18.0 AIR QUALITY

18.1 Introduction

The purpose of an Air Quality Analysis is to identify and quantify any potentially significant air quality impacts which result from the proposed project. The sources of potential air quality impacts are:

- Mobile Sources - Emission redistribution from traffic induced by the proposed platform over FDR Drive.
- Stationary Sources - Emissions of on-site and ventilation exhaust vents, and off-site emission sources.

An air analysis consists of the identification of the pollutants to be analyzed, the basis for the selection of appropriate air quality analysis sites (receptors), quantification of the existing air quality conditions (the Existing Condition), future conditions without the project (the No-Build Condition) and finally the evaluation of the future conditions including the project (the Build Condition), each of which considers the impacts from mobile and stationary emission sources.

18.2 Pollutants Analyzed

Criteria pollutants are those for which the National Ambient Air Quality Standards (NAAQS) have been established by the Environmental Protection Agency (EPA) and adopted by the New York State Department of Environmental Conservation (NYS DEC). They include carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter (PM-10 and PM2.5), sulfur dioxide (SO2), ozone and lead.

Carbon Monoxide

Carbon monoxide (CO) is produced from the incomplete combustion of gasoline and other fossil fuels. In New York City, about 80% of CO emissions are from motor vehicles. Because this gas disperses quickly, CO concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near congested intersections and along heavily traveled and congested roadways. CO is the only pollutant whose major concentration is generally found immediately adjacent to a roadway. Since the proposed project would be lower than the CEQR Technical Manual air quality screening threshold of 100 peak hour vehicle trips for this area of the city no mobile source analysis is warranted for the project induced vehicular trips. However, the proposed project would include a platform over the FDR Drive. The mobile source air quality is warranted due to the proposed platform over the FDR Drive.

Lead

Lead emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Lead emissions from automobiles have been declining in recent years because of the use of unleaded gasoline. Lead is not produced in large quantities by mobile sources. The proposed project would not generate significant amount of lead and no further analysis was warranted.

Nitrogen Oxides and Ozone

Nitrogen oxides are of concern because of its role as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from sources of precursor pollutants. The effects of nitrogen oxides emissions form mobile sources are therefore generally examined on a regional basis. The proposed project would not have a significant effect on the overall volume of vehicular travel in the metropolitan area. Therefore, it would not have any measurable impact on regional nitrogen oxide emissions or on ozone levels. An analysis of potential impacts from mobile sources for these pollutants was not warranted. The proposed project would not generate significant nitrogen oxide emissions or ozone from the stationary sources because the new building would use steam for heating.

Particulate Matter

Particulate matter is emitted into the atmosphere from a variety of sources: industrial facilities, power plants, construction activity, concrete batching plants, waste transfer stations, etc. The primary concern is with those particulates that are less than 10 μm in diameter (referred to as PM10 and PM2.5) and therefore respirable. EPA's proposed standard of particulate matter with an aerodynamic equivalent diameter less than 2.5 μm (PM2.5) became effective September 16, 1997. PM2.5 concentrations are a concern of a regional nature. Neighborhood scale analyses may be favored over microscale analyses. Gasoline-powered vehicles do not produce any significant quantities of particulate emissions, but diesel-powered vehicles, especially heavy trucks and buses, do emit particulates, and respirable particulate concentration may be associated with higher volumes of heavy diesel-powered vehicles could elevate PM10 and PM2.5 levels in the surrounding area. Stationary sources that burn large volumes of fuel oil could also elevate PM10 and PM2.5 in surrounding area.

Sulfur Dioxide

Sulfur dioxide (SO2) emissions are primarily associated with the combustion of sulfur-containing fuels: oil and coal. No significant quantities are emitted from mobile sources. The stationary of the proposed project would not generate sulfur dioxide.

18.3 Air Quality Standards

National and State Air Quality Standards

Air quality standards for six major air pollutants CO, NO2, ozone, PM10, PM2.5, SO2 and lead have been established. Federal ambient air quality standards consist of primary and secondary standards. The intention of the primary standard is to establish the level of air quality necessary, with an adequate margin of safety, to protect human health, and the intention of the secondary standard is to protect the public welfare, including plant and animal life, buildings and materials. The Federal and New York State Ambient Air Quality Standards are shown in Table 18-1.

Table 18-1 National and New York State Ambient Air Quality Standards

	Primary Standards		**Secondary Standards**	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour(1)	None	
	35 ppm (40 mg/m^3)	1-hour(1)		
Lead	1.5 $\mu g/m^3$	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 $\mu g/m^3$)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 $\mu g/m^3$	24-hour(2)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 $\mu g/m^3$	Annual(3) (Arithmetic Mean)	Same as Primary	
	35 $\mu g/m^3$	24-hour(4)	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour(5)	Same as Primary	
	0.08 ppm (1997 std)	8-hour(6)	Same as Primary	
	0.12 ppm	1-hour(7) (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 $\mu g/m^3$)	3-hour(1)
	0.14 ppm	24-hour(1)		

(1) Not to be exceeded more than once per year.

(2) Not to be exceeded more than once per year on average over 3 years.

(3) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.

(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).

(5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

(6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

De Minimis Criteria

In addition to the National Ambient air Quality Standards (NAAQS), the City of New York applies a *de minimis* impact criterion to determine the significance of the incremental increase in CO concentrations that would result from a proposed action. These set the minimum change in eight-hour average carbon monoxide concentrations that constitutes a significant environmental impact. According to these criteria, significant impacts are defined as follows:

- An increase of 0.5 parts per million (ppm) or more in the maximum eight-hour average carbon monoxide concentration at a location where the predicted no-action eight-hour concentration is equal to 8 ppm or between 8 ppm and 9 ppm; or

- An increase of more than half the difference between baseline (i.e., no-action) concentrations and the 8-hour standard, when no-action concentrations are below 8 ppm.

State Implementation Plan (SIP)

The New York State Implementation Plan (SIP) outlines New York State's strategies for attaining the required federal air quality standards pursuant to the Clean Air Act. The Clean Air Act requires each state to submit to EPA a SIP for attainment of NAAQS. The 1977 and 1990 amendments require comprehensive plan revisions for areas where one or more of the standards have yet to be attained. All of New York City is designated non-attainment for ozone and CO. In the New York City metropolitan area, the standard for ozone continues to be exceeded. No violations of the CO standard have been recorded at New York State Department of Environmental Conservation (DEC) monitoring stations over the past few years. EPA has designated New York County (Manhattan) non-attainment for respirable particulate matter (PM10).

18.4 Methodology

18.4.1 Mobile Sources

The project generated vehicular trips would be below the CEQR Technical Manual air quality screening threshold of 100 as shown in Chapter 16 of this DEIS. Therefore, a detailed air analysis is not required from the project induced vehicle trips.

Because the proposed project will include a platform over the FDR Drive which will extend the existing platform over the FDR Drive by a distance of 103 feet, a study of the emission dispersion effects of traffic related air contaminants were conducted for both the existing platform (750 feet in length) from East 68th Street to East 71st Street and the proposed platform (103 feet in length) from East 71st Street to between East 71st and East 72nd Streets. It should be noted that FDR Drive at East 71st Street between the existing platform (750 feet long) and the proposed platform (103 feet long) would be open (approximately 60 long without platform). Vehicular emissions will be calculated using the Mobile 6 computer model. The dispersion analysis will utilize the CAL3QHCR computer model, the AERMOD computer model, and the CEQR Technical Manual (Garage). The analysis will consider the emissions resulting from the piston effect through the tunnel (the platform) over the FDR Drive. The following is methodologies for the air quality analyses for the platforms over FDR Drive including the proposed one.

18.4.1.1 Emission Calculations

The traffic volumes in the study area were collected using automatic traffic recorder (ATR) for the northbound, southbound and southbound Service Road of the FDR Drive from November 7 (Tuesday) to November 16 (Thursday), 2006. The ATR traffic data is presented in Appendix E. The traffic direction and the platform locations are presented in Figure 18-1. The 2006 traffic volumes were increased by a 0.5% to represent the 2007 Existing condition. In order to conduct a conservative analysis the higher volumes for the weekdays (November 14-16) were used in the analysis. The 24 hour traffic volumes are presented in Appendix E.

The background traffic growth rate of 0.5% annually was used according to the CEQR Technical Manual. A 1.5% (0.5% annually) increase of the Existing condition traffic volumes (2007) was applied to determine the background traffic growth for the No-Build condition (2010).

The vehicular emissions were computed using the MOBILE6 computer model, which is an EPA-approved mobile source emissions model. In order to determine the worst case scenario, vehicle emissions were computed for both the AM and PM peak hours. A mean winter temperature of 50 °F and a persistence factor of 0.7 were used. Auto thermal states for the existing traffic were provided by the NYC DEP.

Vehicle emission is related to classification. Emission estimates were made for five classes of motor vehicles:

- Light-duty, gasoline-powered automobiles;
- Light-duty, gasoline-powered taxis;

- Light-duty, gasoline-powered trucks;
- Heavy-duty, gasoline-powered trucks;
- Heavy-duty, diesel-powered vehicles; and
- Buses.

No light-duty diesel-powered vehicles, light-duty diesel-powered trucks, or motorcycles were assumed. Motorcycles are considered as light-duty gasoline-powered automobiles. The classification was conducted concurrently with the traffic volume survey. The classification data is presented in Appendix E. The sport utility vehicles (SUVs) were counted as light-duty trucks.

Auto thermal states for the existing traffic were provided by the NYC DEP. In Manhattan, the expressway non-catalytic cold start, catalytic cold start and catalytic hot start for the period of 7 AM to 9 AM are 6.61%, 6.79% and 0.19%, respectively. The non-catalytic cold start, catalytic cold start and catalytic hot start for the period of 4 PM to 6 PM are 5.20%, 6.65% and 0.5%, respectively. The non-catalytic cold start, catalytic cold start and catalytic hot start for the period of 6 PM to 7 AM are 6.39%, 9.49% and 1.27%, respectively. The higher the cold-start percentage results in the higher CO emissions. The cold-start percentages for the 6 PM–7 AM are highest. The 6 PM-7 AM thermal states represent the worst case conditions and were used for the AM and PM peak hour emission calculations for the FDR Drive because they predict the highest emission rates. These thermal states were used for the Existing, No-Build and Build conditions.

In Manhattan, the local non-catalytic cold start, catalytic cold start and catalytic hot start for the period of 7 AM to 9 AM are 22.4%, 22.7% and 0.59%, respectively. The non-catalytic cold start, catalytic cold start and catalytic hot start for the period of 4 PM to 6 PM are 19.79%, 26.27% and 4.24%, respectively. The non-catalytic cold start, catalytic cold start and catalytic hot start for the period of 6 PM to 7 AM are 16.76%, 26.04% and 4.97%, respectively. The cold-start percentages for the 4 PM–6 PM are highest. The 4 PM-6 PM thermal states represent the worst case conditions and were used for the AM and PM peak hour emission calculations for the FDR Service Road between East 73rd and East 68th Streets. These thermal states were used for the Existing, No-Build and Build conditions.

Vehicle speeds also affect emission factors. Higher speeds result in the lower emission factors. Average speeds used in the MOBILE6 for local roadway (FDR Service Road) and FDR Drive are based on the survey conducted concurrently with the traffic volume survey of the roadways where air quality analysis was performed. The survey data are presented in Appendix E.

The emission factors for the AM and PM peak hours were computed using MOBILE6 computer model. In order to conduct a conservative analysis, the higher emissions for either the AM or PM peak hour were used in this analysis although the higher emissions for the FDR northbound/southbound roadways and the FDR Drive Southbound Service Road did not occur at the same time. The higher emission factors are summarized in Table 18-2.

Table 18-2 Vehicle Emission Factors

Roadway Segment	2007 Existing	2010 No-Build	2010 Build
	g/mi	g/mi	g/mi
FDR Northbound	8.31	7.27	7.27
FDR Southbound	8.05	7.03	7.03
FDR S/B Service Road	9.49	8.27	8.27

Receptors were selected at the locations with continuous public access. Receptors were placed along the Esplanade from the mid of East 67th and East 68th Streets (the southern end of the existing platform) to East 73rd Street with a total of 60 receptors, approximately 24 feet spacing (see Figure 18-2). The receptors were located along the Esplanade which is approximately 7 feet from the FDR Drive. These receptors were used for both CAL3QHCR (the line source) and AERMOD computer models (volume source).

The existing platform has a ventilation system which absorbs the vehicular CO emissions under the platform and exhausts it through the building roof. According to the methodology shown in the previous FEIS for the Hospital for Special Surgery in 1993, the total emissions are divided into four parts: jets at the north portal, jets at south portal, leak to the esplanade and exhaust through ventilation system. There are five exhaust fans at the existing 750 foot platform and total exhaust capacity is 450,000 cubic foot per minute (cfm). The minimum exhaust volume from the five fans is 120,000 cfm. The higher exhaust volume would result in lower CO emissions from platform to the receptors along the Esplanade. In order to conduct a conservative analysis, the minimum exhaust rate of 120,000 cfm is used. It should be noted that CO, which is extracted through the ventilation system, would not contribute the dispersion analysis to the receptors along the esplanade. The calculated air volumes are presented in Table 18-3. The detailed calculations are presented in Appendix E. The CO distributions would be the same as air ratio.

Table 18-3 Emission Distributions

Location	Existing - 750' Platform		No-Build/Build-750' Platform		Proposed 103' Platform	
	Air, cfm	Fraction	Air, cfm	Fraction	Air, cfm	Fraction
North portal	34090	0.102	34605	0.103	34605	0.362
South Portal	38123	0.115	38699	0.115	41514	0.434
Esplanade	140623	0.422	142745	0.425	19604	0.204

Exhaust	120000	0.361	120000	0.357	-	-
Total	332836	1.000	336049	1.000	95723	1.000

For the dispersion analysis, the line source, volume source and area source methodologies were used and are presented below.

18.4.1.2 Line Source Dispersion Analysis

The FDR Drive is a line source for mobile source air quality analysis. A line source can be modeled with CAL3QHCR computer model, which is the EPA approved air quality dispersion model. The CAL3QHCR models roadways as straight, continuous, finite sources. The concentrations are summed up to a total distance of 1,000 feet in each direction. This air quality analysis includes the FDR Drive roadway from East 67th Street to East 75th Street and FDR Drive Service Road from East 68th to East 73rd Streets. Dispersion analyses were performed using CAL3QHCR computer model with five consecutive year meteorological data for the years of 2000 to 2004.

Under the Existing and No-Build conditions, the FDR Drive between East 68th and East 71st Streets are covered by the existing platform and under the Build conditions, the proposed platform would cover the FDR Drive from East 71st Street to between East 71st and East 72nd Streets. In order to simulate the limited mixing height (17-foot platform) two different mixing heights (17 feet and 1,000 meters) were modeled using CAL3QHC computer model. The analysis results of the 17-foot mixing height and the 1000 meter mixing height are presented in Appendix E. The comparison indicates that the analysis result of the 17-foot platform (17 feet in mixing height) is approximately 2.9 time of the result of 1,000-meter mixing height. For a conservative analysis, the covered roadway (the platform) was performed using CAL3QHCR with an emission factor of 3 (e.g. 3 x emission factor) to simulate the 17-foot platforms for all receptors. The highest total concentration was used for the analysis result.

The partial vehicle emissions within the platforms would be carried out of the platforms by vehicle pushes and pulls. This effect, the piston effect of the platforms, was also included in the analysis. The piston effect was modeled as a jet of which the emissions are pushed and pulled out of the platform by the vehicles which exit the platforms.

While there is a substantial amount of documentation that suggests that the length of the jet of air created by the traffic exiting the tunnel portals could be substantial (e.g. between approximately 150 and 300 feet, especially during hour of relatively high vehicular speeds in one direction and low vehicular speeds in the other direction), it is conservatively assumed that the following jet lengths are used for this project:

- 105 feet with a relatively high vehicular speed (greater than 25 miles per hour) and
- 35 feet with relatively low vehicular speeds (lower than 10 miles per hour).

It should be noted that the longer jet would result in lower CO concentration within the jet and thus the lower CO concentration at a receptor. The jet would maintain its integrity (i.e. maintain

a uniform set of conditions from which pollutants disperse) for a finite distance along the roadway after exiting the portal. For the purpose of this analysis, since the exact length of this is unknown, three jet lengths (i.e., 35, 70 and 105 feet) were assumed, and the impacts associated with each jet length estimated at all receptors along esplanade using CAL3QHCR dispersion model. Each jet was concurrently modeled with five year meteorological data.

The maximum 1-hour and 8-hour carbon monoxide concentrations were determined using the CAL3QHCR computer model. These predicted concentrations were superimposed to the background concentrations to obtain the total concentrations. The 1- and 8-hour concentrations were calculated for the existing condition for the Existing year of 2007 and future No-Build and Build conditions of 2010. The 2010 No-Build conditions do not include the proposed platform, and the 2010 Build conditions include the proposed platform. The analysis results for the worst case scenario are presented in Table 18-5.

18.4.1.3 Volume Source Dispersion Analysis

The FDR Drive with the platforms was modeled as a volume source using AERMOD computer model, the EPA approved computer model. Total vehicle emissions were calculated based on the vehicle emission factors, travel distance and number of vehicles. The total emissions for each vehicle moving direction were evenly apportioned for each volume source.

The vehicle missions except for the CO that are exhausted through the ventilation system are assumed to be a uniform volume source within the platform. The northbound and southbound roadways of the FDR Drive are 32 feet in width. Each volume source consists of 32 feet by 32 feet in horizontal level and 17 feet in height. The existing platform (750 feet in length) consists of 24 volume source in each direction. In order to conduct a conservative analysis, the FDR Drive Southbound Service Road emissions were added to the FDR Drive southbound volume source. The initial lateral dimension, σ_{yo} is 4.5 meters (32 ft x 0.3048 m/ft/2.15). The initial vertical dimension, σ_{zo} is 2.4 meters (17 ft x 0.3048 m/ft/2.15).

The volume emission rate for AERMOD input is called as following:

(Vehicle emission factor) x (travel length) x (vehicle volume) x (1- exhaust fraction)

For example, the volume emission rate for the FDR northbound under the Existing condition is:

(8.31 g/mi-veh) x (32 ft/5280 ft/mi) x (5038 veh/hr) x (1-0.361)/3600 s/hr = 0.0450 g/s

The calculated volume emission rates are presented in Table 18-4. It should be noted that the southbound volume rates include the southbound Service Road emissions.

Table 18-4 Volume Emission Rates

Roadway Segment	2007 Existing Existing Platform g/s	2010 No-Build Existing Platform g/s	2010 Build Existing Platform g/s	2010 Build Proposed Platform g/s
FDR Northbound	0.0450	0.0403	0.0403	0.0626
FDR Southbound	0.0495	0.0441	0.0441	0.0744

Note:
1. The existing platform is 750 feet in length.
2. The proposed platform is 103 feet in length.

Under the Build condition, the proposed platform would be 103 feet in length. In order to conduct a conservative analysis, it is assumed that the 60 foot open space between the existing and the proposed platforms is also volume source with 17 foot limitation in height. The build condition would have same volume source size: 32 feet x 32 feet x 17 feet. The volume source CO emissions for the proposed platform would capture 100% vehicle emissions because of no ventilation system for the proposed platform. Calculated volume emission rates are presented in Table 18-4.

Dispersion analyses were performed using AERMOD computer model with five consecutive year meteorological data for the years of 2000 to 2004. The analysis results for the worst case scenario are presented in Table 5.

18.4.1.4 Area Source Dispersion Analysis

The FDR Drive with the platform was modeled as an area source using the CEQR methodology of garage. According to garage air quality definition as shown in the CEQR Technical Manual, the FDR under the existing platform and the proposed platform can be classified as a naturally ventilated garage because the area under the platforms opens on three sides: north, south and east. For the existing platform the emissions except for the CO that are exhausted through the ventilation system were used for the garage dispersion analysis. For the proposed platform all CO emissions were used for the garage dispersion analysis. The dispersion analysis followed the CEQR Technical Manual procedure (see Appendix E).

The travel distance is the platform length. The garage area is the platform area. Receptors for the garage air quality analysis are presented in Figure 18-3. Receptor A represents the receptors along the esplanade which are the same as the receptors shown in Figure 18-2. Although there are no public accessible places at the northern and southern ends of the existing platform, Receptor B is selected to represent the receptors at the FDR Drive northern and southern ends of the existing platform which are assumed to be seven (7) feet from the FDR northbound roadway in order to conduct a conservative analysis. Receptor C is selected to represent the receptor at

the northern end of the proposed platform which is assumed to be seven (7) feet from the FDR Drive northbound roadway in order to conduct a conservative analysis. The analysis results for the worst case scenario are presented in Table 5.

The existing and proposed platforms were modeled separately. Under the Build condition the CO concentrations for Receptors B and C were superimposed for the existing and the proposed platforms (see Table 5).

18.4.2 Stationary Sources

The stationary emission source would be the on-site boiler emissions and laboratory vents, and adjacent off-site emissions. Air quality impacts from the proposed project to the adjacent buildings and from the adjacent emission sources to the proposed building can be evaluated using SCREEN3 dispersion model which is developed by the EPA. The SCREEN3 computer model can be used for analyzing the 1-hour concentrations and for both direct impact and downwash effect on the subject building. The highest concentration of the SCREEN3 outputs represents the concentrations which may occur at the adjacent buildings or on the subject building. The meteorology persistence factors of 0.9, 0.7 and 0.4 were used for the 3-, 8- and 24-hour periods, respectively.

If exceedance for a pollutant occurs using the SCREEN3 computer model, AERMOD computer model developed by the EPA can be used for further detailed analysis. The AERMOD computer model can simulate point sources, area sources or volume sources. The AERMOD computer models require meteorological data input. The surface data for La Guardia airport and the up-air data for Brookhaven, New York may be selected for the computer modeling. Five consecutive years of meteorological data from 2000 to 2004 may be used for the AERMOD dispersion analysis.

The proposed building will use steam for space heating, which is supplied by Con Edison. No pollutant emissions would occur from the project site. The proposed new building would not have any laboratory hood exhaust vents which may exhaust contaminants. Therefore, no air quality impacts are anticipated from the project site to the adjacent buildings.

A survey was conducted by Ethan C. Eldon Associates, Inc. to search the adjacent emission sources within an approximately 400-foot radius area. A request letter to search emission information in the study area was sent to the New York City Department of Environmental Protection (NYC DEP). The response from the NYC DEP dated October 28, 2004 states:

"We do not have information on the Con Edison or NYC Department of Sanitation sites. The only information we have for 523 E. 70 Street are equipment registrations, which do not include information on emissions or locations of stack/vents".

Therefore, there are no stationary emission sources within the 400-foot radius area. No significant air quality impacts would occur from the adjacent sites to the project building.

18.5 Background CO Levels

The one-hour and eight-hour background CO values used in this analysis for the existing year of 2007 are based on the NYS DEC monitoring data at the nearest monitoring station, PS59 in Manhattan (228 East 57th Street). The latest DEC monitoring data available is for the year of 2005. As shown in the NYS DEC monitoring data reports, CO concentrations decrease year by year, e.g. the CO levels in 2005 are lower that those in 2004. The 2006 data should be lower than 2005. The monitoring data in 2005 indicate that the one-hour background CO concentration at PS59 was 2.2 ppm and eight-hour concentration was 1.5 ppm which is assumed to be representative of the Existing condition background CO level in the study area in order to conduct a conservative analysis.

Future CO levels will be affected by the specific vehicle inspection and maintenance program chosen to reduce mobile source air pollution. This program regulates the manner and frequency of motor vehicle inspections for air emissions in the state. The future background CO concentrations will continue to decrease. The decrease is due to the increasing numbers of federally mandated lower-emission vehicles that are projected to enter the vehicle fleet as older higher polluting vehicles are retired, and the continuing benefits of the New York State Inspection & Maintenance program. For a conservative analysis, the one-hour future (2010 No-Build and Build Conditions) background level of CO is assumed to the same as the Existing condition: 2.2 ppm. The 8-hour background concentration is assumed to be 1.5 ppm for the Build year of 2010.

18.6 Analysis Results

The line source (CAL3QHCR model), volume source (AERMOD model) and area source (CEQR garage) were modeled to analyze the CO concentrations at the receptors along the Esplanade for the Existing, No-Build and Build conditions. The analysis results (computer outputs) are presented in Appendix E and the highest concentrations are summarized in Table 18-5.

In the line source analysis with CAL3QHCR computer model, three jet lengths (35, 70 and 105 feet) were analyzed and the results indicate that worst case is the shortest jet length (35 feet). The highest analysis concentration would occur at Receptors 32/33 which are located at the Esplanade at East 71st Street for the Existing, No-Build conditions and at Receptors 39/40 at the Esplanade at north end of the proposed platform for the Build condition. The volume source analysis results indicate that the highest CO concentrations occur at Receptor 15 (the middle of the existing platform) for the Existing and No-Build conditions and at Receptor 32 (East 71st Street) for the Build condition. The area source analysis results indicate that the highest CO concentrations occur at Receptor B (the ends of the existing platform) for the Existing and No-build conditions and at Receptor C (the north end of the proposed platform) for the Build condition.

Table 18-5 Analysis Results

Model	Time period	NAAQS ppm	Back-ground ppm	Existing Condition		No-Build Condition		Build condition	
				Analysis ppm	Total ppm	Analysis ppm	Total ppm	Analysis ppm	Total ppm
CAL3QHCR	1-hr	35	2.2	5.7	7.9	5.1	7.3	3.4	5.6
Receptor 32/33	8-hr	9	1.5	3.6	5.1	3.2	4.7	2.1	3.6
CAL3QHCR	1-hr	35	2.2	2.7	4.9	2.5	4.7	6.7	8.9
Receptor 39/40	8-hr	9	1.5	1.5	3.0	1.3	2.8	3.8	5.3
AERMOD	1-hr	35	2.2	1.4	3.6	1.3	3.5	1.5	3.7
Results	8-hr	9	1.5	1.0	2.5	0.9	2.4	1.1	2.6
Garage	1-hr	35	2.2	3.4	5.6	3.0	5.2	3.6	5.8
Results	8-hr	9	1.5	2.4	3.9	2.1	3.6	2.5	4.0

Note

1. NAAQS - National Ambient Air Quality Standards
2. The 1- and 8-hour background levels are from the NYS DEC monitoring data 2005 report at PS59 Station.
3. The 1-hour and 8-hour resulst are from the CAL3QHCR output.
4. Total concentration = background concentration + analysis result.
5. CAL3QHCR Receptors 32/33 are located near north end of the existing 750 foot platform.
   CAL3QHCR Receptors 39/40 are located near north end of the proposed 103 foot platform.

18.6.1 Existing Conditions

Mobile Source

As shown in Table 18-5, the highest CO concentration, was determined assuming a 35 foot jet using CAL3QHCR. The total CO concentration in Table 18-5 is the combination of the analysis results and the background concentration. The highest 1-hour total concentration is 7.9 ppm (the background concentration of 2.2 ppm plus the analysis concentration of 5.7 ppm) at Receptor 32 and the 8-hour total concentration is 5.1 ppm (the background concentration of 1.5 ppm plus the analysis concentration of 3.6 ppm) at Receptors 33 from the line source analysis. The predicted total concentrations indicate that the NAAQS for CO (35 ppm for the one-hour period and 9 ppm for the eight-hour period) were not exceeded.

Stationary Source

In the existing conditions there are not any potential significant air quality impacts on the project site nor at any adjacent site receptors from the stationary source emissions. No potential significant air quality impacts would occur without the proposed project.

18.6.2 No-Build Conditions

Mobile Source

A 1.5% (0.5% annually) increase of existing traffic volumes was applied to determine the background traffic growth for the No-Build condition. Although the background traffic volumes increase, the carbon monoxide levels will decrease because the increasing numbers of Federally mandated lower-emissions vehicles replace the older, higher polluting vehicles.

As shown in Table 18-5, the highest 1-hour total concentration is 7.3 ppm (the background concentration of 2.2 ppm plus the analysis concentration of 5.1 ppm) at Receptor 32 and the 8-hour total concentration is 4.7 ppm (the background concentration of 1.5 ppm plus the analysis concentration of 3.2 ppm) at Receptor 33 from the line source analysis. The one-hour and eight-hour CO levels for the No-Build Condition are predicted to be below the respective NAAQS standards of 35 ppm and 9 ppm. In fact, the calculated CO levels are slightly less than the corresponding Existing Condition concentrations at the receptors because newer, cleaner (i.e., lower CO emission) vehicles will continue to replace older, more polluting vehicles.

Stationary Source

In the No-Build conditions there would not be any potential significant air quality impacts on the project site and at any adjacent nor receptors from the stationary source emissions. No potential significant air quality impacts would occur without the proposed project.

18.6.3 Build Condition

Mobile Source

As shown in Table 18-5, the highest 1-hour total concentration is 8.9 ppm (the background concentration of 2.2 ppm plus the analysis concentration of 6.7 ppm) at Receptor 39 and the highest 8-hour total concentration is 5.3 ppm (the background concentration of 1.5 ppm plus the analysis concentration of 3.8 ppm) at Receptor 40 from the line source analysis. The one-hour and eight-hour CO levels for the Build Condition are predicted to be below the respective NAAQS standards of 35 ppm and 9 ppm.

In addition to the NAAQS, the City of New York applies a *de minimis* impact criterion to estimate impacts on air quality from the proposed project. The analysis results indicate that the *de minimis* criterion would not be exceeded.

Therefore, the proposed project, with the new platform over the FDR Drive, would not result in significant air quality impact due to mobile sources.

Stationary Source

The proposed building would use steam for space heating, which would be supplied by New York Hospital. No pollutant emissions are anticipated from the project site. The proposed new building would not have any laboratory hood exhaust vents which may exhaust contaminants. Therefore, no air quality impacts are anticipated from the project site to the adjacent buildings.

According to the information provided by the New York City Department of Environmental Protection (NYC DEP), there are no emission sources within the 400-foot study area. No significant air quality impacts are anticipated from sites adjacent to the project building.

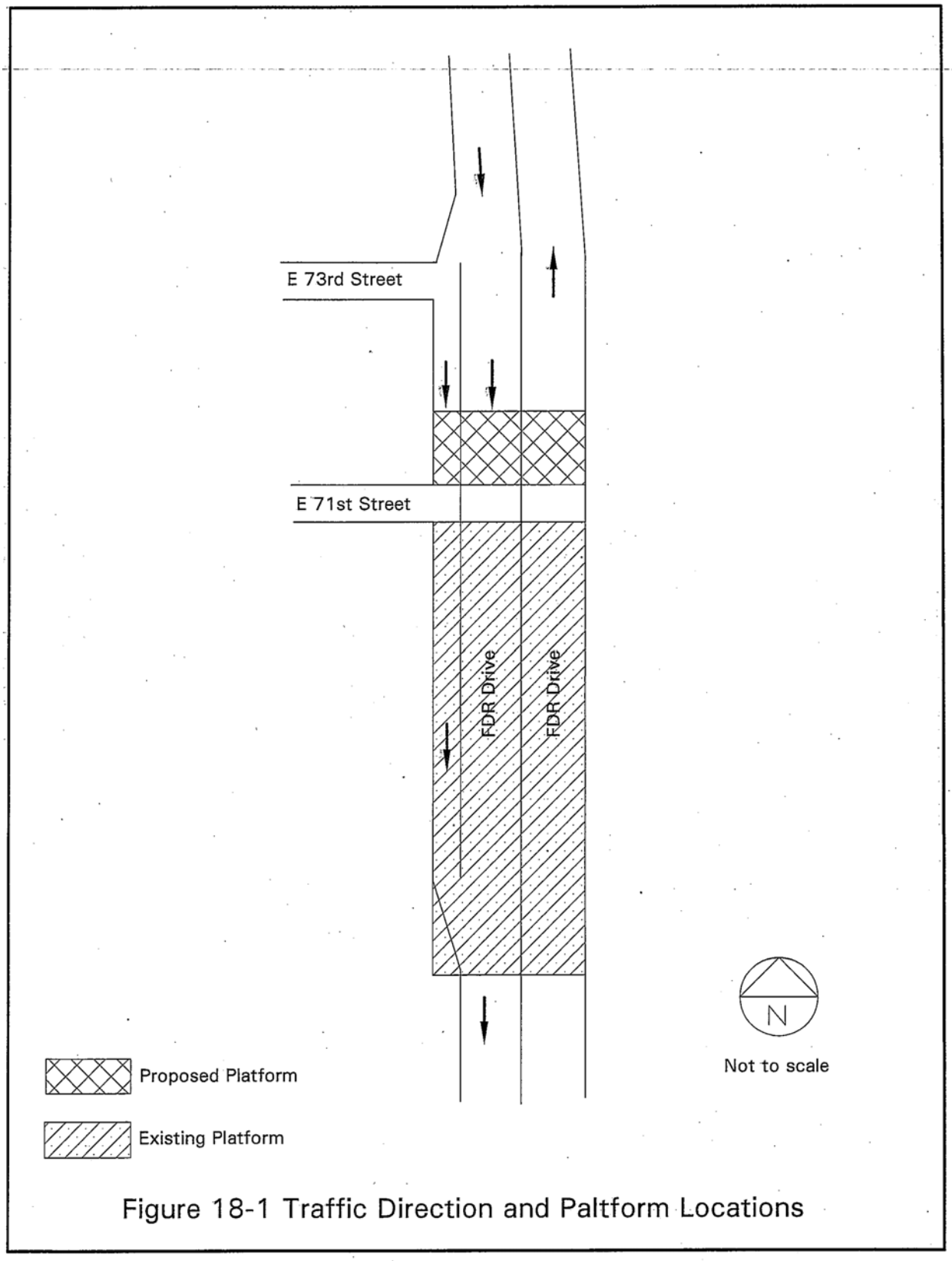

Figure 18-1 Traffic Direction and Paltform Locations

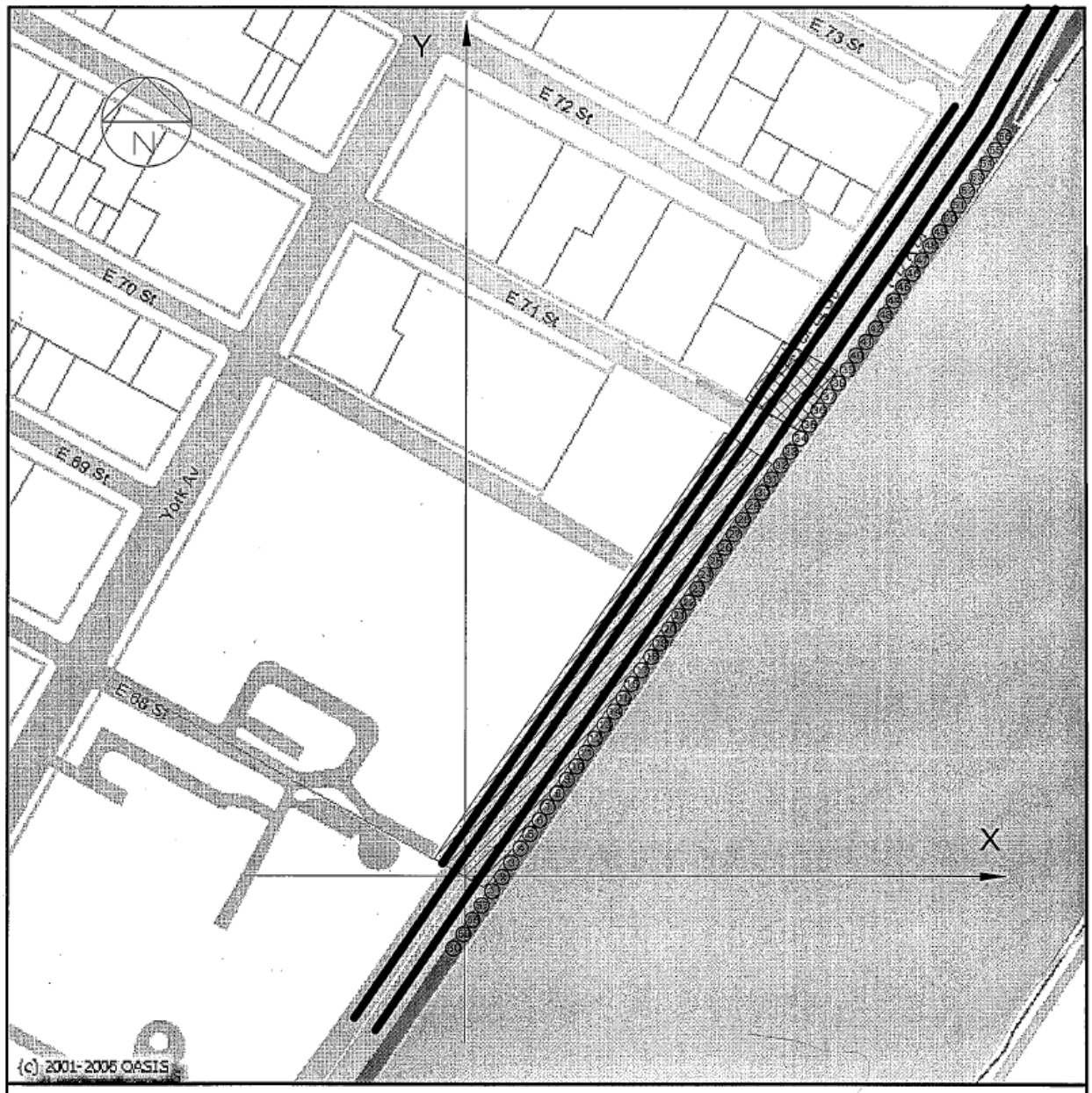

Figure 18-2 Mobile Source Links

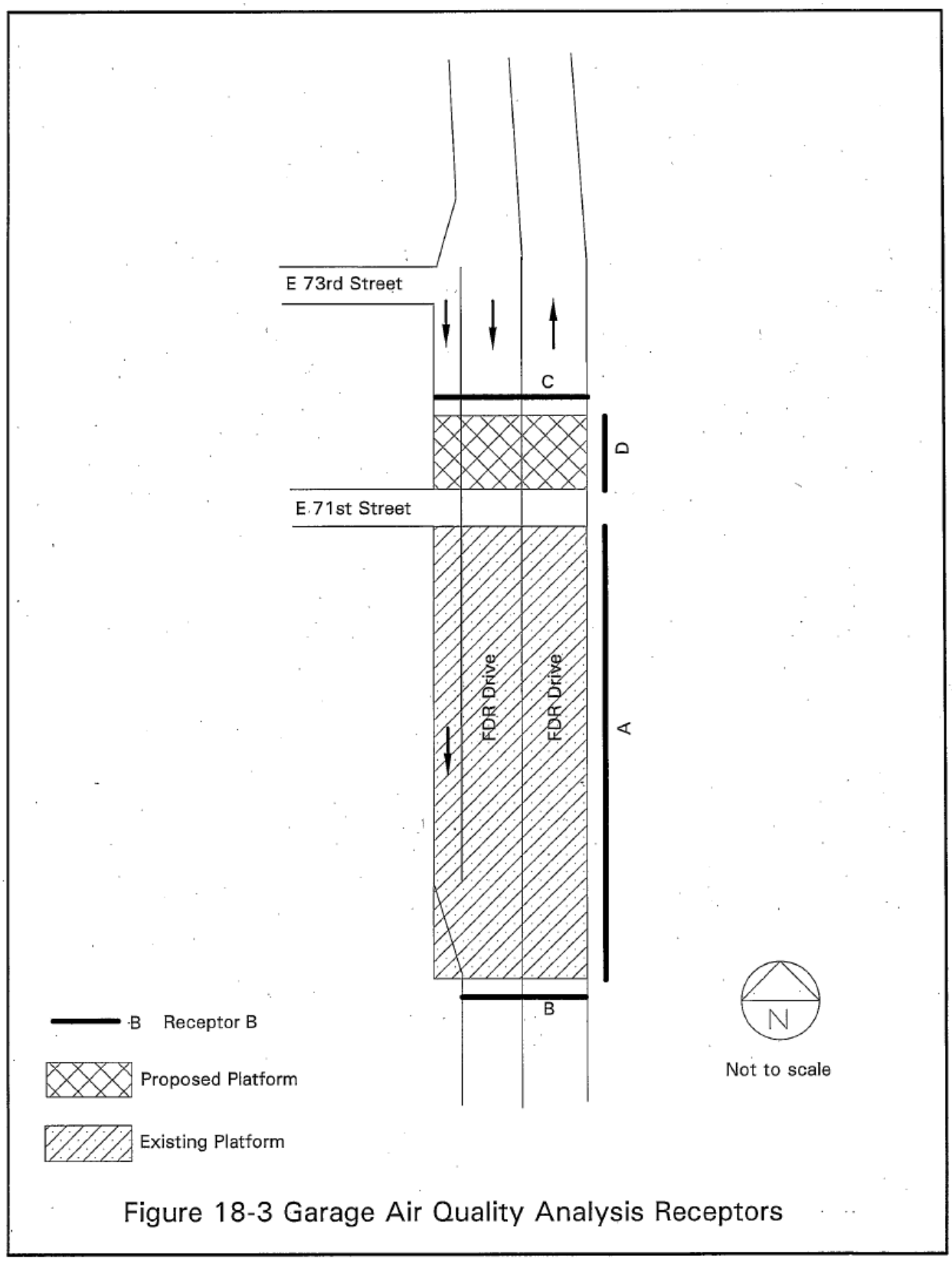

Figure 18-3 Garage Air Quality Analysis Receptors