

Long Island Rail Road Expansion Project  
Floral Park to Hicksville

Draft Environmental Impact Statement  
Appendix 1-A  
Draft Preliminary Engineering Technical Memorandum

November 2016

**MTA Long Island Rail Road  
LIRR Expansion Project from Floral Park to Hicksville**

**DRAFT**

**Preliminary Engineering  
Technical Memorandum**

**Prepared by**

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## TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY .....	1-1
2.0	FUTURE WITHOUT THE PROPOSED PROJECT ALTERNATIVE.....	2-1
3.0	PRELIMINARY ENGINEERING OF PROPOSED PROJECT.....	3-1
3.1	GUIDING PRINCIPLES.....	3-1
3.2	DESIGN CRITERIA .....	3-1
3.3	ALIGNMENT AND TRACKWORK.....	3-1
3.3.1	THIRD TRACK.....	3-1
3.3.2	INTERLOCKINGS, CROSSOVERS AND SIDINGS .....	3-9
3.4	ROADWAY GRADE CROSSINGS.....	3-9
3.5	PROPERTY ACQUISITION, RETAINING WALLS, AND SOUND ATTENUATION WALLS .....	3-11
3.6	UTILITY RELOCATIONS .....	3-16
3.6.1	SIGNALS AND COMMUNICATION.....	3-16
3.6.2	GAS.....	3-16
3.6.3	ELECTRIC POWER LINES.....	3-16
3.6.4	FIBER OPTIC AND TELEPHONE .....	3-24
3.6.5	CABLE TELEVISION.....	3-24
3.6.6	WATER AND SANITARY SEWER .....	3-24
3.6.7	DRAINAGE SYSTEM .....	3-38
3.6.8	PLANNED UTILITY PROJECTS .....	3-41
3.7	PASSENGER STATIONS .....	3-41
3.7.1	NEW HYDE PARK STATION .....	3-42
3.7.2	MERILLON AVENUE STATION .....	3-42
3.7.3	MINEOLA STATION.....	3-42
3.7.4	CARLE PLACE STATION .....	3-43
3.7.5	WESTBURY STATION .....	3-43
3.7.6	HICKSVILLE STATION .....	3-45
3.8	BRIDGES.....	3-45
3.9	OTHER STRUCTURES .....	3-45
3.10	CULVERTS .....	3-45
3.11	REDUCED ASPECT SIGNALS (RAS).....	3-45
3.12	DEMOLISHED STRUCTURES .....	3-45
3.13	TRACTION POWER AND SUBSTATIONS.....	3-49
3.14	SIGNAL SYSTEM AND SIGNAL BLOCK TOWER.....	3-49
3.15	COMMUNICATIONS.....	3-49
3.15.1	STATION COMMUNICATIONS .....	3-49
3.15.2	BACKBONE COMMUNICATIONS .....	3-49
3.16	MODIFICATIONS OF ADJACENT ROADWAYS .....	3-50
3.17	PARKING .....	3-51
3.18	CONSTRUCTION ASSESSMENT .....	3-52

4.0	DRAWINGS.....	4-1
4.1	PROPOSED PROJECT SHOWN ON AERIAL MAPS.....	4-1
4.2	CONCEPTUAL ENGINEERING DRAWINGS.....	4-1
4.3	NYSDOT GRADE CROSSING DRAWINGS.....	4-2

## LIST OF TABLES

Table 3-1:	Design Criteria .....	3-2
Table 3-2:	Sound Attenuation Walls .....	3-11
Table 3-3:	Retaining Walls for Third Track Construction .....	3-12
Table 3-4:	Summary of Anticipated Property Acquisitions and Easements .....	3-13
Table 3-5:	Utilities – Gas .....	3-17
Table 3-6:	Utilities – Electric .....	3-19
Table 3-7:	Utilities – Fiber Optic, Telephone, and Cable Television .....	3-25
Table 3-8:	Utilities – Water and Sanitary Sewer .....	3-31
Table 3-9:	Station Use Level and Ridership .....	3-44
Table 3-10:	Bridge Matrix .....	3-46

## 1.0 EXECUTIVE SUMMARY

The Preliminary Engineering Technical Memorandum describes the proposed LIRR Expansion Project (“Proposed Project”) between Floral Park Station in Floral Park, New York and “Divide” Interlocking in Hicksville, New York (referred to herein as the “Project Corridor”) as of November 2016. The Proposed Project consists of the construction of a third Main Line track from Floral Park Station to Hicksville; elimination of seven existing grade crossings at Covert Avenue, South 12th Street, New Hyde Park Road, Main Street, Willis Avenue, School Street, and Urban Avenue; construction of retaining walls along portions of the corridor; modifications to passenger rail stations and parking; modifications to railroad infrastructure including signal systems, substations, culverts, interlockings, crossovers, sidings, track bed, storm water drainage, power systems, communications, and signals; and relocation of utilities, including electric, signal, communications, gas, water, sewer, and storm sewer conveyances and drainage systems at the grade crossing eliminations.

The Proposed Project would add a track alignment south of the existing tracks in some locations and north of the existing tracks in others to minimize property impacts. Between Floral Park and Roslyn Road in Mineola, the new track location is proposed south of the existing alignment. The proposed track alignment would then shift to the north side of the existing tracks east of Roslyn Road in Mineola, and would continue to just east of Carle Place Station near the western Westbury Village limits. The entire alignment would gradually shift to the south between Carle Place and Westbury Station connecting to the existing tracks and providing a proposed track south of the existing alignment at Westbury station. East of Westbury Station, the new track would gradually shift to the north, cross under the existing Grand Boulevard Overgrade Bridge, and tie into the existing north siding track in Hicksville west of Hicksville Station. On the east end of Hicksville Station, a new equilateral turnout would add a parallel move to eliminate a choke point between the Port Jefferson Branch and Main Line to provide greater train capacity in and out of the station.

The Proposed Project development emphasized avoidance of residential property acquisition and minimization of all property impacts for the construction of the new third track. A similar emphasis was used in developing grade crossing elimination options. Consequently, out of the approximately 1,100 properties that border the LIRR ROW between Floral Park and Hicksville, it is estimated that only 14 non-residential parcels would be acquired either in part or in full by the construction of the new third track and grade crossing eliminations. This is in part accomplished through the construction of approximately 35,000 feet of retaining walls adjacent to the new third track and the proposed alignment. As described in this Technical Memorandum, a set of Guiding Principles and Design Criteria were established and refined to encourage the avoidance of additional impacts.

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## 2.0 FUTURE WITHOUT THE PROPOSED PROJECT ALTERNATIVE

The Future Without the Proposed Project Alternative represents the infrastructure that will be in place between Floral Park and Hicksville if the Proposed Project is not implemented (also referred to as the “No Build” or “No Action” Alternative). The Proposed Project represents the Project Corridor infrastructure when the project is fully completed.

The Future Without the Proposed Project Alternative is presented on schematic Drawing SC01. It consists of the existing Project Corridor configuration and improvements that have been recently completed, currently underway, or planned to be completed independently of the Proposed Project. Examples of such improvements include:

- Improvements to Ellison Avenue Bridge, recently completed.
- Replacement of Post Avenue Bridge, currently underway.
- Hicksville Station and North Track Siding Improvements, currently underway.

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### 3.0 PRELIMINARY ENGINEERING OF PROPOSED PROJECT

#### 3.1 GUIDING PRINCIPLES

A set of Guiding Principles were established to guide the development of project alternatives. The following Guiding Principles were used in the alternatives development and screening process:

1. **Avoid Residential Property Impacts:**
  - Design criteria to eliminate residential property impacts.
2. **Minimize All Private Property Impacts:**
  - Define types of property impacts
    - Right-of-Way Acquisition – property converted to railroad property. Current owner no longer able to use property.
    - Permanent Easement – current owner retains ownership of property, but use may be restricted.
    - Temporary Easement – land is temporarily used for construction activity and is returned to owner after construction is completed.
  - Design criteria to minimize property impacts.
  - Obtain waivers where design, construction, or maintenance criteria may avert property impacts without compromising operations, maintenance, or safety.
3. **Operations, Feasibility, and Construction:**
  - Improve railroad operations and achieve 80 miles per hour (mph) civil design speed.
  - Provide permanent benefits to Main Line infrastructure.
  - Ensure project feasibility (i.e., no fatal flaws).
  - Minimize community disruption during and after construction.
  - Design for ease of construction.
  - Minimize capital, operational, and maintenance costs.

#### 3.2 DESIGN CRITERIA

Design criteria were established for the preliminary engineering of the LIRR Expansion Project. The criteria were developed through a series of alignment workshops and the formation of a design criteria and issues matrix.

Table 3-1 presents the current design criteria for the LIRR Expansion Project. The table has three columns—“Desirable,” “Absolute,” and “Apply as Required.”

“Absolute” criteria are the limits of what is acceptable. It should only be applied when there is no other practical alternative and requires justification. On the other hand, “Apply as Required” criteria are established for situations that may necessitate deviating from the “Desirable” criteria to achieve the overall objectives of the project, including economy. Therefore, the order of design process would be to first try to achieve the “Desirable” criteria. If that is not practical, use the “Apply as Required” criteria. Where neither criteria is practical, use the “Absolute” criteria. Again the use of “Absolute” criteria would require justification. Where there is no “Absolute” or “Apply as Required” criteria, the “Desirable” criteria should be applied. The preliminary design attempts to meet the “Desirable” criteria wherever practical and economical. However, there are situations where following “Desirable” criteria is not possible,

economical, or practical. Where these situations might exist, “Apply as Required” and “Absolute” criteria categories have been developed.

#### 3.3 ALIGNMENT AND TRACKWORK

The Proposed Project was developed with the priority of minimizing impacts to adjoining properties as much as possible. The new third track alignment was developed by maintaining 13 to 14 feet of centerline clearance between tracks. In order to minimize property impacts the two existing tracks were relocated and/or shifted to accommodate the third track where necessary. In order to minimize property impacts, retaining walls are proposed in certain locations.

##### 3.3.1 THIRD TRACK

The Proposed Project follows the south alignment between Floral Park Station and just east of Roslyn Road. From east of Plainfield Avenue to east of Denton Avenue, the third track will be on 13-foot centers to the Main Line track to avoid ROW impacts. To accommodate the proposed highway grade separation, the existing Main Line tracks and the third track will be raised by 5 feet at Covert Avenue. To accommodate the minimum roadway vertical clearance, the existing Main Line tracks and the third track will be raised by approximately 2 feet over Nassau Boulevard. The new third track will tie into the existing three track alignment at Herricks Road and continue on a south alignment over Roslyn Road to new Nassau 3 Interlocking. At the Roslyn Road Bridge, the third track will use an existing bay which was constructed to accommodate the new third track.

The new third track will pass through an existing bay provided for the track in the Mineola Boulevard Overgrade Bridge design just east of Mineola Station platform. From east of Roslyn Road to east of Carle Place Station, the new third track follows a north alignment.

Continuing east, the new third track follows the south alignment from east of Carle Place Station to east of Westbury Station.

From east of Westbury Station to Hicksville Station, the new third track follows a north alignment. To accommodate the roadway grade crossing eliminations, the existing Main Line tracks and the third track will be raised by 3 feet over School Street and Urban Avenue. There will be a Maintenance of Way siding just east of School Street and just east of Urban Avenue. Starting just west of Wantagh Parkway the third track will utilize the north track from the Hicksville Station and North Track Siding Improvements Project. The only change to the Main Line tracks in this area will be just east of Hicksville Station. Two No. 15 turnouts will be placed on Station Tracks 2 and 3. These will connect to a No. 10 equilateral turnout on Port Jefferson Track 2.

At Divide 4, a new equilateral turnout will add a parallel move to eliminate a potential choke point between the Port Jefferson Branch and Main Line at the east end of Hicksville Station. The center track at Hicksville Station will now connect to both of the two Port Jefferson Branch tracks.

Table 3-1 Design Criteria

Design Element	Desirable	Absolute	Apply as Required	Comments
<b>A. Track Work</b>				
<b>Track Elevation and Speed Limitations</b>				
Actual Superelevation, $E_a$ (maximum)	Maximum 1"	Maximum 3"	Maximum 3"	Keeping actual superelevation ( $E_a$ ) to 1" or less to minimize overbalanced elevation for freight trains and passenger trains stopping at stations. Where increasing elevation may mitigate impacts on property acquisitions or significant capital costs up to 3" $E_a$ will be used. We do not anticipate superelevating the tracks beyond 3" even though the FRA will allow 5" with an exception for specific rolling stock. Minimum desirable superelevation is ½" unless approved by the LIRR Chief Engineer, however negative underbalance will not be permitted. Absolute minimum superelevation to meet AREMA formula $E_a + E_u = 0.0007V^2D$ .
Unbalance limits, $E_u$ (under and over balance, maximum)	Maximum 1.50"	Maximum 3"	Maximum 3"	Underbalanced elevation will be limited to less than 1.50". However, for passenger or freight trains stopping on a curve the overbalance will equal the actual superelevation ( $E_a$ ); therefore, where tracks may be required to be elevated greater than 1 1/2", overbalanced elevation must be allowed to be equal to $E_a$ (especially at stations and areas where freight train reverse moves will occur).
Design Speed	Passenger: 80 mph design. Freight: 45 mph (MAS).	Civil Speed ( $E_a = 3"$ )	Civil Speed ( $E_a = 3"$ )	Track design for construction will provide a maximum speed of 80 mph. This speed will be used to set actual superelevation.
Curvature - degree limits	0° 25' 00"	Design based on civil speed for maximum allowable $E_a$	Design based on civil speed for $E_a = 3"$	Current recommendation is based on $V = 80$ mph, $E_a = 1"$ and $E_u = 0.87"$
Curvature - Tangent Between Reverse Curves (Minimum)	100'	75'	75'	100' distance between reverse curves (adjacent curves of opposite direction) is desirable for maintenance of superelevation (MW2000 £57.4).
Curvature - Spiral Lengths, $L_s$ (Minimum)	$L_s > \text{or} = 1.63 E_u V$	Use formula $L_s (\text{min}) = 1.17 E_u V$ for comfort	Use formula $L_s (\text{min}) = 1.17 E_u V$ for comfort	Spiral lengths should be calculated to provide 1/4" runoff in 31 feet as well as $L_s (\text{min}) = 1.63 E_u V$ , where $E_u$ is unbalance in inches and $V$ is speed in mph. For areas where a shorter spiral may reduce property acquisitions or reduce capital costs, $L_s (\text{min}) = 1.17 E_u V$ may be used in lieu of $1.63 E_u V$ .
<b>Track Centers</b>				
Track center limits for new tangent track	Minimum 14'	Minimum 13'	Meet existing conditions at tie-in points.	13' minimum if needed to minimize property impacts.
Track center limits for re-aligned existing Track (If possible)	Minimum 14'	Existing (see comments)	Existing (see comments)	When tracks are realigned, they should be constructed to the current standards except at tie-in locations where tracks should transition from the existing track center dimension to proposed design. Existing spacing may be maintained to avoid/minimize property impacts.
<b>Grades</b>				
All tracks	Match Existing adjacent tracks	1% (maximum, see comments)	½% to 1%	Match adjacent existing tracks except at locations where increasing the grade of the tracks may improve vertical clearance of the existing undergrade bridge or where new grade-separated crossings are being constructed at Covert Avenue (raise mainline 5'), School Street (raise mainline 3') and Urban Avenue (raise mainline 3').
<b>Horizontal Clearances</b>				
Minimum Legal Side Clearance for Special Obstructions	9'-0"	8'-6" outside 8'-0" in buildings and doorways (NY State statute)	8'-6"	The current LIRR Minimum Roadway Clearances Diagram shows the minimum legal side clearance as 8'-0" minimum in special obstructions. These special obstructions include all through bridges and tunnels, inside of buildings, engine house and all other building doorways. Provides no horizontal clearance. Dimensions shown are for Tangent Track; curve and elevation corrections need to be applied for curved track.

Design Element	Desirable	Absolute	Apply as Required	Comments
Side Clearance on all Permanent Obstructions	12'-4 1/4"	8'-6"	9'-0"	The current LIRR Minimum Roadway Clearances Diagram shows the minimum legal side clearance as 8'-6" for all structures not listed above. However, the standard side clearance for all permanent obstructions is 12'-4 1/4" minimum. The standard side clearance for all permanent obstructions other than above except where property impacts may be reduced or eliminated by achieving a side clearance between the standard and legal limit. Dimensions shown are for Tangent Track; curve and elevation corrections need to be applied for curved track.
High platforms	5'-7"			Dimension is to the face of the platform rubbing board. Dimensions shown are for Tangent Track; curve and elevation corrections need to be applied for curved track.
Minimum Right of Way	15'-0"	10'-0 (residential property only, see comments)	12'-0	15 feet is the minimum limit for equipment to foul a track. However, 10' minimum right of way with retaining wall has been approved by LIRR to avoid residential property impacts.
<b>Special Trackwork</b>				
Interlockings, Crossovers and Sidings	Interlockings located for best operational preferences to best utilize new third track. Design to accommodate all freight sidings unless officially abandoned.	No. 10 Turnout (Siding Tracks)	Use No. 24, No. 20, No. 15, or No. 10 turnouts.	Where an alignment alternative may require that a siding lose its access, the loss of the siding will be shown as an impact.
Switch Types - high speed switches, others	No. 24	No. 10	No. 20 or No. 15	Apply new LIRR No. 24 High Speed Standard (CE-1 Specification Number S2-SS-24 (136-TW) SW PT & LRSR MPF) where practical. Premium special work without heel blocks or rail bound manganese frogs shall be utilized to limit noise and vibration.
Distance between facing switch points of same hand, L	L > or = 3 V, and L > or = 100 feet	65'-0 minimum (see comments)	100 feet	The distance between facing switch points of the same hand shall be at least 3 times the design speed or 100 feet, whichever is greater.
<b>B. Utility Relocations</b>				
LIRR-Owned Power and Communication Lines on LIRR-owned utility poles and in underground facilities on the north and south side of the LIRR ROW	Relocate conflicting facilities to existing PSEG-LI poles on the north side and south side of the LIRR ROW		Throughout the project limits to eliminate conflicts with track alignments, retaining walls and platforms and avoid property impacts.	LIRR's overhead facilities will be relocated to new LIRR poles or existing PSEG-LI poles, which have no impacts from proposed construction. PSEG-LI will evaluate the capacity of the existing poles per current load regulations, and upgrade the poles. Cross-backs from the north side of tracks to the south side will be minimized. Pre-construction relocation will be required to reduce schedule impacts.
PSEG-LI Power poles and lines within the north side and south side of the LIRR ROW	Relocate to new locations within 12'-4 1/4" the LIRR ROW.	8'-6" from closest edge of pole to centerline of Main Line track 7'-0" from closest edge of pole to centerline of siding track	Throughout the project limits to eliminate conflicts with track alignments, retaining walls and platforms, eliminate horizontal clearance issues and avoid property impacts.	If the relocation results in unavoidable property impacts, consideration will be given to relocating poles to the back of platforms, on top of retaining walls, replacing the pole(s) with steel hybrid poles or special bridge-type support structures, or moving them outside the LIRR ROW. Pre-ordering long lead time materials will reduce schedule impacts.
Other major utilities adjacent to or crossing the LIRR ROW (electric, telephone, cable television, fiber optic, gas, water, sanitary sewer, drainage)	Relocate to eliminate potential conflicts with proposed track realignment, platforms, retaining walls, widening of existing bridges and grade crossing eliminations.		Along Main Avenue, Railroad Avenue, 2 <sup>nd</sup> Avenue, 3 <sup>rd</sup> Avenue, and other streets parallel to the LIRR ROW, existing bridges to be widened (South Tyson Avenue, Plainfield Avenue, Denton Avenue, Nassau Boulevard, Meadowbrook Parkway, Glen Cove Road, Cherry Lane), and grade crossings to be eliminated (Covert Avenue, South 12 <sup>th</sup> Street, New Hyde Park Road, Main Street, Willis Avenue, School Street, Urban Avenue).	Other locations where utilities cross the LIRR ROW will also require relocation, or additional protection. Extensive coordination with utility owners will be required. Seasonal shutdown restrictions (gas, water, electric) will need to be considered. Pre-construction relocation will be required to reduce schedule impacts. Other streets with known utility crossings include Herricks Road, Charlotte Avenue, Grand Boulevard, South 8 <sup>th</sup> Street, Millers Lane, Tanners Pond Road, 10 <sup>th</sup> Avenue, 5 <sup>th</sup> Avenue, 4 <sup>th</sup> Avenue, Linden Avenue, Baer Place, 3 <sup>rd</sup> Avenue, Roslyn Road, Russell Drive, Carle Road, Ellison Avenue, Post Avenue, Sherman Street, Magnolia Avenue, Swalm Avenue, Kinkel Street, School Street, Railroad Avenue, Mineola Boulevard, Alpha Plaza, Engel Street, Laurel Street, Newbridge Road, Jerusalem Avenue, and South Broadway.
<b>C. Retaining Walls</b>				

Design Element	Desirable	Absolute	Apply as Required	Comments
Affects Property Acquisition Limits	Construct retaining walls to minimize or avoid property acquisition.			Avoid use of driven piles and use wall types that can be constructed within ROW limits. Avoid use of spread footings. Provide approximately 8'-0" barrier in cut sections, 4'-0" barrier in fill sections (when retaining wall height is greater than 3'-6"), and 8'-0" barrier in fill sections (when retaining wall height is less than 3'-6") for safety and noise mitigation. Consider using modular gravity walls. Generally, retaining walls will be used when existing ground line and new or relocated track elevations do not permit the use of Type A, B, C, F, G, J or K track sections as shown on Drawings S08, S09, and S10.
Minimum permanent ROW distance from centerline of track	15'-0"	10'-0"	10'-0 to 15'-0	See Drawings S01 through S04 for minimum permanent ROW distance requirements from the centerline of new or relocated track. 10' minimum right of way with retaining wall has been approved by LIRR to avoid residential property impacts. There are two areas that may require less than 10'-0" to avoid property impacts. Waivers by LIRR are required at these two locations.
Drainage (pipe to nearest recharge basin, other design approach)	Only provide drainage system in cut.			Based on LIRR direction. Use weep holes to relieve back pressure for retaining walls where railroad is on fill.
Horizontal clearance from centerline of outside new or relocated track to wallface, parapet or handrail, minimum	12'-4 1/4"	8'-6"	8'-6" to 12'-4 1/4"	Apply curve correction where applicable. 8'-6" absolute minimum approved by LIRR to avoid residential property impacts.
Structural loading	Cooper E-80	Cooper E-80		
<b>D. Substations and Power Distribution</b>				
Number of substations between Floral Park and Hicksville	Upgrade/rebuild 7 existing substations on existing substation footprint.			A Load Flow Traction Power Study is presently underway to determine final rehabilitation of substations.
Third rail sectionalization	Sectionalizing switches at all substation supply points and all interlockings			
Negative return reactors	Consistent with LIRR C&S/Power practice for multiple track territory			Needed to eliminate any potential C&S "run-around" paths in traction power negative return system, but only used where signal design has proven they are required.
Third rail composition	Stainless Steel Capped Aluminum Contact Rail			Provide aluminum contact rail between Floral Park and Hicksville on existing and new Main Line tracks.
<b>E. Stations – Utilize LIRR Station Design Guidelines</b>				
Removal of buildings at stations		Remove Mineola eastbound waiting room building. Remove existing Merillon westbound building (station building) located within the northern parking lot.		
Replacement of shelter structures		Per LIRR Guidelines Two (2) at westbound platform One (1) at eastbound platform		New platform shelters will be provided per LIRR station guidelines per station-use level.
Platform Width (Side Platform)	10 ft. wide	8 ft. wide minimum (LIRR guidelines)		Existing LIRR ROW can accommodate 10 ft. wide westbound platforms and 8 ft. wide eastbound platforms at all stations with the exception of Carle Place, which has sufficient ROW to permit both platforms to be 10'-0" wide. All platforms at new Hyde Park, Merillon, and Carle Place shall be 8'-0" wide.
Platform Height		4'-2" above top of rail		LIRR guidelines.

Design Element	Desirable	Absolute	Apply as Required	Comments
Platform Canopies		All Stations Westbound – 510 ft. long Eastbound – 255 ft. long  Mineola Station Westbound and Eastbound – 510 ft. long		
Clearance from platform edge to element on platform		6 ft. clear		FTA ADA (Section 37.42)
Platform Length		1,020 ft.(12 car consist)		
All Station Boarding Platforms		Provide hydronic heating snowmelt system with boiler rooms.		
Overpass / Underpass relocation / access		ADA and LIRR Guidelines (see comments) Westbury – extend existing underpass.		New Hyde Park, Merillon, and Carle Place will be provided with pedestrian overpasses with elevators that will serve as the access point between platforms. The existing pedestrian overpass with elevators at Mineola Station shall remain as the access point. ADA ramps will be provided at Westbury station and the existing tunnel/underpass will serve as the access point between platforms.
Minimum clearance to underside of overpass		22 ft.		LIRR guidelines.
Minimum overpass width		6 ft.		LIRR guidelines.
Maximum distance from end of platform to egress stair		Shall not exceed 82 ft. or one car length, whichever is greater.		NFPA 130 – section 5.3.3.6
Minimum number of egress stairs Minimum stair width	Covered at elevated stations per LIRR station design guidelines	Four (4) per platform 60 inches		Length of platform and maximum travel distance used to determine quantity required LIRR Station Guidelines
Minimum number of ADA ramps		Two (2) per platform		2015 NYS building Code – 1009.1
Maximum travel distance		200 ft.		2015 NYS building Code (Table 1017.2) and LIRR station guidelines
Area of Safe dispersal	10 sq.ft. per person		5 sq.ft. per person	When passengers cannot exit the platform off the ROW and area of safe dispersal will be provided for assisted evacuation.
Tactile Warning		2 ft. wide at platform edge		LIRR Station Guidelines
Benches		All stations (except Carle Place) - four (4) westbound platform and two (2) east bound platform Carle Place – two (2) westbound platforms.		LIRR Station Guidelines
<b>F. Bridges</b>				
Undergrade Bridges				
- Loading	Cooper E-80 (railroad bridges) HL-93 (roadway bridges)			Existing bridges may not have been designed for Cooper E-80 loading.
Design Type and Requirements	LIRR and AREMA standards			
- Roadway Clearance	14'-6"	Match existing. 14'-0" for grade crossing eliminations (See Section K).	Provide better than existing up to 14'-6".	Raise track 1'-4" at Nassau Boulevard to improve vertical bridge clearance.
- Width between new and existing (adjacent) undergrade bridges.	4'-6"	3'-0"		Distance between superstructure components to allow for inspection and maintenance.
Overgrade Bridges and Structures				
- Design Type and Requirements	NYS DOT & AASHTO LRFD			

Design Element	Desirable	Absolute	Apply as Required	Comments
- Minimum Vertical Clearance	22'-0			20'-8" minimum vertical clearance accepted by NYSDOT for Ellison Avenue Bridge because the 22' clearance can be acquired by future lowering of roadway.
Pedestrian Overpass	23'-0			NYSDOT criteria.
<b>G. Signals</b>				
Signals – Reduced Aspect Signals without bridges	Fit new Alignment Condition			Rule 410 signaling (cab/no wayside) assumed throughout the project limits. RAS signal required only at interlockings. Assume minimum setback of 50' from PS, unless otherwise directed.
Signal System Architecture				
- Applicable operating rules - signal architecture	"Rule 410" Cab with Wayside only at Interlockings			Consistent with latest signal standards – redundant processor interlockings with hot standby, conventional relay master locations and electric locks with copper line cables.
- Applicable operating rules - current of traffic	"Rule 261" bidirectional signaling.			Consistent with latest signal standards.
- Safe braking distance criteria for signal block layout (affects simulated capacity)	Use EBT-2 for EMU, DE-30 diesel and DM-30 dual mode trains			Consistent with latest signal standards.
- Applicable code rates	180, 270, 420, 120, 75 and 0 code will be used. 50 code will not be used.			For use in straight route signal control lines.
- Interlockings	Expansion/Modification of "Floral Park" Relocation of "Nassau 1" Modification of "Nassau 2" Relocation of "Nassau 3" Retention of "Nassau 4" Expansion of "Divide 1" Modification of "Divide 2" Modification of "Divide 4"			Consistent with latest signal standards.
- Signaling for crossovers	0 code for No. 10, 75 code for No. 15, 120 code for No. 20 and code TBD for No. 24.			
- Grade crossing elimination				The seven grade crossings (Covert Avenue, South 12 <sup>th</sup> Street, New Hyde Park Road, Main Street, Willis Avenue, School Street and Urban Avenue).
- Positive Train Control (PTC) Requirements	Including wayside interface units at the new interlockings, radio cases and antennas, network equipment and connections to the back office and transponders.			Consistent with LIRR's latest PTC standards.
<b>H. Signal Components and Construction</b>				
Signal enclosures				
- Interlocking Plants	The interlocking to include a main CIL hut, auxiliary huts as required, and battery hut.			The final size to be determined by the signal vendor and based on the latest LIRR standard including the complexity of circuitry and spare space requirements.
- Master Location	The master locations to include a signal hut and battery case.			The final size to be determined by the signal vendor and based on the latest LIRR standard including the complexity of circuitry and spare space requirements.
Negative return reactors	Consistent with LIRR C&S/Power practice for multiple track territory.			Needed to eliminate any potential C&S "run-around" paths in traction power negative return system, but only used where signal design has proven they are required.
<b>I. Communications</b>				

Design Element	Desirable	Absolute	Apply as Required	Comments
Support for substation monitoring and control from LIRR Power Director's office in Jamaica	Redundant communications to all existing and new substation locations.			
Remote control of all interlockings (Nassau-1, Nassau-2, Nassau-3, Nassau-4, Divide-1, Divide-2 and Divide-3, plus entire Oyster Bay Branch.	Support for remote control of all interlockings from Jamaica Central Control, with full backup control from Queens and/or Divide Towers (Nassau to be retired).			Oyster Bay Branch (Locust Interlocking) currently controlled from Nassau Tower.
TVM Health Monitoring	Full support for all stations.			
Station Public Address	Support for announcements from Jamaica Central Control, from supervising towers and from local station agents.			
Station CCTV	Provide a complete CCTV at each station, on the platforms and inside the station building and around the perimeter of the station building.			
PTC Interface	Connection between the office and the wayside communications network.			Consistent with latest standards.
<b>J. Operations</b>				
Frequency of crossovers	Locate crossovers to best utilize operation with new third track. Center Main Line is used as express track during peak periods.			Crossovers located to allow for most efficient use of center track as express track.
Freight considerations - clearances	No special consideration for freight trains.			This project will not provide any special benefits to freight operations.
<b>K. Drainage</b>				
Design Flood Frequency – LIRR ROW	100-year 24-hour storm event runoff	100-year flood frequency		
<b>L. Highway for Grade Crossing Eliminations</b>				
Functional Classification	Urban Minor Arterials, Collectors and Streets			
Design Speed	30 mph for underpass 35 mph for surface streets	25 mph for underpass 30 mph for surface streets		Absolute minimums of 30 mph and 25 mph are used to minimize extent of impacts and require justification for non-standard features.
Lane Width	Travel lanes: 11 ft. Turn Lanes: 11 ft. Parking Lanes: 9 ft.	Travel lanes: 10 ft. Turn Lanes: 10 ft. Parking Lanes: 8 ft.		Combined lane and shoulder width of 12 ft. for two-way roads and 14 ft. for one-way roads required for snow removal operations. 11 ft. lanes and 8 ft. parking used.
Shoulder Width/Offsets	1 ft. for two-way operation 1.5 ft. for one-way underpasses	No shoulder.		Combined lane and shoulder width of 12 ft. for two-way roads and 14 ft. for one-way roads required for snow removal operations.
Grades	Level terrain: 9% max. for Collectors and Streets; 8% max. for Minor Arterials  8% max. for highway overpasses	10% for two-way grades and 14% for one-way downgrades.		10% and 14% to minimize extent of impacts.  8% max. for highway overpasses to avoid sidewalks with slopes exceeding 8%.
Horizontal Curvature	371 ft. for 35 mph design speed	154 ft. for 25 mph design speed 250 ft. for 30 mph design speed		Design exception required when not achieved.
Superelevation	4% max.			
Minimum Vertical Stopping Sight Distance	200 ft. for 30 mph	155 ft. for 25 mph		Design exception required when not achieved.

Design Element	Desirable	Absolute	Apply as Required	Comments
Minimum Intersection and Driveway Sight Distance	250 ft. for 35 mph	200 ft. for 30 mph		Design exception required when not achieved.
Horizontal Clearance	At face of curb	18 in. min. from face of curb		
Vertical Clearance	14'-6" for roadways under track	14 ft. for roadways under track		
Vertical Curve Length	Must allow for a tractor trailer with 53 ft. long trailer to pass beneath rail bridge			
Cross Slope	2% min.			
Rollover	4% between adjacent lanes			
Pedestrian Accommodation	-Sidewalk width = 5 ft. and no streetscaping or hardware  -Sidewalk width = 10 ft. with streetscaping (trees, planters, signs, parking meters, hydrants, benches)	-Sidewalk width = 4 ft. with 5 ft. passing every 200 ft. and no streetscaping or hardware  -Sidewalk width = 7.5 ft. with streetscaping (trees, planters, signs, parking meters, hydrants, benches)		2011 PROWAG for ADA. Absolute minimums used to minimize property impacts.
Design Vehicle	-Passenger car for residential driveways -SU30 for minor commercial driveways -SU40/City Bus/Large School Bus for minor intersections -WB40 for major commercial and major intersection turning movements -WB67 for through movements beneath railroad overpass	Allow encroachments for vehicles larger than SU30.		
Design Flood Frequencies – Grade Crossing Eliminations		Storage for eight (8) inches of runoff from the tributary area (100-year storm event).		Nassau County Department of Public Works Drainage Requirements requires the storage for eight (8) inches of runoff from the tributary area.
Flow Rate Determination	-Rational Method to compute a peak discharge -Modified Soil Cover Complex Method utilizing NRCS TR-55 to compute design runoff volume			HDM Section 8.3.2.4.

### 3.3.2 INTERLOCKINGS, CROSSOVERS AND SIDINGS

Due to the addition of the new third track, existing interlockings within the project limits would be modified or extended to provide flexibility and accommodate train movements from the new third track to the existing Main Line tracks and vice versa.

At “Floral Park”. A new No. 15 right-hand turnout will be installed to allow double track operation on the Hempstead Branch while providing a route for the new third track. This construction will require a slight modification in the southeast edge of the center island platform amounting to seven inches. A new No. 20 universal crossover will be installed on the Hempstead Branch just east of Tunnel Street. This will improve operations and avoid conflicts with the new third track connection at “Floral Park”.

The existing Nassau 1 Interlocking will be moved from the vicinity of Denton Avenue to east of Nassau Boulevard. The Main Line tracks at the proposed Nassau 1 interlocking will be realigned to accommodate new No. 24 crossovers. The proposed Nassau 3 Interlocking will be located east of Roslyn Road. East of Mineola Station two turnouts are proposed off the northernmost Main Line track. A No. 15 left-hand turnout to Oyster Bay Track 1 with a track speed of 30 mph is proposed. A second No. 10 left-hand turnout to Oyster Bay Track 2 with a track speed of 15 mph is proposed.

Just east of Hicksville Station two No. 15 turnouts are proposed to be constructed on Station Tracks No. 2 and No. 1. These will connect to a No. 10 equilateral turnout which would connect to Port Jefferson Track No. 2. These proposed crossovers and turnouts will allow the railroad to optimize its operations and meet the demands of passenger operations expected when the East Side Access program, which will provide LIRR access to Grand Central Terminal as well as Penn Station New York, is implemented.

### 3.4 ROADWAY GRADE CROSSINGS

Seven existing roadway grade crossings are proposed to be eliminated within the Project Corridor. They are as follows, listed west to east:

1. Covert Avenue
2. South 12<sup>th</sup> Street
3. New Hyde Park Road
4. Main Street
5. Willis Avenue
6. School Street
7. Urban Avenue

A number of potential options for each grade crossing elimination are being considered based on design criteria, impacts on traffic, property acquisition, construction impacts and duration, other environmental considerations, and the satisfaction of the Project Purpose and Need. The selection of a particular option also will consider the input received from the public and elected officials for the municipalities where the grade crossing is located.

The modifications to the grade crossings would be designed to accommodate emergency vehicles, snow plows, and truck traffic. Sidewalks or pedestrian bridges are proposed to allow for pedestrian and first responder access. The NYSDOT Grade Crossing Drawings in Section 4.3 show the design options outlined below.

#### COVERT AVENUE CROSSING

*Covert Avenue—Two-Way Underpass with Sidewalk, LIRR Tracks Raised Several Feet*

The Covert Avenue grade crossing would be replaced with a two-lane grade-separated underpass with a sidewalk on the east side. It would require raising the LIRR tracks approximately five feet in order to keep Second Avenue and Third Avenue open to through-traffic and avoid the acquisition of residential property. This option would provide a one-way service road connecting Covert Avenue northbound traffic to Third Avenue and Covert Avenue southbound traffic to Second Avenue. The existing access from Covert Avenue to the commercial building at the northeast corner of Covert and Second Avenues would be restricted, and may require its acquisition. Minor reconstruction to Second Avenue, Third Avenue, Wayne Avenue, and driveways would be necessary.

#### SOUTH 12<sup>TH</sup> STREET CROSSING

*South 12<sup>th</sup> Street—Option 1: Permanent Crossing Closure with Pedestrian Bridge*

This option would permanently close South 12<sup>th</sup> Street to vehicular traffic across the LIRR tracks and provide an ADA-compliant pedestrian bridge over the tracks. Vehicular traffic would divert to Covert Avenue and New Hyde Park Road, which are less than ¼-mile away on either side of the tracks and would be grade-separated.

*South 12th Street—Option 2: One-Way Underpass with Sidewalk*

This option would construct a one-way grade-separated southbound underpass with a sidewalk on the east side and a pedestrian bridge integrated into the station design. It would provide a one-way service road connecting northbound South 12<sup>th</sup> Street traffic to Third Avenue and southbound South 12<sup>th</sup> Street traffic to Second Avenue. This option would result in the loss of approximately eight on-street parking spaces along South 12<sup>th</sup> Street and would re-route South 12<sup>th</sup> Street northbound traffic onto other roads in the area. The adjacent crossing streets are less than ¼-mile away on either side of the tracks.

#### NEW HYDE PARK ROAD CROSSING

*New Hyde Park Road—Option 1: Five-Lane Underpass with Kiss and Ride northwest of Tracks*

The New Hyde Park Road grade crossing would be replaced with a five-lane grade-separated underpass with sidewalks on the east and west sides of the underpass. It would provide a dedicated left turn lane from southbound New Hyde Park Road to Clinch Avenue. Reconstruction of Clinch Avenue, Greenridge Avenue, Plaza Avenue, and Second Avenue would be necessary to improve safety. Pedestrian access from Garden City to the LIRR Station platforms would be provided via a pedestrian crossing parallel to and located south and north of the tracks on the bridge. This option would require the acquisition of the commercial building at the southwest corner of New Hyde Park Road and Plaza Avenue. The space created with this acquisition would be used to connect Second Avenue to Plaza Avenue, providing a dedicated left turn lane from northbound New Hyde Park Road to Plaza Avenue, providing space for a Kiss and Ride area, allowing for a safe and convenient location to drop off and pick up railroad passengers; the remaining space would be used for parking, drainage and stormwater management practices.

*New Hyde Park Road—Option 2: Four-Lane Underpass with Kiss and Ride southwest of Tracks*

This option would entail the construction of a four-lane grade-separated underpass with sidewalks on the east and west sides of the underpass. A dedicated left-turn lane would be provided for the southbound New Hyde Park Road traffic turning onto Clinch Avenue. The left lane of the northbound New Hyde Park Road traffic would be shared with a left turn onto Plaza Avenue. This option would involve construction of a Kiss and Ride area on the southwest side of New Hyde Park Road. This option would not require the acquisition of any buildings. Under this option, Second Avenue would not access (connect to) New Hyde Park Road.

#### **MAIN STREET CROSSING**

##### *Main Street—Option 1: Permanent Crossing Closure with Pedestrian Bridge*

This option would permanently close Main Street to vehicular traffic across the LIRR tracks and provide a pedestrian bridge over the LIRR tracks with elevators. The pedestrian bridge would span over the LIRR tracks and connect to a Kiss-and-Ride area, surface parking, and other improvements on the LIRR property at the southwest corner of Main Street. A roundabout would be constructed on the north side of the railroad tracks connecting Main Street and Front Street. The crossing vehicle traffic would divert to Mineola Boulevard and Willis Avenue, which are less than ¼-mile away on either side of the tracks.

##### *Main Street—Option 2: One-Way Underpass with Pedestrian Bridge*

This option would construct a one-way grade-separated northbound traffic underpass and provide a pedestrian bridge over the LIRR tracks with elevators. The pedestrian bridge would connect to surface parking and other improvements on the LIRR property at the southwest corner of Main Street. This option would provide a one-way northbound service road connecting northbound Main Street to Front Street south of the tracks and Front Street north of the tracks to northbound Main Street. On-street parking would be maintained in front of the east side businesses. On the north side of the tracks, two four foot wide sidewalks would be constructed. This reduced width would allow for the construction of the underpass without the acquisition of the commercial building on the northwest side of the tracks. Southbound crossing vehicle traffic would be diverted to Mineola Boulevard and Willis Avenue, which are less than ¼ mile away on either side of the tracks.

#### **WILLIS AVENUE CROSSING**

##### *Willis Avenue—Option 1: Two-Way Underpass*

A two-way grade-separated underpass with a pedestrian bridge and elevators would be constructed. It would provide a one-way service road on the west side of Willis Avenue connecting northern Willis Avenue traffic to Hinck Way eastbound and to businesses located between the LIRR Main Line and spur. This option would extend the underpass to the south to maintain traffic on Front Street westbound across Willis Avenue.

##### *Willis Avenue—Option 2: One-Way Underpass*

This option would construct a one-way southbound grade-separated underpass with pedestrian bridge and elevators. It would provide a one-way southbound service road connecting northern Willis Avenue traffic to Hinck Way eastbound and to businesses located between the LIRR Main Line and spur. This option would extend the underpass to the south to maintain traffic on Front Street eastbound across Willis

Avenue. This option would allow the commercial building at the southeast corner of Willis Avenue and Second Street to maintain access to Willis Avenue.

#### **SCHOOL STREET CROSSING**

##### *School Street—Two-Way Underpass and Tracks Raised Several Feet*

The School Street grade crossing would be replaced with a two-way grade-separated underpass with a sidewalk on the east side. Railroad Avenue would be reconstructed to maintain access to School Street. Acquisition of a narrow strip of land would be required from the commercial property on the southeast corner of the intersection of School Street and the LIRR tracks to build a service road to maintain access to the business. This option would require raising the LIRR tracks approximately three feet in order to avoid the acquisition of a residential property to the southeast of School Street. It also would require the acquisition of the commercial property at the northeast quadrant due to the elimination of access to School Street.

The following property access options will be explored for this location:

Scenario 1A: This scenario would relocate the access of the commercial property on the northwest corner of the intersection of School Street and the LIRR tracks to Union Avenue.

Scenario 1B: This scenario would maintain access of the commercial property on the northwest corner of the intersection of School Street and the LIRR tracks on School Street.

#### **URBAN AVENUE CROSSING**

##### *Urban Avenue—Two-Way Underpass with Tracks Raised Several Feet*

This option would construct a two-lane grade-separated underpass with a sidewalk on the west side. Railroad Avenue would bridge over the underpass and remain connected. It would require raising the LIRR tracks approximately three feet in order to avoid impacting residential properties at the north side of Broadway and acquiring an additional property on the south end of Urban Avenue. The driveway of the residential property northeast of the tracks would need to be relocated to provide access to Railroad Avenue. The commercial property at the southwest quadrant (117 Urban Ave) would be acquired due to the elimination of access to Urban Avenue and to provide space for staging during construction. Access to the commercial property on the west side of Urban Avenue south of the LIRR tracks (109 Urban Avenue) would be relocated to Rushmore Street.

The following access scenarios will be explored for the commercial property in the southeast quadrant (100 Urban Avenue):

Scenario 1A: Access from Urban Avenue would be eliminated. A new access would be constructed that would allow all vehicles (including large trucks) to enter the property from Sylvester Street and exit onto Kinkel Street.

Scenario 1B: Access from Urban Avenue would be maintained for passenger cars and single unit trucks only. A new access would be constructed to allow large trucks to enter the property from Sylvester Street and exit onto Kinkel Street.

### 3.5 PROPERTY ACQUISITION, RETAINING WALLS, AND SOUND ATTENUATION WALLS

Retaining walls are proposed where necessary to minimize property impacts. To reduce noise and vibration impacts to adjacent properties, pile driving will be avoided. One method of constructing the retaining walls that would reduce noise impacts along the Proposed Project Alignment would be augering holes for soldier piles and then filling the holes with concrete after the piles are placed. This method may also be used for the installation of piles during bridge construction. Another option that can be considered includes modular gravity walls. This type of wall does not need piles if the supporting soil has moderate to good load carrying capacity. Ultimately, the design-build contractor would select the means and methods of retaining wall construction working within performance criteria, including noise abatement.

Table 3-3 presents information on the proposed retaining walls for third track construction. The table lists the wall location, reasons for proposing the retaining wall, whether the wall is in cut or fill, approximate length, approximate average height, and approximate offset from nearest track. Retaining walls for the grade crossing eliminations are not included in the table

Retaining walls would be provided along the outside of the new track area and would serve several purposes: first and foremost, retaining walls enable LIRR to avoid or minimize new ROW acquisition by eliminating the additional land area needed for sloped embankments to meet the surrounding grade. Retaining walls also preserve the use of LIRR property for station parking and equipment. Walls would also retain soil and ballast, stormwater runoff, track debris, and third rail sparks within the Project Corridor ROW, thereby addressing concerns of adjacent property owners regarding erosion, drainage, migration of materials, and brush fires. Walls would also be constructed adjacent to the pedestrian tunnel at Linden Avenue in Floral Park that would be extended to accommodate construction of the third track above.

Retaining walls would be in locations where the Project Corridor is either elevated or depressed compared to the surrounding land, taking into account transverse grading from the track clear area to the edge of the ROW. Retaining structures would have a barrier that would extend vertically from the Project Corridor finished grade (in the case of an elevated Main Line section), or from the surrounding land grade (in the case of a depressed Main Line section). Drawings S02, S03, S04, S08, S09, and S10 provide typical track sections where retaining walls would be employed. Architectural treatments would be included on retaining wall exteriors (facing the community) for aesthetics.

Avoidance of residential property acquisitions and minimization of all property acquisitions are key guiding principles of the LIRR Expansion Project. The strategic placement of retaining walls is critical to optimizing the existing LIRR and minimizing property acquisition. Nonetheless, in some locations, the Proposed Project would extend beyond the existing ROW and require property acquisition. Most of these acquisitions would result from the grade crossing eliminations. Table 3-4 presents a summary of the potential property impacts, including potential full property acquisitions, potential partial acquisitions, and potential permanent easements. A number of temporary easements could also be required depending on the means and methods of construction. Some potential temporary easements have also been identified in Table 3-4.

Since operational noise impacts are predicted under the Proposed Project, sound attenuation walls are proposed at several locations along the Project Corridor and are identified in Table 3-2.

**Table 3-2 Sound Attenuation Walls**

Location	Track Side	From	To	Length	Retaining Wall Required
Floral Park / New Hyde Park	South	110+00	157+00	4,700 ft	Yes
Floral Park / New Hyde Park	North	110+00	134+00	2,400 ft	No
Garden City	South	174+00	188+50	1,450 ft	Yes
Garden City / Garden City Park	South	199+50	243+00	4,350 ft	No
Garden City	North	214+00	225+00	1,100 ft	No
Mineola	South	254+00	279+00	2,500 ft	Yes from 264+50 – 278+00
Mineola	North	255+00	277+00	2,200 ft	No
Mineola	South	299+00	333+00	3,400 ft	Yes
Carle Place	North	367+00	388+00	2,100 ft	Yes
Carle Place / Westbury	South	383+00	403+00	2,000 ft	No
Westbury	South	404+00	412+00	800 ft	Yes from 405+50 – 412+00
Westbury	South	419+00	428+00	900 ft	No
Westbury	North	419+00	440+00	2,100 ft	No
Westbury	South	429+00	440+00	1,100 ft	Yes from 429+50 – 439+50
New Cassel	North	534+00	535+00	100 ft	Yes
Hicksville	North	594+00	596+00	200 ft	No
Note: Sound attenuation wall heights to be determined.					

Table 3-3 Retaining Walls for Third Track Construction

Location	Reason For Wall	Cut/Fill	Approx. Length (ft)	Average Height (ft)*	Offset From CL of Nearest Track to Track-Side Face of Wall (ft)
South side approaching Plainfield Ave	Avoid impacts to LIRR substation	Fill	250	16	12.35
South Side – Plainfield Avenue to between South 8 <sup>th</sup> and South 9 <sup>th</sup> Street (New Hyde Park)	Avoid/minimize ROW take	Fill	4500	7	8.5 to 17.6
South Side – Between South 8 <sup>th</sup> and South 9 <sup>th</sup> Street to South 12 <sup>th</sup> Street (New Hyde Park)	Avoid/minimize ROW take	Cut	900	2	9.5
South Side – New Hyde Park Road to ~200' West of Denton Avenue (Garden City)	Avoid ROW take	Cut	2200	2	8.7 to 9.7
South Side – ~200' West of Denton Avenue to Denton Avenue (Garden City)	Avoid ROW take	Fill	200	5	9.5
South Side – 11 <sup>th</sup> Avenue to Mineola Station (Mineola)	Avoid ROW take	Cut	1400	5	10.8 to 24.38
South Side – Main Street to Willis Avenue (Mineola)	Avoid ROW take	Cut	400	6	10 to 10.9
South Side – Willis Ave to Roslyn Road (Mineola)	Avoid ROW take	Cut	600	7	8.5 to 12.35
South Side – Roslyn Road to Laurel Drive (Mineola)	Avoid ROW take	Cut	2900	5	8.5 to 24
North Side – Croyden Road to Russel Drive (Mineola)	Avoid ROW take	Cut	1500	9	9.5 to 22
North Side – ~1100' West of Glen Cove Road to Glen Cove Road (Mineola/Carle Place)	Avoid ROW take	Fill	1100	7	22
North Side – Glen Cove Road to Meadowbrook State Parkway (Carle Place)	Avoid ROW take	Fill	1000	11	22-23
North Side – Meadowbrook State Parkway to Cherry Lane (Carle Place)	Avoid ROW take	Fill	2200	10	23
South Side – Bert Avenue to Ellison Avenue (Westbury)	Avoid ROW take	Cut	1400	10	16-23
North Side – Carle Road to Ellison Avenue (Westbury)	Avoid ROW take	Cut	1800	11	9.5 to 17
South Side – Madison Avenue to ~400' West of Post Avenue (Westbury)	Avoid ROW take	Cut	750	7	11.6 to 15
South Side – ~350' West of Post Avenue to Post Avenue (Westbury)	Avoid ROW take	Fill	400	6	11 to 11.6
South Side – East end of Westbury Station to ~400' West of School Street (Westbury)	Avoid ROW take	Fill	350	4	11-11.6
North Side – Grant Street to 100' West of Urban Avenue (New Cassel)	Avoid ROW take	Cut	4500	6	9.5-18
North Side – 100' West of Urban Avenue to between Kinkel Street and Sylvester Street (New Cassel)	Avoid ROW take	Fill	600	3	9.5
North Side – Between Kinkel Street and Sylvester Street to Wantagh State Parkway (New Cassel)	Avoid ROW take	Cut	2500	5	9.5-12.35
South Side – ~550' East of School Street to ~150' East of Costar Street (New Cassel)	Avoid ROW take	Cut	2200	6	15-23
South Side – 100' East of Urban Avenue to 100' West of Sylvester Street	Avoid ROW take	Fill	250	3	11-25
South Side – 100' West of Sylvester Street to 100' West of Bond Street	Avoid ROW take	Cut	1000	4	11-25

\* Height of wall is measured from top of subgrade to existing ground for walls in cut and from existing ground to top of ballast for walls in fill. The height of wall does not include barrier or potential noise attenuation wall, which can be constructed on top of the retaining wall where required to mitigate adverse noise impacts.

Table 3-4 Summary of Anticipated Property Acquisitions and Easements

Location	Block/Lot	Property Type	Impact Type	Need for Acquisition/Easement
<b>Third Track Construction</b>				
New Hyde Park / Garden City	Block 556 / Lots 14-15	Commercial property (no impact to building)	Partial Fee (Strip Take)	Retaining wall for new third track / New Hyde Park station platform
Garden City	Block 556 / Lots 16-19	Commercial property (no impact to building)	Partial Fee (Strip Take)	Retaining wall for new third track / New Hyde Park station platform
Mineola	Block 437A / Lot 461	Commercial property (no impact to buildings)	Partial Fee (Strip Take) and Permanent Easement	Signal hut for new Nassau 3 interlocking
Mineola	Block 437A / Lot 460	Commercial property (no impact to buildings)	Permanent Easement	Driveway access to signal hut for new Nassau 3 interlocking
Mineola	Block 210 / Lots 229 and 378	Garage for residential apartment complex (garage to be demolished and reconstructed)	Temporary Easement	Retaining wall for new third track
Mineola	Block 474 / Lots 134 and 140	Village of Mineola parking Deck (no impact to building)	MOU	Station platform at Mineola Station
Garden City Park	Block A / Lot 8E	Town of North Hempstead	MOU	LIRR equipment
<b>Covert Avenue Grade Crossing Elimination</b>				
New Hyde Park	Block 110 / Lots 296-299, 312	Commercial property (auto repair shop) to be demolished	Full Fee Take	Potential need to acquire (in part or in full) to accommodate Covert Ave grade crossing elimination
New Hyde Park	Block 179 / Lots 129, 130, 217	Residential property (no impact to building)	Temporary Easement	Work area to accommodate Covert Avenue grade crossing elimination
New Hyde Park	Block 30 / Lots 12-15	Residential property (no impact to building)	Temporary Easement	Work area to accommodate Covert Avenue grade crossing elimination
New Hyde Park	Block 30 / Lots 16-17	Residential property (no impact to building)	Temporary Easement	Work area to accommodate Covert Avenue grade crossing elimination
New Hyde Park	Block 95 / Lots 39-42	Residential property (no impact to building)	Temporary Easement	Work area to accommodate Covert Avenue grade crossing elimination
New Hyde Park	Block 110 / Lot 324	Residential property (no impact to building)	Temporary Easement	Driveway tie-in to accommodate Covert Avenue grade crossing elimination
New Hyde Park	Block 110 / Lots 315-317, 325	Residential property (no impact to building)	Temporary Easement	Work area to accommodate Covert Avenue grade crossing elimination
New Hyde Park	Block 179 / Lot 216	Residential property (no impact to building)	Temporary Easement	Work area to accommodate Covert Avenue grade crossing elimination
<b>New Hyde Park Road Grade Crossing Elimination</b>				
New Hyde Park	Block 386 / Lots 6-34	Commercial property (self-storage facility) to be demolished	Full Fee Take or Permanent Easement	Drainage features and surface parking lot to accommodate New Hyde Park Road grade crossing elimination (Option 1). Retaining wall and sidewalk construction to accommodate New Hyde Park Road grade crossing elimination (Option 2).
New Hyde Park	Block 571 / Lot 12	Commercial property (no impact to building)	Permanent and Temporary Easements	Retaining wall construction to accommodate New Hyde Park Road grade crossing elimination (Options 1 and 2)
New Hyde Park	Block 387 / Lot 75	Residential property (no impact to building)	Permanent and Temporary Easements	Retaining wall construction to accommodate New Hyde Park Road grade crossing elimination (Option 2)
Garden City	Block 505 / Lots 7-9 and 112-114	Residential property (no impact to building)	Temporary Easement	Work area to accommodate New Hyde Park Road grade crossing elimination (Options 1 and 2)
New Hyde Park	Block 514 / Lots 1-2	Residential property (no impact to building)	Temporary Easement	Work area to accommodate New Hyde Park Road grade crossing elimination (Options 1 and 2)
Garden City	Block 213 / Lot 75	Residential property (no impact to building)	Temporary Easement	Sidewalk construction to accommodate New Hyde Park Road grade crossing elimination (Option 2)
Garden City	Block 505 / Lots 1-6	Village of Garden City Municipal Property	MOU	Retaining wall and sidewalk construction to accommodate New Hyde Park Road grade crossing elimination (Option 2)
Garden City	Block 213 / Lot 76	Village of Garden City Municipal Property	MOU	Retaining wall and sidewalk construction to accommodate New Hyde Park Road grade crossing elimination (Option 2)
Garden City	Block 556 / Lots 20-24	Village of Garden City Municipal Property	MOU	Station platform at New Hyde Park Station to accommodate new third track (Options 1 and 2). Kiss & Ride (Option 2)

Location	Block/Lot	Property Type	Impact Type	Need for Acquisition/Easement
<b>Main Street Grade Crossing Elimination</b>				
Mineola	Block 423 / Lots 2, 115, 314, 103	Commercial property (retail store – no impact to building)	Partial Fee (Strip Take) and Temporary Easement	Local road improvements and elevator/stairs to accommodate Main Street grade crossing elimination (Option 1)
Mineola	Block 423, Lots 4-6, 10	Commercial property (no impact to building)	Partial Fee (Strip Take) and Temporary Easement	Access road to accommodate Main Street grade crossing elimination (Option 1)
Mineola	Block 426 / Lot 5	Commercial property (no impact to building)	Partial Fee (Strip Take) and Temporary Easement	Access road to accommodate Main Street grade crossing elimination
Mineola	Block 423 / Lots 11-13, 16	Commercial property (retail store – no impact to building)	Permanent and Temporary Easements	Retaining wall construction to accommodate Main Street grade crossing elimination (Option 2)
Mineola	Block 423 / Lot 214	Commercial property (retail store – no impact to building)	Permanent Easement	Retaining wall construction to accommodate Main Street grade crossing elimination (Option 2)
Mineola	Block 423 / Lots 115, 2, 314	Commercial property (retail store – no impact to building)	Permanent Easement	Retaining wall construction to accommodate Main Street grade crossing elimination (Option 2)
Mineola	Block 423 / Lot 19	Commercial property (retail store – no impact to building)	Temporary Easement	Work area to accommodate Main Street grade crossing elimination (Option 2)
Mineola	Block 423 / Lots 113, 212, 213	State of New York (surface parking lot)	MOU	Parking facility
Mineola	Block 426 / Lot 7	State of New York (surface parking lot)	MOU	Parking facility
<b>Willis Avenue Grade Crossing Elimination</b>				
Mineola	Block 417 / Lot 518	Commercial property (parking lot)	Partial Fee (Strip Take)	Roadway shift for Willis Avenue grade crossing elimination (Options 1 and 2)
Mineola	Block 129 / Lot 232	Commercial property (impacts on strip of parking lot)	Partial Fee (Strip Take) and Permanent Easement	Elevators and stairs at new pedestrian bridge for Willis Avenue grade crossing elimination (Options 1 and 2)
Mineola	Block 426 / Lot 8	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Willis Avenue grade crossing elimination (Options 1 and 2)
Mineola	Block 420 / Lot 107	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Willis Avenue grade crossing elimination (Options 1 and 2)
Mineola	Block 417 / Lot 512	Commercial property (no impact to building)	Temporary Easement	Utility relocations to accommodate Willis Avenue grade crossing elimination (Option 1)
Mineola	Block 452 / Lot 621	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Willis Avenue grade crossing elimination (Options 1 and 2)
Mineola	Block 417 / Lot 1	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Willis Avenue grade crossing elimination (Options 1 and 2)
Mineola	Block 355 / Lot 246	Commercial property (no impact to building)	Temporary Easement	Parking lot reconstruction to accommodate Willis Avenue grade crossing elimination (Options 1 and 2)
<b>School Street Grade Crossing Elimination</b>				
New Cassel	Block 243 / Lots 36, 51, 52	Industrial property (demolition)	Full Fee Take	Drainage and access for School Street grade crossing elimination
New Cassel	Block 61 / Lots 5064-5065	Commercial property (no impact to buildings)	Partial Fee (Strip Take)	School Street grade crossing elimination
New Cassel	Block 61 / Lot 5068	Residential property (no impact to building)	Temporary Easement	Work area to accommodate School Street grade crossing elimination
Westbury	Block 229 / Lots 28-29	Commercial/industrial property (no impact to buildings)	Temporary Easement	Driveway relocation for School Street grade crossing elimination
New Cassel	Block 243 / Lots 48-50	Commercial property (no impact to buildings)	Temporary Easement	New driveway construction for School Street grade crossing elimination
Westbury	Block 229 / Lot 13	Industrial property (no impact to buildings)	Temporary Easement	Work area to accommodate School Street grade crossing elimination
Westbury	Block 229 / Lot 30	Commercial property (no impact to buildings)	Temporary Easement	Grading for School Street grade crossing elimination
<b>Urban Avenue Grade Crossing Elimination</b>				
New Cassel	Block 174 / Lots 63-66	Industrial property (demolition)	Full Fee Take	Accommodate potential drainage and Urban Avenue grade crossing elimination

Location	Block/Lot	Property Type	Impact Type	Need for Acquisition/Easement
New Cassel	Block 174 / Lots 16-17	Industrial property (no impact to building)	Partial Fee (Strip Take)	Driveway construction to accommodate access for Urban Avenue grade crossing elimination
New Cassel	Block 174 / Lots 59-62	Industrial property (no impact to buildings)	Permanent and Temporary Easements	New driveway and retaining wall construction for Urban Avenue grade crossing elimination
New Cassel	Block 178 / Lots 82-84	Industrial property (potential building relocation)	Temporary Easement	Modification of egress/ingress, driveway and retaining wall construction for Urban Avenue grade crossing elimination
New Cassel	Block 174 / Lot 58	Industrial property (no impact to building)	Temporary Easement	Driveway construction to accommodate access for Urban Avenue grade crossing elimination
New Cassel	Block 53 / Lot 9	Residential property (no impact to building)	Temporary Easement	Driveway construction to accommodate access for Urban Avenue grade crossing elimination
New Cassel	Block 178 / Lot 88	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Urban Avenue grade crossing elimination
New Cassel	Block 178 / Lot 89	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Urban Avenue grade crossing elimination
New Cassel	Block 174 / Lots 54-57	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Urban Avenue grade crossing elimination
New Cassel	Block 174 / Lots 52-53	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Urban Avenue grade crossing elimination
New Cassel	Block 174 / Lots 30-32, 49-51	Commercial property (no impact to building)	Temporary Easement	Work area to accommodate Urban Avenue grade crossing elimination

### 3.6 UTILITY RELOCATIONS

A preliminary utility inventory was conducted to determine type, location, and ownership of utilities within the Project Corridor, including at the grade crossings, perpendicular mid-block crossings, and adjacent impacted roadways. Utilities located within the Project Corridor include LIRR signals and communication, gas, electric, fiber optic, telephone, cable, water, sanitary sewer, and storm sewer (Sections 3.6.1 through 3.6.7). The utility locations were evaluated and potential conflicts and suggested mitigations were developed. Information and record plans were obtained from local utility companies and agencies. As part of the inventory, the utility companies were requested to provide any planned utility work within the next five years (Section 3.6.8).

In general, most types of utilities cross the LIRR ROW, often along local roads, aerially and/or underground. Longitudinal utilities that run east-west along the LIRR ROW consisting of PSEG-LI transmission, distribution, and secondary power lines along the north and south sides of the ROW, including dedicated traction power rectifier transformer feeds for LIRR substations. The voltage ranges from 13.2 kV and 69 kV AC for transmission lines to 120/240 volts for service lines to the station platforms along the corridor. Additional utilities include LIRR signal lines, LIRR communication lines, Verizon Business fiber optic lines, Lighttower fiber optic lines, and Altice fiber optic lines. All of these facilities can be found either on poles or buried within the railroad ROW north and/or south of the existing tracks.

At the grade crossing eliminations, field verification was performed with conventional surveying for surface utility features and tone-out to identify horizontal locations of underground utility facilities. The types, approximate locations, approximate lengths, conditions/conflicts of utility facilities and possible mitigation identified within each location are provided in the subsections that follow. The study applies to all feasible grade crossing elimination options with the exception of South 12<sup>th</sup> Street Option 1 and Main Street Option 1 which no major utility would be impacted.

The following subsections summarize the data obtained through the preliminary utility investigations, identify conflicts where known, and discuss relocation strategies for each utility type. Field investigations were limited as most of the information was obtained from record plans as supplied from each utility company, authority, or DPW. A detailed investigation is recommended during the final design phase of the proposed improvements.

#### 3.6.1 SIGNALS AND COMMUNICATION

Between Floral Park and New Hyde Park, signal and communication lines are located along the north side of the existing LIRR right-of-way. In New Hyde Park between Baer Place and Millers Lane the signal and communication lines switch to the south side of the ROW and continue to Hicksville on the south side.

To accommodate the new third track alignment the existing signal equipment should be replaced and/or relocated. In many cases, the existing signal equipment is in the path of the new alignment as indicated on Drawings No. T-PP-001 to T-PP-046. Equipment that could remain would still require updating since there is insufficient space in the existing signal huts, cases and cables and cable trays. New signal equipment would be installed and then cut-over before the new third track would be constructed.

The new signal huts and cases would be procured via a pre-wired signal enclosure specification package that would be built and delivered. The new signal system design would include hardware and software to accommodate all construction staging for the new track construction and interlockings. The locations of the proposed signal houses are not finalized.

#### 3.6.2 GAS

National Grid gas lines are located throughout the Project Corridor. Gas lines traverse the LIRR corridor, station platforms, and the adjoining roadways. Gas lines are typically placed 30 inches below roadway elevations. National Grid has 60 psi gas lines under the roadways paralleling and abutting the LIRR ROW throughout the Project Corridor. Facilities that cross the tracks are typically placed in steel sleeves.

The relocation of gas lines would be required at each of the seven grade crossing elimination locations. Some relocations may also be required at the seven bridge widening locations. Protection of existing mains would also be needed.

Table 3-5 summarizes the existing gas utilities, conflicts, and potential relocations. A detailed investigation is recommended during the final design phase of the proposed improvements.

#### 3.6.3 ELECTRIC POWER LINES

PSEG-LI has a leasing arrangement with the LIRR and maintains an existing pole line and underground conduit within the railroad's right-of-way throughout the project limits. It operates five transmission districts within the project area from which it provides transmission and distribution services within the LIRR ROW to the LIRR and along local streets to its other customers bordering the railroad. The aerial and underground power lines are operated and maintained on a day-to-day basis by PSEG-LI under a contract with the Long Island Power Authority (LIPA). LIPA owns the equipment and is responsible for annual capital and maintenance expenditures.

PSEG-LI's pole line is located primarily along the northerly side of the existing ROW with some crossovers to the south side of the right-of-way and back to the north side at intermittent locations. Additional poles are located along the local streets that parallel the railroad. PSEG-LI also maintains a line of poles along the south side of the right-of-way that carries various fiber optic cables and LIRR power and communications lines, as discussed below.

PSEG-LI's transmission lines carry 13.2 kV (distribution) and 69kV (transmission) services.

Power poles that are 50 feet or higher are considered high tension poles. There are both high tension steel and wood poles along the corridor.

A summary of the anticipated impacts to and relocation requirements for PSEG-LI's poles and overhead and underground transmission and distribution lines within the Project Corridor can be found in Table 3-6. In general, poles that are cited to be relocated having PSEG-LI facilities shall be new wood or hybrid poles. Poles not needing relocation would remain as is. Poles where new communications fiber optic cables would be hung would automatically be hybrid poles.

Table 3-5 Utilities – Gas

UTILITIES - GAS					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
NATIONAL GRID	<b>Covert Avenue – Grade Crossing Elimination</b>				
	Gas (2" PE)	NB lane north of tracks	200'		Relocate / Split 2' main to each side of underpass as needed to maintain services. For the 2 services on the north/south of 2nd Ave west of Covert Avenue it is requested to provide service from South 6th Street.
	Gas (2" PE)	WB lane on 2nd Avenue north of tracks	130'	Proposed underpass would expose the gas main	Relocate / Split 2' main to each side of underpass as needed to maintain services. For the 2 services on the north/south of 2nd Ave west of Covert Avenue it is requested to provide service from South 6th Street.
	Gas (2" PE)	SB lane south of tracks and Wayne Avenue	290'	Proposed underpass would expose the gas main	Relocate / Split 2' main to each side of underpass as needed to maintain services.
	Gas (service connections)	Crosses the roadway south of tracks	(2)	Proposed underpass would expose the service connections	Relocate / Split 2' main to each side of underpass as needed to maintain services.
	<b>South 8th Street</b>				
	Gas (2" ST)	South of tracks and turns east along 3 <sup>rd</sup> Avenue	150'	No conflict.	N/A
	<b>South 12th Street – Grade Crossing Elimination</b>				
	Gas (2" ST)	NB lane north of tracks	170'	Possible impact by construction of the east retaining wall	Option 1: No Impacts Option 2: Relocate gas main to sidewalks and re-establish service connections.
	Gas (2" PL)	Crosses the roadway at 2nd Avenue north of tracks	50'	Proposed underpass would expose the gas main	Option 1: No Impacts Option 2: Reconnect services on 2nd Avenue to 2" main on South 11th Street.
	Gas (service connections)	Crosses the roadway north of tracks	(2)	Proposed underpass would expose the service connections	Option 1: No Impacts Option 2: Provide new 2" main west of underpass to connect services.
	<b>Millers Lane</b>				
	Gas (2" ST)	Crosses tracks at Miller's Lane in 4" Steel sleeve and ties into 3 <sup>rd</sup> Avenue.	100'	Platform and new rail construction activities.	Protect main.
	<b>New Hyde Park Road – Grade Crossing Elimination</b>				
	Gas (6" ST)	SB lane south of tracks	240'	Proposed underpass would expose the gas main	Relocate to follow the proposed depressed roadway profile.
	Gas (8" PL)	SB roadway crosses and north of tracks and Plaza Avenue	500'	Proposed underpass would expose the gas main	Relocate to follow the proposed depressed roadway profile.
	Gas (8" PL)	SB lane north and south of tracks			Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW. Adjust for proposed roadway grade change north of Plaza Avenue.
	Gas <sup>(3)</sup>	Plaza Avenue east and west			Replace for proposed roadway grade change on Plaza Avenue.
	Gas (2" ST)	NB lane of Clinch Avenue	220'	Proposed underpass would expose the gas main	Re-establish for new grade and alignment from bypass.
	Gas (4" ST)	SB lane of Greenridge Avenue	130'	Proposed underpass would expose the gas main	Re-establish for new grade and alignment from bypass.
<b>Tanner's Pond Road</b>					
Gas (12" ST)	Near west abutment. Crosses north - south at tracks	(2)	Proposed abutment construction.	Relocate outside construction zone.	
<b>Main Street – Grade Crossing Elimination</b>					
Gas (4" ST)	Center of the roadway south of tracks	260'	Proposed underpass would expose the gas main	Option 1: No Impact Option 2: Relocate to proposed access road east of underpass.	

## UTILITIES - GAS

Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
NATIONAL GRID	Gas (PL) <sup>(3)</sup>	SB lane south of tracks	120'	Proposed underpass would expose the gas main	Option 1: No Impact Option 2: Relocate to proposed access road east of underpass.	
	Gas <sup>(3)</sup>	Along east and west sidewalks north of tracks	470'		Option 1: No Impact Option 2: Relocate to proposed access road east of underpass.	
	Gas <sup>(3)</sup>	Along west sidewalk south of tracks	200'		Option 1: No Impact Option 2: Relocate to proposed access road east of underpass.	
	Gas (service connections)	Crosses the roadway north of tracks	(2)	Proposed underpass would expose the service connections	Option 1: No Impact Option 2: Relocate to proposed access road east of underpass.	
	<b>Willis Avenue – Grade Crossing Elimination</b>					
	Gas (8" ST)	Center of the roadway crosses and at south and north of tracks	350'	Proposed underpass would expose the gas main	Relocate to proposed east sidewalk.	
	Gas (6" PE)	Center of the roadway north of tracks	420'	Proposed underpass would expose the gas main	Relocate to proposed east sidewalk.	
	Gas (4" ST)	EB lane of Front Street east	70'	Conflict with proposed east retaining wall	Reconnect to relocated 8" main on east sidewalk.	
	Gas (4" PE)	EB lane of Front Street east	70'	Conflict with proposed east retaining wall	Reconnect to relocated 8" main on east sidewalk.	
	Gas (8" ST)	Center of the roadway south of tracks	80'	Proposed underpass would expose the gas main	Relocate to proposed west sidewalk.	
	<b>School Street – Grade Crossing Elimination</b>					
	Gas (4" PE)	NB lane north of tracks	200'	Proposed underpass would expose the gas main	Relocate to east sidewalk. Service to 172 School Street would be provided from Union Avenue.	
	Gas (2" PE)	Along Railroad Avenue west	180'	Proposed underpass would expose the gas main	Lower to meet cover requirements for proposed roadway grade.	
	Gas <sup>(3)</sup>	NB lane south of tracks	240'	Proposed underpass would expose the gas main	Relocate to east sidewalk.	
	<b>Urban Avenue – Grade Crossing Elimination</b>					
	Gas <sup>(3)</sup>	NB lane crosses and north and south of tracks	430'	Proposed underpass would expose the service connections.	Provide new services from Broadway down both east and west side proposed sidewalks for north of the tracks. Provide new services from proposed at grade turn-out lane to east side south of tracks.	
	<b>10<sup>th</sup> Avenue</b>					
	Gas (2" ST)	Near western curblin. Does not cross.	(2)	Proposed retaining wall construction.	Protect facility.	
	<b>5<sup>th</sup> Avenue</b>					
	Gas (Plastic Service)	Ends at southern ROW line.	(2)	Proposed retaining wall construction.	Protect facility.	
<b>4<sup>th</sup> Avenue</b>						
Gas (4" ST)	Crosses under railroad and in a steel casing	100'	No impact.	Protect facility.		

## Notes:

(1) Most of the existing utilities are within the roadway limits. Length measured within the footprint of the roadway construction

(2) Length unknown

(3) Type and/or size unknown

## Abbreviations:

ST – Steel, PE – Polyethylene, PL – Plastic, N/A – Not Applicable, TBD – To Be Determined

**Table 3-6 Utilities – Electric**

UTILITIES – ELECTRIC					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
PSE&G (LIPA)	<b>Transmission Lines</b>				
	Electric (Overhead)	Sta. 107+50 to Sta. 109+80 south side of the tracks along LIRR ROW	230'	2-33KV Lines	No relocation.
	Electric (Overhead)	Sta. 137+50 to Sta. 109+80 south side of the tracks along LIRR south ROW	680'	1-69KV Line.	No relocation.
	Electric (Overhead)	Sta. 170+50 to Sta. 196+60 on poles North side, @ 5' and varies within north ROW line.	2610'	1-69KV Line	New hybrid poles on north side.
	Electric (Overhead)	Sta. 196+60 to Sta. 199+00 on poles North side, varies from 5' to 12' from north ROW line.	240'	1-69KV Line	New hybrid poles on north side.
	Electric (Overhead)	Sta. 199+00 to Sta. 233+45 on poles North side, 12' from north ROW line.	3445'	1-69KV Line	New hybrid poles on north side.
	Electric (Overhead)	Sta. 235+45 to Sta. 237+30 on poles North side, 12' from north ROW line to a pole along ROW line.	385'	1-69KV Line	No relocation.
	Electric (Overhead)	Sta. 237+30 to Sta. 240+60 on poles North side, along northern ROW line and then turns out to the street.	330'	1-69KV Line	No relocation.
	Electric (Overhead)	From Sta. 240+60 1-66KV, 1-13.2KV, and 1-Neutral wire crosses LIRR Tracks to a pole 15' south of Southern ROW line at Sta. 241+65	105'	1-69KV Line	No relocation.
	Electric (Overhead)	From Sta. 241+65 to Sta. 253+10 runs out side parallel to southern ROW line	1245'	1-69KV Line	No relocation.
	Electric (Overhead)	From a pole outside of the southern ROW line at Sta. 253+00 overhead 1-69KV, 1-13.2KV, and 1-neutral wire crosses over tracks to a pole inside of northern ROW line at Sta. 253+10 and then runs along northern ROW line to Sta. 290+00	3700'	1-69KV Line	No relocation.
	Electric (Overhead)	From Sta. 290+00 1-69KV line continue easterly on the north side of the tracks to a pole at Sta. 295+75.	575'	1-69KV Line	No relocation.
	Electric (Overhead)	From Sta. 297+25 to Sta. 325+02, on north side	2775'	1-69KV Line	New hybrid poles on north side.
	Electric (Overhead)	At Sta. 338+00 two 69kV lines cross tracks from north to south.	120'	2-69KV Lines	New hybrid poles on south side.
	Electric (Overhead)	Sta. 338+00 1-69KV line enters overhead from the outside of northerly ROW line to a pole at Sta. 338+65 within LIRR and continues along poles (poles approximately 20 to 25 feet from northerly ROW line).	75'	1-69KV Line	New hybrid poles on south side.
	Electric (Overhead)	From Sta. 338+65 to Sta. 400+60	6195'	1-69KV Line	New hybrid poles on south side.
Electric (Overhead)	From Sta. 400+60 (ROW narrows) to Sta. 419+00 pole line distance from ROW line is approximately 10 to 15 feet from northerly ROW line.	1840'	1-69KV Line	No relocation.	
Electric (Overhead)	From Sta. 419+00 (ROW widens) to Sta.435+50 on poles approximately 55 feet from the northerly ROW line.	1650'	1-69KV Line	No relocation.	
Electric (Overhead)	From 435+50 to 504+60 approximately 10 feet from the northerly ROW line.	6910'	1-69KV Line	Relocate poles further north.	

## UTILITIES – ELECTRIC

Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
PSE&G (LIPA)	Electric (Overhead)	From Sta. 505+65 to Sta. 533+00 approximately 10 feet from the northerly ROW line.	2935'	1-69KV Line	Relocate poles further north.	
	Electric (Overhead)	From Sta. 533+00 to Sta. 536+00 line moves from 10 feet from northerly ROW to close to ROW line and runs along ROW line.	300'	1-69KV Line	Relocate poles further north.	
	Electric (Overhead)	From Sta. 536+00 to Sta. 551+00 along northerly ROW line.	1500'	1-69KV Line	Relocate poles further north.	
	<b>Covert Avenue – Grade Crossing Elimination</b>					
	Electric (Overhead)	East and west sidewalks crossing and north and south of tracks	1870'	No impact.	N/A	
	Electric (Overhead)	Overhead Transmission on east/south of Covert Avenue			To remain in place with the understanding that the poles may need to be held, made temporarily taller or require offset as a result of final design and construction methods.	
	Electric (Overhead)	Primary and Secondary cables on west/south of Covert Ave			Relocate all primary cables from Covert Avenue between Wayne Avenue and north of 2nd Avenue, poles for secondary cables and service will be permitted south from 1st Avenue and north from Wayne Avenue.	
	<b>South 12th Street – Grade Crossing Elimination</b>					
	Electric (Overhead)	East and west sidewalks crossing and north and south of tracks	680'	No impact.	N/A	
	Electric (Overhead)	Northeast corner at 3rd Avenue intersection	60'	Electrical pole is within the new staircase footprint	Relocate pole	
	Electric (Overhead)	SB lane south of tracks			Option 1: Under Option 1 raise all overhead lines or relocate underground to eliminate conflicts with pedestrian overpass. Option 2: Along the west side of South 12th Street it may be necessary to laterally shift poles onto town property at parking lot. Temporary relocation of east/west facilities may be needed for construction of walls.	
	Electric (Overhead)	NB lane north of tracks			Option 1: No impact Option 2: The pole in the NE corner of 12th Street and 2nd Avenue would need to be relocated away from the intersection to maintain the east/west connectivity. The second pole on the east/south of 12th Street would need to be relocated north beyond underpass limits, as the 4' sidewalk areas would not support poles. Services from this relocated pole may need to be underground.	
	<b>New Hyde Park Road – Grade Crossing Elimination</b>					
	Electric (Overhead)	West sidewalk south of tracks	250'	Proposed underpass would impact utility poles	Relocate to follow the proposed depressed roadway profile	
	Electric (Overhead)	Along Greenridge Ave and crossing New Hyde Park Rd	250'	No impact.	N/A	
	Electric (Overhead)	West sidewalk crossing and north of tracks and crossing New Hyde Park Road	550'	No impact.	N/A	
	Electric (Overhead)	Plaza Avenue north sidewalk	40'	Proposed underpass would impact utility poles	Relocate to follow the proposed depressed roadway profile	
	Overhead Cables	Primary and secondary cables SB sidewalk area			Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.	
	Overhead Cables	South of railroad, transfer cables into neighborhood to east			Requires pole replacement for change in grades, minor alignment changes.	
	Overhead Cables	On and at Plaza Avenue			Change in vertical grades requires pole replacement.	

UTILITIES – ELECTRIC					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
PSE&G (LIPA)	<b>Main Street – Grade Crossing Elimination</b>				
	Electric	West sidewalk and crossing roadway south of tracks	210'	Proposed underpass would expose the electrical duct	Option 1: No impact Option 2: Relocate to proposed west sidewalk to 3rd Street and back to access road east of underpass and reconnect at Front Street.
	Electric	East sidewalk south of tracks	60'		Option 1: No impact Option 2: Relocate to proposed east sidewalk.
	Electric	Along 3 <sup>rd</sup> Street	60'		Option 1: No impact Option 2: Adjust for proposed roadway grade.
	Electric (Overhead)	Along east and west sidewalks south of tracks	310'	Proposed underpass would impact utility poles	Option 1: No impact Option 2: Relocate all trunk lines to west side and re-establish all service lines on the east side. Re-establish services lines through alternate roadway routes (Front Street) when necessary.
	Electric (Overhead)	Crossing roadway south of tracks	90'	No impact.	N/A
	Electric (Overhead)	East sidewalk north of tracks	330'	Proposed underpass would impact utility poles	Option 1: No impact Option 2: Relocate all trunk lines underground. Service connections cannot be maintained underground or overhead to service building. Will require modification of service connections at the homes. This would require R.O.W. damage payments.
	Electric	East sidewalk north of tracks	70'	No impact.	N/A
	Electric (Overhead)	Crossing sidewalks and roadway north of tracks (3)	130'	Proposed underpass would impact utility poles	Relocate to follow the proposed depressed roadway profile
	Electric	SB lane north of tracks	160'	Proposed underpass would expose the electrical duct	Option 1: No impact. Option 2: Relocate to proposed west sidewalk. Then reconnect to east sidewalk via 2nd Street and access road east of underpass.
	<b>Willis Avenue – Grade Crossing Elimination</b>				
	Electric (Overhead)	West sidewalk south of tracks and crossing roadway north and south of tracks	450'		Relocate all trunk lines north and south of tracks to adjacent to proposed west side sidewalk.
	Electric (Overhead)	East sidewalk crosses and at north and south of tracks	900'	Proposed underpass would impact utility poles	Relocate all service lines north and south of tracks adjacent to proposed east side sidewalk to maintain existing services to buildings.
	Electric (Overhead)	Along 2 <sup>nd</sup> Avenue			Relocate and re-align poles along 2nd Avenue for vertical changes.
	<b>School Street – Grade Crossing Elimination</b>				
	Electric (Overhead)	North and south sidewalks and crossings	670'	No impact.	N/A
	Electric (Overhead)	West sidewalk north and south and crossing tracks			Relocate all trunk lines underground and re-establish all services via relocated service lines south of the tracks and through alternate roadway routes (Union Avenue or Center Street to Grant Street) north of the tracks.
	Electric (Overhead)	East sidewalk south of tracks			Relocate all trunk lines underground and re-establish all services via relocated service lines south of the tracks and through alternate roadway routes (Union Avenue or Center Street to Grant Street) north of the tracks.
	<b>Urban Avenue – Grade Crossing Elimination</b>				

## UTILITIES – ELECTRIC

Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
PSE&G (LIPA)	Electric (Overhead)	West sidewalk crosses and south of tracks	740'	Proposed underpass would impact utility poles	Relocate all trunk lines initially temporarily back to the west side within acquired ROW and then relocate adjacent to retaining walls upon completion of construction. Re-establish all services lines on the east side.	
	Electric (Overhead)	West sidewalk north of tracks			Relocate all trunk lines to west within the park boundary and re-establish all services lines on the east side.	
	<b>Linden Avenue, Sta. 126+50</b>					
	Electric (Underground)	Crossing north & south of tracks	200'	New track and retaining wall construction.	Protect	
	<b>Baer Place, Sta. 166+60</b>					
	Electric (Overhead)	Crossing north & south of tracks	200'	Unknown at this time	Protect	
	<b>Denton Avenue/Tanners Pond Road</b>					
	Electric (3 Underground ducts)	Crossing north and south of tracks	300'	Abutment Construction	Relocated outside construction zone.	
	Electric (Overhead)	Along Tanners Pond Road	400'	Unknown at this time	Protect	
	<b>5th Avenue, Sta. 214+30</b>					
	Electric (Underground)	Crossing north & south of tracks	150'	Track construction	Protect	
	<b>Nassau Boulevard, Sta. 228+40</b>					
	Electric (Underground)	Crossing north & south of tracks	150'	Abutment construction.	Relocate outside construction zone.	
	<b>Herricks Road, Sta. 254+50</b>					
	Electric (Underground)	Crossing north & south of tracks along east side curb	200'	No Conflict	No relocation	
	<b>3rd Avenue, Sta. 285+30</b>					
	Electric (2 Underground ducts)	Crossing north and south of tracks	150'	Track and platform construction	Protect	
	<b>Sta. 291+75</b>					
	Electric (Overhead)	13 KV and 1 neutral distribution south of and outside ROW		Substation Demolition		
	Electric (1 Underground duct)	Serving distribution lines south and outside the ROW		Substation Demolition	Relocate	
	<b>Roslyn Road, Sta. 306+35</b>					
	Electric (2 Underground ducts)	Crossing north and south of tracks	150'	Retaining Wall Construction	Protect	
	Electric (Overhead Neutral)	Crossing north and south of tracks	150'	Retaining Wall Construction	Protect	
	<b>Russell Drive, Sta. 338+20</b>					
	Electric (Overhead Neutral)	Crossing north and south of tracks	100'	Track Construction	Protect	
	Electric (Overhead)	Crossing north and south of tracks	100'	Track Construction	Protect	
	Electric (3 Underground ducts)	Crossing north and south of tracks	100'	Track Construction	Protect	
	Electric (Overhead)	Crossing north and south of tracks	100'	Track Construction	Protect	
	Electric (2 Underground ducts)	Running parallel 25' north of north tracks	200'	Track Construction	Protect	
	<b>Glen Cove Road</b>					
Electric (Overhead)	Crossing north and south of tracks	200'	Retaining Wall Construction	Relocate the line		
Electric (1 Underground duct)	Crossing north and south of tracks	200'	Abutment construction	Relocate the line		
Electric (Overhead)	Crossing north and south of tracks	200'	Retaining Wall Construction	Relocate the line		
Electric (3 Underground ducts)	Running parallel 20' north of north tracks	300'	Retaining Wall Construction	Relocate the line		
<b>Sta. 360+40</b>						

UTILITIES – ELECTRIC					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
PSE&G (LIPA)	Electric (2 UG ducts sep. by 30')	Crossing north and south of tracks	150'	Unknown at this time	TBD
	<b>Sta. 369+40</b>				
	Electric (6 Underground ducts)	Crossing north and south of tracks	200'	Track Construction	Protect
	<b>Cherry Lane</b>				
	Electric (Overhead)	Crossing north and south of tracks	100'	Abutment construction	Relocate/raise the line
	<b>Carle Road</b>				
	Electric (Overhead Neutral)	Crossing north and south of tracks	100'	Abutment construction	Relocate/raise the line
	<b>Ellison Avenue</b>				
	Electric (Overhead)	Crossing north and south of tracks	100'	No Construction, No conflicts	No relocation
	Electric (1 Underground duct)	Crossing north and south of tracks	100'	No Construction, No conflicts	No relocation
	Electric (2 Underground ducts)	Running parallel 10' north of north tracks	100'	No Construction, No conflicts	No relocation
	Electric (Overhead)	Running parallel 25' north of north tracks	100'	No Construction, No conflicts	No relocation
	<b>Post Avenue<sup>(2)</sup></b>				
	Electric (Overhead)	Crossing north & south of Tracks	200'	Not in Contract/Unknown at this time	Not in Contract/Unknown at this time
	Electric (2 Underground ducts separated by 30')	Crossing north and south of tracks	100'	Not in Contract/Unknown at this time	Not in Contract/Unknown at this time
	Electric (Underground ducts)	Running parallel 10' north of tracks	100'	Not in Contract/Unknown at this time	Not in Contract/Unknown at this time
	Electric (Underground ducts)	Running parallel 25' north of tracks	100'	Not in Contract/Unknown at this time	Not in Contract/Unknown at this time
	<b>Grand Blvd</b>				
	Electric (Overhead)	Crossing north and south of tracks	100'	No Conflict	No relocation
	<b>Sherman Street</b>				
	Electric (Overhead)	Crossing into the ROW on the north		Retaining Wall Construction	Relocate/raise the line
	<b>Magnolia Avenue</b>				
	Electric (Overhead)	Crossing north & south of Tracks	150'	Retaining Wall Construction	Relocate/raise the line
<b>Swalm Avenue</b>					
Electric (Overhead)	Crossing north and south of tracks	200'	Track construction	Protect	
Electric (Underground 3 ducts)	Crossing north and south of tracks	100'	Track construction	Protect	
Electric (Overhead)	Crossing north and south of tracks	200'	Track construction	Protect	
<b>Kinkel Street</b>					
Electric (Overhead)	Running north of north tracks on street	200'	Retaining Wall Construction	Relocate/raise the line	
Note: (1) Most of the existing utilities are within the roadway limits. Length measured within the footprint of the roadway construction. Note: (2) Post Avenue to be replaced by separate contract. Utility information may change. Abbreviation: N/A – Not Applicable					

### 3.6.4 FIBER OPTIC AND TELEPHONE

Several companies maintain underground and aerial fiber optic and telephone lines through the Project Corridor: Verizon, Verizon Business Solutions, AT&T, Lighttower, and Crown Castle.

#### VERIZON

Verizon maintains overhead telephone lines on its own utility poles and on PSEG-LI utility poles along the streets immediately adjacent to the LIRR ROW throughout the project limits. In addition, there are service connections into the LIRR ROW from 3rd Avenue at South 10th Street and from 2nd Avenue east of Herkomer Street. A summary of Verizon conflicts and relocations can be found in Table 3-7. Aerial relocations will need to be coordinated with PSEG-LI and the other communications companies prior to the start of construction of the LIRR Expansion Project.

#### VERIZON BUSINESS SOLUTIONS (VBS)

VBS (formerly MCI) underground fiber optic lines and aerial lines are located within the LIRR ROW. The VBS utilities run along the south of the ROW from Plainfield Avenue aerially to the eastern end of Greenridge Road, underground from there to 4<sup>th</sup> Avenue, then aerially along the north side of the tracks from 4<sup>th</sup> Avenue to Kilburn Avenue. From Kilburn Avenue to the vicinity of Whitehall Boulevard, the cable runs underground along the north ROW. From this point to a point east of Roslyn Road, the cable switches to the south aerially. Then at Glen Cove Road, the cable runs in a LIRR trough to a point just west of Rushmore Avenue. It stays on the south aerially for the remainder of the project.

Verizon Business is typically bundled with Altice fiber optic cable. A summary of conflicts and relocations can be found in Table 3-7. Aerial relocations will need to be coordinated with PSEG-LI and LIRR.

#### AT&T

AT&T maintains aerial and underground fiber optic facilities at seven locations along and across the LIRR ROW carrying their Local Network Service (LNS). The locations include:

- Crossing the LIRR ROW along South Tyson Avenue; AT&T's LNS facilities are carried in both AT&T LNS conduit and in Verizon conduit.
- Crossing the LIRR ROW along Herricks Road; AT&T's LNS facilities are carried in both AT&T LNS conduit and in Verizon conduit.
- Crossing the LIRR ROW along Cherry Lane; AT&T's LNS facilities are carried in Verizon conduit.
- Along the south side of the LIRR ROW on Railroad Avenue between Post Avenue and School Street; AT&T's LNS facilities are carried as aerial cable on utility poles.
- Crossing the LIRR ROW along Charlotte Avenue; AT&T's LNS facilities are carried on Lighttower cable.

Conflicts with AT&T facilities were not identified at South Tyson Avenue, Herricks Road, or Charlotte Avenue. Protecting the conduit from construction is proposed at Cherry Lane. Other conflicts and relocations will be determined during the final design phase of the proposed improvements. A summary of conflicts and relocations can be found in Table 3-7. Relocations may need to be coordinated with other entities where applicable and completed prior to the start of construction of the LIRR Expansion Project.

#### LIGHTTOWER

Lighttower maintains overhead fiber optic lines at four crossings of the LIRR ROW: Covert Avenue, School Street, New Hyde Park Road, and Grand Boulevard.

At Grand Boulevard, no conflicts have been identified. At School Street, the overhead lines would be relocated underground. At Covert Avenue, a bypass routing is proposed. Other relocations are not yet

known and will be determined during the final design phase of the proposed improvements. Relocations will need to be coordinated with PSEG-LI, and where applicable, completed prior to the start of construction of the LIRR Expansion Project. Refer to Table 3-7 for these locations and potential conflicts and relocations.

#### CROWN CASTLE

Crown Castle leases fiber optic facilities from Lighttower at Covert Avenue, New Hyde Park Road, and School Street.

Crown Castle conflicts and relocations will follow the Lighttower relocations. Refer to Table 3-7 under Lighttower for these locations and potential conflicts and relocations.

### 3.6.5 CABLE TELEVISION

Altice (formerly Cablevision-NC) provides cable television to the various municipalities traversed by the project area for the LIRR Expansion Project. Cable lines usually closely follow the alignments of overhead and underground facilities of the local power (PSEG-LI) and telephone (Verizon) companies. In addition, Altice's facilities are tied to the VBS's fiber optic facilities located on LIRR poles within the LIRR ROW. Accordingly, actual relocation requirements for Altice's cable facilities will be determined on a case-by-case basis in conjunction with electric, telephone and fiber optic relocations. Construction of the cable facility relocations within the LIRR ROW will be coordinated with the relocations of LIRR's poles and VBS's fiber optic relocations. To date there has been no information about Altice's local network, but where discovered, construction of the off-ROW relocations would have to be coordinated with PSEG-LI's pole relocations required for the grade crossing eliminations and bridge widenings, where applicable, and completed prior to the start of construction of the LIRR Expansion Project.

A summary of conflicts and relocations can be found in Table 3-7.

### 3.6.6 WATER AND SANITARY SEWER

Several municipalities and regional agencies own water and sanitary sewer mains paralleling or crossing the LIRR ROW. Refer to Table 3-8 for these locations and potential conflicts and relocations.

#### NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS (NCDPW)

The NCDPW has sanitary sewer lines that cross and parallel the LIRR ROW.

#### VILLAGE OF GARDEN CITY

The Village of Garden City has water mains and sanitary sewer lines serving the Village of Garden City within and adjacent to the Project Corridor that cross and parallel the LIRR ROW.

#### VILLAGE OF MINEOLA

The Village of Mineola has water mains and sanitary sewer lines serving the Village of Mineola within and adjacent to the Project Corridor that cross and parallel the LIRR ROW.

#### THE WATER AUTHORITY OF WESTERN NASSAU COUNTY (WAWNC)

The WAWNC has several water mains serving the Villages of New Hyde Park and Garden City that cross and parallel the LIRR ROW.

#### WESTBURY WATER DISTRICT

The Westbury Water District has several water mains serving the Village of Westbury that cross and parallel the LIRR ROW.

**Table 3-7 Utilities – Fiber Optic, Telephone, and Cable Television**

UTILITIES – FIBER OPTIC, TELEPHONE, AND CABLE TELEVISION					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
VERIZON	<b>Covert Avenue – Grade Crossing Elimination</b>				
	Fiber Optic (OH & UG)	SB lane crossing and north and south of tracks and Wayne Avenue	770'		Relocate facilities to follow a path from Covert Avenue to Wayne Avenue, South 5th Street and 1st Avenue back to Covert Avenue.
	Fiber Optic (OH)	Crosses the roadway at 3rd Avenue south of tracks	100'	Proposed underpass would expose the fiber optic duct	Relocate to poles on east side.
	<b>South 12th Street – Grade Crossing Elimination</b>				
	Fiber Optic (UG)	SB lane south of tracks	240'		Option 1: Raise all overhead lines or relocate underground to eliminate conflicts with pedestrian overpass. Option 2: Along the west side of South 12th Street it may be necessary to laterally shift poles onto town property at parking lot. Temporary relocation of east/west facilities may be needed for construction of walls.
	Fiber Optic (UG)	NB lane north of tracks	250'		Option 1: No Impacts Option 2: The pole in the NE corner of South 12th Street and 2nd Avenue will need to be relocated away from the intersection to maintain the east/west connectivity. The second pole on the east/south of South 12th Street will need to be relocated north beyond under pass limits, as the 4' sidewalk areas will not support poles. Services from this relocated pole may need to be underground.
	<b>New Hyde Park Road – Grade Crossing Elimination</b>				
	Fiber Optic (UG)	SB lane crosses and at north and south of tracks	250'	Proposed underpass would expose the fiber optic duct	Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.
	Fiber Optic (UG)	West sidewalk south of tracks	260'	Proposed underpass would impact utility poles	Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.
	Fiber Optic (UG)	Along Greenridge Avenue	150'	No impact.	N/A
	Overhead Cables	SB sidewalk area north / south of tracks, drops to underground to on approach to railroad.			Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.
	Overhead Cables	South of railroad, transfer cables into neighborhood to east			Requires pole replacement for change in grades, minor alignment changes - Clinch Avenue / Greenridge Avenue.
	Overhead Cables	On and at Plaza Avenue			Change in vertical grades requires pole replacement.
	<b>Main Street – Grade Crossing Elimination</b>				
	Fiber Optic (UG)	In roadway crosses and at north and south of tracks	1120'	Proposed underpass would expose the fiber optic duct	Option 1: No impact. Option 2: Relocate to west sidewalk.
	<b>Willis Avenue – Grade Crossing Elimination</b>				
	Fiber Optic (UG)	East sidewalk south of tracks and along 3rd Street	150'	No impact.	N/A
<b>School Street – Grade Crossing Elimination</b>					
Fiber Optic (OH & UG)	Approaches aerially on west sidewalk pole line from the south and drops underground to go under tracks and comes back up to aerial poles at pole immediately south of Union Avenue along School Street.	630'	Proposed underpass would expose the fiber optic duct	Relocate all trunk lines underground and re-establish all services via relocated service lines south of the tracks and through alternate roadway routes (Union Avenue or Center Street to Grant Street) north of the tracks.	
<b>Urban Avenue – Grade Crossing Elimination</b>					

## UTILITIES – FIBER OPTIC, TELEPHONE, AND CABLE TELEVISION

Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
VERIZON	Fiber Optic (UG)	NB lane crossing and north and south of tracks	600'	Possible impact by construction of the east retaining wall	Reroute lines along Urban Avenue between Broadway and Main Street to Sylvester Street.	
	<b>Glen Cove Road</b>					
	Telephone (Underground)	Duct bank (19 conduits) crossing north south at Sta. 355+00		Abutment construction	Protect and Maintain.	
	Telephone (Underground)	Duct bank (12 conduits) is west sidewalk		Abutment construction	Protect and Maintain.	
	<b>Cherry Lane</b>					
	Telephone (Overhead)	OH line crossing north to south		Vertical clearance	Relocate/raise poles.	
	<b>Ellison Avenue</b>					
	Telephone (Overhead)	OH line running parallel on the west side of Ellison Avenue crossing north and south tracks		No Conflict	No Relocation.	
	Telephone (Overhead)	OH line running 50' away outside ROW parallel to the railroad north side of north tracks stopping at Ellison Avenue Sta. 401+00 to Sta. 418+50	1700'	Proposed Retaining wall	Protect and Maintain.	
	<b>Post Avenue</b>					
	Telephone (Overhead)	OH line running 20' away parallel to the railroad north side of north tracks stopping at Post Avenue		Not in Contract		
	<b>School Street</b>					
	Telephone (Overhead)	OH line running 20' away parallel to the railroad north side of north tracks stopping at School Street Sta. 457+00 to Sta. 459+25		Unknown at this time	TBD	
	Telephone (Overhead)	OH line running parallel on the west side of School Street for the full length of the street crossing north and south tracks		Unknown at this time	TBD	
Telephone (Overhead)	OH line running 50' away parallel to the railroad south side of south tracks then crossing north and south tracks. Sta. 459+00 to Sta. 462+00		Unknown at this time	TBD		
<b>Grand Boulevard</b>						
Telephone (Overhead)	OH line running parallel on the west side of Grand Boulevard along the Boulevard crossing north and south tracks.		No Conflict	No Relocation.		
VERIZON BUSINESS <sup>(2)</sup>	Fiber Optic Aerial	Aerial FO cables on poles along Plainfield Ave, south of RR. Then, at bridge FO cable entering ROW on south on pole line in ROW.	ML TRK Sta. 109+50 to 175+30	(2 Strands bundled together with Altice, 288 & 192 cables)	Relocated to North side of ROW on new LIRR poles.	
	Fiber Optic Aerial	Aerial FO cable on south pole line coming from N. Hyde Park Substation	156+00 To 175+30	(spliced in a 12 Strand FO. 2 strands bundled together with Altice, 288 & 192 cables)	Relocated to North side of ROW on new LIRR poles.	
	Fiber Optic Aerial	Aerial FO cable on south pole line	175+30 To 188+90	(2 Strands bundled together with Altice, 288 & 192 cables)	Relocated to North side of ROW on new LIRR poles.	
	Fiber Optic UG	Underground FO cables crosses RR Tracks then goes aerial on a pole line on the north side of tracks	188+90 To 212+60	(2 Strands bundled together with Altice, 12 & 192 cables)	Relocated to North side of ROW on new LIRR poles until Sta. 199+00 the relocated to south side on new LIRR poles.	
	Fiber Optic Aerial	Underground FO cables in innerducts crossing RR Tracks then goes aerial on a pole line on the north side of tracks	212+60 To 212+75	(2 Strands bundled together with Altice, 12 & 192 cables, (1) 1" and (2) 1 1/4" innerducts)	Relocated to south side of ROW on new LIRR poles.	
	Fiber Optic Aerial	Aerial FO cable on north pole line	212+75 To 230+40	(2 strands FO bundled together with Altice, 288 & 192 cables)	Relocated to south side of ROW on new LIRR poles.	

UTILITIES – FIBER OPTIC, TELEPHONE, AND CABLE TELEVISION					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
<b>VERIZON BUSINESS</b> <sup>(2)</sup>	Fiber Optic Aerial	Aerial FO cable on riser pole to manhole	230+40 To 230+58	(2 strands FO bundled together with Altice, 288 & 192 cables)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic UG	FO cables travels in UG conduit system north side of track to MH	230+58 To 241+75	(2 Strands bundled together with Altice, 288 & 192 cables, (1) 1" and (2) 1 1/4" innerducts)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic	FO cables travels in UG conduit north side of track to Riser Pole	241+75 To 242+25	(2 Stands bundled together with Altice, 288 & 192 cables)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on north pole line	242+25 To 291+50	(2 Stands bundled together with Altice, 288 & 192 cables, 1 – 288 strand crosses on cable bridge to NC Data Center)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on north pole line up the Oyster Bay Branch to a riser pole on north	291+50 To 297+00 (OBB)	(1 - 192 Stand bundled together with Altice)	Relocated to south side of ROW on new LIRR poles to Sta. 296+00. Then relocated to north side of ROW.
	Fiber Optic UG	From riser pole under 2 tracks to hut south of Oyster Bay Branch tracks	297+00 (OBB) To 297+20	(4 strands – 36, 87, 192 & 288 bundled together with Altice in innerduct conduit system)	No relocation.
	Fiber Optic UG	From hut in innerduct conduit system to riser pole	297+20 To 296+50	(3 strands – 36, 240 & 288 bundled together with Altice in innerduct conduit system)	No relocation.
	Fiber Optic Aerial	Aerial FO cable from riser pole and to north pole line on main branch	296+50 To 337+00	(2 strands – 240 & 288 bundled together with Altice)	At Sta. 326+62 transfer to southern side on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on north pole crossing to pole on south of tracks	337+00 To 337+40	(2 strands – 240 & 288 bundled together with Altice)	Transfer to new poles, but remain on south side.
	Fiber Optic Aerial	Aerial FO cable on south pole line to riser pole	337+40 To 356+25	(2 strands – 240 & 288 bundled together with Altice)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From Riser pole on south to UG innerducts in Trough System on south of tracks to a riser pole	356+25 To 378+30	(2 strands – 240 & 288 bundled together with Altice in (2) 1 1/4" innerducts)	Transfer to new poles, but remain on south side.
	Fiber Optic Aerial	From riser pole on south to pole line on south to riser pole	378+30 To 417+40	(2 strands – 240 & 288 bundled together with Altice)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From riser pole on south to LIRR vault	417+40 To 418+00	(2 strands – 240 & 288 bundled together with Altice in LIRR conduit)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From LIRR vault in LIRR conduit to LIRR vault	418+00 To 421+50	(2 strands – 240 & 288 bundled together with Altice in LIRR conduit)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From LIRR vault to Riser Pole on south	421+50 To 422+00	(2 strands – 240 & 288 bundled together with Altice in LIRR conduit)	Transfer to new poles, but remain on south side.
Fiber Optic Aerial	From Riser Pole on south to pole line on south	422+00 To 449+00	(2 strands – 240 & 288 bundled together with Altice)	No relocation.	
<b>AT&amp;T</b> <sup>(3)</sup>	<b>South Tyson Avenue</b>				
	Fiber Optic (UG)	Crossing the LIRR ROW along South Tyson Avenue; underground fiber optic facilities in 3 sets of duct banks one owned by Verizon, two owned by AT&T – in the center of the roadway.	200'	No conflicts.	No relocations.
	<b>Herricks Road</b>				
	Fiber Optic (UG)	Crossing the LIRR ROW along Herricks Road; AT&T's LNS facilities are carried in both AT&T LNS conduit and in Verizon conduit – along curblines of the southbound lane.	200'	No conflicts.	No relocations.
<b>Cherry Lane</b>					
Fiber Optic (UG)	Crossing the LIRR ROW along Cherry Lane; AT&T's LNS facilities are carried in Verizon conduit - along curblines of the northbound lane.	200'	Proposed abutment construction.	Protect Conduit	

UTILITIES – FIBER OPTIC, TELEPHONE, AND CABLE TELEVISION					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
AT&T <sup>(3)</sup>	<b>Charlotte Avenue</b>				
	Fiber Optic (UG)	Crossing the LIRR ROW along Charlotte Avenue; AT&T's LNS facilities are carried on Lighttower cable – in the middle of the northbound lane.	170'	No conflicts.	No relocations.
	<b>Main Street Grade Crossing Elimination</b>				
Fiber Optic (UG)	In roadway crosses and south of tracks			Proposed underpass would expose the fiber optic duct	Option 1: No Impact Option 2: Relocate to west sidewalk
LIGHTTOWER (Also Crown Classic Cables) <sup>(3)</sup>	<b>Covert Avenue Grade Crossing Elimination</b>				
	Fiber Optic (OH)	Crossing the LIRR ROW along west side of south bound lane and running north and south of the tracks.	700'	Crown Castle cables leases from Lighttower	Length and mounting to be determined later.
	Fiber (Overhead)	East and west sidewalks crossing and north and south of tracks			Relocate overhead to follow a path from Covert Ave to Wayne Ave, South 5th Street and 1st Avenue back to Covert Avenue.
	<b>New Hyde Park Road Grade Crossing Elimination</b>				
	Fiber Optic (OH)	Crossing the LIRR ROW along west side of south bound lane and running north and south of the tracks.	700'	Crown Castle cables leases from Lighttower	Length and mounting to be determined later.
	<b>School Street Grade Crossing Elimination</b>				
	Fiber Optic (OH)	West sidewalk north and south and crossing tracks			Crown Castle cables leases from Lighttower
<b>Grand Boulevard</b>					
Fiber Optic (OH)	Crossing the LIRR ROW on the poles over the bridge			No proposed construction, no conflict.	No relocation.
ALTICE <sup>(2)</sup>	Fiber Optic Aerial	Aerial FO cables on poles along Plainfield Avenue, south of LIRR. Then, at bridge, FO cable entering ROW on south on pole line in ROW.	ML TRK Sta. 109+50 To 175+30	(2 Strands bundled together with Verizon Business, 288 & 192 cables )	Relocated to North side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on south pole line coming from NHP Substation	156+00 To 175+30	(12 Stands FO & 2 strands FO bundled together with Verizon Business, 288 & 192 cables)	Relocated to North side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on south pole line	175+30 To 188+90	(2 strands bundled together with Verizon Business, 288 & 192 cables )	Relocated to North side of ROW on new LIRR poles.
	Fiber Optic UG	Underground bundled cables in innerduct.	188+90 To 212+60	(12 Strands bundled together with Verizon Business, 288 & 192 cables, (2) 1 ¼" innerduct )	Relocated to North side of ROW on new LIRR poles until Sta. 199+00 the relocated to south side on new LIRR poles.
	Fiber Optic	Underground FO cables in innerducts crossing LIRR Tracks then goes aerial on a pole line on the north side of tracks	212+60 To 212+75	(2 Strands bundled together with Verizon Business, 12 & 192 cables, (1) 1" and (2) 1 ¼" innerducts )	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on north pole line	212+75 To 230+40	(2 strands FO bundled together with Verizon Business, 288 & 192 cables)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on riser pole to manhole	230+40 To 230+58	(2 strands FO bundled together with Verizon Business, 288 & 192 cables)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic UG	FO cables travels in UG conduit system north side of track to MH	230+58 To 241+75	(2 Strands bundled together with Verizon Business, 288 & 192 cables, (1) 1" and (2) 1 ¼" innerducts )	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic	FO cables travels in UG conduit north side of track to Riser Pole	241+75 To 242+25	(2 Strands bundled together with Verizon Business, 288 & 192 cables)	Relocated to south side of ROW on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on north pole line	242+25 To 291+50	(2 Strands bundled together with Verizon Business, 288 & 192 cables, 1 – 288 strand crosses on cable bridge to NC Data Center)	Relocated to south side of ROW on new LIRR poles.

UTILITIES – FIBER OPTIC, TELEPHONE, AND CABLE TELEVISION					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
ALTICE <sup>(2)</sup>	Fiber Optic Aerial	Aerial FO cable on north pole line up the Oyster Bay Branch to a riser pole on north	291+50 To 297+00 (OBB)	(1 - 192 Strand bundled together with Verizon Business)	Relocated to south side of ROW on new LIRR poles to Sta. 296+00. Then relocated to north side of ROW.
	Fiber Optic UG	From riser pole under 2 tracks to hut south of Oyster Bay Branch tracks	297+00 (OBB) To 297+20	(4 strands – 36, 87, 192 & 288 bundled together with Verizon Business in innerduct conduit system)	No relocation.
	Fiber Optic UG	From hut in innerduct conduit system to riser pole	297+20 To 296+50	(3 strands – 36, 240 & 288 bundled together with Verizon Business in innerduct conduit system)	No relocation.
	Fiber Optic Aerial	Aerial FO cable from riser pole and to north pole line on main branch	296+50 To 337+00	(2 strands –240 & 288 bundled together with Verizon Business)	At Sta. 326+62 transfer to southern side on new LIRR poles.
	Fiber Optic Aerial	Aerial FO cable on north pole crossing to pole on south of tracks	337+00 To 337+40	(2 strands –240 & 288 bundled together with Verizon Business)	Transfer to new poles, but remain on south side.
	Fiber Optic Aerial	Aerial FO cable on south pole line to riser pole	337+40 To 356+25	(2 strands –240 & 288 bundled together with Verizon Business)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From riser pole on south to UG innerducts in Trough System on south of tracks to a riser pole	356+25 To 378+30	(2 strands –240 & 288 bundled together with Verizon Business in (2) 1 ¼" innerducts)	Transfer to new poles, but remain on south side.
	Fiber Optic Aerial	From riser pole on south to pole line on south to riser pole	378+30 To 417+40	(2 strands –240 & 288 bundled together with Verizon Business)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From riser pole on south to LIRR vault	417+40 To 418+00	(2 strands –240 & 288 bundled together with Verizon Business in LIRR conduit)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From LIRR vault in LIRR conduit to LIRR vault	418+00 To 421+50	(2 strands –240 & 288 bundled together with Verizon Business in LIRR Conduit)	Transfer to new poles, but remain on south side.
	Fiber Optic UG	From LIRR vault to riser pole on south	421+50 To 422+00	(2 strands –240 & 288 bundled together with Verizon Business in LIRR Conduit)	Transfer to new poles, but remain on south side.
	Fiber Optic Aerial	From riser pole on south to pole line on south	422+00 To 449+00	(2 Strands bundled together with Verizon Business, 288 &192 cables )	No relocation.
	<b>Covert Avenue Grade Crossing Elimination</b>				
Overhead Cables	Along west side of Covert Avenue.				Relocate facilities to follow a path from Covert Avenue to Wayne Avenue, South 5th Street and 1st Avenue back to Covert Avenue.
<b>South 12<sup>th</sup> Street Grade Crossing Elimination</b>					
Overhead Cables	SB lane south of tracks				Option 1: Under Option 1 raise all overhead lines or relocate underground to eliminate conflicts with pedestrian overpass. Option 2: Along the west side of South 12th Street it may be necessary to laterally shift poles onto town property at parking lot. Temporary relocation of east/west facilities may be needed for construction of walls.
Overhead Cables	NB lane north of tracks				Option 1: No Impacts Option 2: The pole in the NE corner of South 12th Street and 2nd Avenue will need to be relocated away from the intersection to maintain the east/west connectivity. The second pole on the east/south of South 12th Street will need to be relocated north beyond under pass limits, as the 4' SW areas will not support poles. Services from this relocated pole may need to be underground.
<b>New Hyde Park Road Grade Crossing Elimination</b>					
Overhead Cables	SB sidewalk area north / south of tracks				Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.

**UTILITIES – FIBER OPTIC, TELEPHONE, AND CABLE TELEVISION**

<b>Owner</b>	<b>Type</b>	<b>Location/Side</b>	<b>Approx. Length<sup>(1)</sup></b>	<b>Utility Condition<sup>(2)</sup>/Conflict</b>	<b>Possible Mitigation</b>
<b>ALTICE<sup>(2)</sup></b>	Overhead Cables	South of railroad, transfer cables into neighborhood to east			Requires pole replacement for change in grades, minor alignment changes - Clinch Avenue / Greenridge Avenue
	Overhead Cables	On and at Plaza Avenue			Change in vertical grades requires pole replacement transfers.

## Notes:

- (1) Most of the existing utilities are within the roadway limits. Length measured within the footprint of the roadway construction.  
 (2) VBS Fiber Optic system reported herein was built by MCIWORLD.COM (Verizon Business) in 1999. A statement that Altice is bundled with Verizon Business was made. Altice has not indicated what facilities are shared/owned/leased.  
 (3) Utility Condition Unknown at this time. Conflicts are discussed in general terms. Design-Build Contractor to determine actual conflict as a part of their analysis of design.

## Abbreviations:

UG – Underground, OH – Overhead, N/A – Not Applicable, TBD – To Be Determined

Table 3-8 Utilities – Water and Sanitary Sewer

UTILITIES – WATER AND SANITARY SEWER					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
NCDPW	<b>Covert Avenue Grade Crossing Elimination</b>				
	Sewer (8")	NB lane north of tracks and 2 <sup>nd</sup> Avenue east	300'	Proposed underpass would expose the sewer	Relocate to the east sidewalk.
	Sewer (8")	West sidewalk north of tracks and main connecting from the west along 2 <sup>nd</sup> Avenue west	300'		Reconstruct and grade sewer main on 2nd Ave west of Covert Ave and along the SB lane of Covert Ave to a point where it can be crossed and connected to the sewer main in the east sidewalk.
	Sewer (8")	NB lane south of tracks	220'		Relocate to SB Frontage Road.
	Sewer (8")	SB lane south of tracks	200'	Proposed underpass would expose the sewer.	Relocate to the west sidewalk.
	Sewer Manhole	Center of Wayne Avenue	100'	Proposed underpass would expose the manhole.	Lower the manhole or reset the cover.
	Water <sup>(3)</sup>	Water main crossing north and south tracks	100'	Unknown at this time	TBD
	Water <sup>(3)</sup>	Water main running parallel 50' north of the north tracks	50'	Unknown at this time	TBD
	Water <sup>(3)</sup>	Water main running parallel 100' north of the north tracks	50'	Unknown at this time	TBD
	<b>3<sup>rd</sup> Avenue</b>				
	Sewer (8")	South of LIRR ROW from east of South 8 <sup>th</sup> Street to west of South 10 <sup>th</sup> Street.	<sup>(2)</sup>	No impact.	N/A
	Sewer (8")	South of LIRR ROW from east of South 10 <sup>th</sup> Street to South 11 <sup>th</sup> Street.	<sup>(2)</sup>	No impact.	N/A
	Sewer (8")	South of LIRR ROW from South 12 <sup>th</sup> Street to west of Baer Place.	<sup>(2)</sup>	No impact.	N/A
	<b>South 12<sup>th</sup> Street Grade Crossing Elimination</b>				
	Sewer (24")	Center of the roadway and crosses LIRR tracks			Option 1: No impacts Option 2: Reconstruct 24" main to provide mains on both sides of underpass.
	Sewer (6" & 8")	Centerline of 2nd and 3rd Avenues from both directions, connect into 24"			Option 1: Stagger piers and protect and maintain all sewer mains. Option 2: Connect to new north/south mains.
	Water <sup>(3)</sup>	Water main crossing north and south tracks	100'	Unknown at this time	TBD
	Water <sup>(3)</sup>	Water main running parallel 100' north of the north tracks	50'	Unknown at this time	TBD
	Water (8")	12th Street, crosses LIRR tracks			Option 1: No Impacts Option 2: Reconstruct 24" main to provide mains on both sides of underpass.
	Water (6" & 8")	2nd and 3rd Avenues from both directions, connect into 12"			Option 1: Stagger piers and protect and maintain all sewer mains. Option 2: Connect to new north/south mains.
	<b>New Hyde Park Road Grade Crossing Elimination</b>				
	Sewer <sup>(3)</sup>	Crosses the roadway at 2 <sup>nd</sup> Avenue north of tracks	60'	Proposed underpass would expose the sewer.	Relocate to Plaza Avenue and bring services back down New Hyde Park Road in the sidewalks or west of New Hyde Park Road within acquired ROW.
	Sewer (8")	East sidewalk north of tracks	370'		Relocate to cross New Hyde Park Road at Plaza Avenue south of Plaza Avenue; reconstruct along east side as needed for services.
Sewer (8")	SB lane north of tracks and Plaza Avenue West	460'	Proposed underpass would expose the sewer.	Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW. Reconnect to existing 8" in 2nd Avenue.	
Water <sup>(3)</sup>	Water main crossing north and south tracks	100'	Unknown at this time	TBD	

UTILITIES – WATER AND SANITARY SEWER					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
NCDPW	<b>School Street Grade Crossing Elimination</b>				
	Water <sup>(3)</sup>	Water main crossing north and south tracks	100'	Unknown at this time	TBD
	Water (12")	Water main crossing north and south tracks	100'	Unknown at this time	TBD
	<b>Urban Avenue Grade Crossing Elimination</b>				
	Sewer <sup>(3)</sup>	Center of the roadway south of tracks	260'	Proposed underpass would expose the sewer.	Relocate to and provide new services from proposed at grade turn-out lane to east side south of tracks.
	Sewer <sup>(3)</sup>	Along Broadway east and west	150'	No impact.	Protect and maintain.
	Sewer (10")	Center of the roadway north of tracks	340'	Proposed underpass would expose the sewer.	Relocate to the east sidewalk to maintain services.
	Sewer <sup>(3)</sup>	WB lane of Railroad Avenue (west)	80'	Conflict with proposed west retaining wall.	Connect to relocated main on the east sidewalk.
	Sewer <sup>(3)</sup>	EB lane of Railroad Avenue (east)	70'	Conflict with proposed east retaining wall.	Eliminate main. Provide new service connection from the building in town park from Broadway.
Water (6")	Water main crossing north and south tracks	100'	Unknown at this time	TBD	
VILLAGE OF GARDEN CITY	<b>New Hyde Park Road Grade Crossing Elimination</b>				
	Sewer (8")	Center of Clinch Ave	110'	Proposed underpass would expose the sewer.	Shorten the main within the depressed roadway and adjust manhole.
	Sewer (8")	NB lane south of tracks	150'	Proposed underpass would expose the sewer.	Split and relocate to both sides of underpass in order to maintain services.
	<b>Main Avenue</b>				
	Water (8")	Mostly located along the south side of Main Avenue from Tanners Pond Road to Nassau Boulevard. Provides 6-inch line connections to the south along each intersecting side street.	(2)	TBD	TBD
	Sewer <sup>(3)</sup>	South of LIRR ROW, each side street begins a sanitary sewer line immediately south of Main Avenue from Tanners Pond Road to Nassau Boulevard.	(2)	No impact.	N/A
	<b>Plainfield Avenue</b>				
	Sewer	Parallels south side of LIRR ROW (50' off) from Plainfield Avenue to Sta. 113+50.		Abutment Construction.	Protect and maintain.
	<b>Sta. 132+50</b>				
	Sewer (42")	Crossing north and south of tracks	200'	Conflict with proposed retaining wall.	Protect and maintain.
	<b>5<sup>th</sup> Avenue, Sta. 139+50</b>				
	Sewer	In road parallel to, but south, of ROW.	100'	Conflict with proposed retaining wall.	Protect and maintain.
	<b>New Hyde Park Road</b>				
	Water (8")	Clinch Avenue, near Hathaway Drive, running south from intersection with New Hyde Park Road and does not cross LIRR ROW.	(2)	TBD	TBD
	Water Interconnect	Interconnect between water systems located between Clinch and Greenridge Avenues			Relocate and reconstruct for grade alignment changes.
	Water (8")	NB lane of New Hyde Park Road			Relocate for grade and underpass alignment.
Water (6")	Center of Clinch Avenue			Relocate to west sidewalk along Clinch Avenue, crosses Clinch Avenue and reconnect at Greenridge Avenue.	
<b>Denton Avenue</b>					
Sewer (24")	Center of roadway crossing north and south of tracks	200'	Proposed underpass would expose sewer.	Relocate Sewer.	
<b>Nassau Boulevard, Sta. 228+20</b>					

UTILITIES – WATER AND SANITARY SEWER						
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
VILLAGE OF GARDEN CITY	Sewer	Crossing north and south of tracks		Abutment Construction	Protect and maintain.	
	<b>East of Herricks Road, Sta. 249+50</b>					
	Sewer (30")	Crossing north and south of tracks	75'	Track Construction	Protect and maintain.	
	<b>12<sup>th</sup> Avenue, Sta. 261+00</b>					
	Sewer (36")	Crossing north and south of tracks	200"	Track Construction	Protect and maintain.	
	<b>Railroad Avenue</b>					
Sewer <sup>(3)</sup>	Parallels north side of LIRR ROW from Denton Avenue to 5 <sup>th</sup> Avenue, providing connections to the north along each side street.		<sup>(2)</sup>	No impact.	N/A	
VILLAGE OF MINEOLA	<b>Main Street Grade Crossing Elimination</b>					
	Sewer <sup>(3)</sup>	Center of the roadway crossing and north of tracks <sup>(3)</sup>		270'	Proposed underpass would expose the sewer.	Option 1: No Impact Option 2: Relocate to proposed access road east of underpass.
	Sewer	North sidewalk of Front Street west				Option 1: No Impact Option 2:
	Sewer (12")	NB lane of the roadway south of tracks		290'		Option 1: No Impact Option 2: Protect and maintain.
	Sewer (8")	Along 3 <sup>rd</sup> Street east and west and SB lane south of tracks		110'		Option 1: No Impact Option 2: Protect and maintain.
	Water (6")	NB lane crosses and at north and south of tracks				Option 1: No Impact Option 2: Protect and maintain.
	Water (6")	Center of Front Street east				Option 1: No Impact Option 2: Protect and maintain.
	Water (6")	Along 3 <sup>rd</sup> Street				Option 1: No Impact Option 2: Protect and maintain.
	Water (12")	Along 2 <sup>nd</sup> Street				Option 1: No Impact Option 2: Protect and maintain.
	Water (12")	Center of Front Street west				Option 1: No Impact Option 2: Terminate at Main Street intersection
	<b>Willis Avenue Grade Crossing Elimination</b>					
	Sewer (18")	Center of the roadway south of tracks		290'	Proposed underpass would expose the sewer.	Relocate/split main to each side of underpass as needed to maintain services.
	Sewer (18")	Center of Front St east		70'	Conflict with proposed east retaining wall.	Connect to relocated main on east side of underpass.
	Sewer	Center of the roadway north of 2nd Street				Partially relocated to east sidewalk and reverse flow, connect with existing sewer at 1st Avenue.
	Sewer	South sidewalk along 2nd Street				Eliminate section within the approach. Construct new main along south sidewalk and beneath Oyster Bay Branch tracks to provide services and connect to existing sewer east of tracks.
	Sewer	North sidewalk along 2nd Street				Eliminate section within the approach.
	Water (6")	SB lane crossing and south of tracks				Relocate to proposed west sidewalk.
	Water (6")	SB lane north of tracks				Relocate to proposed west sidewalk.
	Water (6")	Along Front Street west				No conflict.
	Water (8")	Along 2 <sup>nd</sup> Street				Lower to meet cover requirements for proposed roadway grade.

UTILITIES – WATER AND SANITARY SEWER						
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
VILLAGE OF MINEOLA	Water (12")	Along Front St east			Maintain services and terminate at Willis Ave intersection.	
	<b>Glen Cove Road, Sta. 355+00</b>					
	Sewer	Crossing north and south of tracks	120'	Conflict with proposed abutment.	Relocate	
	<b>Glen Cove Road, Sta. 355+35</b>					
	Water (10")	Crossing north and south of tracks	150'	Proposed underpass would expose the water main.	Relocate	
	<b>Sta. 369+75</b>					
	Sewer	Crossing north and south of tracks	120'	Conflict with retaining wall and track construction.	Protect and maintain.	
	<b>Cherry Lane, Sta. 388+50</b>					
	Water	Crossing north and south of tracks	150'	Abutment Construction	Protect and maintain.	
	<b>East of Cherry Lane, Sta. 393+00</b>					
	Sewer (36" RCP)	Crossing north and south of tracks	120'	Conflict with proposed retaining wall.	Protect and maintain.	
	<b>Carle Road</b>					
	Sewer	Crossing north and south of tracks	100'	Conflict with proposed retaining wall.	Protect and maintain.	
	Water (12")	Crossing north and south of tracks	100'	Retaining Wall Construction	Protect and maintain.	
	Water (6")	Crossing north and south of tracks	100'	Retaining Wall Construction	Protect and maintain.	
	<b>West of Post Avenue, Sta. 442+00</b>					
	Sewer	Crossing north and south of tracks	150'	Conflict with proposed platforms.	Protect and maintain.	
<b>School Street Grade Crossing Elimination</b>						
Sewer (8")	Center of the roadway passing under north and south tracks	150'	Proposed underpass would expose the sewer.	Relocate to east sidewalk		
Sewer <sup>(3)</sup>	Eastside of the roadway passing under north and south tracks	150'	Unknown at this time.	TBD		
Sewer <sup>(3)</sup>	Crossing north and south tracks about 25' east of the tracks	150'	Unknown at this time.	TBD		
<b>Covert Ave Grade Crossing Elimination</b>						
Water (6")	SB lane south of tracks and Wayne Avenue	410'	Proposed underpass would expose the water main.	Reroute water main north of tracks from water tower to 1st Avenue and bring services back in east and west sidewalks along Covert Avenue. Reroute water main south of tracks from tower to Wayne Avenue and bring services back in east and west sidewalks along Covert Avenue.		
Water (8")	Crosses the roadway at 2 <sup>nd</sup> Avenue north of tracks	60'	Proposed underpass would expose the water main.	Relocate to the space between underpass roof and bottom of pavement section.		
Water (8")	2 <sup>nd</sup> Avenue north of tracks west and east	200'	No impact.	N/A		
Water (8")	Crosses the roadway at 3 <sup>rd</sup> Avenue south of tracks	60'	Proposed underpass would expose the water main.	Relocate to the space between underpass roof and bottom of pavement section.		
Water (8")	3 <sup>rd</sup> Avenue south of tracks east	120'	No impact.	N/A		
Water (12")	SB lane crosses and north and south of tracks	350'	No impact.	N/A		
Water (12")	East sidewalk south of tracks	280'	No impact.	N/A		
Water (16")	2 <sup>nd</sup> Avenue west	100'	No impact.	N/A		
WAWNC						

UTILITIES – WATER AND SANITARY SEWER						
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
WAWNC	A network of 6, 8, 12 and 16" water mains originating from pump station at 2nd Avenue and 7th Street.	Points south of tracks, includes a network 6", 8" and 12" mains			12" main at LIRR crossing serving points North, South and East directly impacted. Eliminate 12" between 2nd and 3rd Avenues. Reconnect points south with a 12" main from pump house via Wayne Avenue to the 12" main in Covert Ave. Relocate mains east and west of underpass to maintain services and connection to facilities in 3rd Ave east of Covert Avenue.	
		Points north of tracks, includes a network 6", 8", 12" and 16" mains			Connect 8" and 16" mains to a relocated 12" west of the proposed underpass. North of conflicts with underpass provide an 8" crossing main to the east sidewalk and extend south to the existing 8" main east of the underpass.	
	<b>South 12<sup>th</sup> Street Grade Crossing Elimination</b>					
	Water (service connection)		Crosses the roadway south of tracks	50'	Proposed underpass would expose the water main.	Provide new connection from the 6" main on 3rd Avenue.
	Water (6")		Crosses the roadway at 3rd Ave south of tracks	50'	Proposed underpass would expose the water main.	Relocate to the space between underpass roof and bottom of pavement section.
	Water (8")		SB lane crosses and north and south of tracks	630'	No impact.	N/A
	Water <sup>(3)</sup>		Crosses the roadway at 2 <sup>nd</sup> Avenue north of tracks	50'	Proposed underpass would expose the water main.	Relocate to the space between underpass roof and bottom of pavement section.
	Water (8")		12th Street, crosses LIRR tracks			Option 1: No Impacts Option 2: Relocate water main in NB Frontage Road
	Water (6" & 8")		2nd and 3rd Avenues from both directions, connect into 8"			Option 1: Stagger piers and protect and maintain all water mains. Option 2: From east connect to new north/south water main. From West continue water mains north and south along the west SW of South 12th Street to a point where it can merge back into the existing north/south water main.
	<b>Plainfield Avenue</b>					
	Water		Southbound Lane	200'	Abutment Construction	Protect and maintain.
	<b>Mineola Station, Sta. 281+00</b>					
	Water (2 Mains)		Running along south of Mineola Station Platform Between 4th Avenue & 3rd Avenue	900' (Total)	Platform Construction	Relocate Water Service; protect mains.
	<b>Mineola Boulevard</b>					
	Water		Running along south of Mineola Station Platform Between 4th Avenue & 3rd Avenue		Track Construction	Relocate main.
	<b>New Hyde Park Road Grade Crossing Elimination</b>					
	Water (6")		SB lane south of tracks	200'	Proposed underpass would expose the water main.	Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.
	Water (6")		Crosses roadway north of tracks	50'	Proposed underpass would expose the water main.	Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.
	Water (6")		Crosses Clinch Avenue	270'	Proposed underpass would expose the water main.	Relocate to follow the proposed depressed roadway profile.

UTILITIES – WATER AND SANITARY SEWER					
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation
WAWNC	Water (8")	SB lane crosses and at north and south of tracks	510'	Proposed underpass would expose the water main.	Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW. Adjust for proposed roadway grade change north of Plaza Avenue.
	Water (6")	WB lane of Plaza Avenue	190'	Proposed underpass would expose the water main.	Relocate to follow the proposed depressed roadway profile.
	Water (8")	NB lane south of tracks	150'		Relocate to proposed utility corridor west of New Hyde Park Road within acquired ROW.
	Water (6")	Center of Greenridge Avenue	100'	No impact.	N/A
	Water (6")	Plaza Avenue east and west			Adjust for proposed roadway grade.
	Water (6")	Center of Greenridge Avenue and Clinch Avenue			Relocate to west sidewalk along Clinch Avenue, crosses Clinch Avenue and reconnect at Greenridge Avenue.
WESTBURY WATER	<b>Ellison Avenue</b>				
	Water (8")	Crosses north and south tracks east of the Ellison Avenue @ Sta. 419+25 This water main runs parallel railroad about 20' on the south side.	100'	Track Construction	Protect and maintain.
	<b>School Street Grade Crossing Elimination</b>				
	Water <sup>(3)</sup>	WB lane of Railroad Avenue	150'	Proposed underpass would expose the water main.	Connect to relocated 12" main on west sidewalk.
	Water <sup>(3)</sup>	SB lane south of tracks	180'	Proposed underpass would expose the water main.	Relocate to west sidewalk.
	Water <sup>(3)</sup>	SB lane north of tracks	320'	Proposed underpass would expose the water main.	Relocate to the west sidewalk.
	Water	Service Connection at #173			Re-establish new connection from Grant Avenue to the Railroad Avenue Extension
	<b>Urban Avenue Grade Crossing Elimination</b>				
	Water (6")	SB lane crosses and at north and south of tracks	520'	Proposed underpass would expose the water main.	Relocate main and re-establish service through alternate roadway routes (Kinkel Street or Sylvester Street to Main Street and reconnect to Urban Avenue) to provide services south of tracks. Provide new services from proposed at grade turn-out lane to east side south of tracks.
	<b>Grand Boulevard</b>				
Water (6")	6" main in a 16" sleeve underground crosses north and south tracks	150'	Retaining wall and track construction	Protect and maintain.	
HICKSVILLE WATER DISTRICT	<b>Charlotte Avenue</b>				
	Water <sup>(3)</sup>	Crosses LIRR ROW.	<sup>(2)</sup>	Outside of Project Corridor	TBD
	<b>Alpha Plaza</b>				
	Water <sup>(3)</sup>	Extends from West John Street to north of the track siding.	<sup>(2)</sup>	Outside of Project Corridor	TBD
	<b>Engel Street</b>				
	Water	Extends south from a main in West John Street along Engel Street, crosses LIRR ROW and a private industrial property, and continues along Suggs Lane connecting to a main in West Nikolai Street.		Outside of Project Corridor	
	<b>Laurel Street</b>				
Water	Extends from Engel Street east along the north siding track looping along Laurel Street back to West John Street.		Outside of Project Corridor		
<b>Newbridge Road</b>					

UTILITIES – WATER AND SANITARY SEWER						
Owner	Type	Location/Side	Approx. Length <sup>(1)</sup>	Utility Condition <sup>(2)</sup> /Conflict	Possible Mitigation	
<b>HICKSVILLE WATER DISTRICT</b>	Water	Crosses under the station tracks and platforms continuing north and south beyond the Project Corridor.		Outside of Project Corridor		
	Water	Immediately south of the tracks and continues to Duffy Avenue, where it ties into another water main along Duffy Avenue.		Outside of Project Corridor		
	<b>Jerusalem Avenue</b>					
	Water	Crosses under the railroad viaduct and continues north and south beyond the Project Corridor.		Outside of Project Corridor		
	<b>South Broadway</b>					
	Water	Two water mains that begin at a connection in East John Street and continue south, crossing under the railroad viaduct.		Outside of Project Corridor		
	<b>Nassau Boulevard</b>					
Water	Water main runs on east side of Nassau Blvd and stops at manhole north of tracks		Outside of Project Corridor	NA		
<p>Notes:</p> <p>(1) Most of the existing utilities are within the roadway limits. Length measured within the footprint of the roadway construction</p> <p>(2) Length unknown</p> <p>(3) Type and/or size unknown</p> <p>Abbreviations:</p> <p>N/A – Not Applicable, TBD – To Be Determined</p>						

**HICKSVILLE WATER DISTRICT**

The Hicksville Water District has several water mains serving Hicksville that cross and parallel the LIRR ROW.

**CARLE PLACE WATER DISTRICT**

The Carle Place Water District has several water mains serving Carle Place that cross the LIRR ROW. Each main would need to be protected.

**3.6.7 DRAINAGE SYSTEM**

This section provides a preliminary investigation of the existing drainage condition along the Main Line from the Floral Park Station to the Hicksville Station. Work at Hicksville Station was provided as a separate project from the western edge of the Station to east of Wantagh Parkway. The drainage design of the Hicksville Station was addressed independently from this project and as such, this section will not be included in this analysis. The preliminary investigation evaluated the impact of the new third track to the existing drainage infrastructure along the LIRR ROW and the impact at some of the relocated station platforms needed to accommodate the new third track. This investigation also evaluated the proposed drainage design recommendations and analyzed the drainage designs at the intersection of several cross streets and grade crossing eliminations. Engineer and designer must ensure the tracks are well above the 100-year storm elevation in evaluation of how the system performs under those conditions. The LIRR ROW drainage and grade crossing elimination drainage are independent systems. The drainage design recommendations are based primarily on the available topographical survey and utility infrastructure record information. This information shall be verified during the final design phase.

**EXISTING CONDITIONS – LIRR DRAINAGE**

Storm water collecting within the existing track alignment discharges the runoff directly into the existing sandy soil through ditches located on either side of the LIRR ROW. Approximately two-thirds of the LIRR ROW consists of ballast area and the other third is either bare ground or grass with ditches. The storm surface runoff discharges evenly into the ground along the length of the LIRR ROW. The existing topographical survey did not indicate any type of existing drainage structures, including perforated storm pipe, leaching pits or basins, and existing cross street buried storm pipe. The existing ditch/channel on each side of the ROW appears to handle the existing drainage runoff during low storm year events. In some fill sections, drainage runoff will flow outside of the LIRR ROW to the adjacent properties. In a few cut sections, storm water runoff from the adjacent properties will flow into and contribute to the track drainage discharge. There are no leaching pits/basins, recharge basins, or underground retention system/leaching fields provided for higher frequencies storms, such as the 100- year storm event. There may be some existing under drain pipes installed which were not shown on the topographical and utility survey information. There is a possibility that the existing soil condition has an excellent infiltration rate that adequately accommodates the storm peak flows of up to a 100-year storm event. Based on the valuation maps, there are sporadic drainage pipe systems that parallel the tracks to both the north and south. There are at least 6 culverts crossing the LIRR ROW with pipe sizes ranging from 12-inch to 48-inch diameter. Some of these crossings may be inactive or plugged since they were built prior to 1916. These culvert crossings allow the water to pass through the LIRR ROW but will not contribute to the track drainage runoff. The active culvert crossings would be investigated further to make sure they are sized appropriately for the proposed design capacity without overtopping the top of rail elevations.

At each cross street intersection, there is a separate nearby existing storm drainage system owned and maintained by Nassau County that carries the storm water runoff along the roadway which eventually discharges into existing recharge basins well off LIRR ROW. It is assumed that currently, there is no storm water runoff from LIRR property that contributes to the Nassau County drainage system.

**PROPOSED CONDITIONS – LIRR DRAINAGE**

The proposed track vertical alignment predominantly follows the existing ground topography. Where the proposed alignment was raised from the existing elevation, appropriate retaining walls are to be provided to compensate for the grade change so as not to impact property outside of the LIRR ROW. Based on the proposed track vertical profile, a total of ten (10) watershed areas are developed separated by the high points along the alignment. In most cases, the new third track location will occupy the existing south ditch line and/or will displace the station platform areas. This proposed condition will require moving and upgrading the existing ditch/channel on either side to accommodate the new alignment. This in turn will increase surface runoff volume since bare ground will need to be converted to ballast area. Due to the lack of existing drainage design information, the worst case scenario was assumed by considering the entire ROW width in the sizing of the required storage volume. During higher storm frequencies of up to a 100-year storm event, the storage volume for the storm water flow has to be provided all within the LIRR ROW. The first option was to construct under drain perforated pipes on the north and south sides of the LIRR ROW away from the track footprint and be provided with interconnecting pipes to support each other. No soil percolation/infiltration rate was considered in this scenario. Preliminary calculations show a total of 35,600 linear feet of 36-inch perforated HDPE (High Density Polyethylene) pipes would be required to be installed on the north side. Along the south side, 18,575 linear feet of 12-inch perforated HDPE pipes, 12,455 linear feet of 24-inch HDPE pipe and 4,560 linear feet of 36-inch HDPE pipes would be required. These storage pipes would be able to accommodate the peak volume generated by a 100-year storm assuming no infiltration to the sub soil layers. All existing drainage pipes to the north and south of the LIRR ROW can be maintained and protected during construction as long as they are not in direct conflict with the third track alignment. The existing pipes are not required to be replaced if damaged unless they are accepting storm runoff from outside of the LIRR ROW, station buildings, or platforms. All active culvert crossings would be extended, maintained, and protected during construction, and would be replaced in kind if damaged or upgraded to handle the appropriate design flow rate without overtopping the top of rail elevations. In some cases, a second option can be considered to discharge the peak flows to the nearest Nassau County recharge basins. This option would have to be approved by Nassau County and coordinated with the New York State Department of Transportation (NYSDOT) for the design of the buried storm pipe system connecting to the basins. Also, some existing recharge basins may need to be excavated and deepened to accommodate the additional flow from the LIRR ROW.

Three boring locations to evaluate existing soil infiltration rates were requested to determine how fast the water dissipates into the ground surface. The soils are described to consist of mostly sand and gravel with little silt. Since groundwater table elevations are approximately 45 to 50 feet deep below the surface this provides sufficient room for the surface runoff to perch deep into the sub soil layers. The first boring location's soil permeability tests at watershed area No. 5 had an average infiltration rate of 0.95 in/hour. A second boring location at watershed area No. 2 had an average percolation rate of 0.296 in/hour and the third location at watershed area 9 has an average soil infiltration rate of 1.28in/hour. Each boring location could have a different infiltration rate test result depending on the soil layers and the respective appropriate calculations for each watershed areas should be performed to determine the effect of soil infiltration to the peak volume generated by the storm frequency. Since the soil infiltration rate of the three tests from the boring locations did not yield a favorable result, we have ignored the benefit of the soil permeability in our storage volume calculation at this time. The existing and proposed vertical alignment of the tracks is very flat, predominantly less than 1% slope. Most likely, the surface runoff will seep into the ground vertically faster than it will travel longitudinally. The New York City 100-year flood zone maps and FEMA FIRM maps indicate that the entire Project Corridor is well above the 100-year flood elevation. There is a possibility that the storm peak flows generated by 100-year storm rainfall intensity could be stored temporarily on the side ditches/channels under drain perforated pipes, and the voids within the 12-inch stone ballast and 8-inch sub-ballast layers, without overtopping the top of rail elevation. The NYSDEC

future flood level height projection was not considered in this design analysis and will be addressed accordingly once new guidelines are released by the NYS agencies. The storm water accumulated on the ditch would eventually be absorbed by the existing soil infiltration capability. The storage volume calculations prepared for this analysis did not take into consideration the soil infiltration rate capability and serves as a factor of safety in the design analysis. The existing side ditch on both the north and south sides of the ROW would be upgraded and expanded to accommodate more storage volumes. If this is the case, it would eliminate the need for a pipe retention system and a minimum of 6-inch perforated under drain pipe would be sufficiently constructed underneath the tracks to provide equal runoff infiltration. Each option would improve the existing condition by preventing storm water runoff in the fill sections to flow into neighboring properties.

The upgraded side ditch/channel would be provided with short grass to intercept any oil or other contaminants that might flow from the track areas. Periodic maintenance of the grass-lined ditch would be necessary to ensure the water quality seeping into the ground water table. The drainage improvements for the local roadways resulting from the grade crossing elimination options are as follows:

#### **COVERT AVENUE GRADE CROSSING ELIMINATION**

Preliminary drainage design at this location includes installing a 1,100' underground recharge chamber system (3 rows of 72" corrugated metal pipe) under 3rd Avenue. Known utility locations and the footprint of this system necessitate the use of 3<sup>rd</sup> Avenue instead of 2<sup>nd</sup> Avenue. Approximately 12' of the southern lane on 3<sup>rd</sup> Avenue is available for MPT needs during construction. This system is approximately 22' deep to allow for gravity inflow without the use of pumps. The option of using pumps would reduce the overall depth to 9 feet (minimum 2' cover). A pump house would be located within the existing parking lane along 3<sup>rd</sup> Avenue.

Greater than two (2) feet of separation from the bottom of the recharge chamber to the known groundwater elevation is provided based on preliminary borings. The depth of cover and pipe perforation requires the use of a metal pipe to withstand the loading and meet service life requirements. This chamber system will require access manholes/risers at a recommended interval of 300'. An access manhole is also located within the underpass sidewalk prior to beginning of the chamber system to allow reduced access depth for maintenance. Pretreatment water quality devices are also located within the underpass to allow for ease of access.

An alternative drainage design includes installing an underground recharge chamber system outside of the public right-of-way at the northeast corner of the intersection of Covert Avenue and 2<sup>nd</sup> Avenue. This system would consist of precast concrete arch sections (17' maximum height, 86'x140' overall footprint). To allow for gravity inflow, the system would be approximately 36 feet deep (to the invert). The option of using pumps could reduce the overall depth to 19 feet. A pump station could be located within the same property as the basin.

The crowned underpass roadway requires the collection of runoff on both sides within the retained section of the proposed Covert Avenue improvements. 42" stormwater conveyance piping is required at the sag of the underpass to meet the Nassau County 100-yr design flood frequency requirement.

Another alternative drainage design would connect underpass drainage into an existing Nassau County recharge basin utilizing existing Nassau County drainage systems. These existing drainage systems may require upgrades or replacement as needed. This alternative may require the installation of new sewers (where sewers do not exist), connecting the underpass to existing sewers and may also necessitate pumping.

#### **SOUTH 12<sup>TH</sup> STREET GRADE CROSSING ELIMINATION**

Preliminary drainage design at this location includes installing a 520' x 30' underground recharge chamber system (2 rows of 144" corrugated metal pipe) under 3<sup>rd</sup> Avenue and a 200' x 120' underground recharge chamber system (8 rows of 144" corrugated metal pipe) under the existing municipal parking lot at the southwest corner of 3<sup>rd</sup> Avenue and South 12<sup>th</sup> Street. These systems will be hydraulically connected and function together as one storage system. These systems are approximately 28' deep to allow for gravity inflow without the use of pumps. Greater than two (2) feet of separation from the bottom of the recharge chamber to the known groundwater elevation is provided based on preliminary borings. The depth of cover and pipe perforation requires the use of a metal pipe to withstand the loading and meet service life requirements. This combined chamber system will require access manholes/risers at a recommended interval of 300'. An access manhole is also located within the underpass sidewalk prior to beginning of the chamber system under 3<sup>rd</sup> Avenue to allow reduced access depth for maintenance and within the existing street parking prior to chamber entrance under the municipal parking lot. Pretreatment water quality devices are also located within the underpass to allow for ease of access.

The one-way underpass roadway requires the collection of runoff on the east side within the retained section of the proposed South 12<sup>th</sup> Street improvements. 42" stormwater conveyance piping is required at the sag of the underpass to meet the Nassau County 100-year design flood frequency requirement.

#### **NEW HYDE PARK ROAD GRADE CROSSING ELIMINATION**

Preliminary drainage design at this location includes installing an underground recharge chamber system (9 rows of 144" corrugated metal pipe) under the proposed 'Kiss and Ride' at 115 New Hyde Park Road. This system would be approximately 31 feet deep to allow for gravity inflow without the use of pumps. The option of using pumps would reduce the overall depth to 14 feet (minimum 2' cover). A pump house can be located within the parking lot with the chamber system.

The 144" diameter makes transportation difficult and costly; however CMP can be fabricated on site when conditions allow (noise restrictions, etc.). Alternatively, a precast concrete arch system, measuring 140' x 210', with a maximum arch height, can store the same volume of water. This system would be approximately 30 feet deep to allow for gravity inflow without the use of pumps. The option of using pumps would reduce the overall depth to 11 feet (minimum 2' cover).

*These Alternatives can accommodate the four-lane and five-lane options provided that 115 New Hyde Park Road is acquired and can be utilized for underground stormwater storage.*

Greater than two (2) feet of separation from the bottom of the recharge chamber to the known groundwater elevation is provided based on preliminary borings. The depth of cover and pipe perforation requires the use of a metal pipe to withstand the loading and meet service life requirements. This chamber system will require access manholes/risers at each corner/bend in the configuration. An access manhole is also located within the underpass sidewalk prior to beginning of the chamber system to allow reduced access depth for maintenance. Pretreatment water quality devices are also located within the underpass to allow for ease of access.

The crowned underpass roadway requires the collection of runoff on both sides within the retained section of the proposed New Hyde Park Road improvements. 42" stormwater conveyance piping is required at the sag of the underpass to meet the Nassau County 100-year design flood frequency requirement.

Another alternative drainage design would connect underpass drainage into an existing Nassau County recharge basin utilizing existing Nassau County drainage systems. These existing drainage systems may require upgrades or replacement as needed. This alternative may require the installation of new sewers

(where sewers do not exist), connecting the underpass to existing sewers and may also necessitate pumping.

#### **MAIN STREET AND WILLIS AVENUE (MINEOLA AREA) GRADE CROSSING ELIMINATIONS**

Preliminary drainage design at this location includes installing a stormwater conveyance pipe (varying in size from 48" up to 60") at minimum slope for cleanout velocity, approximately 5,000' west to existing Nassau County Recharge Basin SWB 123 west of the intersection of Old Country Road and Herricks Road. This pipe collects runoff from both the Willis Avenue and Main Street underpasses. It runs south on Willis Avenue from the proposed Willis Avenue underpass then westerly down the center of 3rd Street (to avoid sewer lines) to Main Street. Runoff from the Main Street underpass is then picked up and the pipe run continues west along 3rd Street to the end. At 4<sup>th</sup> Avenue, the sewer turns south to Old Country Road. From there, it runs westerly along the northern curblin on Old Country Road to avoid known major utilities toward the Herricks Road intersection.

At Herricks Road, the sewer crosses Old Country Road and discharges into Basin SWB 123. Additional utility locations will assist in refining the pipe locations within each roadway. Alternatively, there is potential to connect to an existing box culvert located on the north side of Old Country Road, avoiding a crossing. However, this alternative requires the use of pumps to reduce the depth of the proposed sewer.

For sewers crossing Old Country road, the use of Micro Tunneling and Pipe Jacking is an option to avoid utility conflicts and traffic impacts. This method requires pits dug on each end, one for placement of the tunneling/jacking machine and one at the opposite end to receive the tunneling machine.

This system ranges from 25' deep near each underpass approach to 20' deep at Basin SWB 123 to allow for gravity flow without the use of pumps. Alternatively, a pump station could be used to raise the stormwater into a shallower sewer (minimum 9 feet depth, average 11 feet). Shallower construction also facilitates improved sewer slope, reducing the required sewer size to 48" diameter. A pump house can be located outside of the right-of-way within a property located at the northwest corner of the intersection of Main Street and 3<sup>rd</sup> Street.

Alternatively, new drainage systems along parallel routes, north or south of the track, could be considered which would connect underpass drainage into the existing Nassau County recharge basin.

Access manholes are provided at a recommended interval of 400'. An access manhole is also located within each underpass sidewalk prior to the beginning of the connection to the main conveyance pipe to Basin SWB 123 to allow reduced access depth for maintenance. Pre-treatment water quality devices are also located within each underpass to allow for ease of access.

The property located at 57 Main Street was determined not to be viable for stormwater detention/retention use. This property is not large enough to provide a footprint for the required runoff volume. Furthermore, construction feasibility and maintenance were major concerns putting an underground chamber system under a multi-story parking facility.

The crowned Willis Avenue underpass proposed roadway improvements require the collection of runoff on both sides within the retained section. 36" and 42" stormwater conveyance piping is required at the sag of the Main Street and Willis Avenue underpasses, respectively, to meet the Nassau County 100-yr design flood frequency requirement.

Existing Nassau County SWB 123 will be deepened and the bottom, scarified, and raked to provide the required additional runoff volume and improve infiltration. SWB 123 consists of four (4) interconnected quadrants with the southeast quadrant being deepened. The southwest quadrant was not proposed to be deepened as historic aeriols (as recent as 2009) show possible joint-use as a soccer field connected to the recreational complex to the south. The existing operating stages in this basin include a top/overflow EL 86.0 and bottom EL 75.0. Based on available information identified herein, SWB 123 is undersized by approximately 13 acre feet (i.e. 144.31 acre feet is required and 131.31 acre feet is provided). Furthermore, this basin may have bottom infiltration clogging issues. The low edge of pavement at the Main Street and Willis Avenue underpasses are approximately EL 83.0 and EL 85.0, respectively. Existing volume within SWB 123 at the lowest underpass edge of pavement is approximately 99.3 acre feet, less than the required 144.31 acre feet.

As a result of the Basin operating stage issues stated above another option was evaluated deepening the bottom of SWB 123 to EL 70.0 (15 ft. above GWT) at 1:2 slopes providing 58 acre-feet of volume to satisfy all volume requirements at the underpasses low edge of pavement elevations (144.31 – 99.3 = 45 acre-feet required). For this Drainage Option it is recommended to provide the volume required for the underpasses only and correspond with Nassau County on the function of the Basin, maintenance issues and further evaluate current operating stages to ensure the proposed underpasses do not flood from high stages in the Basin backing up the proposed conveyance system. Confirmation on design volumes for this Basin has been requested from Nassau County and the design will be revised accordingly upon receipt of this information. It is also recommended that a backflow prevention device be equipped in this conveyance system to counteract the potential operating stage conflicts.

#### **SCHOOL STREET GRADE CROSSING ELIMINATION**

Preliminary drainage design at this location includes installing a 30" storm water conveyance pipe at minimum slope for cleanout velocity, approximately 3,300' south to the existing Nassau County Recharge Basin SWB 315 south of Linden Avenue. This pipe runs south from the underpass under School Street along the western curb line to avoid sanitary and gas lines as well existing drainage lines. At Old Country Road, the sewer turns east along the north curb line to avoid utilities and minimize traffic impacts. Lastly, it will run south on Linden Avenue in between the sanitary and water main and discharge into existing Basin SWB 315. To cross Old Country Road, the use of Micro Tunneling and Pipe Jacking is an option to avoid utility conflicts and traffic impacts caused by trench installation.

This system ranges from 25' deep near the underpass approach to approximately 15' deep at Basin SWB 315 to allow for gravity flow without the use of pumps. Access manholes are provided at a recommended interval of 300'. An access manhole is also located within the underpass prior to beginning of the conveyance pipe to Basin SWB 315 to allow reduced access depth for maintenance. Pre-treatment water quality devices are also located within the underpass to allow for ease of access.

As an alternative, the use of pumps to raise stormwater into shallower sewers would reduce the sewer size to 18" diameter pipe and reduce the depth to 7 feet on average. This alternative also creates the possibility of connecting the sewer into an existing sewer within Old Country Road. This existing sewer is 54" diameter and drains south from Old Country Road within an easement (west of Linden Avenue) discharging into Basin SWB 315. A pump house can be located outside of the right-of-way within a property located at the northwest corner of the intersection of School Street and Railroad Avenue.

Pumps also create the possibility of connecting into one of two existing sewers located within Union Avenue to the north of the School Street crossing. Additional information is required to validate the capacity of the Union Avenue sewers. A pump house can be located outside of the right-of-way within a property located at the northeast corner of the intersection of School Street and the LIRR right-of-way.

The crowned underpass roadway requires the collection of runoff on both sides within the retained section of the proposed School Street improvements. 24" storm water conveyance piping is required at the sag of the underpass to meet the Nassau County 100-yr design flood frequency requirement.

According to correspondence between Nassau County and the project team, the existing Basin SWB 315 has a volume shortage of approximately 25 acre-feet for the 8" design storm event. To meet this project's volume requirement, existing Basin SWB 315 will be deepened at the north-western side to EL 81.0 at 1:2 slopes yielding 1.3 acre-feet. However, the low edge of pavement at the School Street underpass is approximately EL 91.0. The existing operating stages in this basin include a rim/overflow EL 95.0 and bottom EL 84. The available volume within Basin SWB 315 at the underpass low edge of pavement elevation is approximately 23.3 acre-feet, less than the required 64.6 acre-feet per the correspondence referenced above.

As a result of the Basin operating stage issues stated above another option was evaluated deepening the entire bottom of Basin SWB 315 to EL 69.0 (3 ft. above GWT) at 1:2 slopes providing 42 acre-feet of volume to satisfy all volume requirements at the underpass low edge of pavement elevation (64.6 – 23.3 + 1.1 = 42 acre-feet required). For this Drainage Alternative it is recommended to provide the volume required for the underpass only and correspond with Nassau County on the function of the Basin, maintenance issues and further evaluate the current operating stages to ensure the proposed underpass does not flood from high stages in the Basin backing up the proposed conveyance system. It is also recommended that a backflow prevention device be equipped in this conveyance system to counteract the potential operating stage conflicts.

Alternatively, connecting underpass drainage into an existing Nassau County recharge basin using other parallel routes may be considered.

#### **URBAN AVENUE GRADE CROSSING ELIMINATION**

Preliminary drainage design at this location includes installing a 60" stormwater conveyance pipe at minimum slope for cleanout velocity, approximately 3,500' south to existing Nassau County Recharge Basin SWB 51 south of Old Country Road. This pipe runs south under Urban Avenue along the western curblineline to avoid gas & sewer lines, westerly a short distance under Old Country Road along the northern curblineline, crosses Old Country Road, southerly on Grand Boulevard along the eastern curblineline and then easterly into Basin SWB 51 under Lindy Road along the northern curblineline. Additional utility locates will assist in refining the pipe locations within each roadway. To cross Old Country Road, the use of Micro Tunneling and Pipe Jacking is an option to avoid utility conflicts and traffic impacts caused by trench installation.

This system ranges from 25' deep near the underpass approach to 15' deep at Basin SWB 51 to allow for gravity flow without the use of pumps. Access manholes are provided at a recommended interval of 400'. An access manhole is also located within the underpass sidewalk prior to beginning of the conveyance pipe to Basin SWB 51 to allow reduced access depth for maintenance. Pre-treatment water quality devices are also located within the underpass to allow for ease of access.

Alternatively, pumps could be utilized to move the pre-treated runoff to the existing 60" storm sewer located within Rushmore Avenue which drains into the existing county recharge basin. This alternative would require a 48" diameter pipe at 10' depth from the Urban Avenue crossing, extending south along Urban Avenue, then west along Main Street to Rushmore Avenue.

An existing sewer within Railroad Avenue (north of the underpass) discharges to an existing sewer within Rushmore Avenue. The existing Railroad Avenue sewer is in conflict with the proposed tunnel alignment and must be rerouted. This alternative proposes to replace the Railroad Avenue sewer, designed to capture and convey the 100-year design flow, preventing the water from reaching the underpass. It includes a new sewer alignment terminating at the existing Rushmore Avenue sewer, ultimately maintaining existing drainage patterns.

Two properties at the southwest corner of the Urban Avenue and LIRR intersection were reviewed and determined not viable to use for stormwater detention/retention. These properties are not large enough to provide a footprint for the required runoff volume. Furthermore, future development on these properties would be hindered by placement of underground infrastructure.

The crowned underpass roadway requires the collection of runoff on both sides within the retained section of the proposed Covert Avenue improvements. 54" stormwater conveyance piping is required at the sag of the underpass to meet the Nassau County 100-year design flood frequency requirement.

According to correspondence from Nassau County, the existing Basin SWB 51 has approximately 28.6 acre-feet of excess volume available. This is within 1 acre-feet of what is required based on the attached calculations. A standalone option to deepen Basin SWB 51 at the proposed pipe inflow location was also analyzed to meet the volume requirements. Either option appears viable at this point in the design process and the use of the excess volume capacity is recommended. However, further investigation into the operations and maintenance history of SWB 51 is recommended during final design to ensure excess volume provided in the Basin is sufficient. The existing operating stages in this basin include a top/overflow EL 108.0 and bottom EL 96.0. The low edge of pavement at the Urban Ave underpass is approximately EL 108.0. Backflow of volume from the basin into the underpass, via the new conveyance pipe, is not anticipated based on the above.

#### **3.6.8 PLANNED UTILITY PROJECTS**

A 13kV feeder, maintained by PSEG-LI, currently feeds power to three substations along the corridor, and has been programmed for relocation. All three feeders must be maintained at all times; otherwise, the power supply to the LIRR would be compromised. Relocating the feeders during construction of the LIRR Expansion would require coordination between LIRR and PSEG-LI, especially in several locations where available ROW is limited, in particular, immediately east of Roslyn Road and east of the Carle Place Station. One feeder (Mineola Feeder) is under consideration for replacement in the near future. Accordingly, PSEG-LI is considering delaying implementation of this initial feeder replacement.

#### **3.7 PASSENGER STATIONS**

As part of the LIRR Expansion Project, the following modifications are proposed to be implemented at all of the stations in the Project Corridor. All stations shall meet the requirements as required in the LIRR station guidelines and applicable codes including NFPA 130 and the NY State Building code:

- Remove all platforms and replace with platforms to accommodate a 12 car consist (platforms would be heated to facilitate snow removal).
- Provide 8'-0" wide side platforms meeting LIRR minimum station guidelines, but providing 10'-0" wide platforms where feasible.
- Provide platform canopies for both the eastbound and westbound platforms meeting LIRR minimum station guidelines.
- Provide canopies over egress walkways.
- Platform furnishings and accoutrements per LIRR station guidelines.
- Pedestrian overpasses would be provided for at all stations except Westbury Station to connect

the eastbound and westbound platforms. The existing pedestrian tunnel located at Westbury Station would be extended to accommodate the construction of the new third track alignment above. All overpasses would be provided with elevators (unless noted otherwise) for ADA access and covered stairs for general access at each platform.

- All Platforms would be provided with a minimum of four (4) sets of stairs to comply with NYS Code and LIRR station guidelines for egress requirements (stairs would be heated to facilitate snow removal).
- All platforms would be provided with a minimum of two (2) ADA compliant ramps per NYS accessibility code requirements (ramps would be heated to facilitate snow removal).
- LIRR would work with local villages to establish memoranda of understanding to reaffirm maintenance and security responsibilities for each station area. LIRR would also provide initial funding and explore longer term license agreements with villages or community groups interested in landscaping and gardening in station areas.

LIRR station guidelines designate use levels for each station based on the daily ridership. These use levels dictate specific requirements that must be followed for each station use level unless directed by LIRR to deviate from the requirements. These requirements include, but are not limited to; station building requirements, waiting room areas, bench quantity, shelter size & quantity, and lavatory planning requirements. Typically most use level requirements are shared between levels 1 and 2, and then between levels 3, 4, and 5 with slight variations. See Table 3-9 for existing and proposed ridership and station levels.

### 3.7.1 NEW HYDE PARK STATION

New Hyde Park station is currently designated as a use level 2 station (2,000 – 6,000 passengers per day), but current projections indicate the ridership will increase and the station will become a use level 1 station (greater than 6,000 passengers per day). The change in station use level from 2 to 1 does not change the LIRR station requirements per the station guidelines. The existing station building located north of the westbound platform will remain.

In order to accommodate the new third track, the existing eastbound (southern) platform is proposed to be demolished and replaced with a new 8'-0" wide side platform relocated just south of the new third track. The existing westbound (northern) platform is proposed to be demolished and replaced with a new 8'-0" wide side platform, in its existing location, with slight adjustment for proposed track alignment modifications. Access to the platforms would be provided by four (4) new stairways and two (2) ADA accessible ramps. Per LIRR direction elevators would not be provided if they are not required. The ADA ramps are sufficient to provide ADA compliant access to the platforms from grade.

The egress/access at the eastern end of both platforms would be coordinated with the NYSDOT reconfiguration at New Hyde Park Road. Access from New Hyde Park Road would be provided from NYSDOT sidewalks located on both the east and west side of the road. Access from the west side of New Hyde Park Road would be a direct stair connection to the platforms at a distance no farther than 85 feet from the end of platform. Access from the east side of New Hyde Park Road would be provided via walkways proceeding west to the platform stairs.

Access from eastbound to westbound platform would be provided by a new pedestrian overpass with elevators and covered stairs at each platform complying with ADA requirements. The overpass would be located west of South 12<sup>th</sup> Street providing equal cross track access for able and disabled passengers. Other enhancements, such as a plaza area, with green space, located on 3<sup>rd</sup> Ave east of Baer Place to

the existing dead end, are being considered. The entire portion of Third Avenue at this location would be permanently closed.

The top of rail would remain relatively unchanged and therefore the top of the finished platforms would be constructed at approximately the same height as the existing, 4'-2" above top of rail. The station would be provided with small platform shelters, canopies, and benches per LIRR station guidelines. One (1) shelter would be provided on the eastbound platform and (2) two on the westbound platform. The eastbound platform would be provided with (2) two benches and the westbound platform (4) four benches per LIRR station guidelines.

### 3.7.2 MERILLON AVENUE STATION

Merillon station is currently designated as a use level 3 station (1,000 – 1,999 passengers per day), but current projections indicate the ridership will increase and the station will become a use level 2 station (2,000 – 6,000 passengers per day). The change in station use level from 3 to 2 places Merillon into a different tier, which has additional requirements which would not have been included at the existing station.

LIRR station guidelines recommend that Merillon station be provided with a station building that has all the amenities as indicated for a level 1 use. However, a station building would not be provided under this project per LIRR direction.

In order to accommodate the new third track, the existing eastbound (southern) platform is proposed to be demolished and replaced with a new 8'-0" wide side platform located just south of the new third track. The existing building would be demolished to make room for additional parking. The existing westbound (northern) platform is proposed to be demolished and replaced with a new 8'-0" wide side platform, in its existing location, with slight adjustment for proposed track alignment modifications.

Access to the platforms would be provided by four (4) new stairways and two (2) ADA accessible ramps. Per LIRR direction elevators would not be provided if they are not required. The ADA ramps are sufficient to provide ADA compliant access from platform to grade. Stairs and ADA ramps located on the westbound platform west of the station building plaza would be provided with an ADA compliant walkways at grade, situated between the platform and existing LIRR ROW. The walkway would provide access and emergency egress to the east parking area and 5<sup>th</sup> Ave located west of the station.

Access from eastbound to westbound platform would be provided by a new pedestrian overpass with elevators and covered stairs at each platform complying with ADA requirements. The new pedestrian overpass would be located in the southwest corner of the westbound parking lot directly adjacent to the platform providing equal cross track access for able and disabled passengers.

The top of rail would remain relatively unchanged and therefore the top of the finished platforms would be constructed at approximately the same height as the existing, 4'-2" above top of rail.

The station would be provided with small platform shelters, canopies, and benches per LIRR station guidelines. One (1) shelter would be provided on the eastbound platform and (2) two on the westbound platform. The eastbound platform would be provided with (2) two benches and the westbound platform (4) four benches per LIRR station guidelines.

### 3.7.3 MINEOLA STATION

Mineola station is currently designated as a use level 1 station (greater than 6,000 passengers per day)

which will not change with the predicted future ridership. The existing station building located north of the westbound platform will remain. The existing south side waiting room is proposed to be removed.

The existing eastbound (southern) platform adjacent to the Mineola Intermodal Center is proposed to be demolished and replaced by a new 8'-0" wide side platform located just south of the new third track. The existing westbound (northern) platform is proposed to be demolished and replaced, in its existing location, with slight adjustment for proposed track alignment modifications. The existing ROW provides sufficient clearance to permit a 10'-0" wide westbound platform. The westbound platform would be coordinated and aligned with the existing station plaza finished elevation. Access to the station is primarily at grade providing multiple ADA access points, thus ADA ramps are not required. The east and west end of the platform are slightly above grade requiring one (1) set of stairs at each end of both the eastbound and westbound platforms.

The top of rail would remain relatively unchanged and therefore the top of the finished platforms would be constructed at approximately the same height as the existing, 4'-2" above top of rail. The existing pedestrian overpass at the eastern end of the existing platforms would be demolished and a new pedestrian overpass with stairs would be constructed in its place. The existing pedestrian overpass located at the parking facility on the eastbound platform provides ADA compliant elevator access from platform to platform. No elevators would be required at the new pedestrian overpass.

The station would be provided with small platform shelters, canopies, and benches per LIRR station guidelines. One (1) shelter would be provided on the eastbound platform and (2) two on the westbound platform. The eastbound platform would be provided with (2) two benches and the westbound platform (4) four benches per LIRR station guidelines.

### 3.7.4 CARLE PLACE STATION

Carle Place station is currently designated as a use level 4 station (101 – 999 passengers per day), but current projections indicate the ridership will increase and the station will become a use level 3 station (1,000 – 1,999 passengers per day). The change in station use level from 4 to 3 does not change the LIRR station requirements per the station guidelines. The change in use level does not warrant the construction of a station building unless requested by LIRR due to ridership demands.

In order to accommodate the new third track, the existing westbound (northern) platform is proposed to be demolished and replaced with a new 8'-0" wide side platform located just north of the new third track. The existing eastbound (southern) platform is proposed to be demolished and replaced, in its existing location, with slight adjustment for proposed track alignment modifications. The existing ROW provides sufficient clearance to permit a 10'-0" wide eastbound and westbound platform, but would not be provided. Access to the platforms would be provided by four (4) new stairways and two (2) ADA accessible ramps. Per LIRR direction elevators would not be provided if they are not required. The ADA ramps are sufficient to provide ADA compliant access from platform to grade. ADA compliant walkways at grade would be provided between both eastbound and westbound platforms and their respective LIRR ROW limits. The walkways would provide access and emergency egress to Carle Road, Stonehinge Lane, Garden Avenue, and the stairs located at the west end of the platform provide access to Cherry Lane.

The existing station overpass would be demolished to accommodate the third track and a new pedestrian overpass would be provided with elevators and covered stairs at each platform complying with ADA requirements. The overpass would be centrally located on Stonehinge Lane in the approximate location that the existing overpass is currently situated.

The top of rail would remain relatively unchanged and therefore the top of the finished platforms would be constructed at approximately the same height as the existing, 4'-2" above top of rail.

The station would be provided with small platform shelters, canopies, and benches per LIRR station guidelines. One (1) small platform shelter would be provided on the eastbound platform and a combination of one (1) small shelter and (1) large shelter on the westbound platform per LIRR station guidelines. The eastbound platform would be provided with no benches and the westbound platform (2) two benches per LIRR station guidelines.

### 3.7.5 WESTBURY STATION

Westbury station is currently designated as a use level 2 station (2,000 – 6,000 passengers per day), but current projections indicate the ridership will increase and the station will become a use level 1 station (greater than 6,000 passengers per day). The change in station use level from 2 to 1 does not change the LIRR station requirements per the station guidelines. The existing station building located north of the westbound platform would remain.

In order to accommodate the new third track, the existing eastbound (southern) platform is proposed to be demolished and replaced by a new 8'-0" wide platform located to the south of the new third track and built on top of the retaining wall. The existing westbound (northern) platform is proposed to be demolished and replaced, in its existing location, with slight adjustment for proposed track alignment modifications. The existing ROW provides sufficient clearance to permit a 10'-0" wide westbound platform. Access to the platforms would be provided by four (4) new stairways and two (2) ADA accessible ramps. Per LIRR direction elevators would not be provided if they are not required. The ADA ramps are sufficient to provide ADA compliant access from platform to grade.

The existing station pedestrian tunnel connecting the eastbound and westbound platform would remain in place. The tunnel would be extended to accommodate construction of the third track above and upgraded to current LIRR guidelines. One set of ADA ramps would be located adjacent to the existing pedestrian tunnel and station building providing equal ADA access from platform to platform.

Access from eastbound to westbound platform would be provided with a new pedestrian overpass with elevators and covered stairs at each platform complying with ADA requirements. The overpass would be located within the limits of the proposed parking facility located in the existing south parking lot.

The east portion of the eastbound platform designed to meet the minimum LIRR platform width of 8 ft. is within close proximity to the existing LIRR ROW. Due to the proximity of the platform to the ROW and the surrounding properties, a code compliant means of egress cannot be provided away from the LIRR ROW. In order to provide passengers with a mean to egress the east end of the platform, a second overpass with elevators and covered stairs would be located at the end of the platform to provide emergency egress from the eastbound platform to the westbound platform.

The top of rail would remain relatively unchanged and therefore the top of the finished platforms would be constructed at approximately the same height as the existing, 4'-2" above top of rail. The station would be provided with small platform shelters, canopies and benches per LIRR station guidelines. One (1) shelter would be provided on the eastbound platform and (2) two on the westbound platform. The eastbound platform would be provided with (2) two benches and the westbound platform (4) four benches per LIRR station guidelines.

**Table 3-9 Station Use Level and Ridership**

Design Element	LIRR Standard	Carle Place		Merillon		Mineola		New Hyde Park		Westbury	
		Existing	2040 (Build)	Existing	2040 (Build)	Existing	2040 (Build)	Existing	2040 (Build)	Existing	2040 (Build)
<b>Station Use Level – Passengers Per Day</b>											
Use Level 1	Greater than 6,000					X	X		X		X
Use Level 2	2,000-6,000				X			X		X	
Use Level 3	1,000-1,999		X	X							
Use Level 4	101-1,000	X									
Use Level 5	Less than 100										
<b>Peak Ridership (AM, 1 hour)</b>											
Westbound Side Platform	On:	131	219	279	466	1,333	2,229	585	978	504	843
	Off:	2	4	6	10	296	494	23	38	24	40
Eastbound Side Platform	On:	1	2	2	4	64	104	11	18	11	18
	Off:	14	22	14	24	326	531	42	68	109	177
<b>Peak Ridership (PM, 1 hour)</b>											
Westbound Side Platform	On:	18	32	30	53	371	655	64	113	73	129
	Off:	5	8	8	14	85	150	20	35	17	30
Eastbound Side Platform	On:	4	7	8	14	228	414	24	43	18	32
	Off:	99	179	240	436	915	1,660	501	909	417	757
<b>Daily Ridership</b>											
Total (assumed highest growth factor for proposed, 1.81)		921	1,667	1,882	3,406	13,085	23,684	3,984	7,211	3,861	6,988

### 3.7.6 HICKSVILLE STATION

Modifications to Hicksville Station, including installation of new platforms, heated and glass-enclosed platform waiting rooms, lighting, communications systems, signs, stairways, elevators and escalators, are included in a separate MTA LIRR project, Hicksville Station and North Track Siding Improvements.

The LIRR Expansion Project's scope for Hicksville Station includes the removal of the existing concrete curbing and roofing system previously installed to cover an opening in the viaduct left by the abandoned south east platform stair. See Section 3.9 for viaduct repairs at the above referenced opening.

### 3.8 BRIDGES

Table 3-10 provides a bridge matrix that describes the work that is proposed for the existing bridges on the Project Corridor between Floral Park and Hicksville.

### 3.9 OTHER STRUCTURES

Due to the proposed track changes at the east end of Hicksville Station through the Jerusalem Avenue Bridge, a structural assessment study was performed to determine the following.

- Adequacy of viaduct deck to support the track in its proposed realigned position
- Adequacy of bridge beams to support the track in its proposed realigned position

Separate STAAD models were developed for each structure type. The concrete deck of the Hicksville Viaduct was modeled using the equivalent frame method in accordance with ACI 318-05, Section 13.7. The deck was sectioned into 'column strips' to represent the dropped panel areas and 'intermediate strips' to represent the thinner cross-section between column lines. A two-way slab analysis was used. The section properties of the floor beams of the Jerusalem Avenue Bridge were input directly into the model for this structure. To achieve realistic distribution of wheel loads to the floor beams, the section properties of the rail and concrete deck were included in the model.

For both structures, load rating analysis was performed on the existing and proposed track alignment for E80, M7, DE30 and 286k freight equipment considering different combinations of train moves. The E rating for the Jerusalem Avenue Bridge with the proposed track alignment is above the current controlling rating of E-75. The E-rating for the Hicksville Viaduct decreases from its current value of E-49 to E-45 for the proposed track alignment. Although the E-rating decreases, the capacity of the structure is adequate to support the equipment actually operating on LIRR property. If it is desirable to maintain the Viaduct at its current load rating then this can be accomplished by introducing a concrete column into the structure.

### 3.10 CULVERTS

There is only one culvert that crosses the LIRR's ROW between Floral Park and Hicksville. The culvert is located at Milepost 20.40 between Meadowbrook Parkway and Cherry Lane in Carle Place. Initial investigation indicates that construction of the new third track and associated retaining walls on the north side of the ROW adjacent to Atlantic Avenue would not impact the culvert. However, a more detailed investigation is recommended in the final engineering phase of the LIRR Expansion Project to develop a protection strategy so that the culvert is not impacted during retaining wall construction.

### 3.11 REDUCED ASPECT SIGNALS (RAS)

RAS provides the following:

- Eliminate the need for signal bridges and special track work associated with those bridges.
- Existing cantilever signal bridges would be removed.

Reduced aspect signals would be operational before existing signal bridges would be retired and demolished at the applicable locations. Signal installation would be coordinated with track construction.

### 3.12 DEMOLISHED STRUCTURES

Several structures would need to be demolished for the construction of the new third track. This section does not discuss the demolition of structures for the replacement or modification of proposed improvements or modifications such as retaining walls, bridges and station platforms, but addresses buildings and other structures that are associated with real property such as buildings, garages, sheds and industrial facilities.

The following structures are assumed to require partial or full demolition or relocation on account of the new third track construction and the grade crossing eliminations:

- New Hyde Park; Block 110; Lots 296-299,312
  - Commercial property (auto repair shop) to be demolished for surface parking lot to accommodate Covert Avenue grade crossing elimination.
- New Hyde Park; Block 386; Lots 6-34
  - Commercial property (self-storage facility) to be demolished for drainage purposes and surface parking lot to accommodate New Hyde Park Road grade crossing elimination Option 1.
- Mineola; Block 210; Lots 229, 378
  - Garage for residential apartment complex to be demolished and reconstructed to accommodate retaining wall construction for new third track.
- New Cassel; Block 243; Lots 36,51,52
  - Industrial property to be demolished to accommodate elevator, drainage and access for School Street grade crossing elimination.
- New Cassel; Block 174, Lots 63-66
  - Industrial property to be demolished to accommodate access for Urban Avenue grade crossing elimination.
- New Cassel; Block 178, Lots 82, 84
  - Building on industrial property to potentially be demolished and relocated to accommodate access for Urban Avenue grade crossing elimination.

Table 3-10 Bridge Matrix

Structure ID	Name	Jurisdiction	Existing Structure Type	Proposed Structure Type	Track Center to Existing ML Track	New Structure North or South from Existing ML Track	Existing Roadway Under RR Clearance	Proposed Roadway Under RR Clearance	Roadway Over RR Clearance	Vertical Clearance Issues	Notes
60-O-151	South Tyson Avenue Hempstead Branch	Village of Floral Park	Two separate viaduct structures; one for the Main Line and one for the Hempstead line. Both structures consist of two-track ballasted concrete deck through-girder with shared middle girder.	Widen existing Hempstead track spans over station parking. Widen and retrofit existing bridge over South Tyson Avenue which currently supports Hempstead tracks.  Construct new bents on east side of South Tyson Avenue.	N/A	South	14'-0"	14'-0"	N/A	Re-use existing vertical clearance at existing bridge for new bridge.	Existing. Hempstead Track 1 outages during construction.
11-O-152	Plainfield Avenue	Nassau County	Two-track ballasted concrete deck through-girder with shared middle girder, separate one-track ballasted concrete deck through-girder for abandoned siding track to the north of Mainline Bridge.	Construct separate single-track ballasted steel deck through-girder bridge to the south.  Construct new bents for new single track span over Plainfield Avenue.  Profile of new third track would be approximately 2'-0" higher than existing Main Line tracks to avoid reprofiling roadway at Plainfield Avenue/Terrance Avenue intersection.	Varies 25'-4" +/- to 27'-5" +/-	South	13'-9" (12'-9" Posted)	14'-0"	N/A	Re-use existing vertical clearance at existing bridge for new bridge. Set new bridge higher to maintain same roadway clearance to underside of new span without changing roadway profile.	New retaining wall or bents along Terrance Avenue.
11-O-169	Tanners Pond / Denton Avenue	Village of Garden City	Multi-stringer with open wood deck bearing on existing masonry abutments.	Reconstruct entire bridge for 14'-0" track centers between existing Main Line Track 2 and new third track. New three-track ballasted steel deck through-girder with shared girders between tracks. Extend existing abutments and wingwalls beyond new third track bridge.	14'-0"	South	13'-11" (12'-9" Posted)	14'-0"	N/A	Re-use existing vertical clearance at existing bridge for new bridge.	Provide signalized traffic control devices for bi-directional single lane operation.
11-O-174	Nassau Boulevard	Nassau County	Ballasted concrete deck through-girder with separate girders for each track.	Replace existing bridge with through girder ballasted steel deck.  Profile of new bridge would be approximately 2'-0" higher than existing Main Line tracks.	14'-0"	South	12'-7"	14'-0"	N/A	Increase vertical clearance for new bridge.	Build new span at higher elevation than existing mainline tracks in order to achieve track profile changes at new Nassau 1.
11-O-181	Herricks Road	Nassau County	Three-track two-span multiple concrete box beam structure.	New third track alignment consistent with existing geometry of bridge. New structure not required.	14'-0"	South	14'-6"	14'-6"	N/A	None	None
11-B-186	Mineola Boulevard	Nassau County	Overhead bridge structure.	No change to structure.	N/A	N/A	N/A	N/A	20'-6"	None	None

Structure ID	Name	Jurisdiction	Existing Structure Type	Proposed Structure Type	Track Center to Existing ML Track	New Structure North or South from Existing ML Track	Existing Roadway Under RR Clearance	Proposed Roadway Under RR Clearance	Roadway Over RR Clearance	Vertical Clearance Issues	Notes
11-O-188	Roslyn Road	Nassau County	Three-track ballasted deck through-girder with shared girder for New Third Track and Main Line Track 2.	New third track alignment consistent with existing geometry of bridge. New structure not required.	17'-8"	South	14'-8"	14'-8"	N/A	None	None
13-O-199	Glen Cove Road	Nassau County	Ballasted concrete deck through-girder with shared middle girder.	Reconstruct entire bridge for 14'-0" track centers between existing Main Line and new third track. New three-track ballasted steel deck through-girder with shared girders between tracks.	14'-0"	North	14'-1"	14'-1"	N/A	Re-use existing vertical clearance at existing bridge for new bridge.	None
13-O-201	Meadowbrook Parkway	NYSDOT	Multi-stringer with ballasted concrete deck.	Construct separate steel stringer bridge to match existing bridge adjacent to existing bridge at 14'-0" track centers. Extend existing bridge abutments and wingwalls beyond new third track bridge.	14'-0"	North	13'-2"	13'-2"	N/A	Re-use existing vertical clearance at existing bridge for new bridge.	The existing bridge spans to a pier at midspan that is in the divider of the parkway. For the new bridge to be of similar construction and look (ie. depth), it would also need to span to a pier at midspan.
13-O-205	Cherry Lane	Town of North Hempstead	Ballasted concrete deck through-girder with shared middle girder.	Replace existing bridge with through girder, steel deck and ballast.  Extend existing bridge abutments and wingwalls beyond new third track bridge.	14'-0"	North	13'-10" (12'-10" Posted)	14'-0"	N/A	Re-use existing vertical clearance at existing bridge for new bridge.	Re-profile Cherry Lane and Atlantic Avenue. New retaining wall along Atlantic Avenue (On north side of RR).  Existing sight distance on Atlantic Avenue to be maintained or improved.
13-B-210	Ellison Avenue	Village of Westbury	Overhead bridge structure.	No change to structure.	N/A	N/A	N/A	N/A	19'-6"	None	None
13-O-214	Post Avenue	Village of Westbury / Nassau County	Under construction.	No change to structure.	13'-0"	N/A	14'-1"	14'-1"	N/A	None	None
13-B-222	Grand Boulevard	Town of North Hempstead	Overhead bridge structure.	No change to structure.	N/A	N/A	N/A	N/A	18'-0"	Center new three-track alignment under bridge. No waiver required.	None

Structure ID	Name	Jurisdiction	Existing Structure Type	Proposed Structure Type	Track Center to Existing ML Track	New Structure North or South from Existing ML Track	Existing Roadway Under RR Clearance	Proposed Roadway Under RR Clearance	Roadway Over RR Clearance	Vertical Clearance Issues	Notes
13-B-233	Wantagh State Parkway	NYS DOT	Overhead bridge structure.	No change to structure.	N/A	N/A	N/A	N/A	20'-6"	New third track would be on current North Siding Track alignment - No Impacts.	None
13-O-234	Charlotte Avenue	Town of Oyster Bay	Three-track two-span multiple concrete box beam structure.	New third track alignment would be on current North Siding Track alignment - No impact to bridge.	14'-0"	North	15'-1"	15'-1"	N/A	None	None
13-O-247	Newbridge Road Ramp	NYS DOT	Through plate girder.	None. Divide 4 modification does not require any modifications of existing structure.	N/A	N/A	14'-2"	14'-2"	N/A	None	None
13-O-248	Jerusalem Avenue	Nassau County	Through plate girder.	None. Divide 4 modification does not require any modifications of existing structure.	N/A	N/A	14'-2"	14'-2"	N/A	None	None

### 3.13 TRACTION POWER AND SUBSTATIONS

There are a total of eight (8) existing LIRR traction power substations within the project limits.

The following are the specific locations of these substations:

- Substation G13 in Floral Park, located on Plainfield Avenue opposite 111 Plainfield Avenue.
- Substation G14 in New Hyde Park, located at Third Avenue and South 9th Street south of the railroad.
- Substation G15, the Merillon Avenue substation, located at Atlantic Avenue and Hilton Avenue.
- Substation G16 in Mineola, located at the southwest corner of Main Street and Front Street.
- Substation G17 in Carle Place, located in the southeast quadrant of Meadowbrook State Parkway and the LIRR just north of Mallard Road.
- Substation G18 in Westbury, located southeast of Union Avenue and Sullivan Street north of the LIRR.
- Substation G19 in New Cassel, located at Broadway and Bond Street north of the LIRR.
- Substation G20 in Hicksville, located on the south side of West Barclay Street near Marion Place.

With the exception of the recent replacement of G13 Substation in Floral Park in 2010, the remaining seven (7) substations need to be enhanced to accommodate the new third track. These seven existing substations are over 45 years old and near the end of their operating service life. Their present age/condition and the inability to obtain spare parts warrant that these substations be replaced rather than modified.

The replacement substations are to occupy the same parcels as the present equipment. To accomplish this, prefabricated substation equipment would be used to expedite the implementation of the new units. This would allow the existing substations to function for a longer period of time, as the prefabricated building can be constructed and factory tested offsite until such time it is deemed necessary to de-energize the existing equipment.

At this time, the LIRR has assumed that a maximum of two substations may be taken out of service to support the initial construction staging of this project. These two locations must be non-adjacent locations. A final load flow simulation would be required to verify this assumption, and the load flow assessment would continue to determine the order of substation shutdowns to complete the traction power system. With these existing substations being taken out of service, all remaining traction power substation equipment is to operate within their ratings and provide acceptable third rail voltage (510Vdc minimum) when LIRR is running at their peak time table. LIRR recognizes when in this configuration, they will be operating their system in the “N-1” condition, such that an outage in any of the remaining substation equipment/components may cause impact to train service.

To mitigate any potential long term outage situation, three (3) mobile traction power substations would be designed and provided under this project. One is to be used as an emergency back-up that can be transported/connected into the existing traction infrastructure in the event a substation failure occurred during the period when already in the substation outage condition. The other two units shall be used during construction to facilitate substation removals/replacements.

In addition, the plan to replace the existing steel contact rail with a stainless steel capped aluminum contact rail helps to limit voltage drop in the system. Such contact rail replacement will assist in our approach of removing a substation from service in the affected power block.

### 3.14 SIGNAL SYSTEM AND SIGNAL BLOCK TOWER

Signal system equipment would be replaced as the Proposed Project is constructed between “Floral Park” and “Divide 4” in Hicksville. The replacement signal equipment would be in place before existing equipment would be retired and removed. The replacement signal equipment would be redundant vital microprocessor based systems at interlockings and relay based master locations in accordance with LIRR standards.

The existing signal block tower and SCADA system will be retired and replaced with a SCADA system located in Jamaica Control Center. The replacement system would have back-up control from both Queens and Divide towers.

The new signal system would be designed to support construction staging and allow for portions of the new third track and interlockings to be placed in service and tie into the existing system where applicable.

### 3.15 COMMUNICATIONS

Communications work at the stations and along the Project Corridor would include installing new equipment and infrastructure, relocating existing equipment, and coordinating with LIRR for the relocation or installation of equipment by force account.

#### 3.15.1 STATION COMMUNICATIONS

At five of the seven stations, platforms would be retired. The communications work at the five stations would consist of:

- The installation of public address (PA), CCTV and Audio Visual Paging System (AVPS)
- Relocation of Ticket Vending Machines (TVMs)
- Providing all conduits and cabling for station PA, CCTV, TVMs, and AVPS
- Relocating existing LIRR Telephone (“T- boxes”) during construction and installing them in permanent locations
- Installing new communications huts and communications equipment

Provide connectivity for:

- The primary and back-up SCADA systems between the office and each interlocking
- The PTC system between the office and the wayside communications system.

#### 3.15.2 BACKBONE COMMUNICATIONS

Along the Project Corridor, track work would require segments of the pole line supporting the existing communications backbone to be relocated. The existing communications cables would be maintained and protected throughout construction and new poles would be installed where required to avoid conflicting with the track work. New fiber and copper cables would be installed between Floral Park and Hicksville to replace the existing fiber and copper cables.

Through the backbone, provide connectivity for the following:

- Between each station and JCC
- Station to station

- The primary and back-up SCADA systems between the office and each interlocking
- The PTC system between the office and the wayside communications system.

### 3.16 MODIFICATIONS OF ADJACENT ROADWAYS

As part of the LIRR Expansion Project, the following modifications are proposed to roadways that cross or parallel the Project Corridor:

- Floral Park:
  - Due to the widening of the Plainfield Avenue bridge, a retaining wall is proposed along the north edge of Terrace Avenue. The purpose of the retaining wall is to avoid the potential impacts to the existing sidewalk and the roadway.
- New Hyde Park:
  - A retaining structure is proposed between the Main Line tracks and the north edge of the 5<sup>th</sup> and 6<sup>th</sup> Avenues in order to avoid any potential impacts to the 5<sup>th</sup> and 6<sup>th</sup> Avenue roadways. There are no roadway grade changes proposed along 5<sup>th</sup> and 6<sup>th</sup> Avenues.
  - A retaining structure is proposed between the Main Line tracks and the entire northern edge of 3<sup>rd</sup> Avenue. Along the entire length of 3<sup>rd</sup> Avenue, its width would be reduced to accommodate the new third track. This reduction would result in loss of parking spaces along 3<sup>rd</sup> Avenue, as described in Section 3.17- Parking.
  - The Covert Avenue grade crossing elimination would affect the following roadways:
    - Wayne Ave - approximately 150 feet of roadway would be reconstructed on the existing horizontal alignment to maintain access to the lowered Covert Avenue profile.
    - Third Avenue - the profile would be raised to provide through traffic movements over the underpass. Approximately 450 feet of roadway would need to be reconstructed.
    - Second Avenue – similar to Third Avenue, the profile would be raised to provide through traffic movements over the underpass. Approximately 450 feet of roadway would need to be reconstructed.
  - The South 12<sup>th</sup> Street grade crossing elimination options would affect the following roadways:
    - Option 1 (Permanent Crossing Closure with Pedestrian Bridge) - There would be no impact to side streets, but there would be changes to local traffic patterns.
    - Option 2 (One-Way Underpass with Sidewalk) - There would be no impact to side streets, but there would be changes to local traffic patterns.
- New Hyde Park and Garden City:
  - The New Hyde Park Road grade crossing elimination options would affect the following roadways:
    - Option 1 (Five-Lane Underpass with Kiss and Ride Northwest of Tracks):
    - Clinch Avenue – approximately 200 feet of the roadway would be reconstructed to maintain access to the lowered New Hyde Park Road Underpass profile. The roadway would be realigned to intersect with New Hyde Park Road at a right angle.
    - Greenridge Avenue – the existing access from New Hyde Park Road to Greenridge Avenue loop would be eliminated. A new two-lane roadway would be constructed at the southern section of the loop to provide access to Clinch Avenue.
    - Plaza Avenue – Plaza Avenue, west of New Hyde Park Road would be reconfigured and aligned with Plaza Avenue, east of New Hyde Park Road. This would eliminate the offset intersection condition and provide for a better traffic flow through the intersection. Approximately 350 feet of the roadway would be reconstructed to maintain access to the lowered New Hyde Park Road Avenue Underpass profile.
- Mineola:
  - A retaining structure is proposed between the Main Line tracks and the north edge of the Front Street.
  - The Main Street grade crossing elimination options would affect the following roadways:
    - Option 1 (Permanent Crossing Closure with Pedestrian Bridge):
    - There is no major reconstruction to the existing roadway in this option. However, a new traffic pattern would be required to accommodate the closing of the Main Street Crossing. Two-way traffic would be permitted for Front Street north of the tracks. Main Street would remain two-way, both north and south of the tracks.
    - Option 2 (One-Way Underpass with Pedestrian Bridge):
    - Front Street (north of tracks) – in this option, Main Street underpass access from Front Street north of the tracks would be eliminated. However, two-way traffic would be permitted along Front Street between Main Street and the Citibank parking lot on the north side of Front Street.
  - The Willis Avenue grade crossing elimination options would affect the following roadways:
    - Option 1 (Two-Way Underpass):
    - Front Street (west of tracks) – the one-way, west direction of traffic would be reversed to one-way, east direction. This would allow traffic from Front Street to proceed onto the southbound lane of Willis Avenue. In addition, a new segment of Willis Ave would be constructed at-grade adjacent to the east underpass retaining wall to provide for a connection between Front Street, west of Willis Avenue and Front Street, east of Willis Avenue.
    - Front Street (east of tracks) – the one-way roadway would be reversed from the west to the east direction.
    - Second Street - approximately 350 feet of roadway would be reconstructed on the existing horizontal alignment to maintain access to the lowered Willis Avenue profile.
    - Option 2 (One-Way Underpass)
    - In this option, impacts to Front Street and Second Street would be similar to Option 1.
- Westbury and New Cassel:
  - The School Street grade crossing elimination would affect the following roadway:
    - Railroad Avenue – approximately 200 feet would be reconstructed to maintain access to the lowered School Street Profile.
- New Cassel:
  - The new third track would be constructed adjacent to Railroad Avenue on the north side of the Project Corridor.
  - The Urban Avenue grade crossing elimination would affect the following roadway:
    - Railroad Avenue - the roadway profile would be raised approximately 3 feet

through the intersection at Urban Avenue. Approximately 300 feet of Railroad Avenue would need to be reconstructed through the intersection of Railroad Avenue and Urban Avenue.

### 3.17 PARKING

As part of the LIRR Expansion Project, parking facilities would be impacted by the addition of the new third track, new parking facilities, and by the grade crossing eliminations.

The impact on parking at the stations would result from the addition of the new third track and new parking facilities, as follows:

- New Hyde Park Station
  - On the south side of the station and along 3<sup>rd</sup> Avenue, there are 177 head-on parking spaces that would be affected by the new third track alignment. 51 parallel parking spaces would replace the affected parking spaces, for a net loss of 126 parking spaces on the south side.
  - On the north side of the station and along 2<sup>nd</sup> Avenue, there are 25 head-on parking spaces that would be affected by the new station platform. While the proposed platform would be in the same location as the existing platform, stairs and handicapped ramps are proposed at the rear of the platform in existing parking spaces.
  - A new 95-space surface parking lot is proposed at 115 New Hyde Park Road between Plaza Avenue and Second Avenue
  - In summary, the net total loss at New Hyde Park Station would be 56 spaces.
- Merillon Avenue Station
  - No parking impacts to Main Avenue/Merillon Avenue on the south side of the station.
  - On the north side of the station, 13 spaces would be lost due to the proposed stairs and ramps on the new platform.
  - In summary, the net total loss at Merillon Station would be 13 spaces.
- Mineola Station
  - On the south side, 35 head-on parking spaces would be affected by the new third track alignment. It is anticipated that all of these spaces could be relocated along Station Road.
  - No parking impacts to the north side of the station.
  - A new 424-space seven-level parking deck (with one level below grade) is proposed on Second Street between Main Street and Willis Avenue on an existing 102-space surface parking lot. The total supply of 424 parking spaces would be a net increase of 322 parking spaces.
  - A new 553-space six-level parking deck (with one level below grade) is proposed on an existing 120-space parking lot west of Mineola Boulevard between Harrison Avenue and First Street. The total supply of 553 parking spaces would be a net increase of 433 parking spaces.
  - In summary, the net total gain at Mineola Station would be 755 spaces.
- Carle Place Station
  - No parking impacts to the south side of the station.
  - On the north side of the station, just west of Stonehinge Lane, there are 14 head-on parking spaces which would be replaced by five parallel parking spaces for a net loss of 9 parking spaces.
  - In summary, the net total loss at Carle Place Station would be 9 spaces.
- Westbury Station
  - On the south side, 7 handicap parking spaces would be impacted by stairs and ramps on the east end of the station. Another 13 regular parking spaces would be impacted by

- stairs and ramps on the west end of the station, for a total loss of 20 parking spaces.
- No parking impacts to the south side of the station.
- A new four-level parking deck is proposed on the south side of the LIRR tracks in the existing 302-space surface lot. The new 503-space parking deck would occupy the central portion of the existing parking lot leaving the east and west ends open for 123 surface parking spots to remain. The total supply of 626 parking spaces would be a net increase of 324 parking spaces.
- A new four-level parking deck is proposed on the north side of the LIRR tracks in an existing 275-space surface parking lot south of Scally Place. The 630-space parking deck would retain 52 existing surface spaces to yield a total supply of 682 parking spaces, a net increase of 407 parking spaces.
- In summary, the total net gain at Westbury Station would be 711 spaces.
- Hicksville Station
  - A new four-level 608-space parking deck (with one level below grade) is proposed on the north side of the LIRR tracks south of West Barclay Street on an existing 190-space surface lot. The total supply of 608 parking spaces would be a net increase of 418 parking spaces.
  - A new four-level 675-space parking deck is proposed on the north side of the LIRR tracks north of West Barclay Street on an existing 184-space surface parking lot. The total supply of 675 parking spaces would be a net increase of 491 parking spaces.
  - In summary, the total net gain at Hicksville Station would be 909 spaces.

The impact on parking that serves LIRR commuters and local residents for each of the feasible grade crossing elimination options is as follows:

- Covert Avenue
  - The grade crossing elimination at Covert Avenue would result in the reduction of 10 on-street parking spaces.
- South 12<sup>th</sup> Street
  - South 12<sup>th</sup> Street Option 1 would result in the addition of 10 spaces along 2<sup>nd</sup> Avenue north of the tracks. Refer to New Hyde Park Station information above for parking impacts east of South 12<sup>th</sup> Street.
  - South 12<sup>th</sup> Street Option 2 would result in a net reduction of approximately 25 on-street parking spaces. Refer to New Hyde Park Station information above for parking impacts east of South 12<sup>th</sup> Street.
- New Hyde Park Road
  - Refer to New Hyde Park Station information above.
- Main Street
  - Main Street Option 1 would result in the reduction of approximately 3 on-street parking spaces.
  - Main Street Option 2 would result in the addition of approximately 5 on-street parking spaces.
- Willis Avenue
  - Willis Avenue Option 1 would result in a net reduction of approximately 31 on-street parking spaces.
  - Willis Avenue Option 2 would result in a net addition of approximately 3 on-street parking spaces.
- School Street

- At the School Street crossing there are no parking accommodations for the LIRR commuters so School Street Option 1A and Option 1B would not impact existing parking conditions.
- Urban Avenue
  - The grade crossing elimination at Urban Avenue would result in a net reduction of approximately 6 on-street parking spaces.

### 3.18 CONSTRUCTION ASSESSMENT

The success of any construction project is the well planned and thought out staging and phasing of the work, namely identifying what key work items are predecessors, those activities that affect the critical path, and the interdependency of the work with respect to third parties such as utilities.

From a construction perspective, the LIRR Expansion Project can be divided into 2 distinct regions – (1) Floral Park to Mineola Station; and (2) Mineola Station to Hicksville. Although one project, the work is largely similar in nature throughout the Project Corridor, so staged properly, crews can work on multiple sites at once, or crews doing similar work can move from one location to the next maintaining consistency and efficiency.

The largest project drivers include:

- Staging the grade crossing eliminations to minimize the impacts to communities.
  - Relocate utilities at the grade crossings prior to the start of major construction work.
  - Between Covert Avenue, New Hyde Park Road and South 12<sup>th</sup> Street, 2 of the 3 should remain open at all times. The suggested sequence is to first eliminate the New Hyde Park Road grade crossing, followed by Covert Avenue, then South 12<sup>th</sup> Street.
  - The Willis Avenue and Main Street grade crossing eliminations should be performed separately so that one remains open at all times. The suggested sequence is to first eliminate the Willis Avenue grade crossing followed by Main Street.
  - The Urban Street and School Street grade crossing eliminations should be performed separately so that one remains open at all times. The suggested sequence is to first eliminate the Urban Street grade crossing followed by School Street.
- Relocation of LIRR Nassau Tower east of Main Street, including relocating operations facilities.
- Staging and Access for the Contractor
  - All work to be performed within the LIRR ROW or designated work zones as provided by the Contract. Because of the limited work space within the LIRR ROW for labor, material and equipment, the Contractor will likely need off-site staging and material storage areas, trucking into the work site as needed.
  - Possible rail delivery of materials in locations where available track sidings for loading and unloading are available.
- Work Adjacent to the Railroad
  - Concerns for fouling track and track outages.
  - Contractor will install retaining walls in a narrow corridor, in some cases less than 20 feet from the adjacent active track, requiring sheeting and excavation to eliminate working on the tracks and being limited to track outages.
  - Rail operations will be affected at locations where the track elevations will be raised. For example, the rail profile will be raised approximately 5 feet at the Covert Avenue grade crossing elimination.

Other factors affecting the work include:

- Traffic Detours and Road/Lane Closures
  - Construction of the bridges, either in-place or roll-in, will require lane closures and/or

- road closures over long weekends to lift prefabricated bridge components into place.
- Bridge abutment construction may require continuous lane closures adjacent to the work for crane access, concrete trucks and drilling operations.
- Station Construction
  - Maintaining passenger access to current operative platforms and/or providing temporary platforms and bridges for passenger access.
  - Where feasible, demolish half of a platform at a time and use prefabricated platform elements to ease construction and reduce construction time.
- Track Installation and Switches
  - New “third” track and ballast to be installed at appropriate work hours.
  - New switches and signal tie-in most likely during weekend track outages.

## 4.0 DRAWINGS

### 4.1 PROPOSED PROJECT SHOWN ON AERIAL MAPS

#### Legend Sheet

Sheet 1 of 21 – Floral Park and Bellerose Village  
 Sheet 2 of 21 – Floral Park and New Hyde Park  
 Sheet 3 of 21 – New Hyde Park  
 Sheet 4A of 21 – New Hyde Park, North New Hyde Park and Garden City – Alternate A  
 Sheet 4B of 21 – New Hyde Park, North New Hyde Park and Garden City – Alternate B  
 Sheet 5 of 21 – Garden City, New Hyde Park, North New Hyde Park and Garden City Park  
 Sheet 6 of 21 – Garden City and Garden City Park  
 Sheet 7 of 21 – Garden City, Mineola and Garden City Park  
 Sheet 8A of 21 – Mineola and Garden City – Alternate A  
 Sheet 8B of 21 – Mineola and Garden City – Alternate B  
 Sheet 9 of 21 – Mineola and Garden City  
 Sheet 10 of 21 – Mineola and Carle Place  
 Sheet 11 of 21 – Carle Place  
 Sheet 12 of 21 – Carle Place and Westbury  
 Sheet 13 of 21 – Westbury  
 Sheet 14A of 21 – Westbury and New Cassel – Alternate A  
 Sheet 14B of 21 – Westbury and New Cassel – Alternate B  
 Sheet 15 of 21 – New Cassel  
 Sheet 16A of 21 – New Cassel – Alternate A  
 Sheet 16B of 21 – New Cassel – Alternate B  
 Sheet 17 of 21 – New Cassel and Hicksville  
 Sheet 18 of 21 – Hicksville  
 Sheet 19 of 21 – Hicksville  
 Sheet 20 of 21 – Hicksville  
 Sheet 21 of 21 – Floral Park and New Hyde Park

### 4.2 CONCEPTUAL ENGINEERING DRAWINGS

#### GENERAL

G01—General Notes and Abbreviations, Sheet 1 of 1  
 G02—Legend, Sheet 1 of 1  
 G03—Turnout Single Line Diagrams, Sheet 1 of 1

#### SCHEMATIC DIAGRAMS OF ALTERNATIVES

SC01—Future w/o the Proposed Project - Schematic Diagram, Sheet 1 of 1  
 SC02—Proposed Project Alternative - Schematic Diagram, Sheet 1 of 1

#### TYPICAL SECTIONS AND DETAILS

S01—Proposed Project Alternative—Typical Sections, At-Grade, Sheet 1 of 7  
 S02—Proposed Project Alternative—Typical Sections, Raised Railroad, Sheet 2 of 7  
 S03—Proposed Project Alternative—Typical Sections, Railroad in Cut, Sheet 3 of 7  
 S04—Proposed Project Alternative—Typical Sections, Absolute Minimums, Sheet 4 of 7  
 S05—Proposed Project Alternative—Typical Sections, Station Platform Relocation 1, Sheet 5 of 7

S06—Proposed Project Alternative—Typical Sections, Station Platform Relocation 2, Sheet 6 of 7  
 S07—Proposed Project Alternative—Typical Sections, Station Platform Relocation 3, Sheet 7 of 7  
 S08—Proposed Project Alternative—Typical Track Sections, Sheet 1 of 3  
 S09—Proposed Project Alternative—Typical Track Sections, Sheet 2 of 3  
 S10—Proposed Project Alternative—Typical Track Sections, Sheet 3 of 3

#### KEY PLAN

KP01—Proposed Project Alternative—Key Plan Index, Sheet 1 of 1

#### PLANS AND PROFILES

T-PP-001—Proposed Project Alternative Plan and Profile—Floral Park, Sheet 1 of 46  
 T-PP-002—Proposed Project Alternative Plan and Profile—Floral Park, Sheet 2 of 46  
 T-PP-003—Proposed Project Alternative Plan and Profile—Floral Park, Sheet 3 of 46  
 T-PP-004—Proposed Project Alternative Plan and Profile—Floral Park and New Hyde Park, Sheet 4 of 46  
 T-PP-005—Proposed Project Alternative Plan and Profile—New Hyde Park, Sheet 5 of 46  
 T-PP-006A—Proposed Project Alternative Plan and Profile - Option “A” Plan —New Hyde Park, Sheet 6A of 46  
 T-PP-006B—Proposed Project Alternative Plan and Profile - Option “B” Plan —New Hyde Park, Sheet 6B of 46  
 T-PP-007A—Proposed Project Alternative Plan and Profile - Option “A” Plan—New Hyde Park and Garden City, Sheet 7A of 46  
 T-PP-007B—Proposed Project Alternative Plan and Profile - Option “B” Plan—New Hyde Park and Garden City, Sheet 7B of 46  
 T-PP-008—Proposed Project Alternative Plan and Profile—Garden City and New Hyde Park, Sheet 8 of 46  
 T-PP-009—Proposed Project Alternative Plan and Profile—Garden City and New Hyde Park, Sheet 9 of 46  
 T-PP-010—Proposed Project Alternative Plan and Profile—Garden City, Sheet 10 of 46  
 T-PP-011—Proposed Project Alternative Plan and Profile—Garden City and Garden City Park, Sheet 11 of 46  
 T-PP-012—Proposed Project Alternative Plan and Profile—Garden City and Garden City Park, Sheet 12 of 46  
 T-PP-013—Proposed Project Alternative Plan and Profile—Garden City Park and Mineola, Sheet 13 of 46  
 T-PP-014—Proposed Project Alternative Plan and Profile—Mineola, Sheet 14 of 46  
 T-PP-015—Proposed Project Alternative Plan and Profile—Mineola, Sheet 15 of 46  
 T-PP-016A—Proposed Project Alternative Plan and Profile - Option “A” Plan —Mineola, Sheet 16A of 46  
 T-PP-016B—Proposed Project Alternative Plan and Profile - Option “B” Plan —Mineola, Sheet 16B of 46  
 T-PP-017—Proposed Project Alternative Plan and Profile—Mineola, Sheet 17 of 46  
 T-PP-018—Proposed Project Alternative Plan and Profile—Mineola, Sheet 18 of 46  
 T-PP-019—Proposed Project Alternative Plan and Profile—Mineola and Carle Place, Sheet 19 of 46  
 T-PP-020—Proposed Project Alternative Plan and Profile—Carle Place, Sheet 20 of 46  
 T-PP-021—Proposed Project Alternative Plan and Profile—Carle Place, Sheet 21 of 46  
 T-PP-022—Proposed Project Alternative Plan and Profile—Carle Place, Sheet 22 of 46  
 T-PP-023—Proposed Project Alternative Plan and Profile—Carle Place, Sheet 23 of 46  
 T-PP-024—Proposed Project Alternative Plan and Profile—Carle Place and Westbury, Sheet 24 of 46

46

T-PP-025—Proposed Project Alternative Plan and Profile—Westbury, Sheet 25 of 46  
 T-PP-026—Proposed Project Alternative Plan and Profile—Westbury, Sheet 26 of 46  
 T-PP-027—Proposed Project Alternative Plan and Profile—Westbury, Sheet 27 of 46  
 T-PP-028A—Proposed Project Alternative Plan and Profile - Option “A” Plan—Westbury and New Cassel, Sheet 28A of 46  
 T-PP-028B—Proposed Project Alternative Plan and Profile - Option “B” Plan—Westbury and New Cassel, Sheet 28B of 46  
 T-PP-029—Proposed Project Alternative Plan and Profile—New Cassel, Sheet 29 of 46  
 T-PP-030—Proposed Project Alternative Plan and Profile—New Cassel, Sheet 30 of 46  
 T-PP-031A—Proposed Project Alternative Plan and Profile - Option “A” Plan—New Cassel, Sheet 31A of 46  
 T-PP-031B—Proposed Project Alternative Plan and Profile - Option “B” Plan—New Cassel, Sheet 31B of 46  
 T-PP-032A—Proposed Project Alternative Plan and Profile - Option “A” Plan—New Cassel, Sheet 32A of 46  
 T-PP-032B—Proposed Project Alternative Plan and Profile - Option “B” Plan—New Cassel, Sheet 32B of 46  
 T-PP-033—Proposed Project Alternative Plan and Profile—New Cassel, Sheet 33 of 46  
 T-PP-034—Proposed Project Alternative Plan and Profile—New Cassel and Hicksville, Sheet 34 of 46  
 T-PP-035—Proposed Project Alternative Plan and Profile—Hicksville, Sheet 35 of 46  
 T-PP-036—Proposed Project Alternative Plan and Profile—Hicksville, Sheet 36 of 46  
 T-PP-037—Proposed Project Alternative Plan and Profile—Hicksville, Sheet 37 of 46  
 T-PP-038—Proposed Project Alternative Plan and Profile—Hicksville, Sheet 38 of 46  
 T-PP-039—Proposed Project Alternative Plan and Profile—Hicksville, Sheet 39 of 46  
 T-PP-040—Proposed Project Alternative Plan and Profile—Hicksville, Sheet 40 of 46  
 T-PP-041—Proposed Project Alternative Plan and Profile - Interlocking Detail—Hicksville, Sheet 41 of 46  
 T-PP-042—Proposed Project Alternative Plan and Profile—Floral Park - Hempstead Branch 1, Sheet 42 of 46  
 T-PP-043—Proposed Project Alternative Plan and Profile—Floral Park - Hempstead Branch 2, Sheet 43 of 46  
 T-PP-044—Proposed Project Alternative Plan and Profile—Floral Park - Hempstead Branch 3, Sheet 44 of 46  
 T-PP-045—Proposed Project Alternative Plan and Profile - Oyster Bay Branch 1, Sheet 45 of 46  
 T-PP-046—Proposed Project Alternative Plan and Profile—Oyster Bay Branch 2, Sheet 46 of 46

**BRIDGE AND VIADUCT DRAWINGS**

BA001—Proposed Project Alternative—South Tyson Avenue Bridge, Sheet 1 of 2  
 BA002—Proposed Project Alternative—South Tyson Avenue Bridge, Sheet 2 of 2  
 BB001—Proposed Project Alternative—Plainfield Avenue Bridge, Sheet 1 of 1  
 BC001—Proposed Project Alternative—Denton Avenue Bridge, Sheet 1 of 1  
 BD001—Proposed Project Alternative—Nassau Boulevard Bridge, Sheet 1 of 1  
 BE001—Proposed Project Alternative—Glen Cove Road Bridge, Sheet 1 of 1

BF001—Proposed Project Alternative—Meadowbrook Parkway Bridge, Sheet 1 of 1  
 BG001—Proposed Project Alternative—Cherry Lane Bridge, Sheet 1 of 1  
 BP001—Proposed Project Alternative—Hicksville Station Platform ‘B’ East End Stairway Elimination, Sheet 1 of 1

**4.3 NYSDOT GRADE CROSSING DRAWINGS**

GCC01 – Covert Ave. Crossing – Alternative 1  
 GCC02 – South 12<sup>th</sup> Street Crossing – Alternative 1  
 GCC03 – South 12<sup>th</sup> Street Crossing – Alternative 2  
 GCC04 – New Hyde Park Road Crossing – Alternative 1  
 GCC05 – New Hyde Park Road Crossing – Alternative 2  
 GCC06 – Main Street Crossing – Alternative 1  
 GCC07 – Main Street Crossing – Alternative 2  
 GCC08 – Willis Avenue Crossing – Alternative 1  
 GCC09 – Willis Avenue Crossing – Alternative 2  
 GCC10 – School Street Crossing – Alternative 1A  
 GCC11 – School Street Crossing – Alternative 1B  
 GCC12 – Urban Avenue Crossing – Alternative 1A  
 GCC13 – Urban Avenue Crossing – Alternative 1B

# Long Island Rail Road

LIRR Expansion Project From  
Floral Park to Hicksville

Legend Sheet

November 21, 2016

Project Location



LIRR MAIN LINE



**DRAFT**

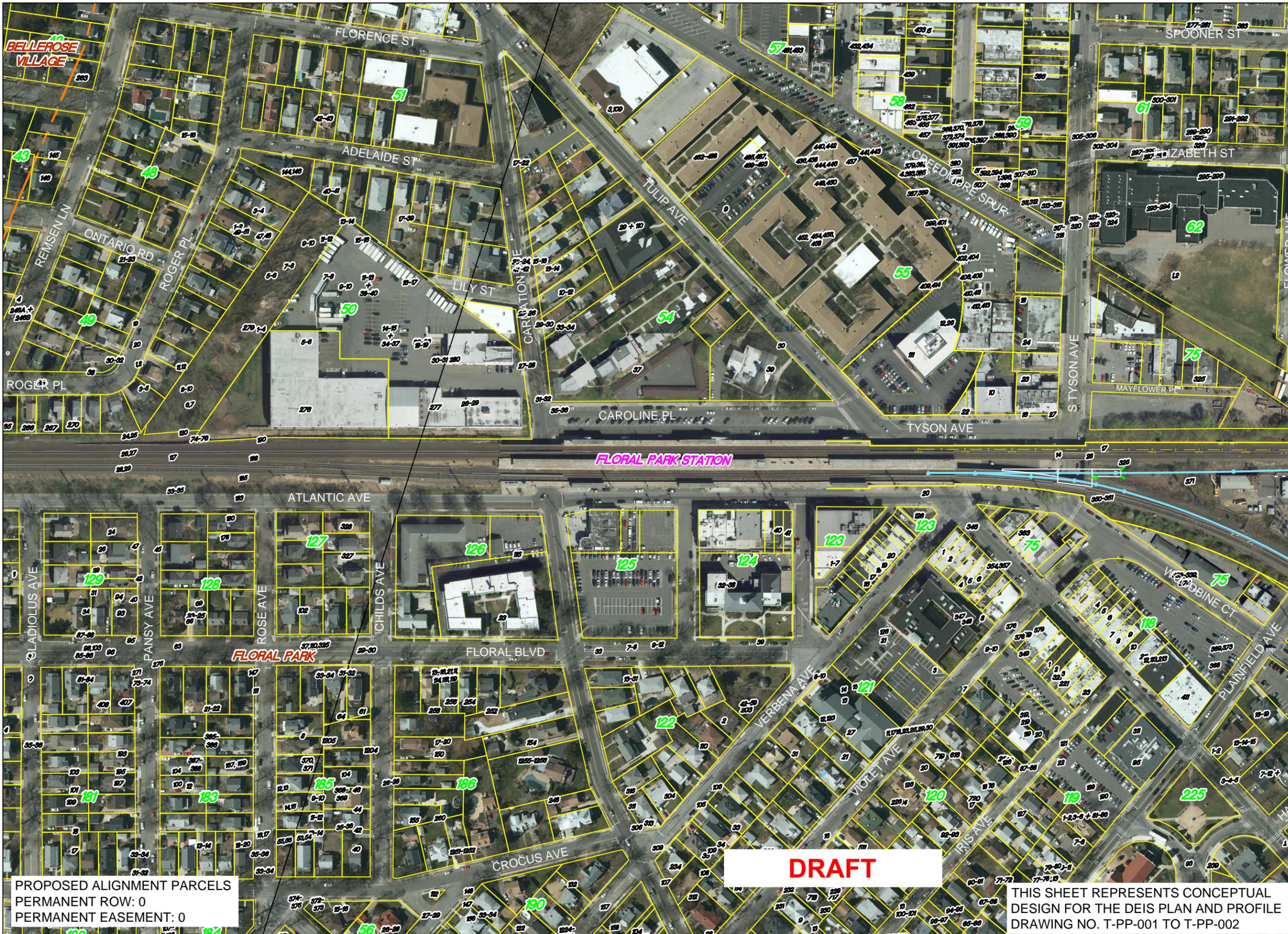


## Legend

-  Permanent ROW, Partial Acquisition
-  Permanent Easement Acquisition
-  Permanent ROW, Full Acquisition
-  Temporary Easement
-  Community Boundary
-  Floral Park Recreation Center Pedestrian Underpass Improvement
-  Existing Facilities or Under Construction Roadway (Not Part of LIRR Expansion)
-  Track to be Removed
-  Proposed Track Alignment
-  New or Relocated Station Platforms
-  Sound Attenuation Wall
-  Retaining Walls
-  Tax Parcel Boundary
-  Impacted National Register Listed and/or Eligible Cultural Resources
-  Proposed or Modified Traffic Signal
-  Proposed Bridge Construction
-  Proposed Roadway Realignment for Grade Crossing Elimination
-  Proposed Walkway

## Annotation

-  Block Number
-  Lot Number
-  Lot with Permanent Easement Acquisition
-  Lot with Temporary Easement
-  Block and Lot with Permanent ROW Acquisition
-  COMMUNITY Community Name



PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-001 TO T-PP-002

# Long Island Rail Road

LIRR Expansion Project From  
 Floral Park to Hicksville  
 Floral Park and Bellerose  
 Village

Sheet 1 of 21

November 21, 2016

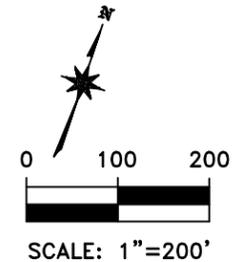


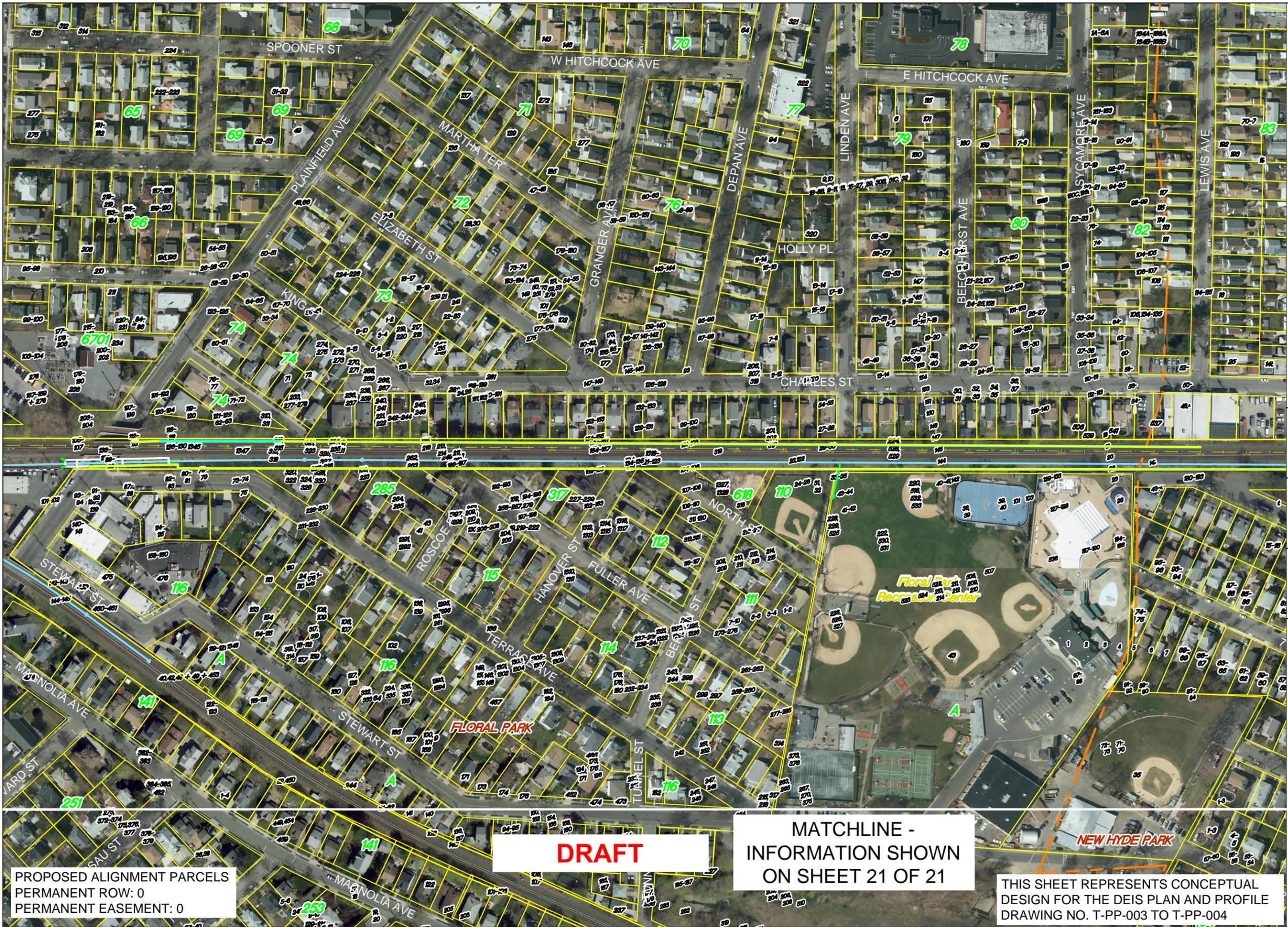
ENLARGED AREA



Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
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 2013

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**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Floral Park and New Hyde Park

Sheet 2 of 21

November 21, 2016



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2013

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0 100 200

SCALE: 1"=200'



PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

**DRAFT**

MATCHLINE -  
INFORMATION SHOWN  
ON SHEET 21 OF 21

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-003 TO T-PP-004

**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville

New Hyde Park

Sheet 3 of 21

November 21, 2016

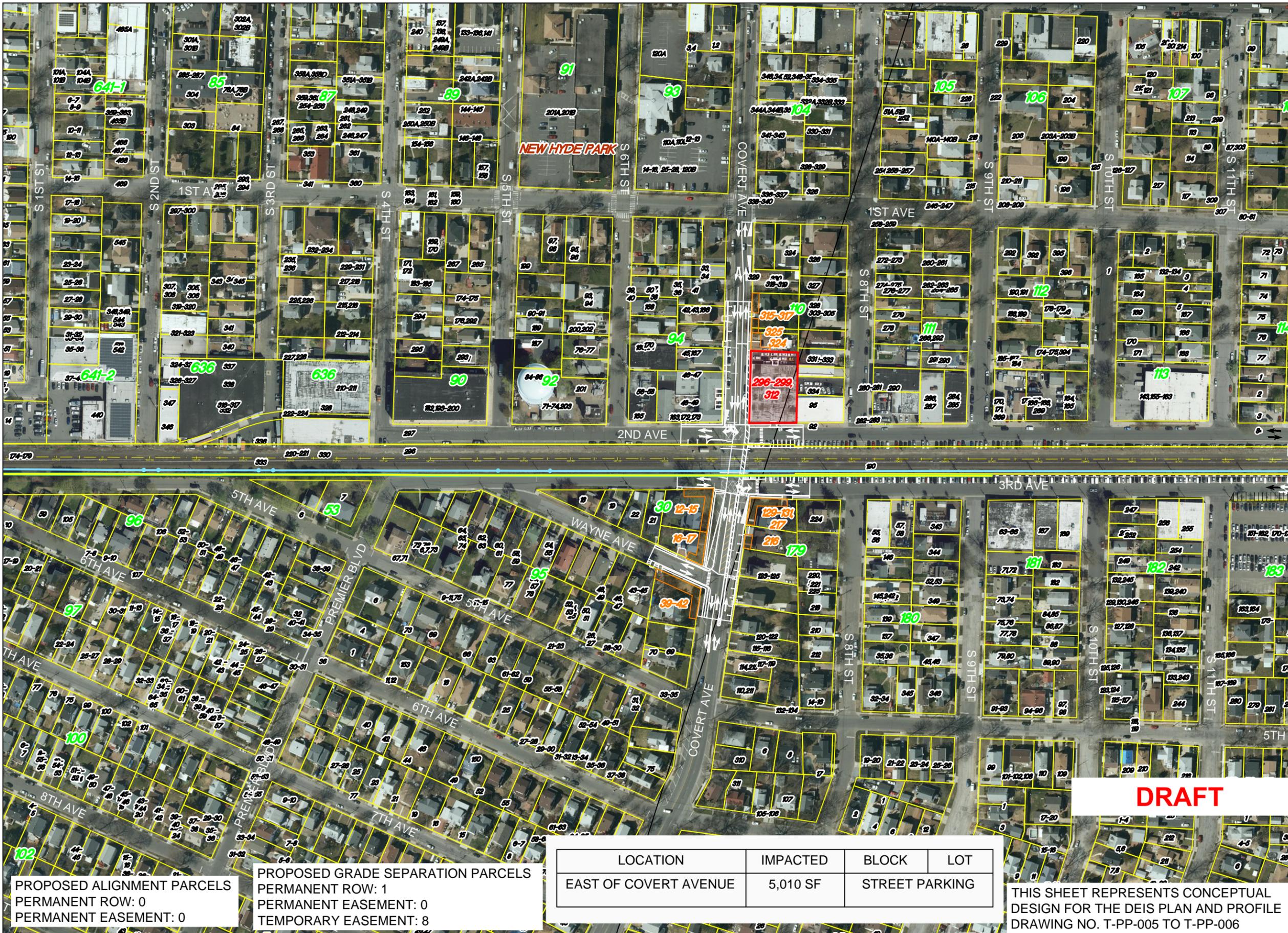
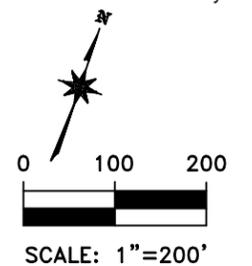


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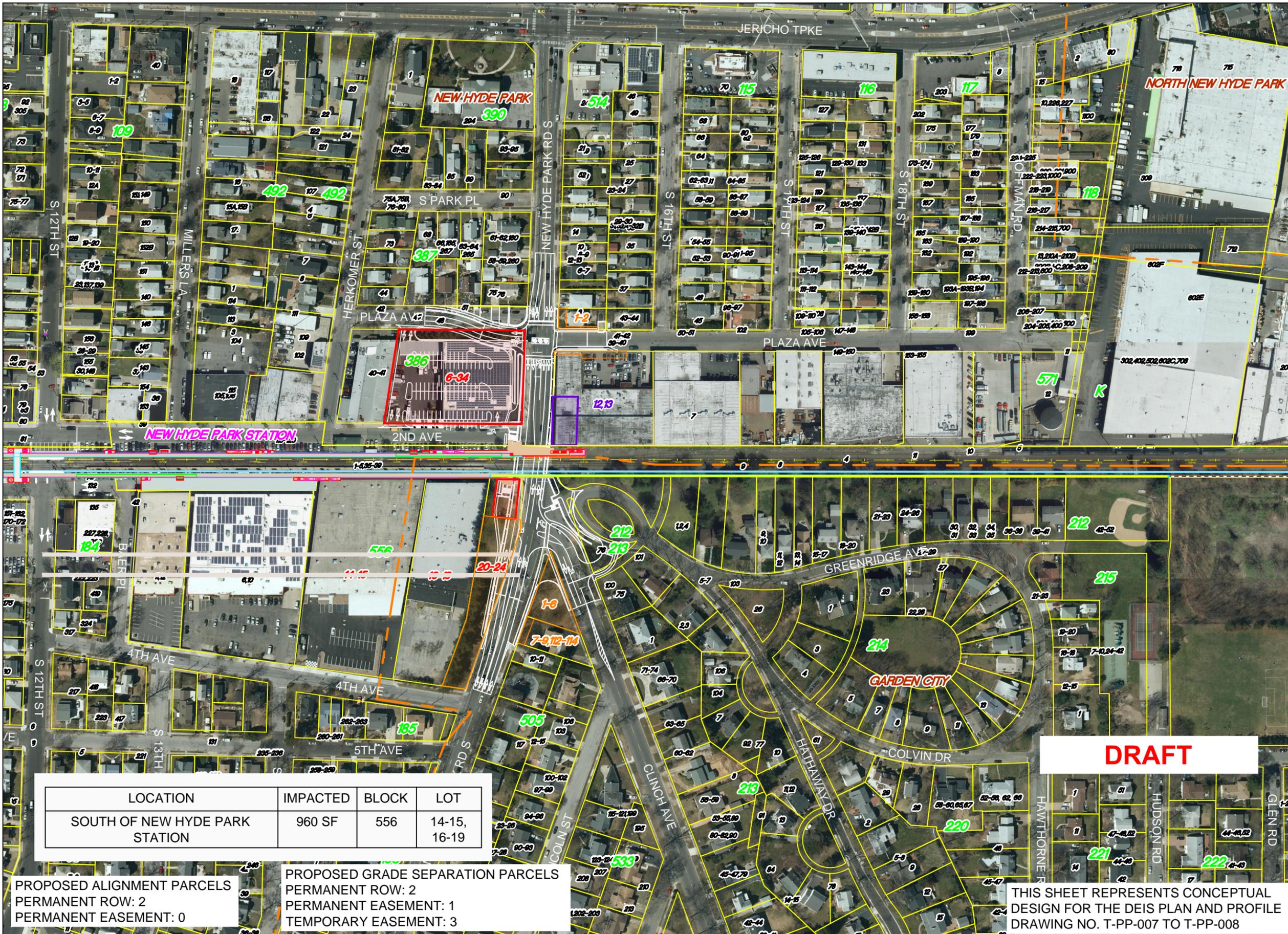


PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 1  
PERMANENT EASEMENT: 0  
TEMPORARY EASEMENT: 8

LOCATION	IMPACTED	BLOCK	LOT
EAST OF COVERT AVENUE	5,010 SF	STREET PARKING	

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-005 TO T-PP-006



**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Alternate A

New Hyde Park, North New  
Hyde Park and Garden City

Sheet 4A of 21

November 21, 2016

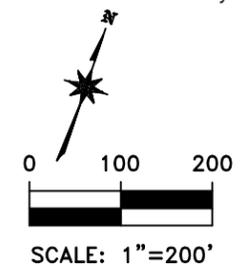


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Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
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Assessment and Nassau County GIS

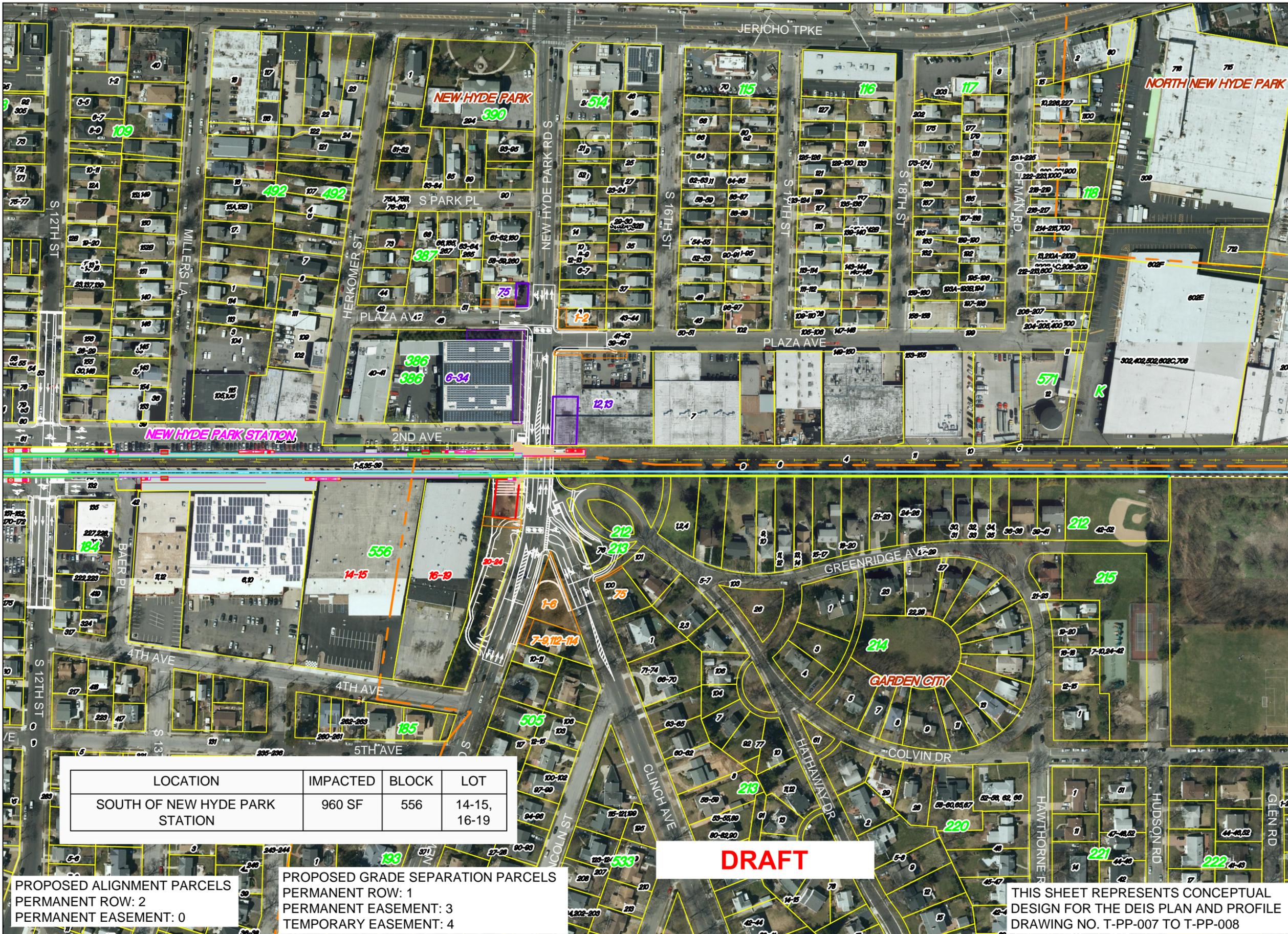


LOCATION	IMPACTED	BLOCK	LOT
SOUTH OF NEW HYDE PARK STATION	960 SF	556	14-15, 16-19

PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 2  
PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 2  
PERMANENT EASEMENT: 1  
TEMPORARY EASEMENT: 3

**DRAFT**  
THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-007 TO T-PP-008



**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Alternate B

New Hyde Park, North New  
Hyde Park and Garden City

Sheet 4B of 21

November 21, 2016

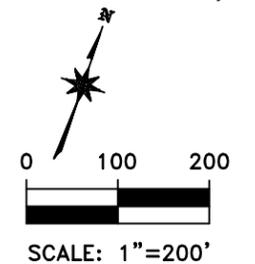


ENLARGED AREA



Source:  
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bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

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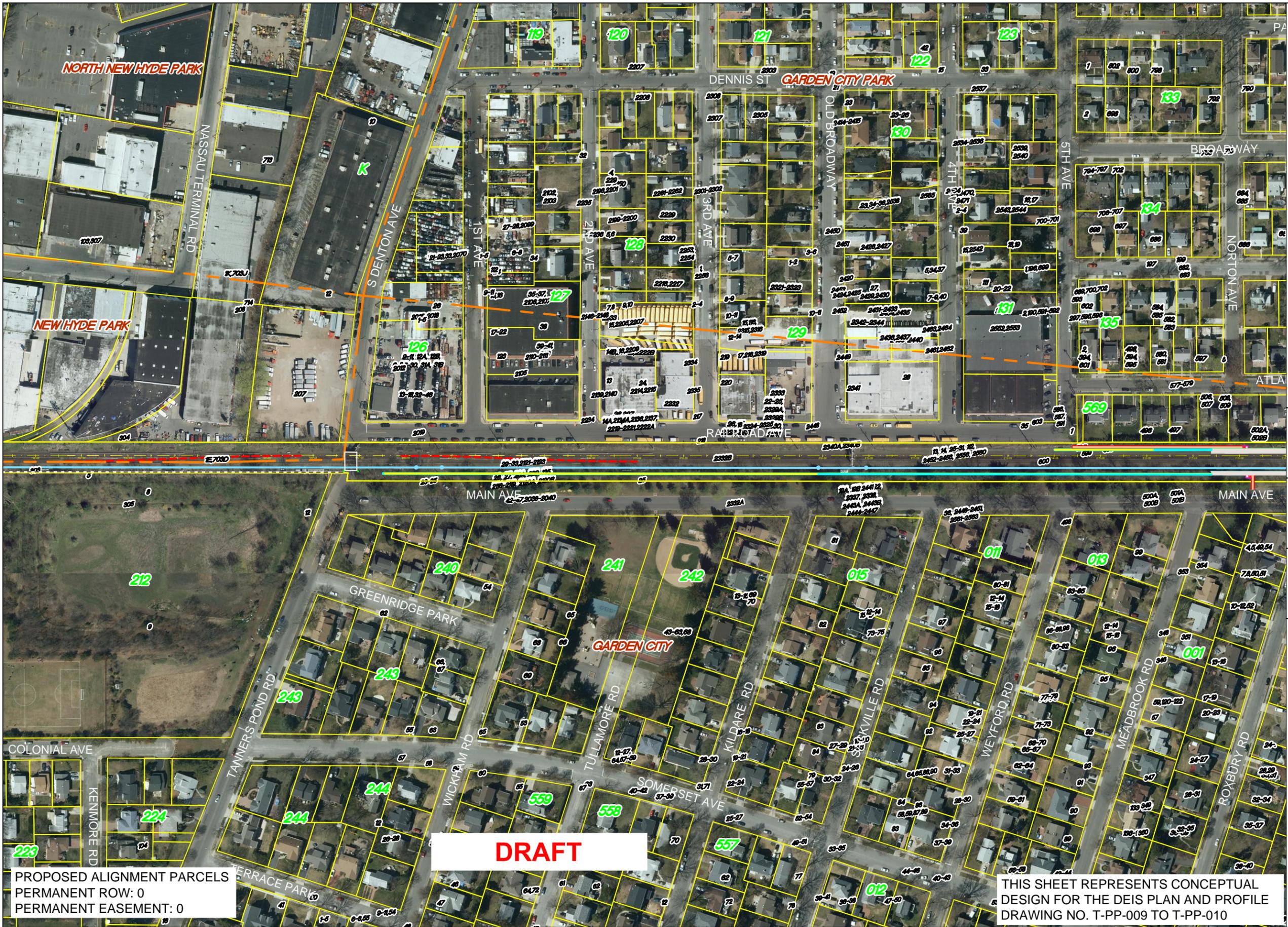
LOCATION	IMPACTED	BLOCK	LOT
SOUTH OF NEW HYDE PARK STATION	960 SF	556	14-15, 16-19

PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 2  
PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 1  
PERMANENT EASEMENT: 3  
TEMPORARY EASEMENT: 4

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-007 TO T-PP-008



**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
  
Garden City, New Hyde Park,  
North New Hyde Park and  
Garden City Park

Sheet 5 of 21

November 21, 2016

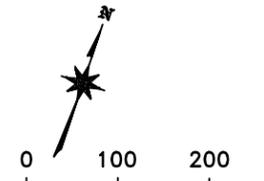


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bandwidth of 500' on either side of the Long  
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State Digital Orthoimagery Program flown in  
2013

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Assessment and Nassau County GIS



SCALE: 1"=200'



PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-009 TO T-PP-010

**DRAFT**



PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-011 TO T-PP-012

### Long Island Rail Road

LIRR Expansion Project From  
 Floral Park to Hicksville

Garden City and Garden City  
 Park

Sheet 6 of 21

November 21, 2016

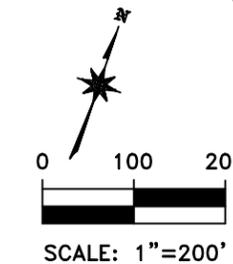


ENLARGED AREA



Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

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 Assessment and Nassau County GIS





PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-013 TO T-PP-014

**Long Island Rail Road**

LIRR Expansion Project From  
 Floral Park to Hicksville  
 Garden City, Mineola and  
 Garden City Park

Sheet 7 of 21

November 21, 2016

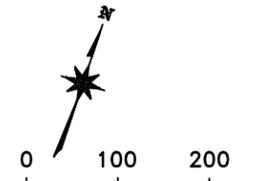


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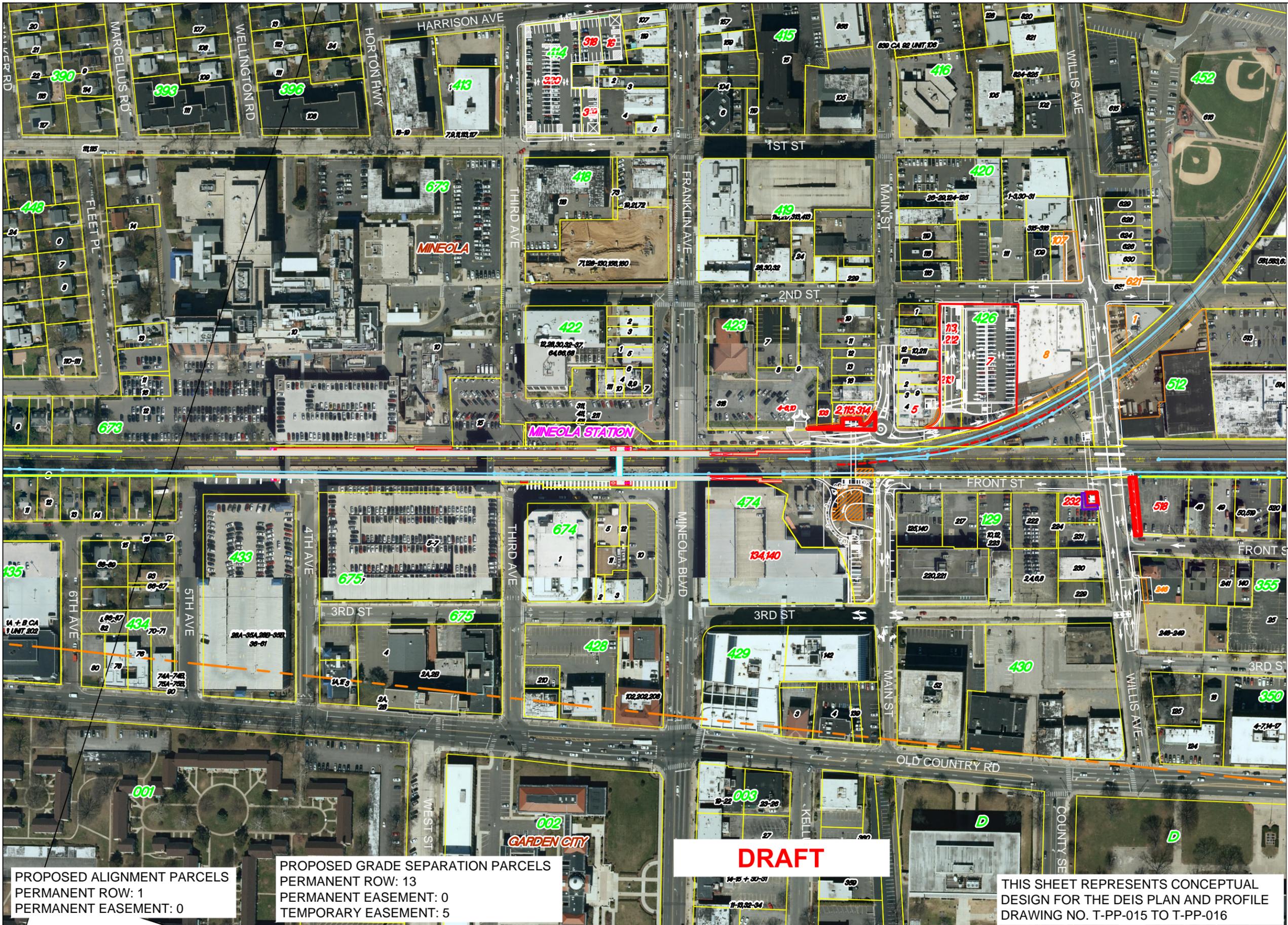
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 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS



SCALE: 1"=200'





**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Alternate A  
Mineola and Garden City

Sheet 8A of 21

November 21, 2016



ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

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Assessment and Nassau County GIS



SCALE: 1"=200'



PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 1  
PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 13  
PERMANENT EASEMENT: 0  
TEMPORARY EASEMENT: 5

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-015 TO T-PP-016



PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 1  
 PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
 PERMANENT ROW: 10  
 PERMANENT EASEMENT: 6  
 TEMPORARY EASEMENT: 5

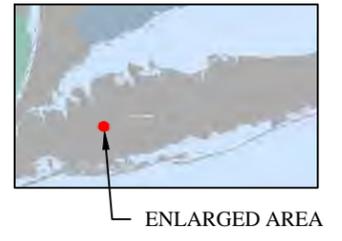
THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-015 TO T-PP-016

### Long Island Rail Road

LIRR Expansion Project From  
 Floral Park to Hicksville  
 Alternate B  
 Mineola and Garden City

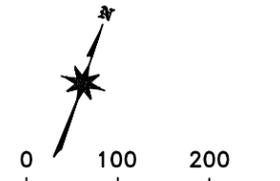
Sheet 8B of 21

November 21, 2016



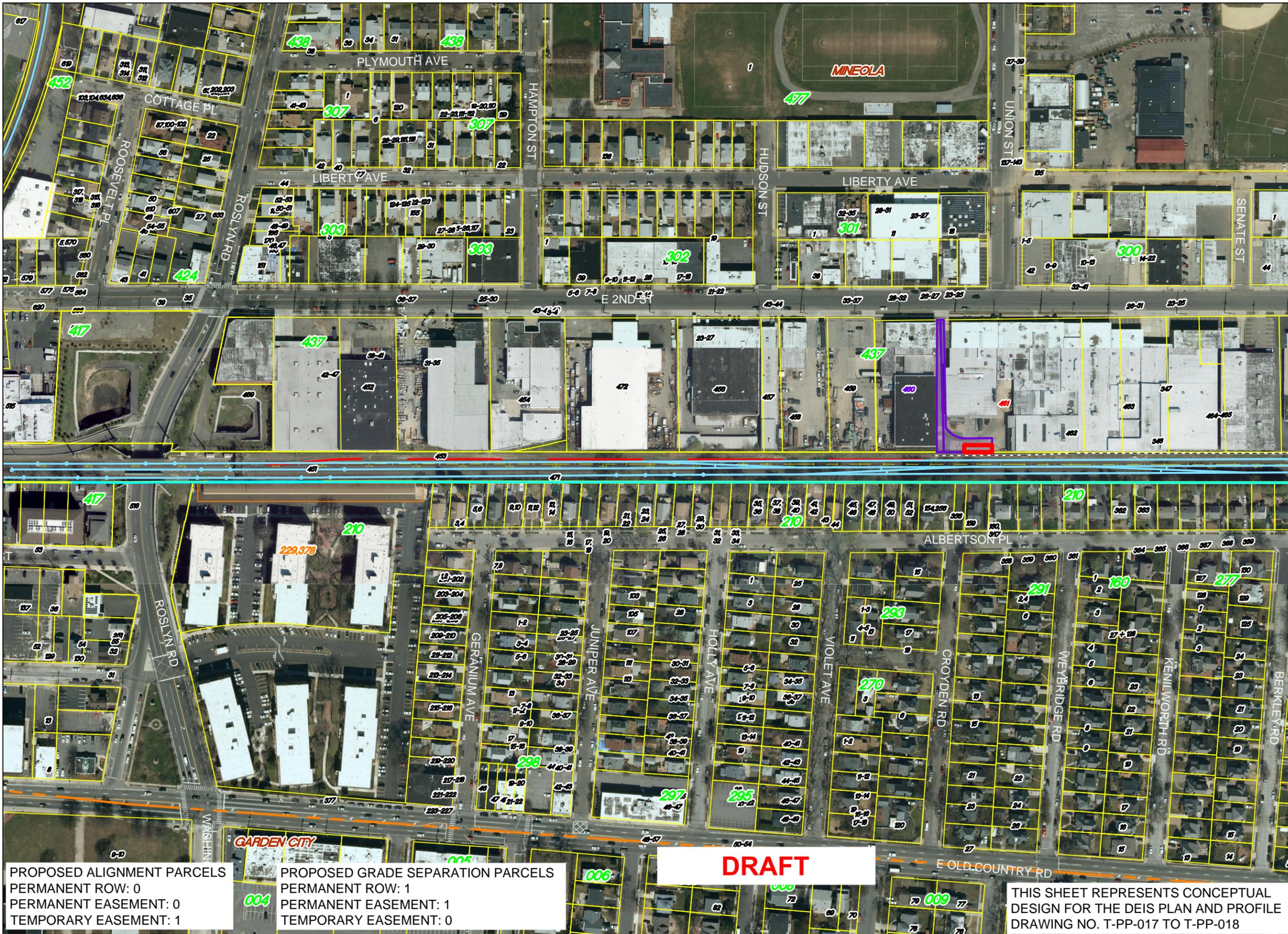
Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS



SCALE: 1"=200'





**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville

Mineola and Garden City

Sheet 9 of 21

November 21, 2016

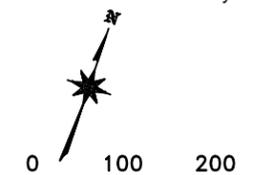


ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



SCALE: 1"=200'

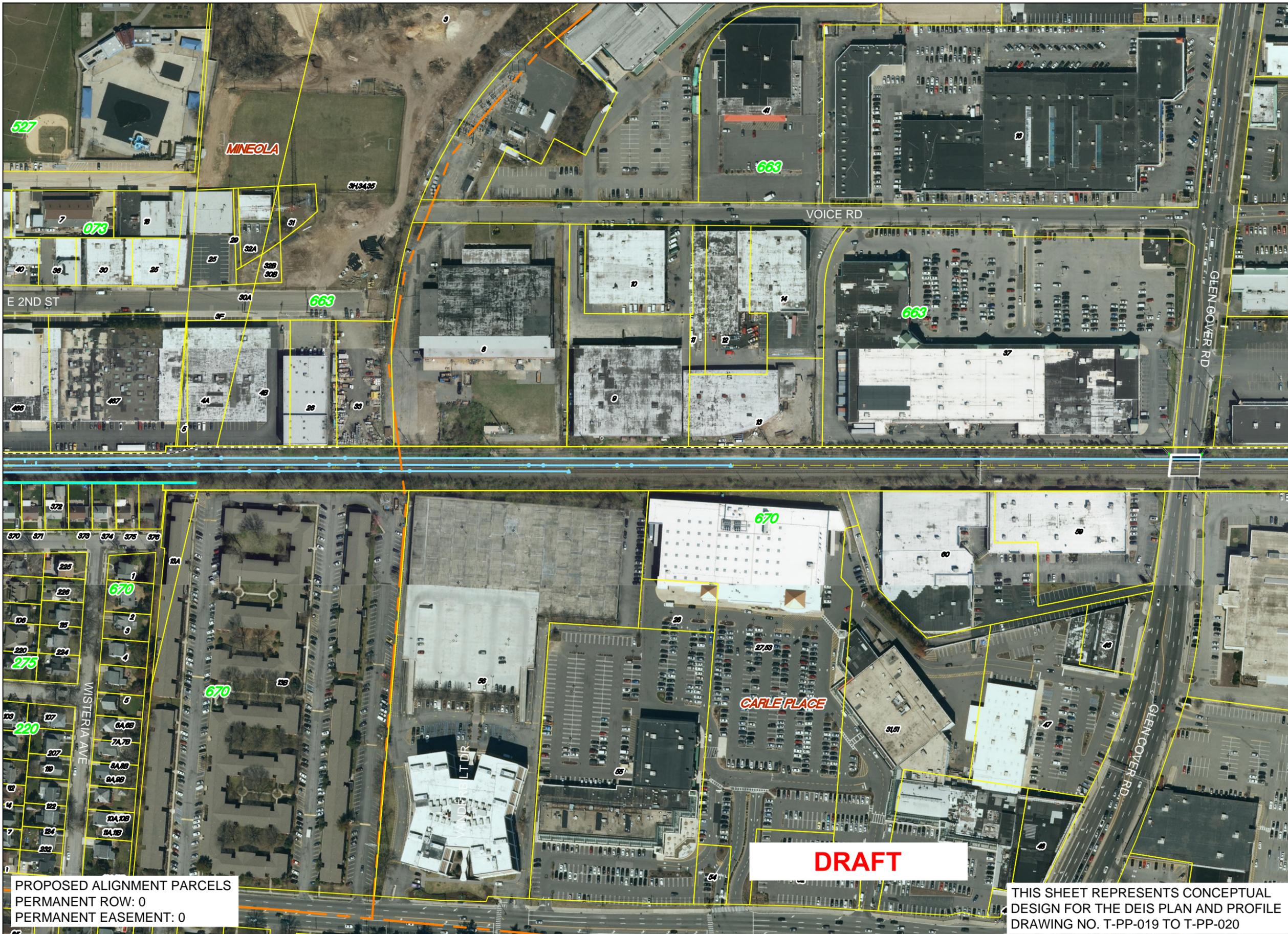


PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0  
TEMPORARY EASEMENT: 1

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 1  
PERMANENT EASEMENT: 1  
TEMPORARY EASEMENT: 0

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-017 TO T-PP-018



PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

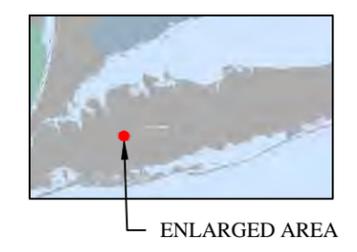
THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-019 TO T-PP-020

**Long Island Rail Road**

LIRR Expansion Project From  
 Floral Park to Hicksville  
 Mineola and Carle Place

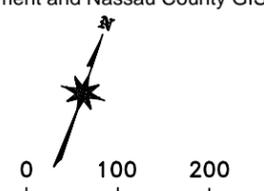
Sheet 10 of 21

November 21, 2016



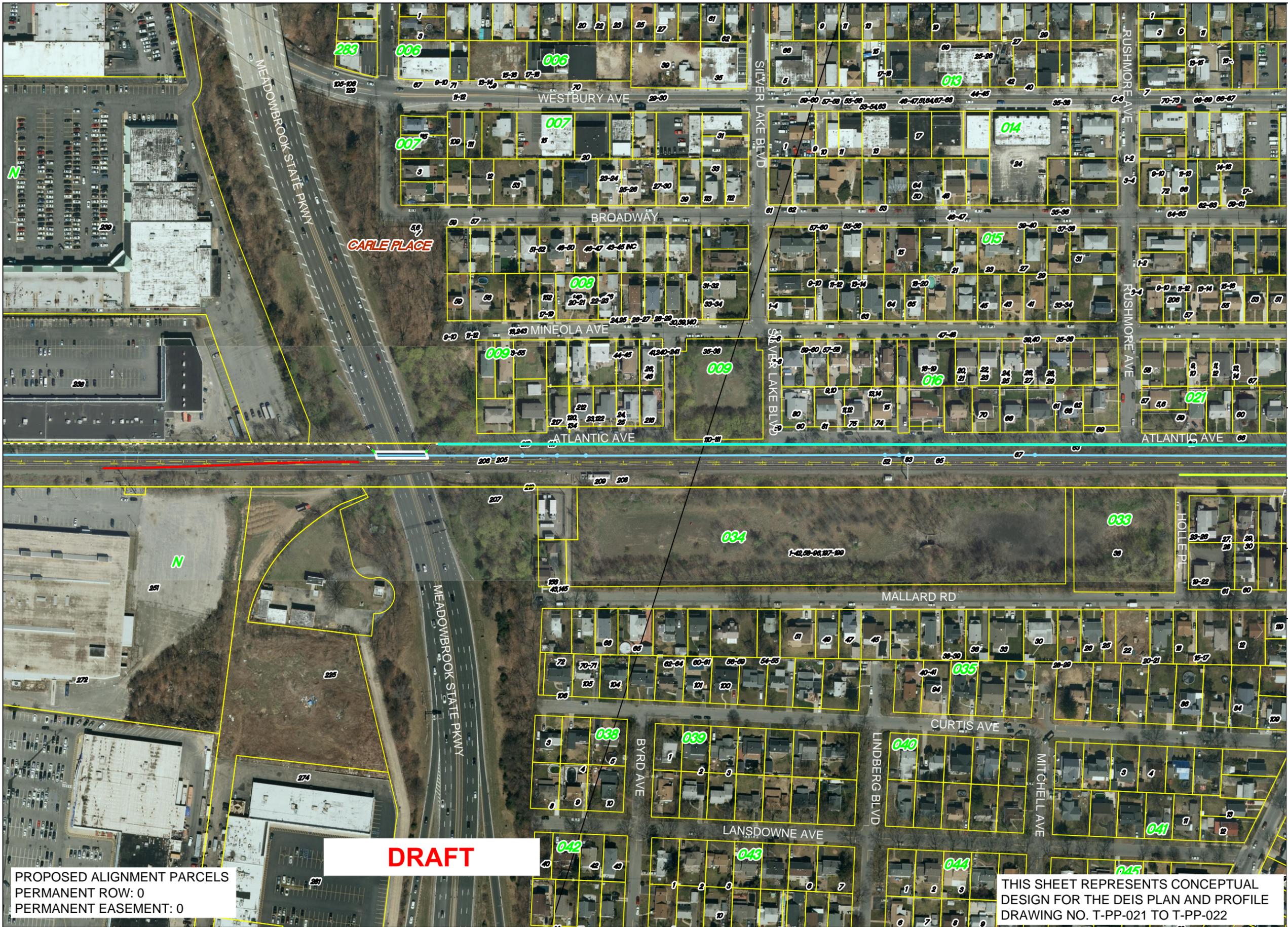
Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS



SCALE: 1"=200'





**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville

Carle Place

Sheet 11 of 21

November 21, 2016

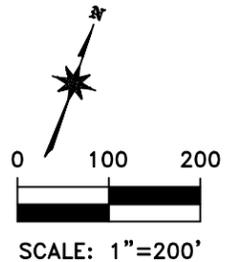


ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS

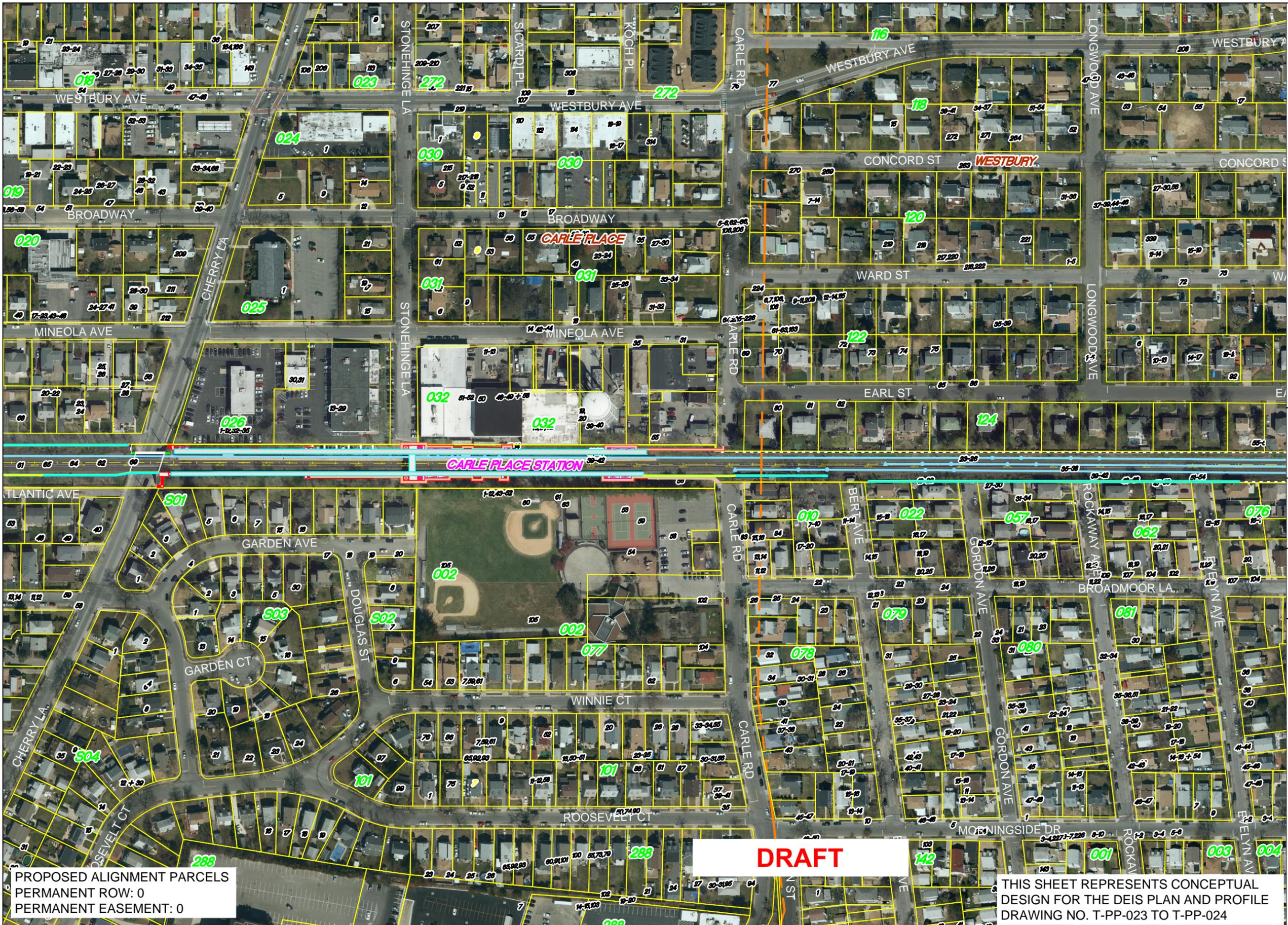


PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-021 TO T-PP-022



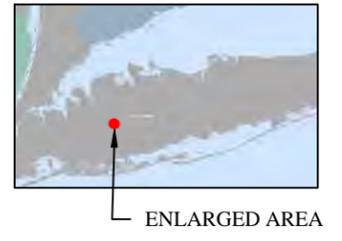


**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Carle Place and Westbury

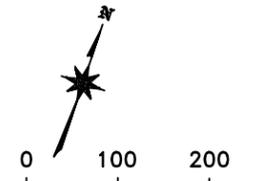
Sheet 12 of 21

November 21, 2016



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



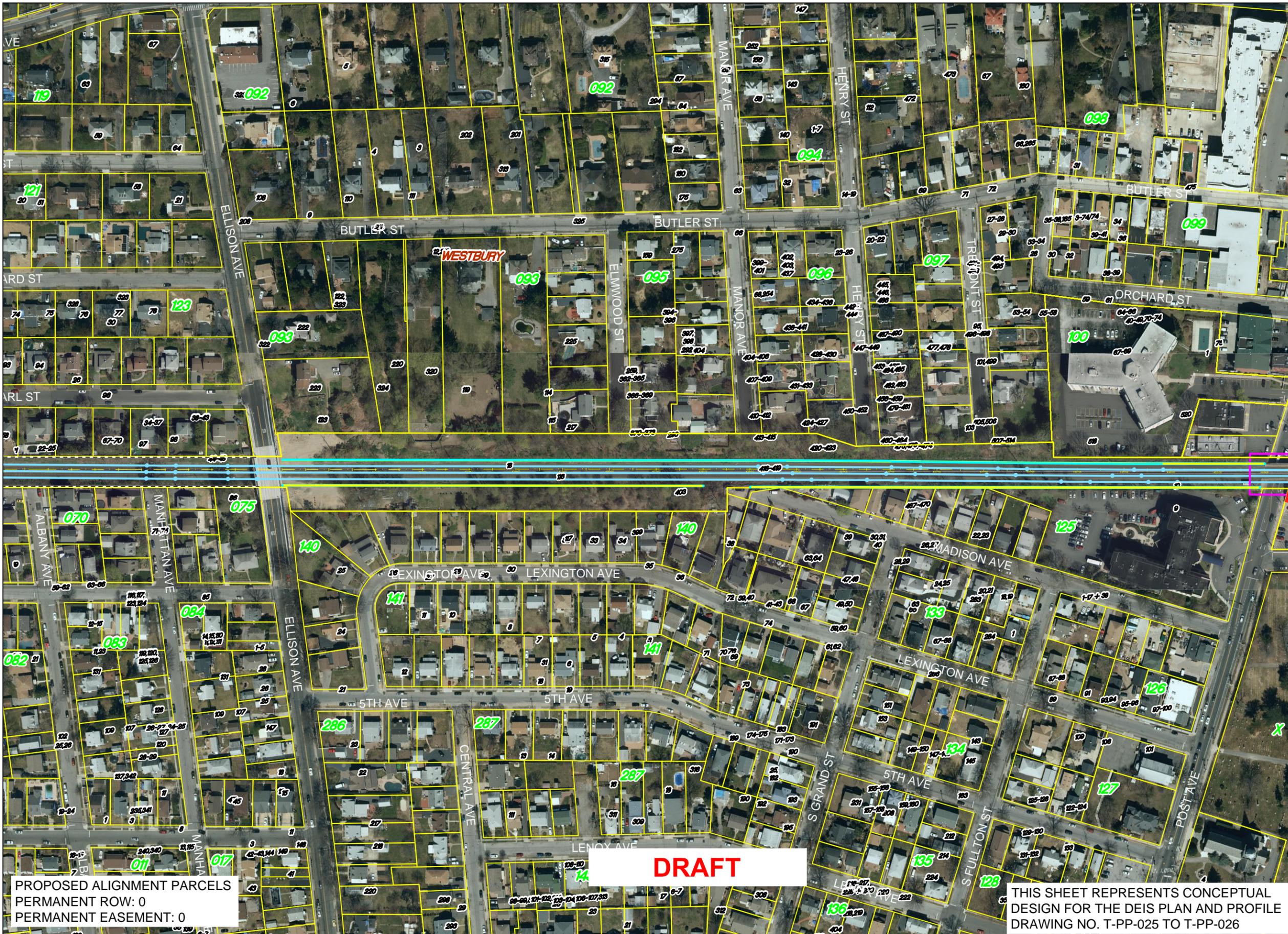
SCALE: 1"=200'



PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-023 TO T-PP-024



PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-025 TO T-PP-026

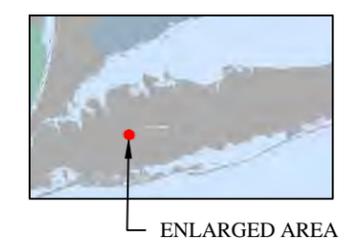
**Long Island Rail Road**

LIRR Expansion Project From  
 Floral Park to Hicksville

Westbury

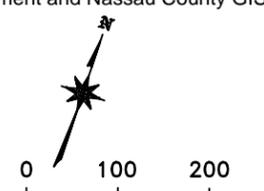
Sheet 13 of 21

November 21, 2016



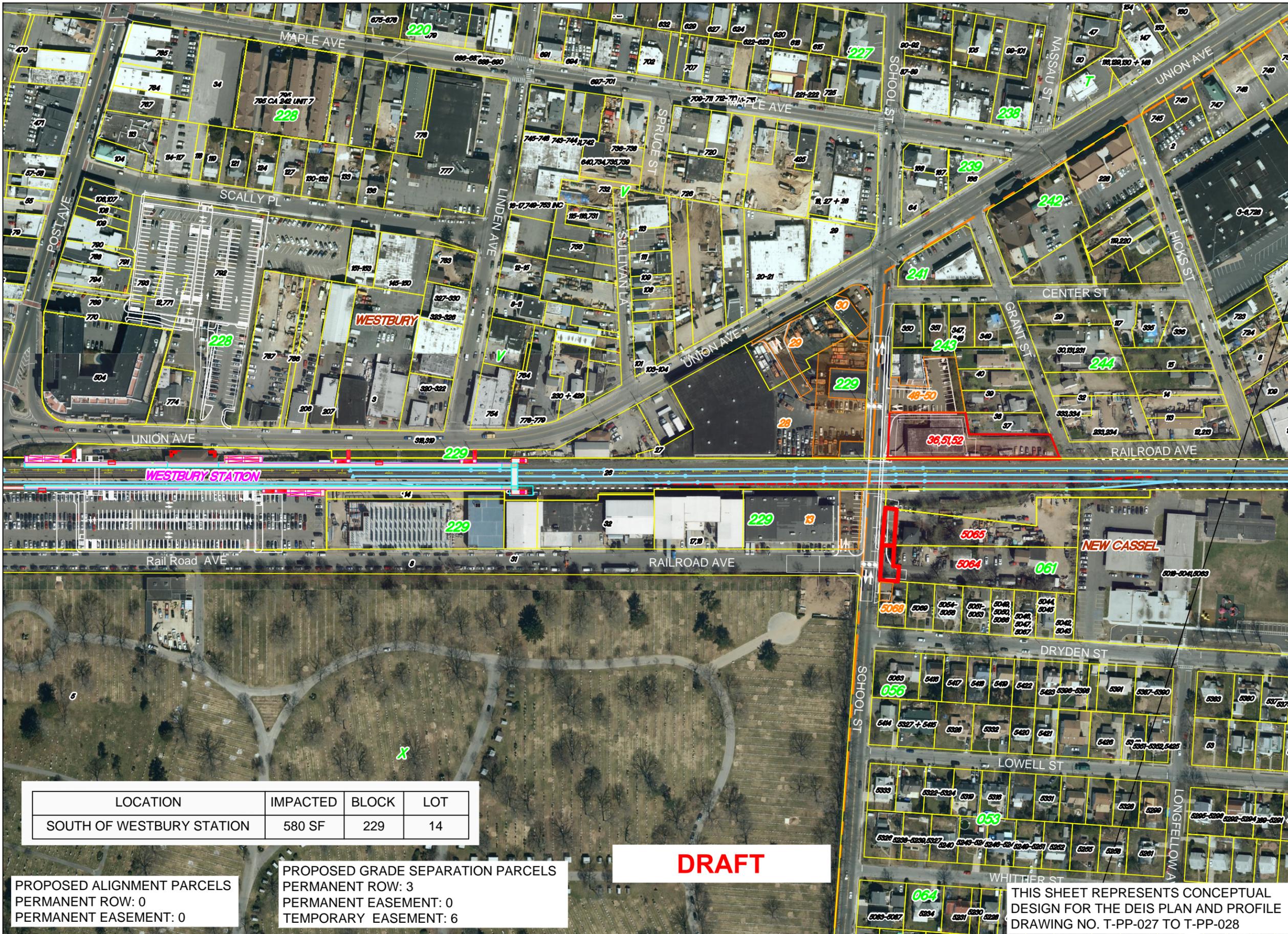
Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS



SCALE: 1"=200'



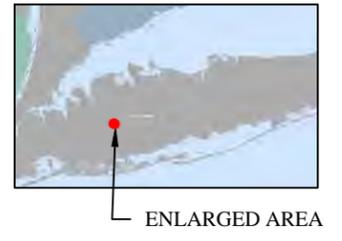


**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Alternate A  
Westbury and New Cassel

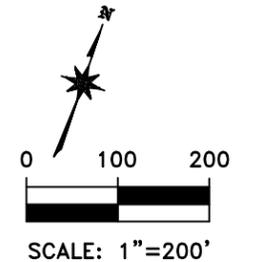
Sheet 14A of 21

November 21, 2016



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



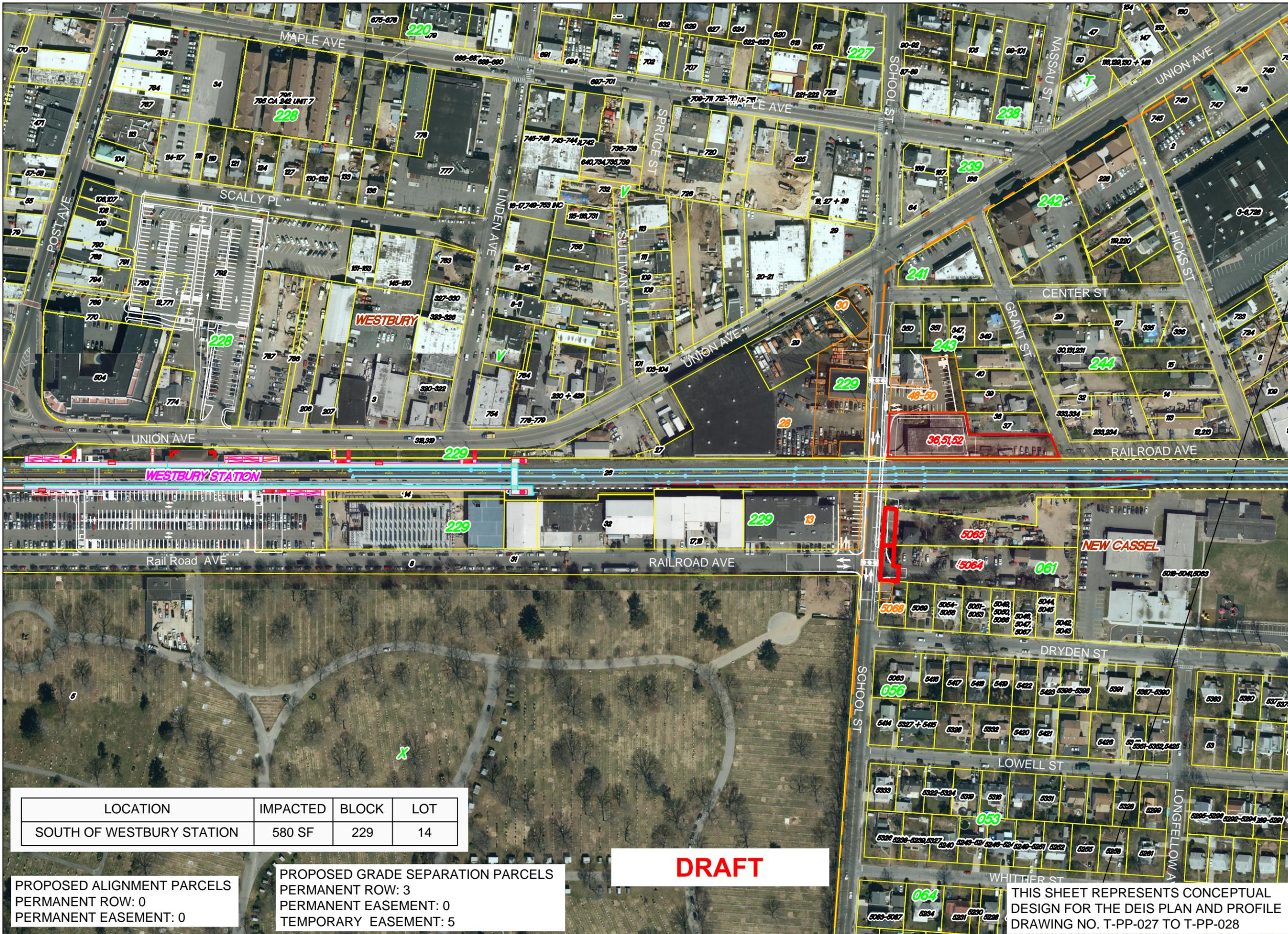
LOCATION	IMPACTED	BLOCK	LOT
SOUTH OF WESTBURY STATION	580 SF	229	14

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 3  
PERMANENT EASEMENT: 0  
TEMPORARY EASEMENT: 6

**DRAFT**

PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-027 TO T-PP-028



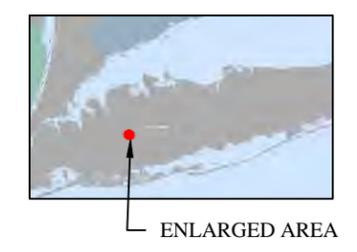
**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Alternate B

Westbury and New Cassel

Sheet 14B of 21

November 21, 2016

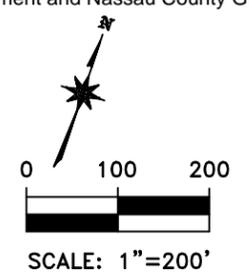


ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



LOCATION	IMPACTED	BLOCK	LOT
SOUTH OF WESTBURY STATION	580 SF	229	14

PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 0  
PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 3  
PERMANENT EASEMENT: 0  
TEMPORARY EASEMENT: 5

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-027 TO T-PP-028



# Long Island Rail Road

LIRR Expansion Project From  
Floral Park to Hicksville

New Cassel

Sheet 15 of 21

November 21, 2016

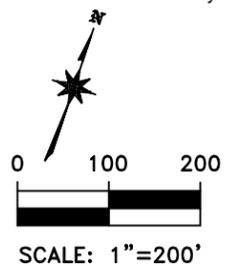


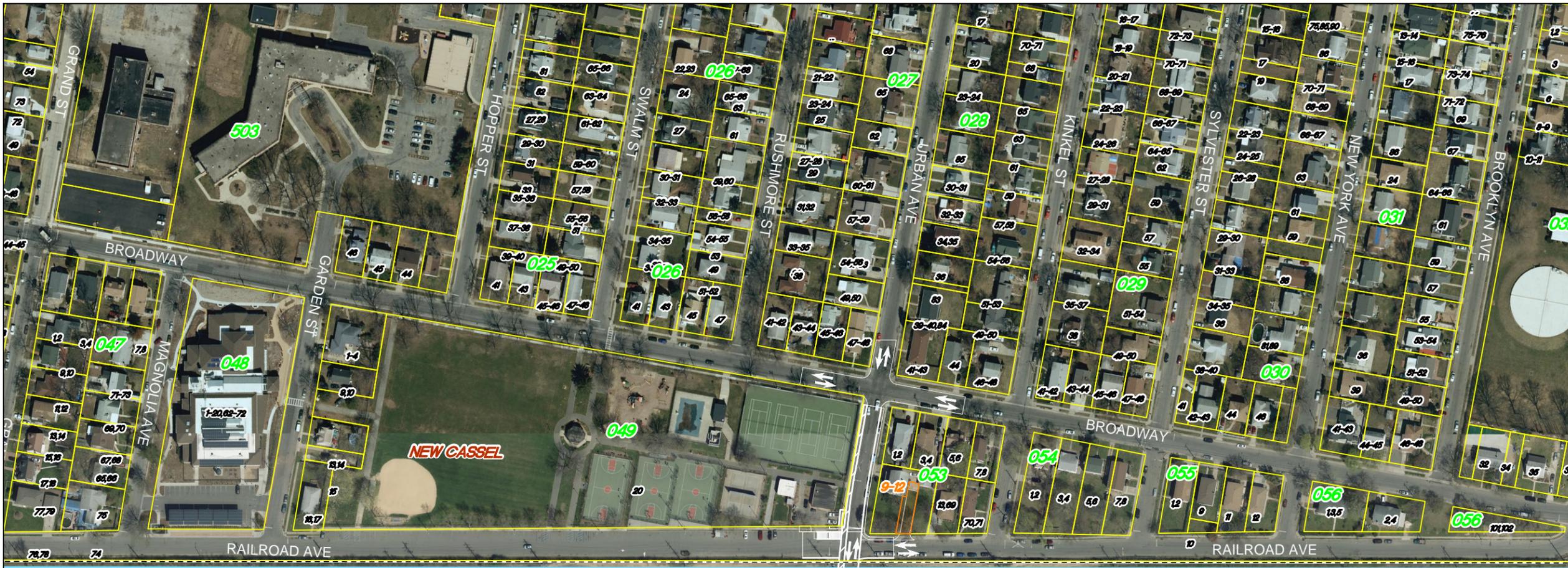
ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



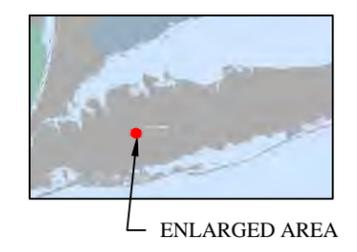


**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Alternate A  
New Cassel

Sheet 16A of 21

November 21, 2016

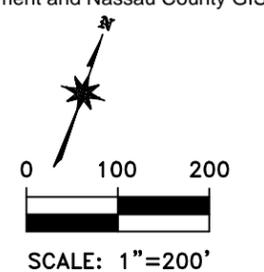


ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



PROPOSED ALIGNMENT PARCELS  
PERMANENT ROW: 2  
PERMANENT EASEMENT: 0  
PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
PERMANENT ROW: 2  
PERMANENT EASEMENT: 1  
TEMPORARY EASEMENT: 10

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
DESIGN FOR THE DEIS PLAN AND PROFILE  
DRAWING NO. T-PP-031 TO T-PP-032





PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

PROPOSED GRADE SEPARATION PARCELS  
 PERMANENT ROW: 2  
 PERMANENT EASEMENT: 1  
 TEMPORARY EASEMENT: 10

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-031 TO T-PP-032

**Long Island Rail Road**

LIRR Expansion Project From  
 Floral Park to Hicksville  
 Alternate B  
 New Cassel

Sheet 16B of 21

November 21, 2016

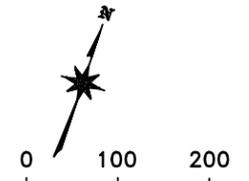


ENLARGED AREA



Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS



SCALE: 1"=200'





PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

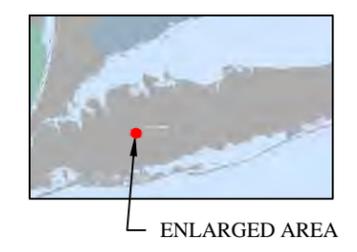
THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-033 TO T-PP-034

# Long Island Rail Road

LIRR Expansion Project From  
 Floral Park to Hicksville  
 New Cassel and Hicksville

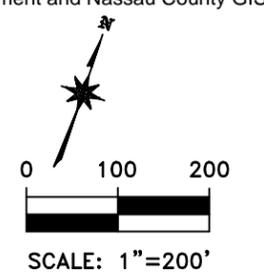
Sheet 17 of 21

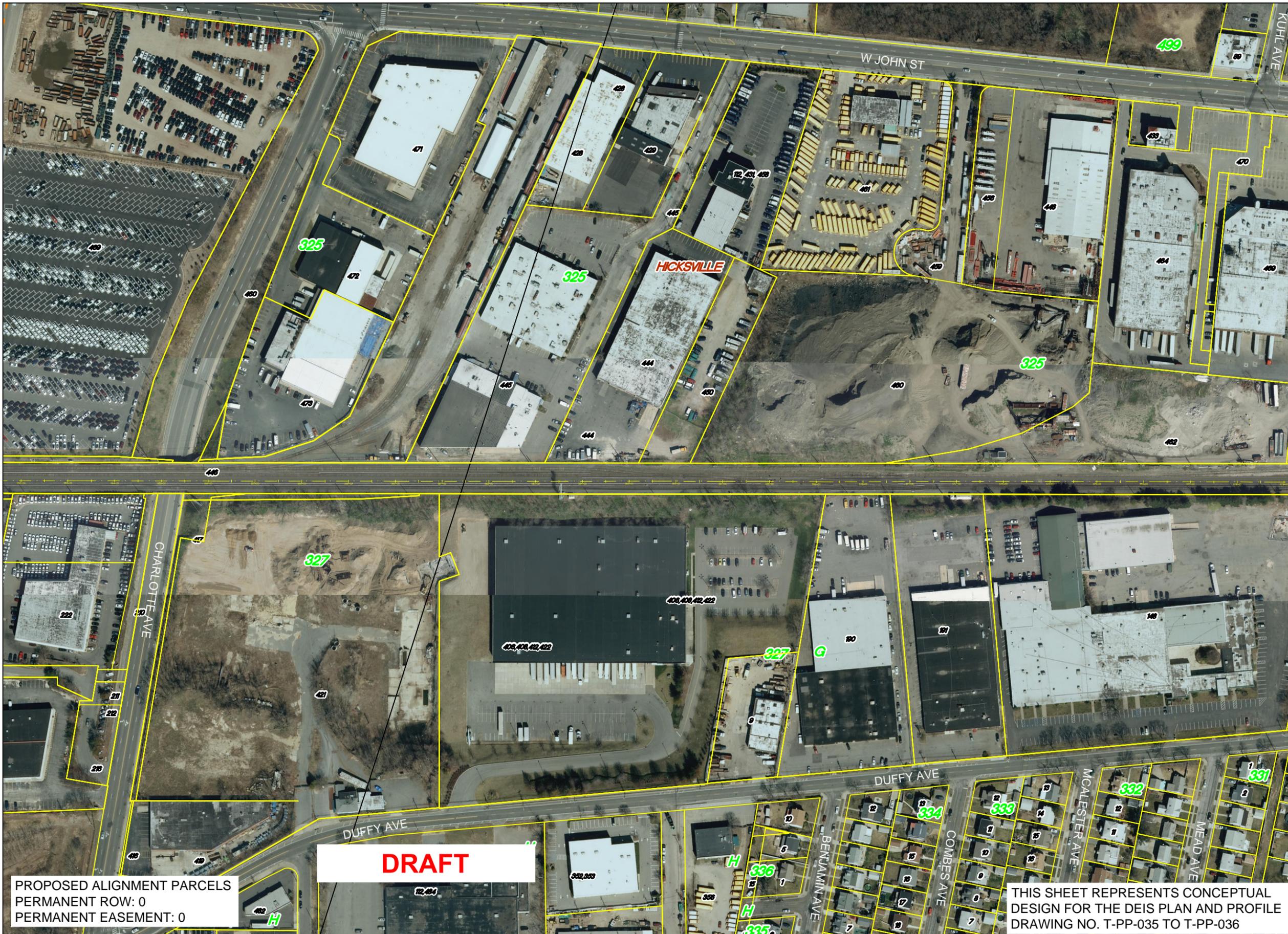
November 21, 2016



Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS





**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville

Hicksville

Sheet 18 of 21

November 21, 2016

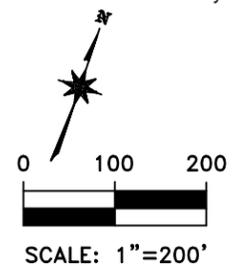


ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



# Long Island Rail Road

LIRR Expansion Project From  
Floral Park to Hicksville

Hicksville

Sheet 19 of 21

November 21, 2016

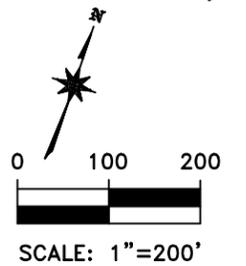


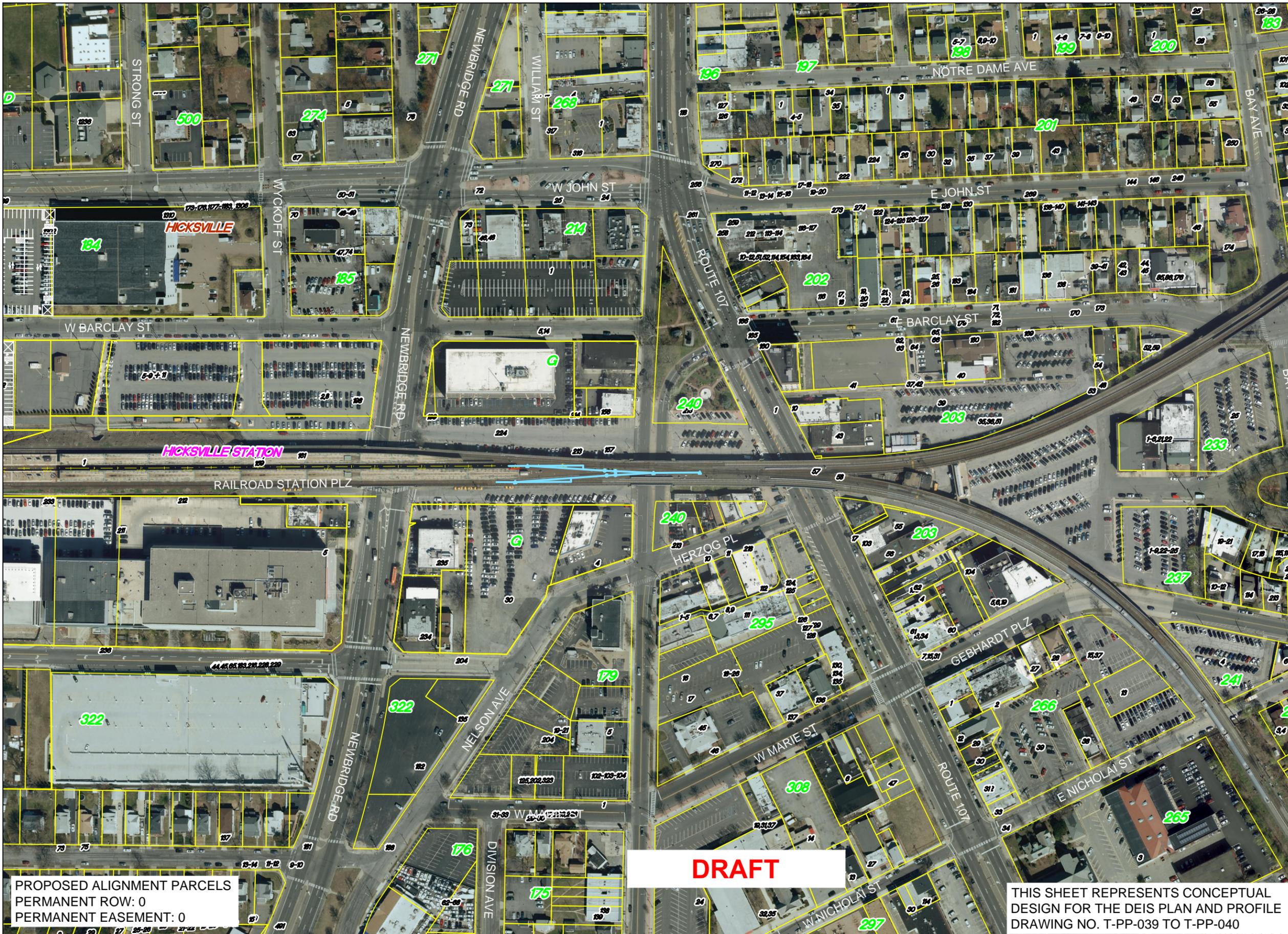
ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS





PROPOSED ALIGNMENT PARCELS  
 PERMANENT ROW: 0  
 PERMANENT EASEMENT: 0

**DRAFT**

THIS SHEET REPRESENTS CONCEPTUAL  
 DESIGN FOR THE DEIS PLAN AND PROFILE  
 DRAWING NO. T-PP-039 TO T-PP-040

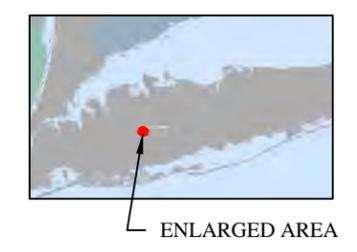
**Long Island Rail Road**

LIRR Expansion Project From  
 Floral Park to Hicksville

Hicksville

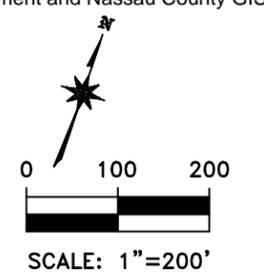
Sheet 20 of 21

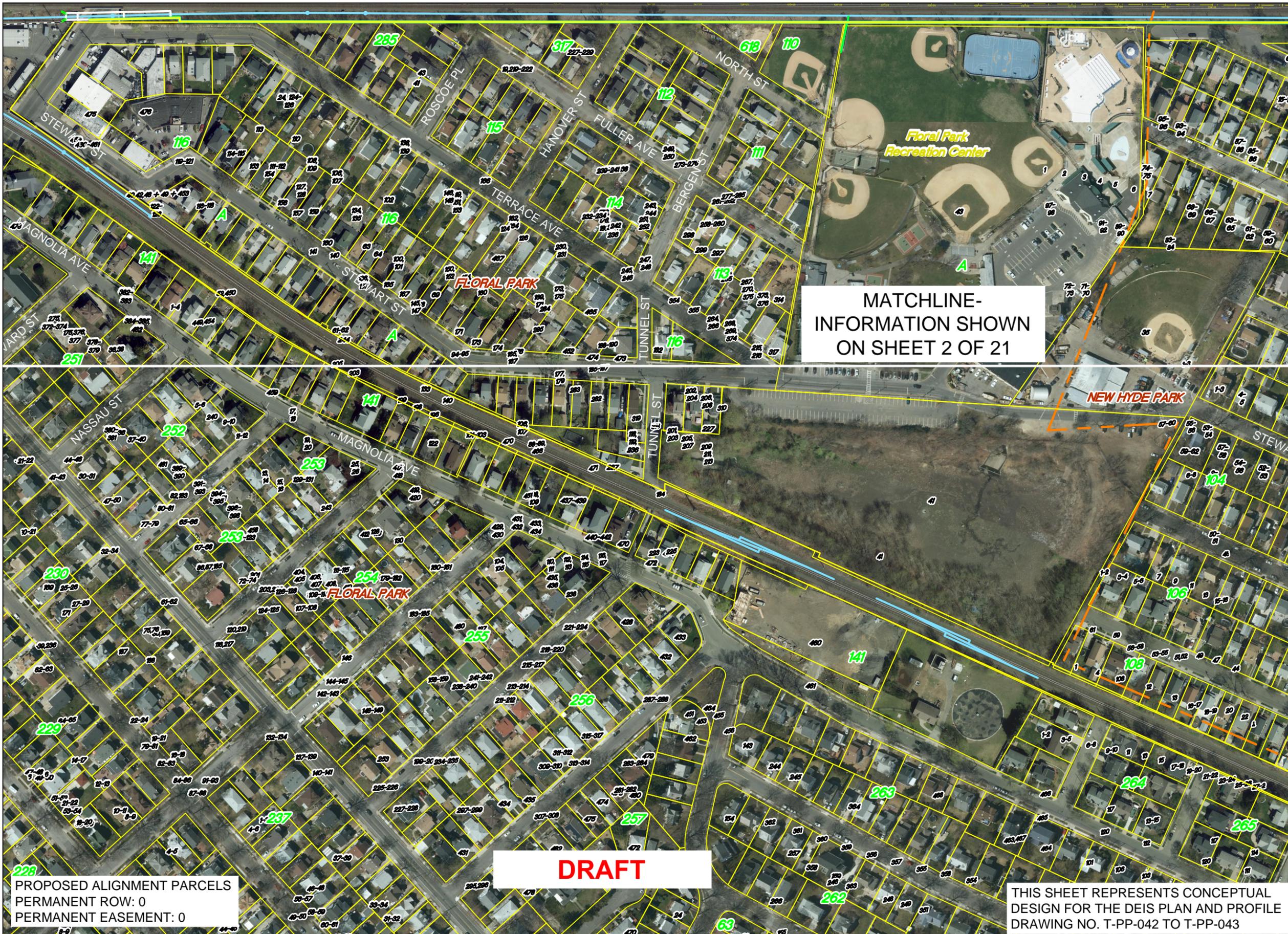
November 21, 2016



Source:  
 Aerial Photography - flown in April 2016 -  
 bandwidth of 500' on either side of the Long  
 Island Rail Road. Merged with New York  
 State Digital Orthoimagery Program flown in  
 2013

Parcels - Nassau County Department of  
 Assessment and Nassau County GIS





**Long Island Rail Road**

LIRR Expansion Project From  
Floral Park to Hicksville  
Floral Park and New Hyde Park

Sheet 21 of 21

November 21, 2016



ENLARGED AREA



Source:  
Aerial Photography - flown in April 2016 -  
bandwidth of 500' on either side of the Long  
Island Rail Road. Merged with New York  
State Digital Orthoimagery Program flown in  
2013

Parcels - Nassau County Department of  
Assessment and Nassau County GIS



SCALE: 1"=200'

