experience does not indicate that red light cameras have led to an increase in serious rear-end collision crashes. In fact, such crashes have decreased at intersections with red light cameras. NYC DOT found that in the three years prior to red light camera installation, there were on average 457 injurious rear-end collisions per year. In 2019, this figure had fallen to 380 – a decrease of 17 percent.

The following table compares the number of rear-end collisions which occurred at camera enforced intersections during the three years prior to each red light camera’s installation, as compared to 2016-2018 and to 2019.

Rear-End Injury Collisions at Intersections with Red Light Camera (RLC) Enforcement

	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	108	480	108	543	131	1,370
Average per year	36	160	36	181	44	457
2016–2018	108	428	66	423	84	1,109
Average per year	36	143	22	141	28	370
2019	45	142	8	142	43	380
Change	+9	-18	-28	-39	-1	-77

* Change is calculated as difference between 2019 and the average year within the three years prior to camera installation (three-year total divided by three), rounded to the nearest whole number.



Severity of Injury Collisions & Injuries to Pedestrians, Bicyclists and Motorists

Red light cameras are not intended to prevent collisions unrelated to the violation of a traffic signal. Injuries sustained in traffic crashes unrelated to traffic signals, such as when pedestrians are struck by turning drivers who have a green light but fail to yield the right of way, are not affected by red light cameras. The following table aggregates by borough the number and severity of all injury collisions which occurred at camera enforced intersections in 2019. Previous years' versions of this report have included comparisons with earlier years. However, starting in 2019, NHTSA mandated that all jurisdictions follow the Model Minimum Uniform Crash Criteria (MMUCC) 4th Edition

guidelines for collecting Serious Injury crashes in order to standardize what data is being collected across the country. Accordingly the New York State DMV changed their definition of severe, "A"-type injuries. As a result of this change, some injuries not previously attributed to the serious injury classification are now included. This change has made data from that year difficult to compare to previous years because any increase in severe injuries may reflect the change in the formula and not an actual change in the trend of severe injuries. For this reason, only severity data from 2019 is shown. In addition, with bicycle injury collision numbers being relatively small compared to those of pedestrians and motor vehicle operators, they are thus subject to greater year-on-year volatility.

Severity of Injuries in Collisions at Intersections with Red Light Camera (RLC) Enforcement, 2019

	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Severe Injury ⁷	9	29	2	32	13	85
Moderate Injury ⁸	9	46	15	44	4	118
Slight Injury ⁹	253	675	71	622	123	1,744

7. Injury severity classification is determined by NYS DMV and NYS DOT. Severe injuries include skull fractures, internal injuries, broken or distorted limbs, unconsciousness, severe lacerations, and unable to leave the scene without assistance.

8. Moderate injuries include visible injuries such as a "lump" on the head, abrasions, and minor lacerations.

9. Slight injuries include hysteria, nausea, momentary unconsciousness, and complaint of pain without visible signs of injury.

This table aggregates by borough the number of injury collisions to pedestrians, bicyclists and motorists at camera enforced intersections during the average of three years prior to each red light camera's installation as compared to 2019, the most recent year for which data is available. It is important to recognize that cycling in New York City has become a dramatically

more popular mode of transportation in recent years, which may explain the overall increase in bicyclist injury crashes. In addition, with bicycle injury collision numbers being relatively small compared to those of pedestrians and motor vehicle operators, they are thus subject to greater year-on-year volatility.

Injury Collisions at Intersections with Red Light Camera Enforcement by Mode

Pedestrian Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	95	284	109	170	19	677
<i>Average per year</i>	32	95	36	57	6	226
2016–2018	97	263	65	191	34	650
<i>Average per year</i>	32	88	22	64	11	217
2019	32	84	17	80	13	226
Change*	0	-11	-19	+23	+7	0

Bicyclist Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three years prior to RLC Installation at Intersection	12	85	33	39	3	172
<i>Average per year</i>	4	28	11	13	1	57
2016–2018	18	109	26	53	4	210
<i>Average per year</i>	6	36	9	18	1	70
2019	7	31	12	16	0	66
Change*	+3	+3	+1	+3	-1	+9

Motorist Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three years prior to RLC Installation at Intersection	797	3,063	450	2,580	526	7,416
<i>Average per year</i>	266	1021	150	860	175	2,472
2016–2018	582	1,794	209	1,967	328	4,880
<i>Average per year</i>	194	598	70	656	109	1,627
2019	238	653	60	614	128	1,693
Change*	-28	-368	-90	-246	-47	-779

* Change is calculated as difference between 2018 and the average year within the three years prior to camera installation (three-year total divided by three), rounded to the nearest whole number.

Adjudication

Each NOL outlines how individuals may request a hearing by mail or in person to contest a violation they believe was issued in error. The rate of those hearing requests has declined over the years. For the first several years of the Program, approximately five percent of individuals who received an NOL requested a hearing to contest the violation. In 2020, 1.98 percent of NOLs resulted in a request for a hearing; the other 98.02 percent of NOLs went to individuals who declined their opportunity for a hearing and are responsible for paying the violation after the NOL was issued.

Pursuant to VTL §1111-a and Section 19-210 of the New York City Administrative Code, the New York City Department of Finance (NYC DOF) is authorized to conduct hearings, either by mail or in person, in any of NYC DOF’s five Borough Business Centers. Once the Administrative Law Judge (ALJ) determines the NOL presents a prima facie case, the ALJ will

conduct a hearing on the merits of any defense presented. The ALJs review witness statements, as well as other types of documentary evidence, to afford the vehicle owner the opportunity to refute the prima facie case and establish a meritorious defense. ALJs are even permitted to consider hearsay evidence, and other evidence which may not be admissible in a traditional court of law, in order to provide a vehicle owner with the opportunity to refute the NOL.

At hearing, about 87 percent of contested NOLs are upheld with a ruling of either guilty or guilty with reduction. In other words, in only 13 percent of hearings is an NOL dismissed by an ALJ—which represents 0.26 percent of all NOLs issued, or less than three in one thousand. In calendar year 2020, red light camera violators paid approximately \$17,726,700 on 333,900 notices of liability.

	Total	Percent of Total Violations Issued
Red Light Camera Violations Issued in 2020	389,554	100%
Red Light Camera Hearings Requested in 2020	7,727	1.98%

	Total	Percent of Challenged Violations
NOL Upheld at Hearing in 2020	6,706	86.79%
NOL Overturned at Hearing in 2020	1,021	13.21%

Revenue and Expenses

Red Light Camera Program (Inception–June 2020)

Program Costs	December 1993 to June 2020	\$194,930,639
Capital Costs	Inception to June 2020	\$23,477,567
NYC DOT Staffing	December 1993 to June 2020	\$27,277,902
NYC DOF Staffing	July 1996 to June 2020	\$8,790,112
Total Expenses	Inception to June 2020	\$254,476,220
Revenues	Inception to June 2020	\$589,659,417
Net Revenues	Inception to June 2020	\$335,183,197

Annual expense and revenue breakdowns for fiscal years 2014 through 2020 may be found in the appendix.

Appendix

	Active Cameras	Observed Events	Events/Day	Events/Week	Events/Month	% Change in Events from previous year	Events/Camera/Day	NOLs Issued	NOLs/Camera/Day#	Hearing Requests	% of Hearings Guilty or Guilty with Reduction
1994	15	438,622	1,202	8,435	36,552	NA	80.11	168,479	30.8	8,103	86%
1995	18	381,601	1,046	7,339	31,800	-13	58.08	146,812	22.3	7,908	87%
1996	18	319,720	874	6,149	26,643	-16.2	48.53	140,751	21.4	7,748	89%
1997	18	258,424	708	4,970	21,535	-19.2	39.33	119,397	19.2	5,968	89%
1998	30	417,747	1,145	8,034	34,812	61.7	47.69	215,242	19.7	7,799	88%
1999	30	391,693	1,073	7,533	32,641	-6.2	35.77	198,324	18.1	7,832	85%
2000	30	414,030	1,131	7,962	34,503	5.7	37.71	207,260	18.9	6,967	84%
2001	50*	453,005	1,241	8,712	37,750	9.4	42.5	226,642	21.3	6,898	84%
2002	50	492,678	1,350	9,475	41,057	8.8	27.07	338,572	18.59	9,506	84%
2003	50	444,529	1,218	8,549	37,044	-9.8	24.42	292,614	16.08	11,323	85%
2004	50	455,048	1,243	8,751	37,921	2.37	24.93	325,024	17.81	8,739	85%
2005	50	409,489	1,122	7,875	34,124	-10.0	22.58	306,117	16.82	8,690	86%
2006	100	554,846	1,520	10,670	46,237	35.5	29.41	384,993	20.41	8,376	88%
2007	100	1,248,896	3,422	24,017	104,075	125.1	34.53	947,341	26.19	20,813	92%
2008	100	1,094,847	2,991	21,055	91,237	-12.3	29.91	791,734	21.63	22,990	92%
2009	121	1,057,463	2,897	20,336	88,122	-3.41	23.91	745,241	16.85	17,824	92%
2010	169	1,455,540	3,988	27,991	121,295	37.6	23.62	1,053,268	17.08	25,414	96%
2011	188	1,167,969	3,200	22,461	97,331	-19.8	17.49	821,483	12.3	27,376	94%
2012	186	908,801	2,483	17,477	75,733	-22.1	13.37	634,088	9.33	11,266	94%
2013	187	839,881	2,301	16,152	69,990	-7.58	12.49	583,778	8.68	15,531	89%
2014	181	802,336	2,198	15,430	66,863	-4.5	12.14	579,318	8.77	16,596	88%
2015	196	678,020	1,858	13,039	56,502	-15.5	9.48	555,025	7.76	15,346	91%
2016	196	561,335	1,538	10,795	46,778	-17.2	7.85	488,007	6.82	8,385	90%
2017	211	1,022,846	2,802	19,670	85,237	82.2	13.28	518,911	6.74	11,951	92%
2018	211	1,001,065	2,743	19,251	83,422	-2.1	13.00	490,124	6.36	11,506	92%
2019	223	892,445	2,445	17,162	74,370	-10.9	10.96	431,472	5.30	11,649	89%
2020	223	869,262	2,382	16,717	72,439	-2.6	10.68	389,554	4.79	7,727	87%

	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Program Costs	\$5,296,726	\$5,276,159	\$5,699,906	\$7,587,608	\$4,949,866	\$4,110,121	\$3,296,146
Capital Costs	\$3,246,236	--	\$2,002,695	--	--	--	--
NYC DOT Staffing	\$614,681	\$1,154,182	\$1,099,695	\$1,322,893	\$911,105	\$816,957	\$564,620
NYC DOF Staffing	\$147,146	\$330,616	\$368,400	\$406,955	\$381,137	\$350,175	\$198,955
Total Expenses	\$9,304,788	\$6,760,957	\$9,170,697	\$9,317,456	\$6,242,108	\$5,277,253	\$4,059,721
Revenues	\$27,549,715	\$29,456,820	\$25,937,549	\$23,868,446	\$22,805,934	\$20,087,457	\$14,122,613
Net Revenue	\$18,244,927	\$22,695,863	\$16,766,852	\$14,550,990	\$16,563,826	\$14,810,204	\$10,062,892