New York City
Red Light Camera Program Review

2022 Report

NEW YORK CITY DOT

Executive Summary

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. New York City used this authorization to launch the nation's first Red Light Camera program (the Program) in 1994 and NYC now has the authority to operate red light cameras at no more than 150 locations at a time. 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 camera locations has declined by over 77 percent since the Program began in 1994.

- **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 13,815 right-angle crashes annually. In 2020, the most recent year of data available, that number had declined to 2,819, a decrease of 80 percent. In 1991-1993, there were an average of 12,024 rear-end crashes per year, but in 2020, this number had fallen by 61 percent to 4,736.

- Like other indicators of reckless driving, **red light running has increased in the aftermath of the Covid-19 pandemic**. Red light cameras issued an average of 7.0 violations per camera per day in 2021, up from 4.79 in 2020 and 5.30 in 2019. If the City were to be granted autonomy over its camera enforcement programs, then far more than 150 intersections could be protected by red light camera technology at any one time, and the City could explore the potential for escalating fines to address repeat violators.

Red Light Camera Program Review

The Danger Posed by Red Light Running

According to the Insurance Institute for Highway Safety, red light running crashes caused 928 deaths nationwide in 2020, along with approximately 143,000 injuries. Half of those killed were pedestrians, cyclists, and other motor vehicle occupants hit by the drivers who violated the signal[1]. Red light running is particularly dangerous in American cities, where drivers who disobey traffic devices are responsible for a large portion of injury crashes. Crashes caused by motorists who violate traffic signals are strongly 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 three percent admitted to doing so regularly or fairly often.[2] 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.[3]

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/2014TSCIreport.pdf
3. Peter Tuckel, William Milczarski, James Rubin *For Many New York City Motorists A Red Light Does Not Mean Stop* Hunter College 2015

Red Light Running Causes

Motorists who are speeding are much more likely to run red lights, because vehicles traveling 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 intersections. Speeding drivers are therefore more likely to find themselves unable to come to a 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 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 for them to notice and react to a traffic signal change while they are mentally occupied with the phone.[4] In addition, distracted drivers make fewer glances at traffic lights, and some drivers fail to even look at traffic signals altogether.[5]

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

5. Ibid

Enhancing Safety at Intersections

In New York City in 2021, 45 percent of traffic crash fatalities, and 55 percent of all pedestrian crash deaths, happened 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

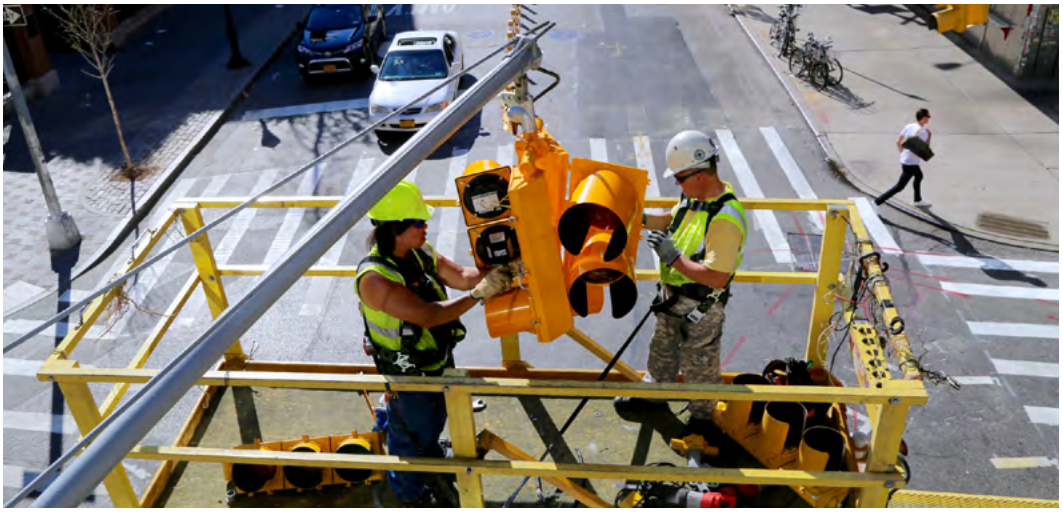
Unlike almost all other U.S. cities, right turns on red are severely restricted in New York City. Within the five boroughs, this movement is permitted only where posted, and has been most prevalent in Staten Island, where lower traffic and pedestrian volumes allow for the safe movement of both vehicles and pedestrians under this condition. After several states adopted laws which enabled right turn on red, studies found marked increases in pedestrian and bicyclist collisions at intersections.[6] An analysis of intersection crashes in four states found that right turn on red crashes frequently involved pedestrians and cyclists, and 93 percent of these crashes resulted in injuries to the pedestrians and cyclists.

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.

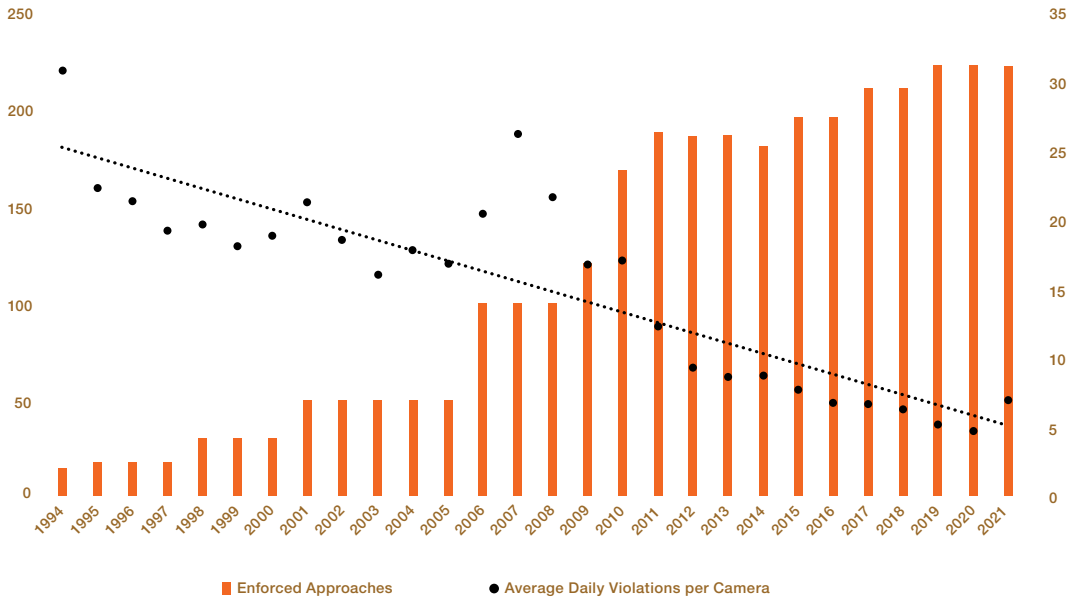
Red Light Cameras Deter Red Light Running Violations

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 2021, the average camera issued 7.0 NOLs on a daily basis – a 77 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.

Historically, 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. However, with the onset of the Covid-19 pandemic in early 2020, the City has confronted a new epidemic of dangerous driving, including more red light running behavior in 2021. This increase has happened alongside a spike in fatalities, and indicates the need for stronger sanctions, including the possibility of escalating fines for repeat offenders.

Change in Daily Average NOL per Camera



Red Light Cameras: Description of Locations

Though the precise number of active cameras may vary on a daily basis due to maintenance, 222 red light cameras were available for operation at no more than 150 intersections at any time in 2021.

Locations were 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.

There are far more than 150 intersections in New York City where red light running frequently occurs. However, State law prohibits NYC DOT from having more than this number of active intersections at any one time.

Borough	Number of Red Light Camera Enforced Intersections*	Number of Individual Camera Locations**
Bronx	19	25
Brooklyn	48	65
Manhattan	15	17
Queens	58	81
Staten Island	21	34

* Sums to greater than 150, as not all intersections are active at the same time. State law limits the number of active intersections to 150, but hardware can be installed at more than 150 intersections and activated in rotation.

** Some intersections have red light cameras at multiple approaches.

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. The data 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.

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 2020 (the "reporting year").

Previous iterations of this report have included a historical breakdown of crash injuries by their severity. However, as part of a series of upgrades beginning in 2019, NYS DMV and NYPD have changed how they report certain types of serious injuries. NYC DOT is working with those agencies to ensure data reported since 2019 is comparable to data from prior years. At the time of this report's publication that analysis was not yet complete. Therefore, because accurate comparisons cannot be made between 2020 injury data and that of years before 2019, only severity data for 2020 is shown in this report.

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, 2020. The data showed that right angle collisions causing injury declined at camera locations by about 72 percent, from an average of 241 per year before installation to 67 a year in 2020.

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 2017-2019 and 2020.

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	82	320	23	259	40	724
Average per year	*27*	*107*	*8*	*86*	*13*	*241*
2017–2019	42	121	8	131	20	322
Average per year	*14*	*40*	*3*	*44*	*7*	*107*
2020	5	33	2	25	2	67
Change	-22	-74	-6	-61	-11	-174

* Change is calculated as difference between 2020 and the average per 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 an average of 452 injurious rear-end collisions per year. In 2020, this figure had fallen to 262 — a decrease of 42 percent.

The following table compares the number of rear-end collisions which have occurred at camera enforced intersections during the three years prior to each red light camera's installation, as compared to 2017-2019 and to 2020.

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	115	481	105	524	131	1356
Average per year	*38*	*160*	*35*	*175*	*44*	*452*
2017–2019	126	422	44	428	98	1118
Average per year	*42*	*141*	*15*	*143*	*33*	*373*
2020	33	95	14	101	19	262
Change	-5	-65	-21	-74	-25	-190

* Change is calculated as difference between 2020 and the average per 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 and 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 its 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 2019 and later difficult to compare to previous years because any increase in severe injury numbers 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 2020 is shown in this report.

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

	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Severe Injury[7]	13	42	7	24	2	88
Moderate Injury[8]	16	54	9	53	11	143
Slight Injury[9]	178	448	52	458	57	1193

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.

The following 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 2020, 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 numbers being relatively small compared to those of pedestrians and motor vehicle occupants, they are thus subject to greater year-on-year volatility and changes may not be considered statistically significant.

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	85	269	110	142	19	625
Average per year	*28*	*90*	*37*	*47*	*6*	*208*
2017–2019	92	258	67	193	40	650
Average per year	*31*	*86*	*22*	*64*	*13*	*217*
2020	27	46	15	38	4	130
Change	-1	-44	-22	-9	-2	-78

Bicyclist Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	12	82	33	39	3	169
Average per year	*4*	*27*	*11*	*13*	*1*	*56*
2017–2019	18	105	30	57	1	211
Average per year	*6*	*35*	*19*	*19*	*≤1*	*70*
2020	7	38	6	17	2	70
Change	+3	+11	-5	+4	+1	+14

Motorist Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	468	1741	279	1614	340	4442
Average per year	*156*	*580*	*93*	*538*	*113*	*1481*
2017–2019	426	1188	130	1267	256	3267
Average per year	*142*	*396*	*43*	*422*	*85*	*1089*
2020	109	302	37	303	48	799
Change	-47	-278	-56	-235	-65	-682

* Change is calculated as difference between 2020 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 believed to be issued in error. The rate of these 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 2021, 2.5 percent of NOLs resulted in a request for a hearings; the other 97.5 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 84.5 percent of contested NOLs are upheld with a ruling or either guilty or guilty with reduction. In other words, in only 15.5 percent of hearings are NOLs dismissed by an ALJ, which represents 0.39 percent of all NOLs issued, or less than four in one thousand. In calendar year 2021, red light camera violators paid approximately $30,160,780 dollars on 520,191 notices of liability.

		Percent of Total Violations Issued
Red Light Camera Violations Issued in 2021	555,442	100%
Red Light Camera Hearings Requested in 2021	14,226	2.6%

	Total	Percent of Challenged Violations
NOL Upheld at Hearing in 2021	12,022	84.5%
NOL Overturned at Hearing in 2021	2,204	15.5%

Revenue and Expenses

Red Light Camera Program (Inception–June 2021)

Program Costs	December 1993 to June 2021	204,285,077
Capital Costs	Inception to June 2021	32,443,386
NYC DOT Staffing	December 1993 to June 2021	28,301,461
NYC DOF Staffing	July 1996 to June 2021	8,975,934
Total Expenses	Inception to June 2021	274,005,857
Revenues	Inception to June 2021	607,783,847
Net Revenues	Inception to June 2021	333,777,990

Annual expense and revenue breakdowns for fiscal years 2014 through 2021 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%
2021	222	1,181,638	3,237	22,724	98,470	35.9	14.58	567,488	7.00	14,226	85%

	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
Program Costs	$5,296,726	$5,276,159	$5,699,906	$7,587,608	$4,949,866	$4,110,121	$3,692,876	$8,957,708
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	$635,450	$952,729
NYC DOF Staffing	$147,146	$330,616	$368,400	$406,955	$381,137	$350,175	$198,955	$185,822
Total Expenses	$9,304,788	$6,760,957	$9,170,697	$9,317,456	$6,242,108	$5,277,253	$4,527,281	$10,096,259
Revenues	$27,549,715	$29,456,820	$25,937,549	$23,868,446	$22,805,934	$20,087,457	$14,122,613	$18,124,430
Net Revenue	**$18,244,927**	**$22,695,863**	**$16,766,852**	**$14,550,990**	**$16,563 ,826**	**$14,810,204**	**$9,595,332**	**$8,028,171**