

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 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 80 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 16,939 right-angle crashes annually. In 2018, the most recent year of data available, that number had declined to 4,174—a decrease of about three-fourths. In 1991–1993, there were on average of 14,873 rear-end crashes per year, but in 2018, this number had fallen by 49.5 percent to 7,499.

 The Program, in conjunction with other traffic safety initiatives, has helped to reduce the number of severe injuries in collisions. At intersections with red light camera enforcement, severe injuries fell by 58 percent overall from the years just prior to the Program's establishment to 2018.

The Program has proven to be a valuable tool for deterring red light running and protecting New Yorkers at signalized intersections.

The Danger Posed by Red Light Running

According to the Insurance Institute for Highway Safety, red light running crashes caused 846 deaths nationwide in 2018, along with approximately 139.000 injuries. About half of those killed were people other than the driver who violated the law and ran the red light, including passengers in the red light running vehicles, occupants of other vehicles, pedestrians, and bicyclists. 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 Causes

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.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 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.



Enhancing Safety at Intersections

In New York City in 2019, 51 percent of fatal traffic crashes, and 61 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 intersections.⁶ 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.

^{1. &}quot;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

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

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

^{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. The NOL includes a link to violationinfo. com, where the owner can view the notice and supporting documentation including the technological certification.

Red Light Cameras Deter Red Light Running Violations

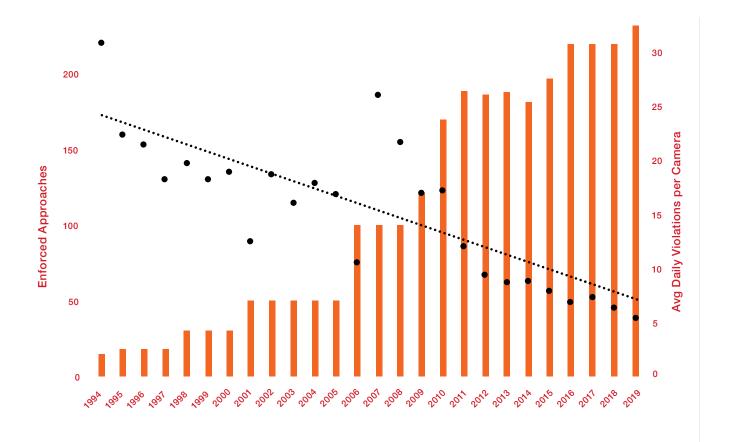
The purpose of the New York City Program is to deter motorists from running red lights. Accordingly, the more successful the Program is, the fewer red light violations should be observed over time.

In the first year of the Program, the average camera issued 30.8 NOLs on a daily basis. In 2019, the average camera issued 5.30 NOLs on a daily basis — an 83 percent drop. This data indicates that the Program has enhanced public safety by serving as an effective deterrent to red light running. 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.

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

Though the precise number of active cameras may vary on a daily basis due to maintenance, on average, 223 red light cameras were operating at no more than 150 intersections at a time in New York City in 2019*. In addition, as a further deterrent, several hundred dummy cameras (non-functional shells) have been installed throughout the City's five boroughs.

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.

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

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 2018 (the "reporting year").

Therefore, this data excludes red light camera locations installed in 2015 or later, in order to ensure that 2015–2017 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. Some intersections have multiple cameras; this data excludes cameras that were installed subsequent to the first.

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, 2018. The data showed that right angle collisions causing injury declined by about 61 percent, from an average of 231 per year before installation to 91 a year in 2018.

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 2015–2017 and 2018.



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	97	315	18	227	35	692	
Average per year	32	105	6	76	12	231	
2015–2017	41	108	7	88	16	260	
Average per year	14	36	2	29	5	87	
2018	16	27	3	39	6	91	
Change	-16	-78	-3	-37	-6	-140	

^{*} 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.

 $\mathbf{6}$

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 432 injurious rear-end collisions per year. In 2018, this figure had fallen to 352—a decrease of 19 percent.

The following table below 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 2015–2017 and to 2018.

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 table opposite** aggregates by borough the number and severity of all injury collisions which occurred at camera enforced intersections during the three years prior to each red light camera's installation as compared to 2015–2017 and to 2018.

The table on page 10 aggregates by borough the number of injury collisions to pedestrians, bicyclists and motorists at camera enforced intersections during the year prior to each red light camera's installation as compared to 2018, 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.

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	120	497	95	477	126	1297	
Average per year	40	166	32	159	42	432	
2015–2017	111	376	61	356	71	975	
Average per year	37	125	20	20 119	24	325	
2018	43	133	15	135	26	352	
Change	+3	-33	-17	-24	-16	-80	

^{*} 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.

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

Severe Injury ⁷	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	49	142	38	114	22	365
Average per year	erage per year 16		13	38	7	122
2015–2017	37	72	16	16 68		209
Average per year	12	24	5	23	5	70
2018	2018 6 Change -10		6	14	6	51
Change			-7	-24	-1	-71

Moderate Injury ⁸	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	stallation at 73		62	185	43	572
Average per year	Average per year 24		21	62	14	191
2015–2017	32	113	34	111	24	314
Average per year	11	38	11	37	8	105
2018	2018 8		10	24	10	86
Change	-16	-36	-11	-38	-4	-105

Slight Injury ⁹	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide	
hree Years Prior to RLC Installation at 856 2849 Intersection		2849	2849 298 1838		362	6303	
Average per year	285	950	99	613	121	2101	
2015–2017	700	1781	221	1560	274	4536	
Average per year	233	594	74	520	91	1512	
2018	265	580	58	613	107	1623	
Change	-20	-370	-41	0	-14	-478	

^{*} 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.

^{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.

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

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	100	268	89	127	18	602	
Average per year	33	89	30	42	6	201	
2015–2017	113	232	63	140	28	576	
Average per year	38	77	21	47	9	192	
2018			18	62	19	211	
Change*			-12	+20	+13	+10	

Bicyclist Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Three Years Prior to RLC Installation at Intersection	9	78	29	36	3	155
Average per year	3	26	10	12	1	52
2015–2017	21	96	34	50	4	205
Average per year	7	32	11	18	1	68
2018	2018 7		7	13	1	67
Change*	+4	+13	-3	+1	0	+15

Motorist Injury Crashes	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide	
Three Years Prior to RLC Installation at Intersection	931	3101	403	2295	480	7210	
Average per year	e per year 310 10		134	765	160	2403	
2015–2017	658	1665	176	1586	286	4371	
Average per year	219	555	59	529	95	1457	
2018	245	523	523 50	578	104	1500	
Change*	-65	-510	-84	-187	-56	-903	

^{*} 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 2019, 2.70 percent of NOLs resulted in a request for a hearing; the other 97.30 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, 89 percent of contested NOLs are upheld with a ruling of either guilty or guilty with reduction. In other words, in only 11 percent of hearings is an NOL overturned by an ALJ—which represents about 0.29 percent of all NOLs issued, or three in one thousand.

	Total	Perccent of Total Violations Issued
Red Light Camera Violations Issued in 2019	431,472	100%
Red Light Camera Hearings Requested in 2019	11,649	2.70%
NOL Upheld at Hearing in 2019	10,418	2.41%
NOL Overturned at Hearing in 2019	1,231	0.29%

••••••••••••••••••••••••

Revenue and Expenses

Red Light Camera Program (Inception–June 2019)

Program Costs Capital Costs	December 1993 to June 2019 Inception to June 2019	\$191,634,493 \$32,443,386
DOT Staffing DOF Staffing	December 1993 to June 2019 July 1996 to June 2019	\$26,713,282 \$8,591,157
Total Expenses	Inception to June 2019	\$259,382,318
Revenues	Inception to June 2019	\$575,536,804
Net Revenues	Inception to June 2019	\$316,154,486

Annual expense and revenue breakdowns for fiscal years 2014 through 2019 may be found in the appendix.

Appendix

	Active Camer	Observed Events	Events/Day	Events/Week	Events/ Mont	% Change in Events from previous year	Events / Camera / Day	NOLs Issued	NOLs / Camera / Day	Hearing Requests	% of Hearing Guilty or Guilt with Reductio
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%

	FY14	FY15	FY16	FY17	FY 18	FY 19
Program Costs	\$5,296,726	\$5,276,159	\$5,699,906	\$7,587,608	\$4,949,866	\$4,110,121
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
NYC DOF Staffing	\$147,146	\$330,616	\$368,400	\$406,955	\$381,137	\$350,175
Total Expenses	\$9,304,788	\$6,760,957	\$9,170,697	\$9,317,456	\$6,242,108	\$5,277,253
Revenues	\$27,549,715	\$29,456,820	\$25,937,549	\$23,868,446	\$22,805,934	\$20,087,457
Net Revenue	\$18,244,927	\$22,695,863	\$16,766,852	\$14,550,990	\$16,563 ,826	\$14,810,204