

BOP

Study Prepared by:

BIG - Bjarke Ingels Group - Planning + Design

Arcadis US - Engineering

Sherwood Design Engineers NYC - Civil Engineering

Nelson Nygaard - Traffic Advising

Ed Kamerer - Utilities



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TEAM







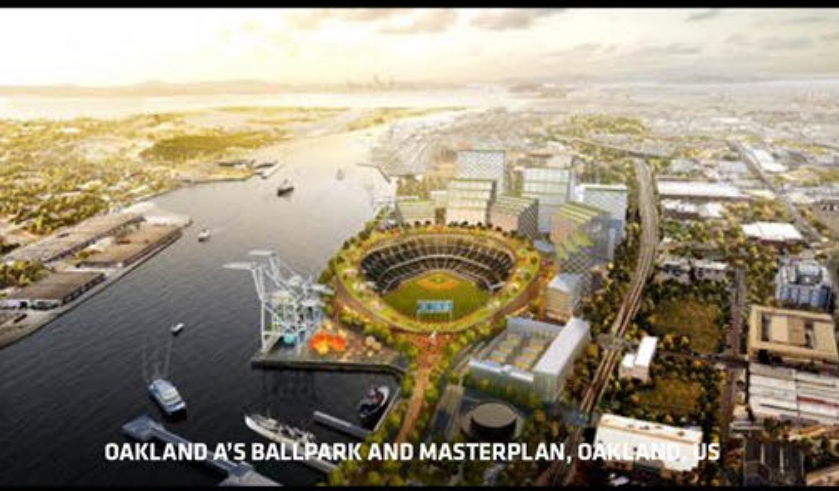
THE BIG U, NEW YORK, US



EAST SIDE COASTAL RESILIENCY PROJECT, NEW YORK, US



GOOGLE CAMPUS, MOUNTAIN VIEW, US



OAKLAND A'S BALLPARK AND MASTERPLAN, OAKLAND, US



BERKELEY GLOBAL CAMPUS, BERKELEY, US



SUPERKILEN MASTERPLAN, COPENHAGEN, DK



AARHUS MASTERPLAN, AARHUS, DK



SMITHSONIAN INSTITUTION CAMPUS MASTERPLAN, WASHINGTON, D.C., US



RESILIENT BY DESIGN, SAN FRANCISCO, US



CONSTRUCTION, 1950s

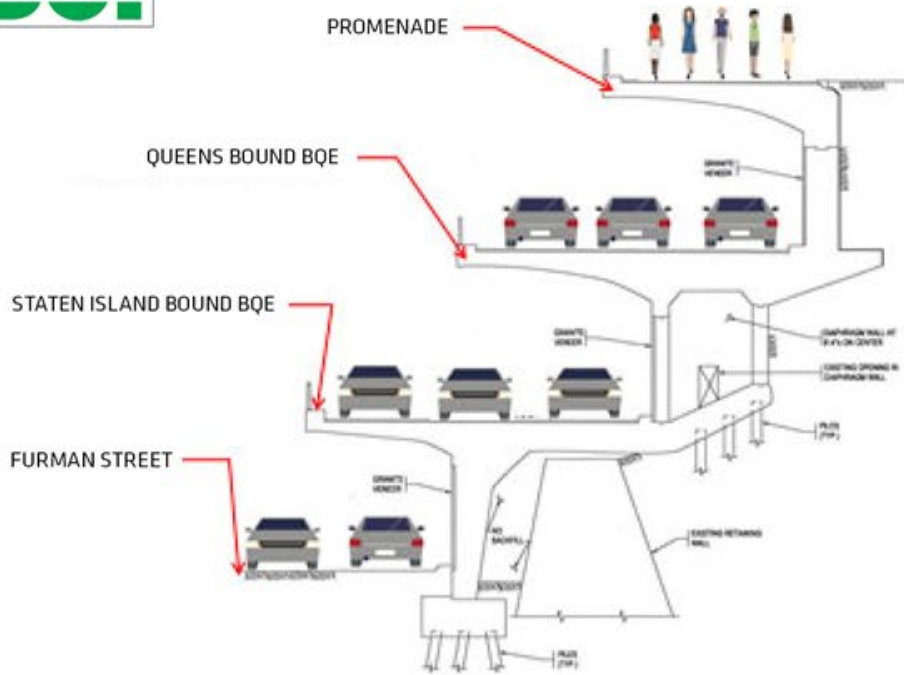


OPENING, 1954

A MARVEL OF ENGINEERING, THE TRIPLE CANTILEVER BQE STRUCTURE AND ESPLANADE WAS BUILT BY ROBERT MOSES IN THE 1950S - ACCOMMODATING VEHICLES BUT CUTTING OFF THE NEIGHBORHOOD FROM ITS WATERFRONT

BQE TRIPLE-CANTILEVER

TRIPLE CANTILEVER



TRIPLE-CANTILEVER CROSS-SECTION



TODAY, STEEL REINFORCEMENT IS RAPIDLY CORRODING - IF NOT REPAIRED BY 2026, TRAFFIC WILL BEGIN TO BE FORCED ONTO NEIGHBORHOOD STREETS

BQE LOOKING SOUTH

THE PROBLEM

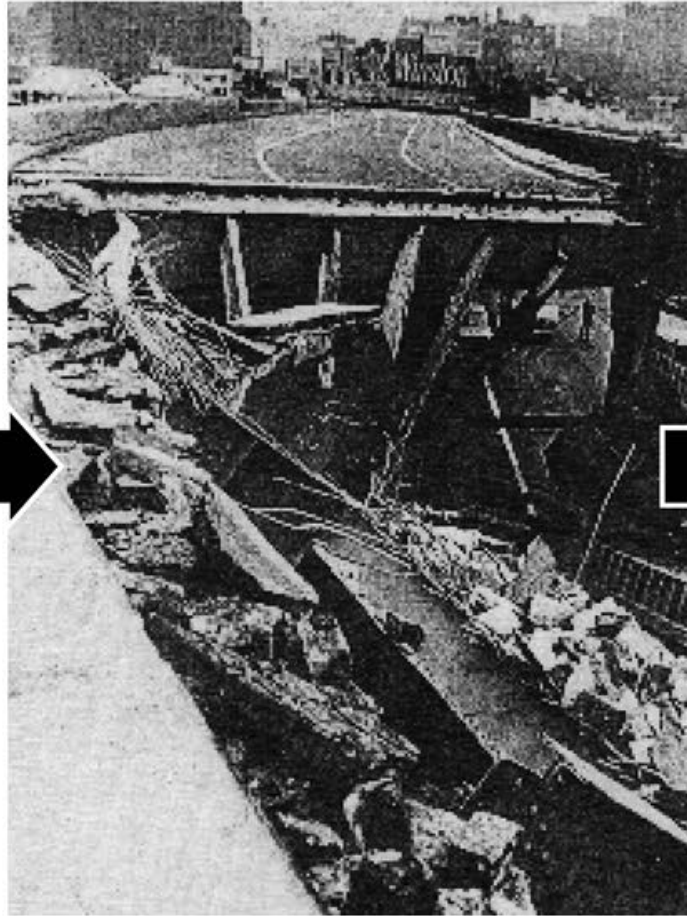


EMBARCADERO TRANSFORMATION - SAN FRANCISCO, CALIFORNIA

THINKING BIGGER



WEST SIDE HIGHWAY - 1948



WEST SIDE HIGHWAY - 1973



HUDSON RIVER PARK - TODAY

AS NYC HAS DONE IN THE PAST, MIGHT THIS BE THE RIGHT MOMENT TO RE-THINK THE HIGHWAY'S INTEGRATION WITH THE CITY?

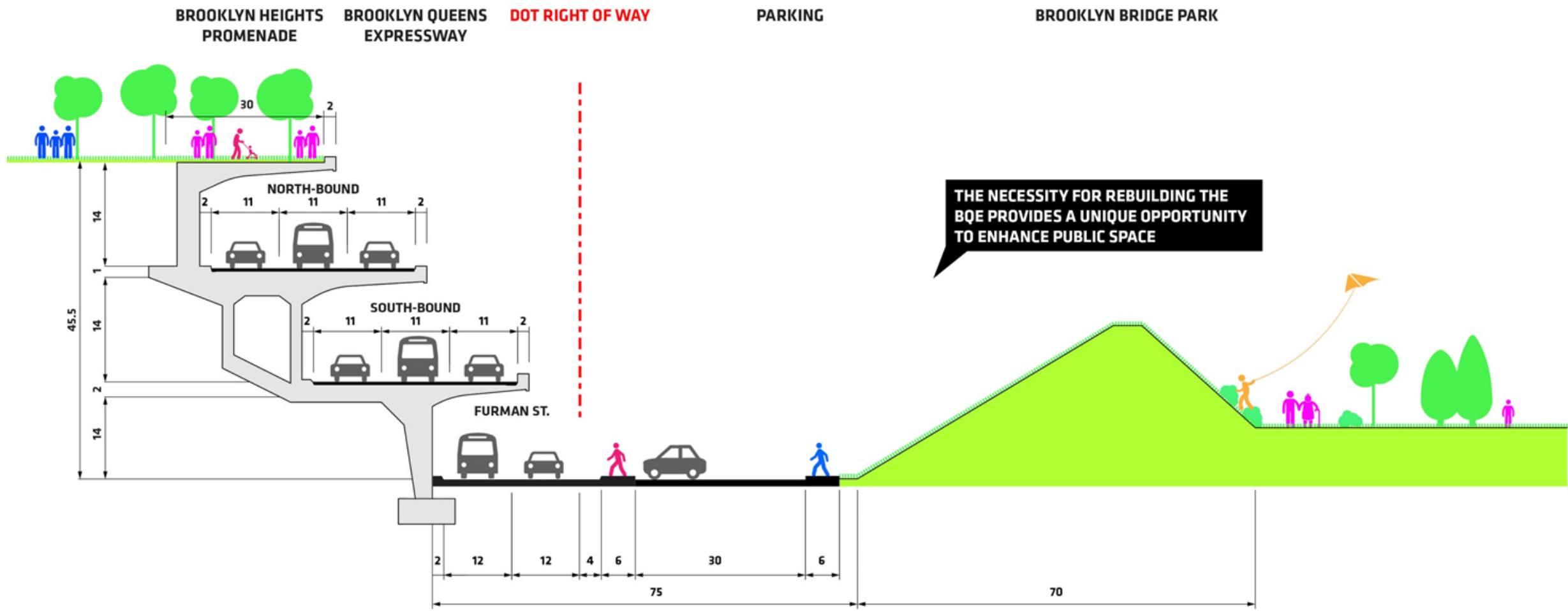
THINKING BIGGER

A detailed historical illustration of Brooklyn Heights in 1874. The scene is viewed from an elevated perspective, showing a dense urban landscape of red brick buildings. In the foreground, the East River is filled with numerous sailing ships and a few steamships. A prominent suspension bridge, the Brooklyn Bridge, spans the water on the left side. The city extends up a hillside, with a large white building, likely a government or institutional structure, visible on a peak. The overall atmosphere is one of a bustling port city in the late 19th century.

CAN WE LEARN FROM
THE WATERFRONT'S PAST
TO SHAPE IT'S FUTURE?

EARLY BK HEIGHTS WAS A SEAMLESS
TRANSITION BETWEEN NATURE AND
CITY - PORT OPERATIONS DEMANDED
A STRONG RELATIONSHIP BETWEEN
THE CITY AND WATER

BROOKLYN HEIGHTS, 1874

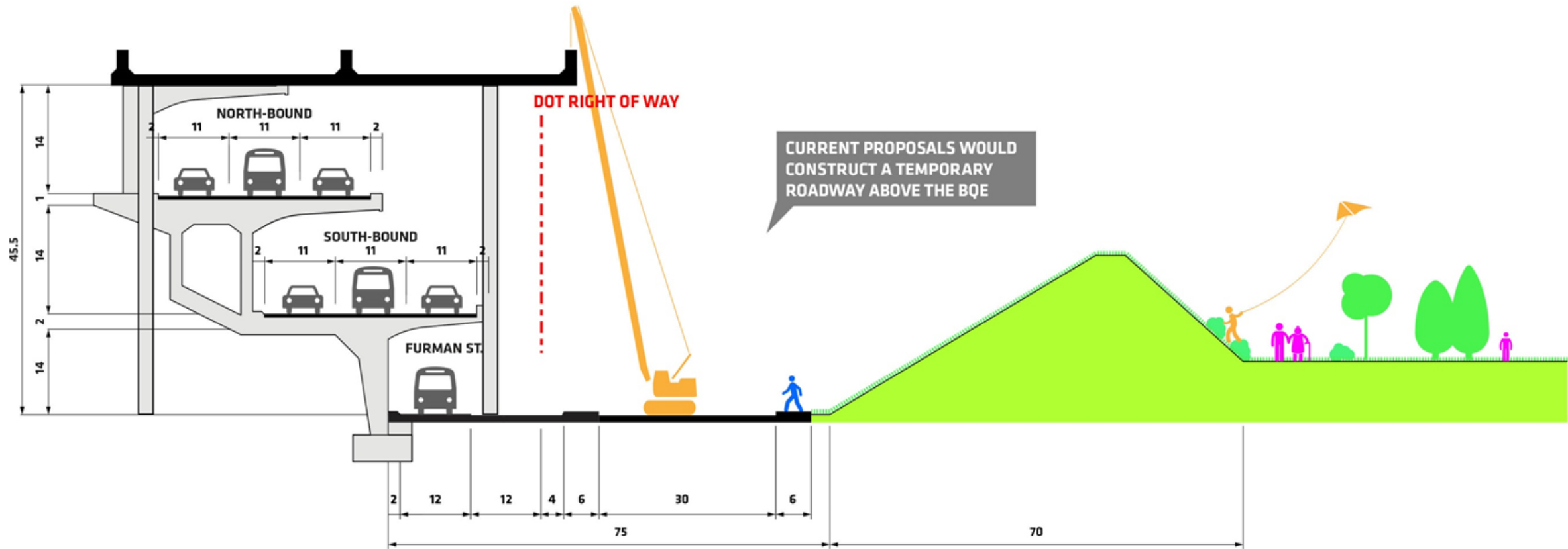


EXISTING CONDITIONS

BROOKLYN QUEENS EXPRESSWAY

PARKING

BROOKLYN BRIDGE PARK

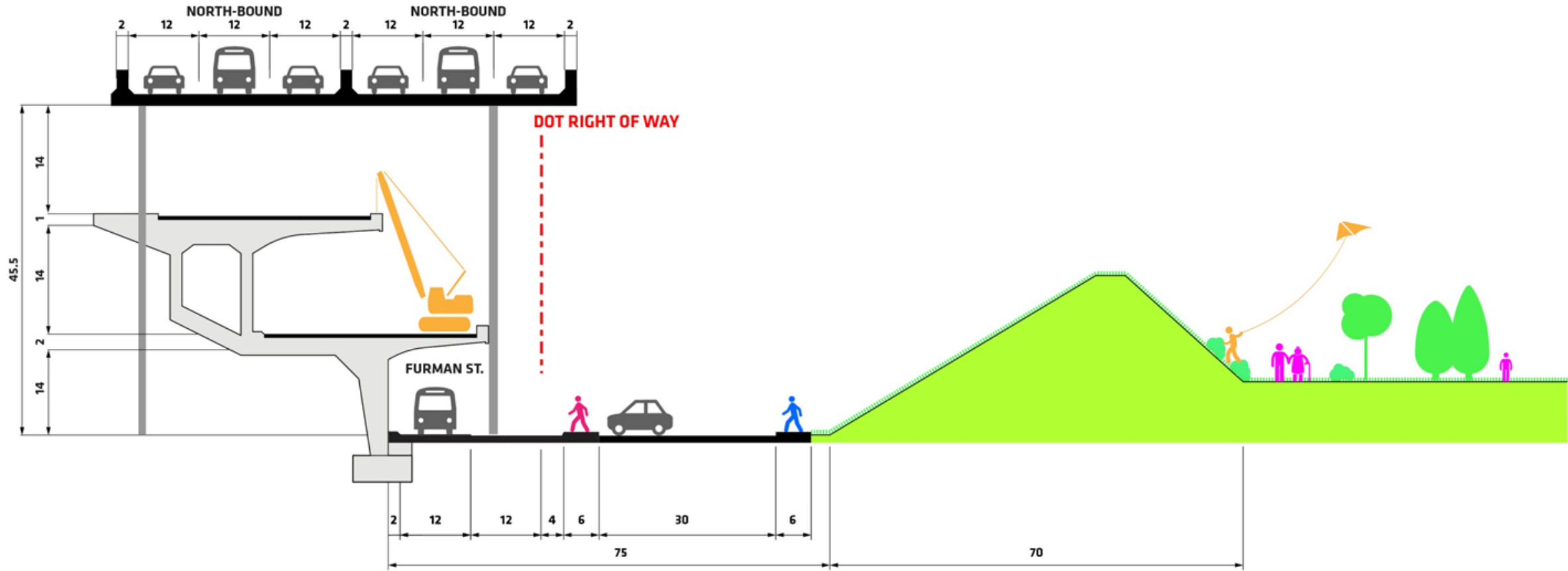


CURRENT PROPOSAL

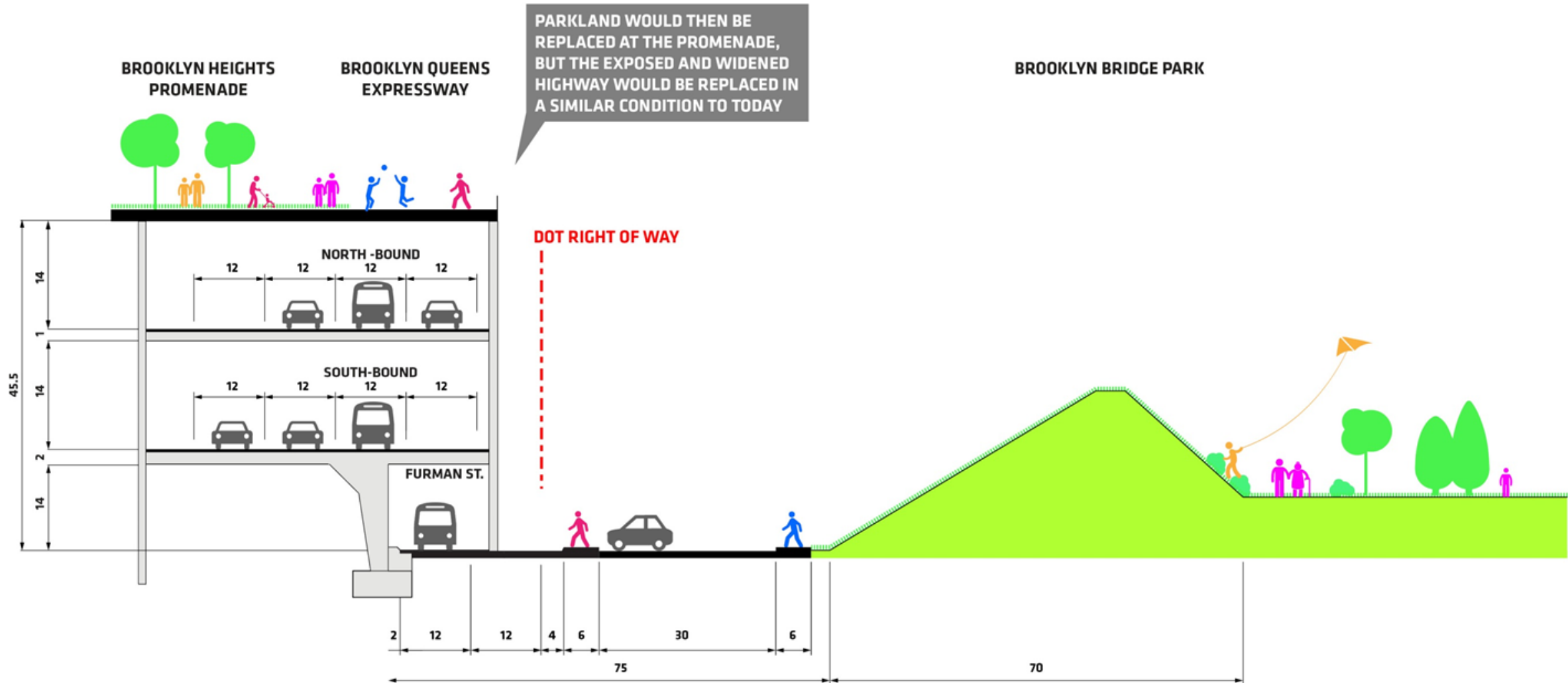
BROOKLYN QUEENS EXPRESSWAY

AND ROUTE TRAFFIC THROUGH THE BK HEIGHTS PROMENADE CORRIDOR DURING CONSTRUCTION

BROOKLYN BRIDGE PARK




CURRENT PROPOSAL

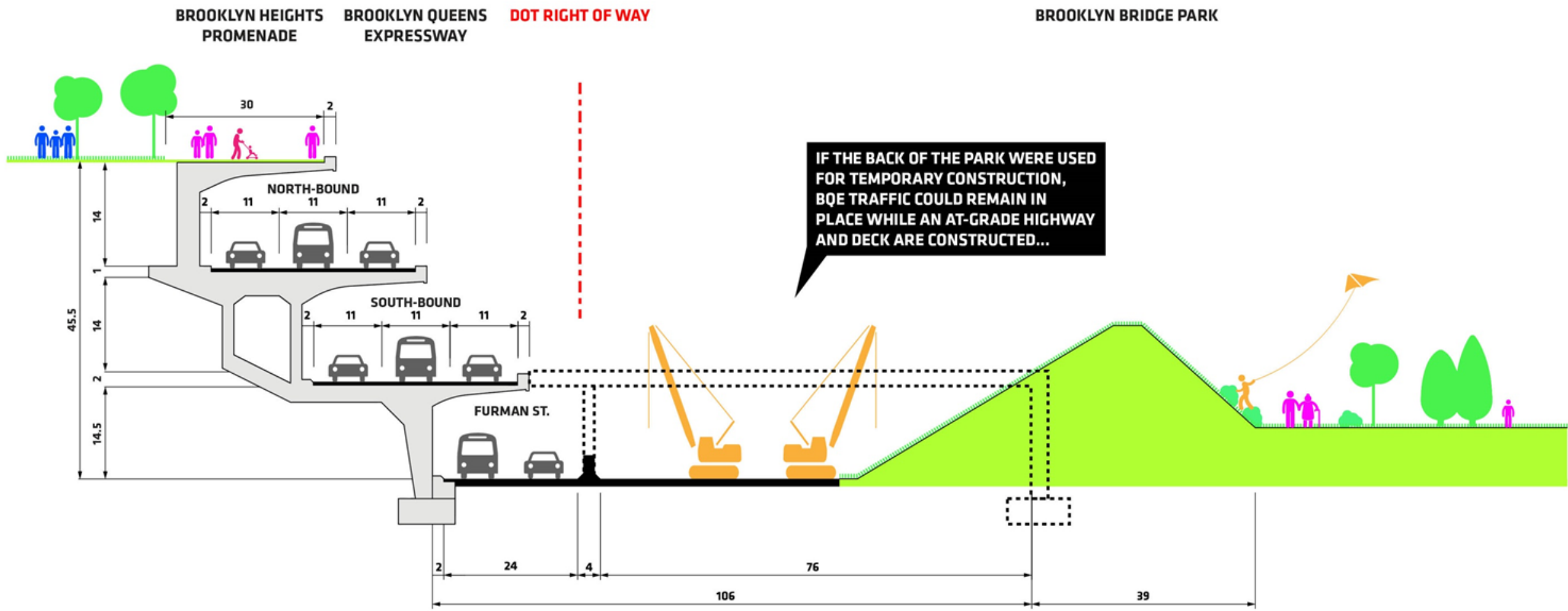


PARKLAND WOULD THEN BE REPLACED AT THE PROMENADE, BUT THE EXPOSED AND WIDENED HIGHWAY WOULD BE REPLACED IN A SIMILAR CONDITION TO TODAY

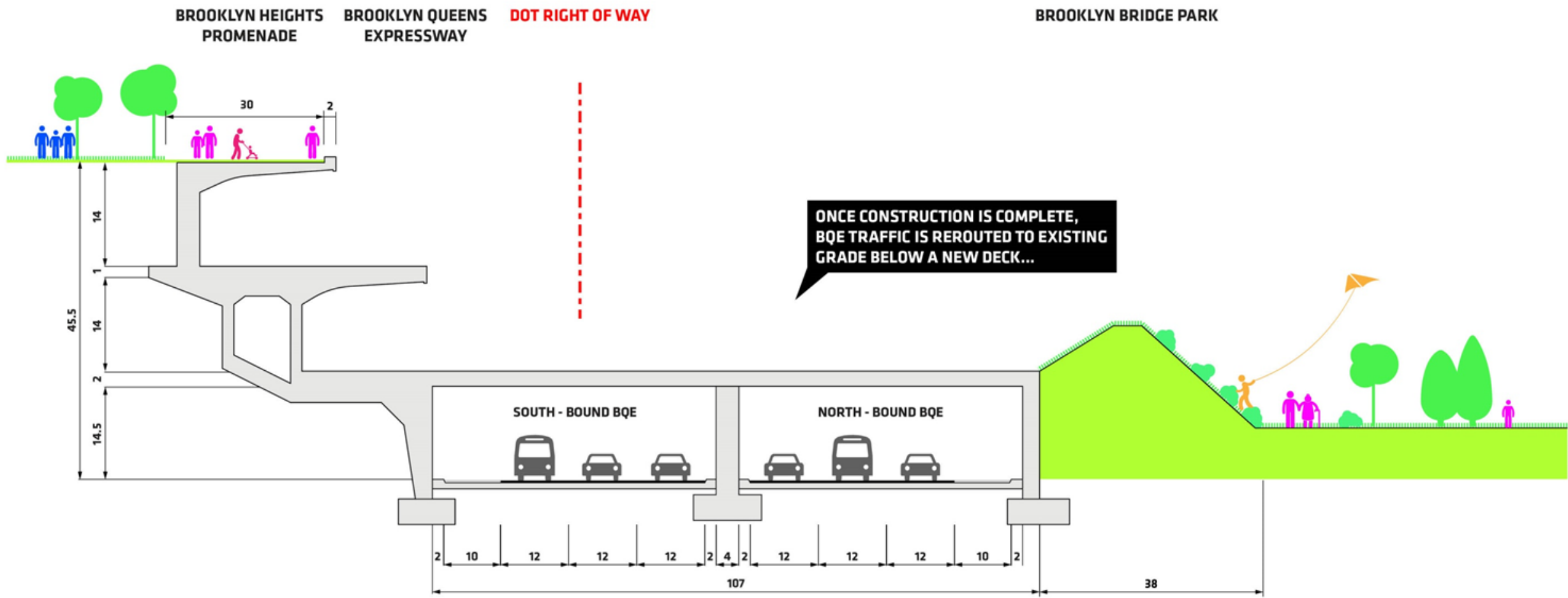
CURRENT PROPOSAL

BQE → **BQP** 

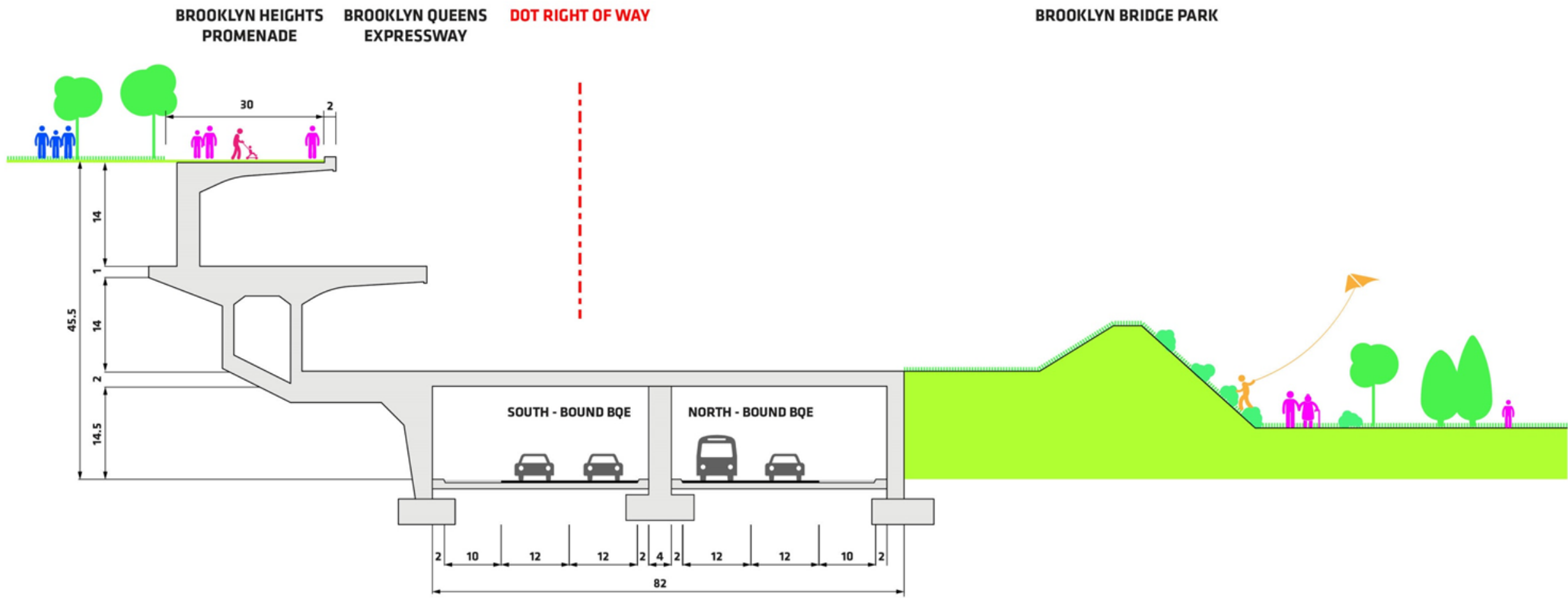
FROM BQ-EXPRESSWAY TO BQ-PARK



BQP - PHASE 1



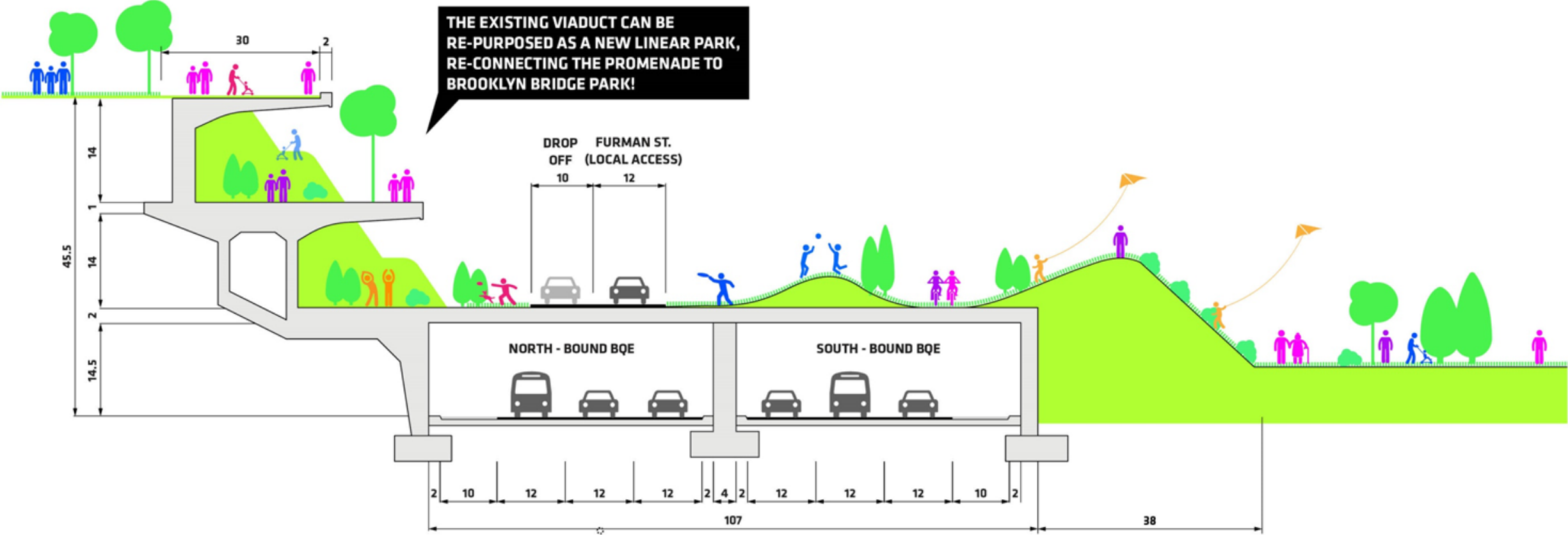
BQP - PHASE 2



BQP - PHASE 2 (4 LANE OPTION)

**BROOKLYN HEIGHTS
PROMENADE**

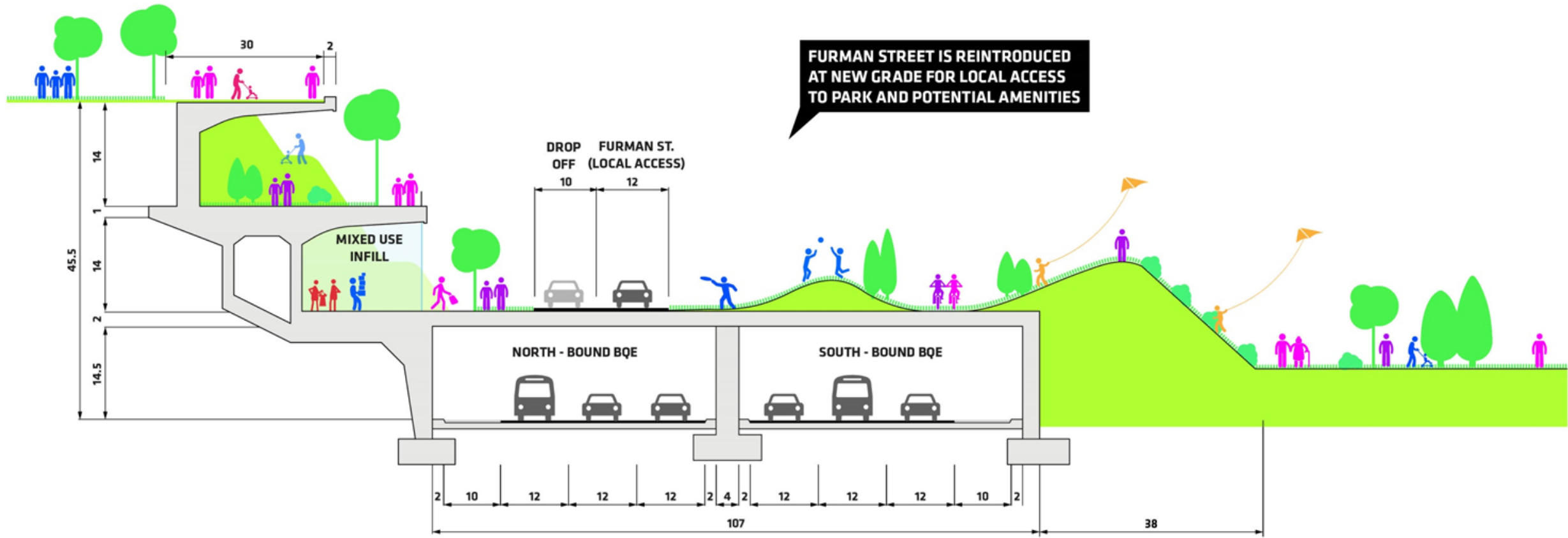
BROOKLYN BRIDGE PARK



BQP - PRESERVED TRIPLE CANTILEVER

**BROOKLYN HEIGHTS
PROMENADE**

BROOKLYN BRIDGE PARK

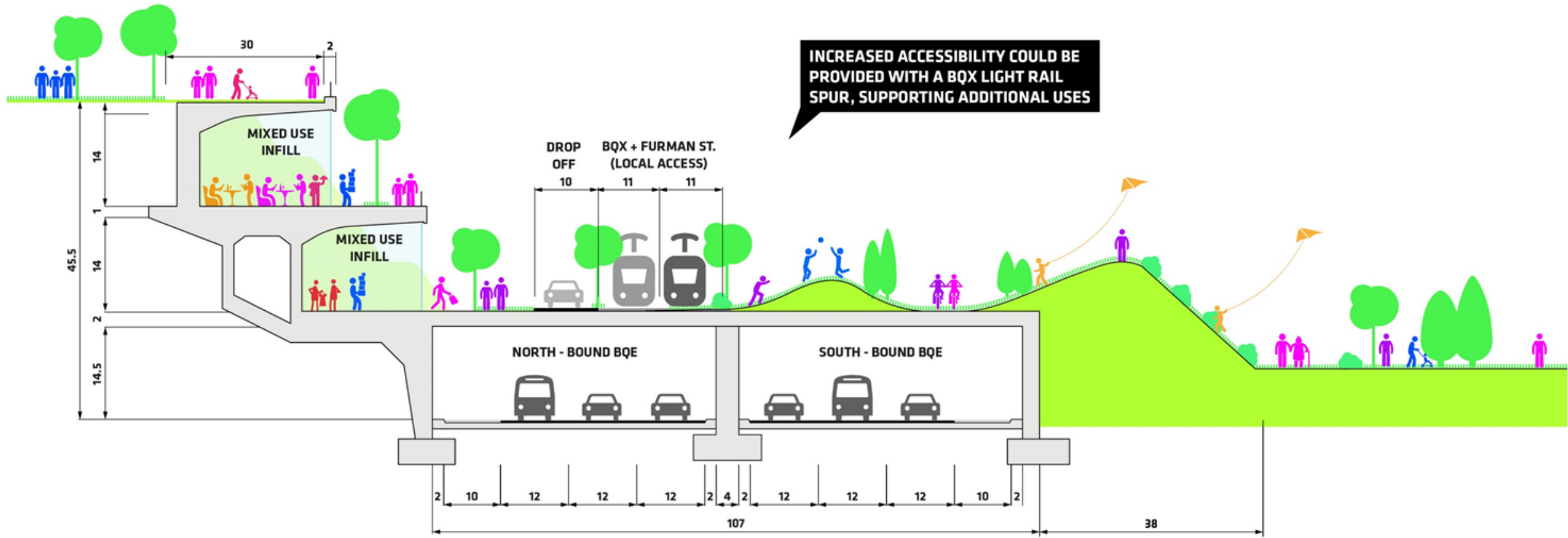


**FURMAN STREET IS REINTRODUCED
AT NEW GRADE FOR LOCAL ACCESS
TO PARK AND POTENTIAL AMENITIES**

BQP - PRESERVED TRIPLE CANTILEVER

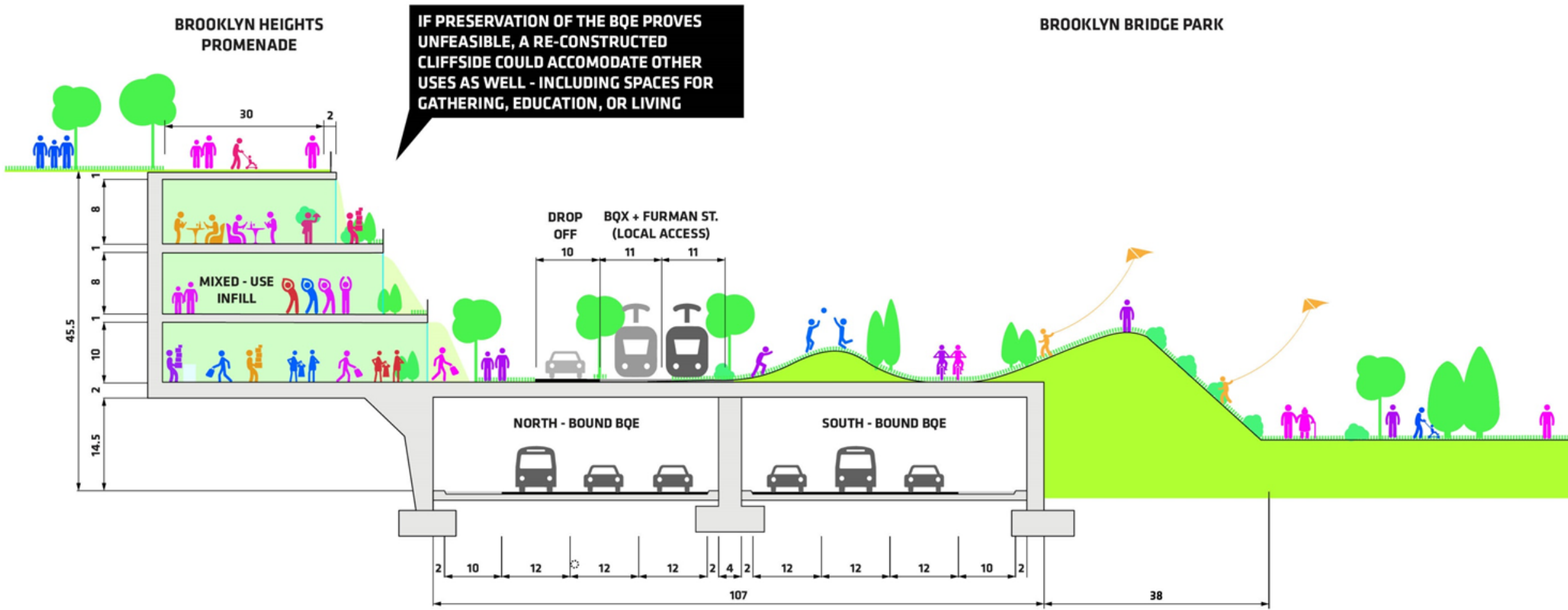
**BROOKLYN HEIGHTS
PROMENADE**

BROOKLYN BRIDGE PARK

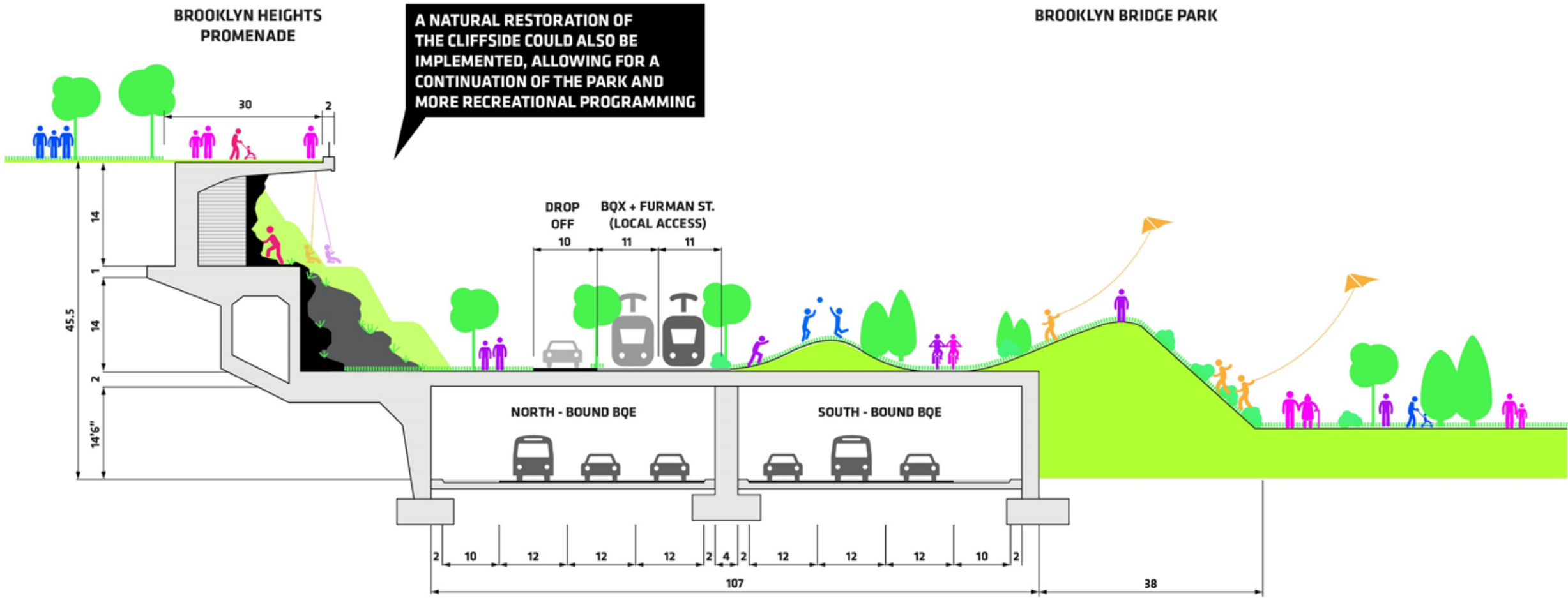


INCREASED ACCESSIBILITY COULD BE PROVIDED WITH A BQX LIGHT RAIL SPUR, SUPPORTING ADDITIONAL USES

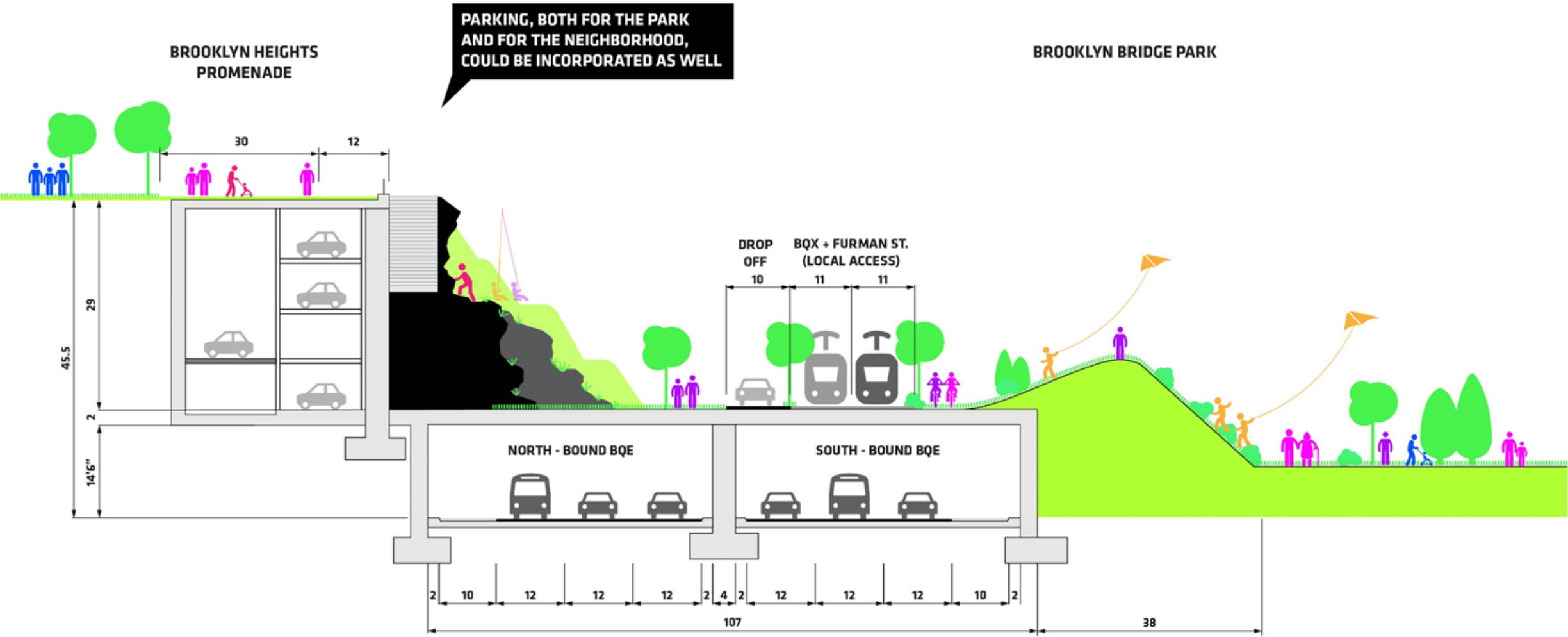
BQP - PRESERVED TRIPLE CANTILEVER



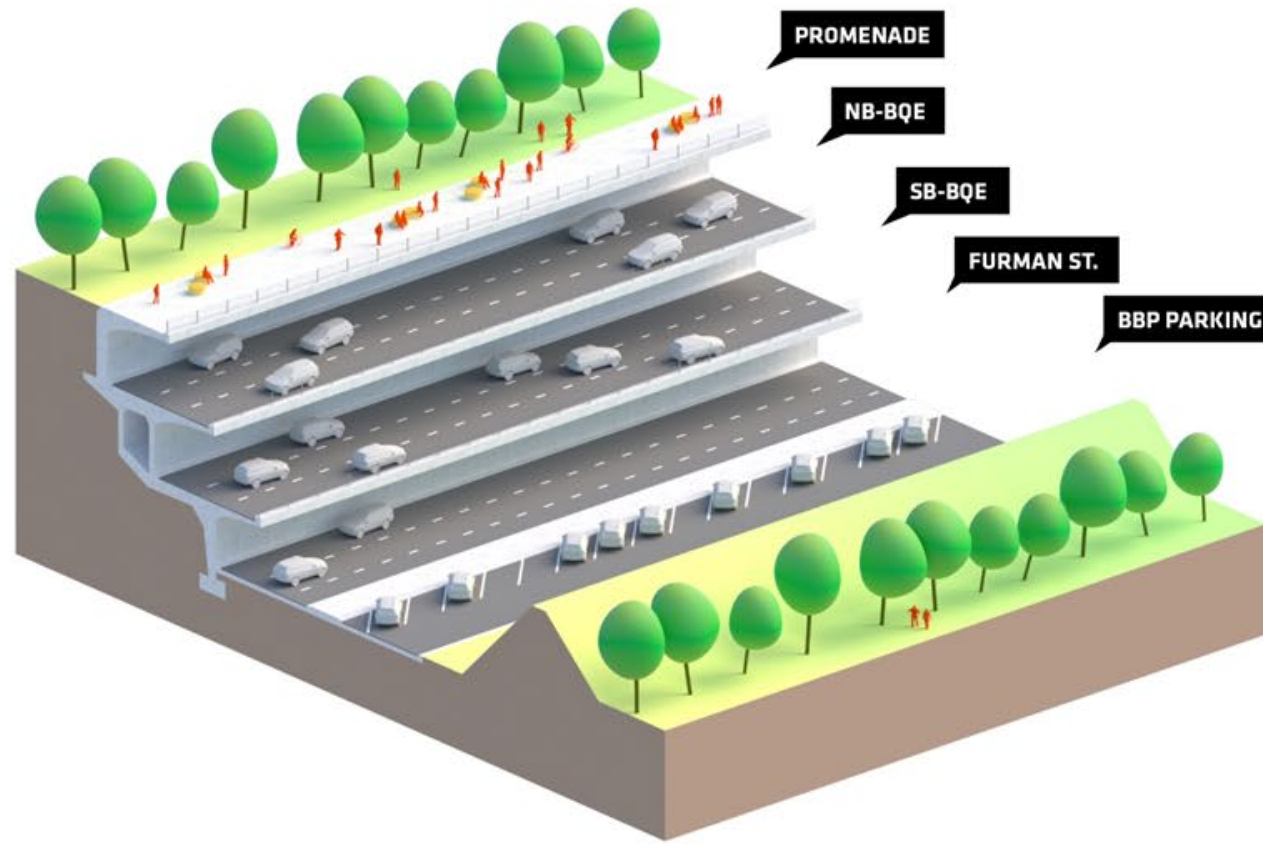
BQP - CLIFFSIDE RE-CONSTRUCTION



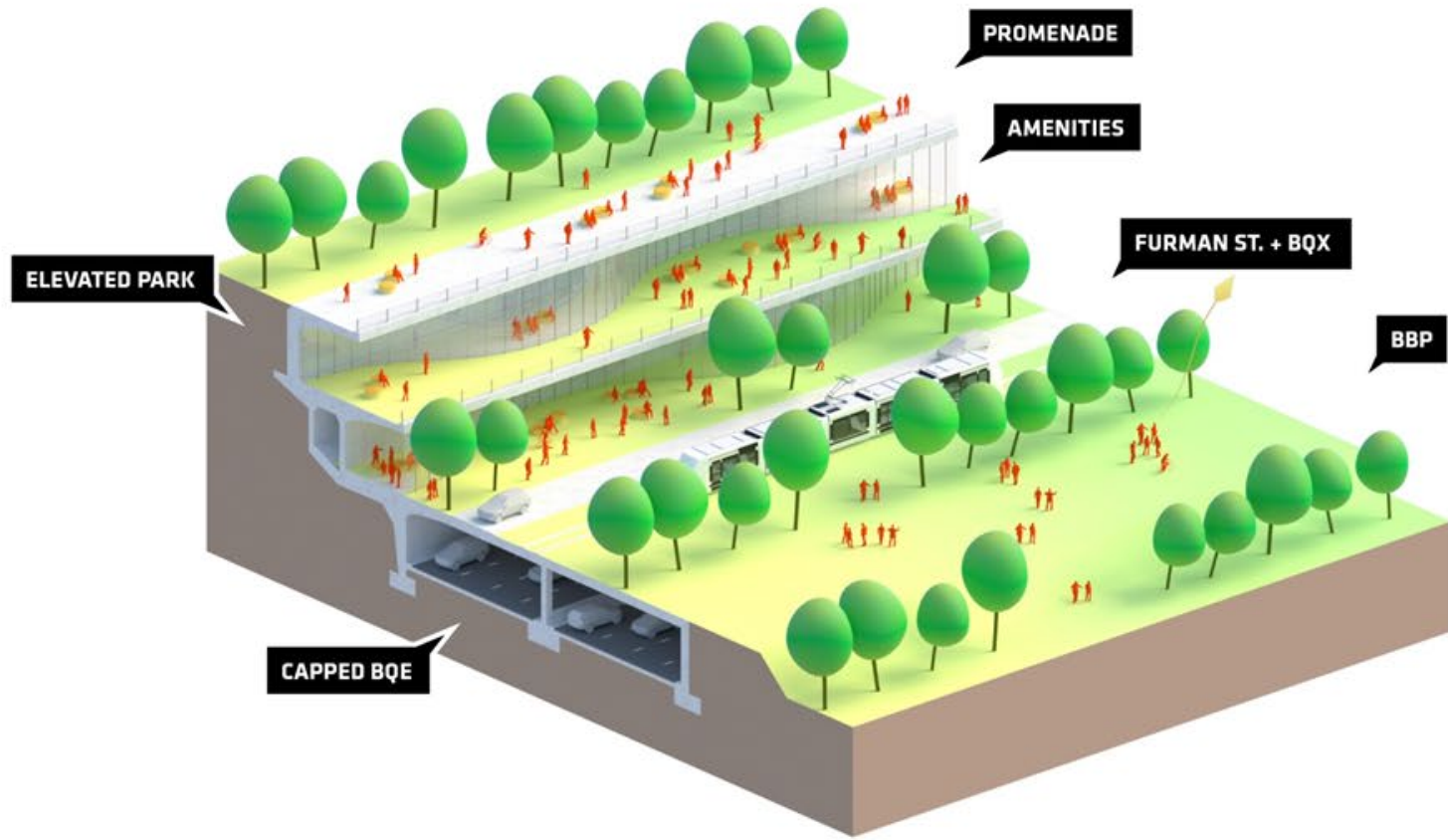
BQP - CLIFFSIDE RE-CONSTRUCTION



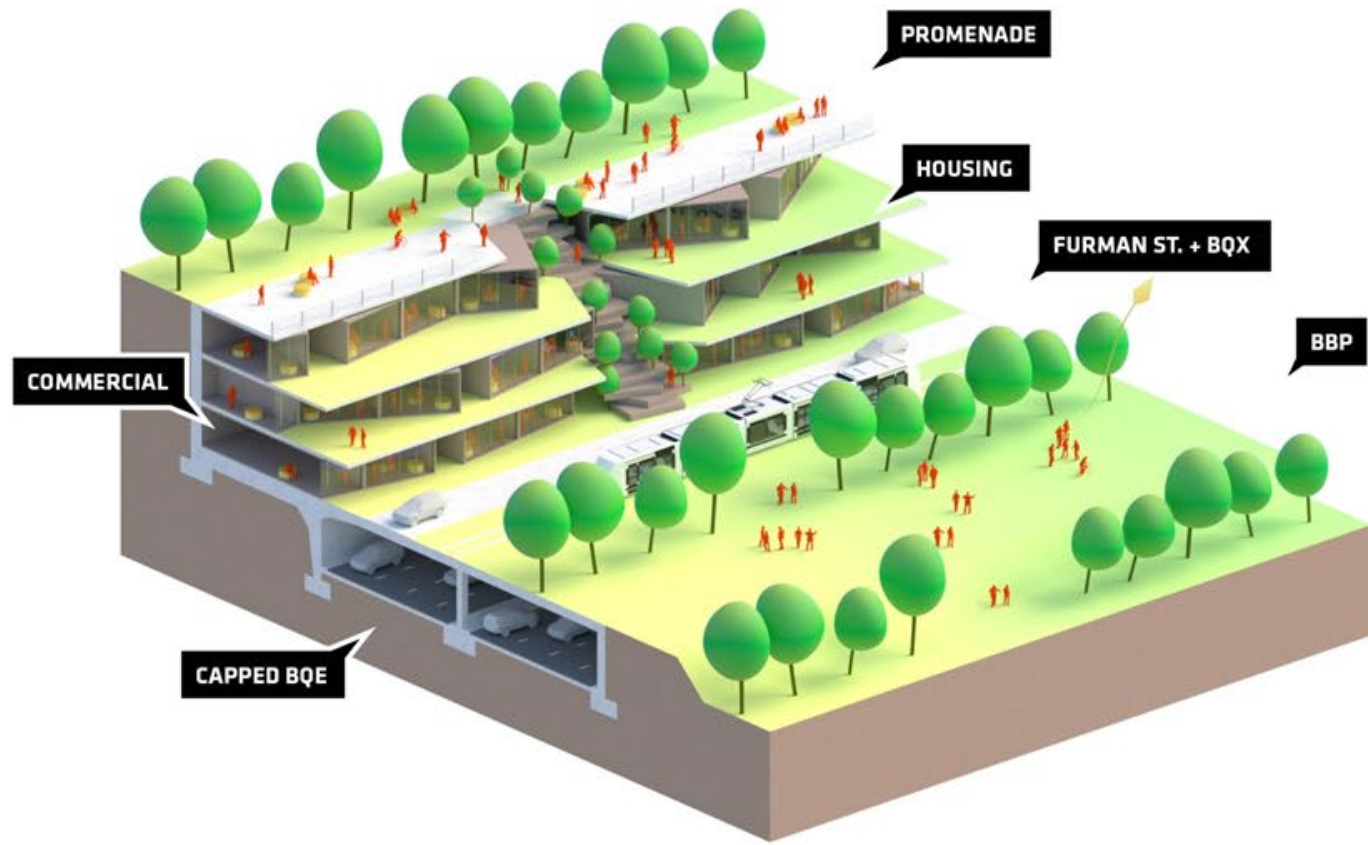
BQP - CLIFFSIDE RE-CONSTRUCTION



BQE EXISTING CONDITIONS

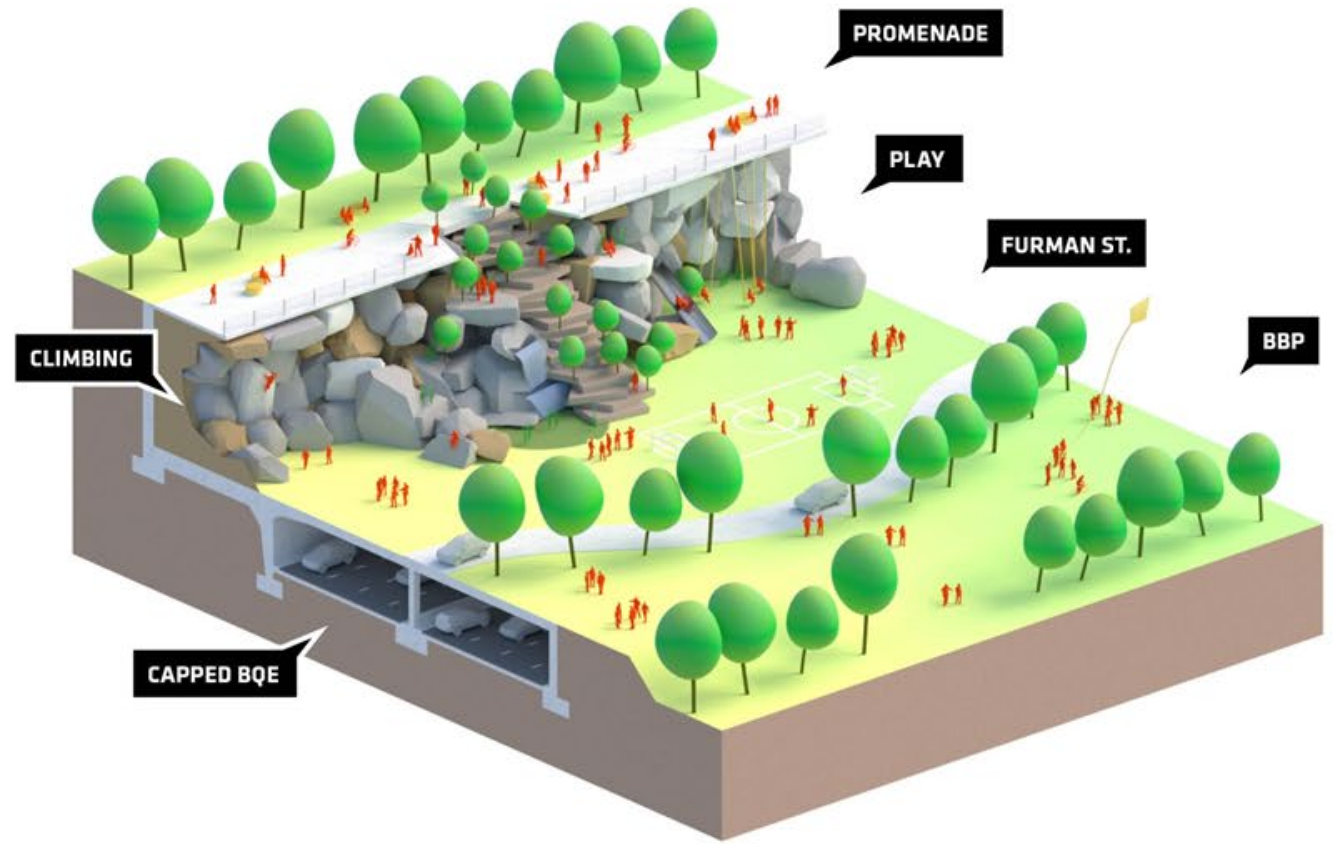


BQP - OPTION A
REINFORCED STRUCTURE | MIXED-USE + PUBLIC SPACE

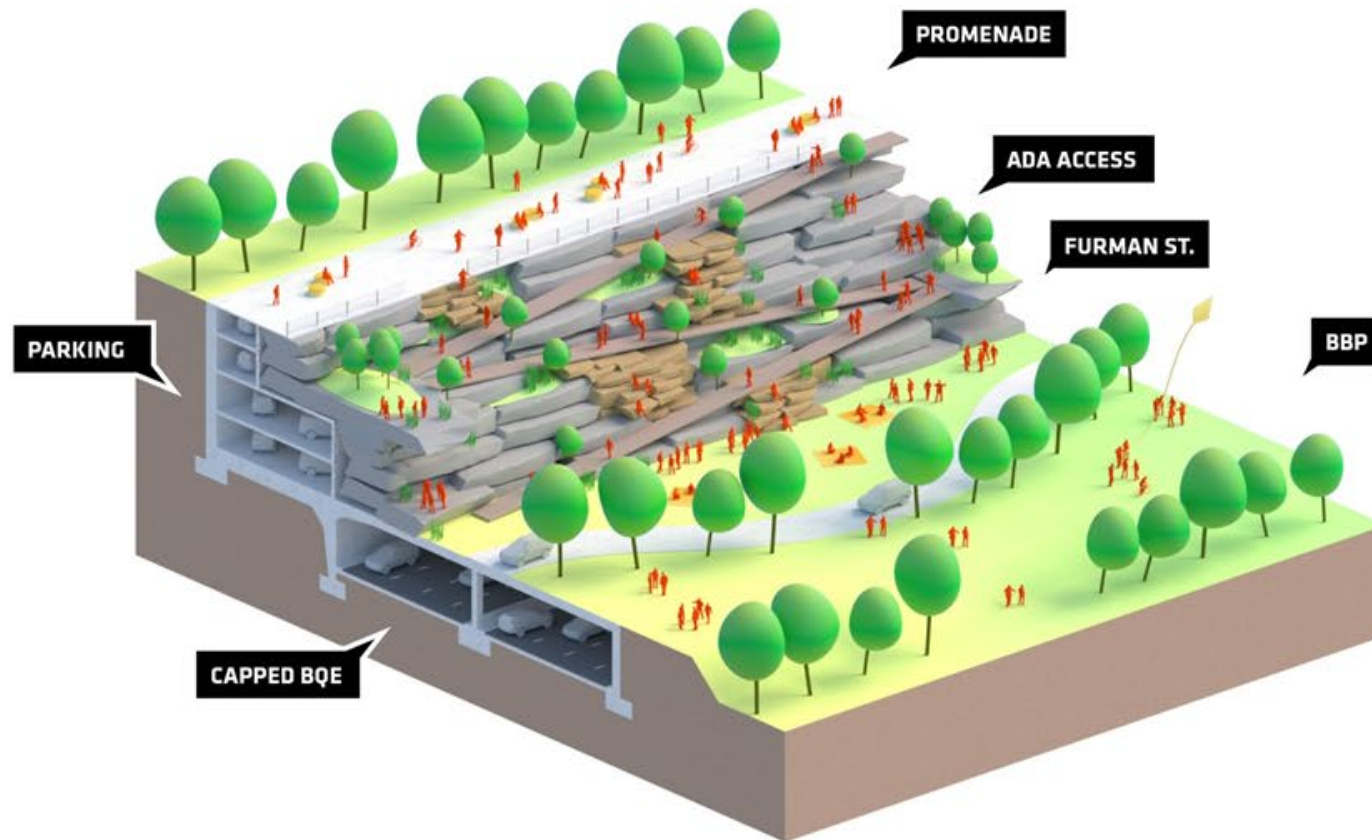


BQP - OPTION B

REPLACE STRUCTURE | HILLSIDE MIXED-USE + CONNECTION

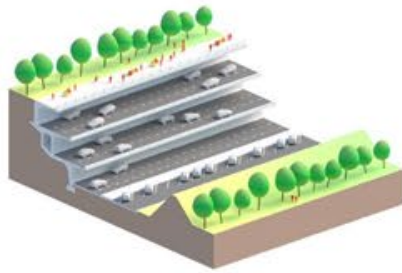


BQP - OPTION C
MODIFY STRUCTURE | PLAY + CONNECTION

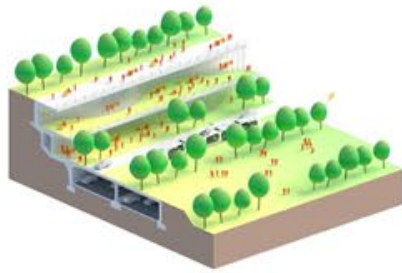


BQP - OPTION D

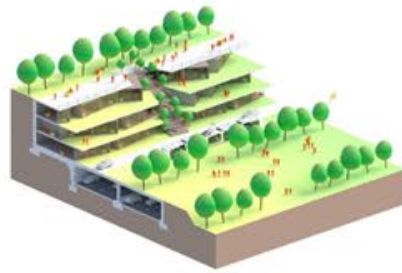
REPLACE STRUCTURE | PARKING + PARK



EXISTING CONDITION
BQE



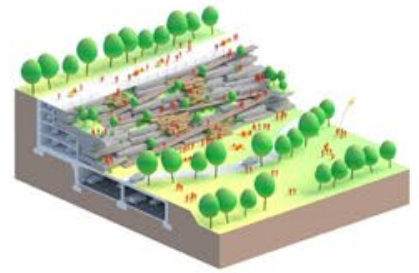
OPTION A
REINFORCE STRUCTURE
MIXED-USE + PUBLIC SPACE



OPTION B
REPLACE STRUCTURE
MIXED-USE



OPTION C
REPLACE STRUCTURE
PARK



OPTION D
REPLACE STRUCTURE
PARKING STRUCTURE + PARK

**A KIT OF PARTS IS CREATED, WHICH
CAN BE MIXED AND MATCHED
ACCORDING TO COMMUNITY NEEDS**

BQE ALTERNATIVES

SCENARIO 1

REPAIR



SCENARIO 1 - REPAIR

CROSS SECTION LOOKING SOUTH



CONNECTION
TO COLUMBIA
HEIGHTS

BROOKLYN
HEIGHTS
PROMENADE

AMENITIES

TERRACE
GARDENS

BQX

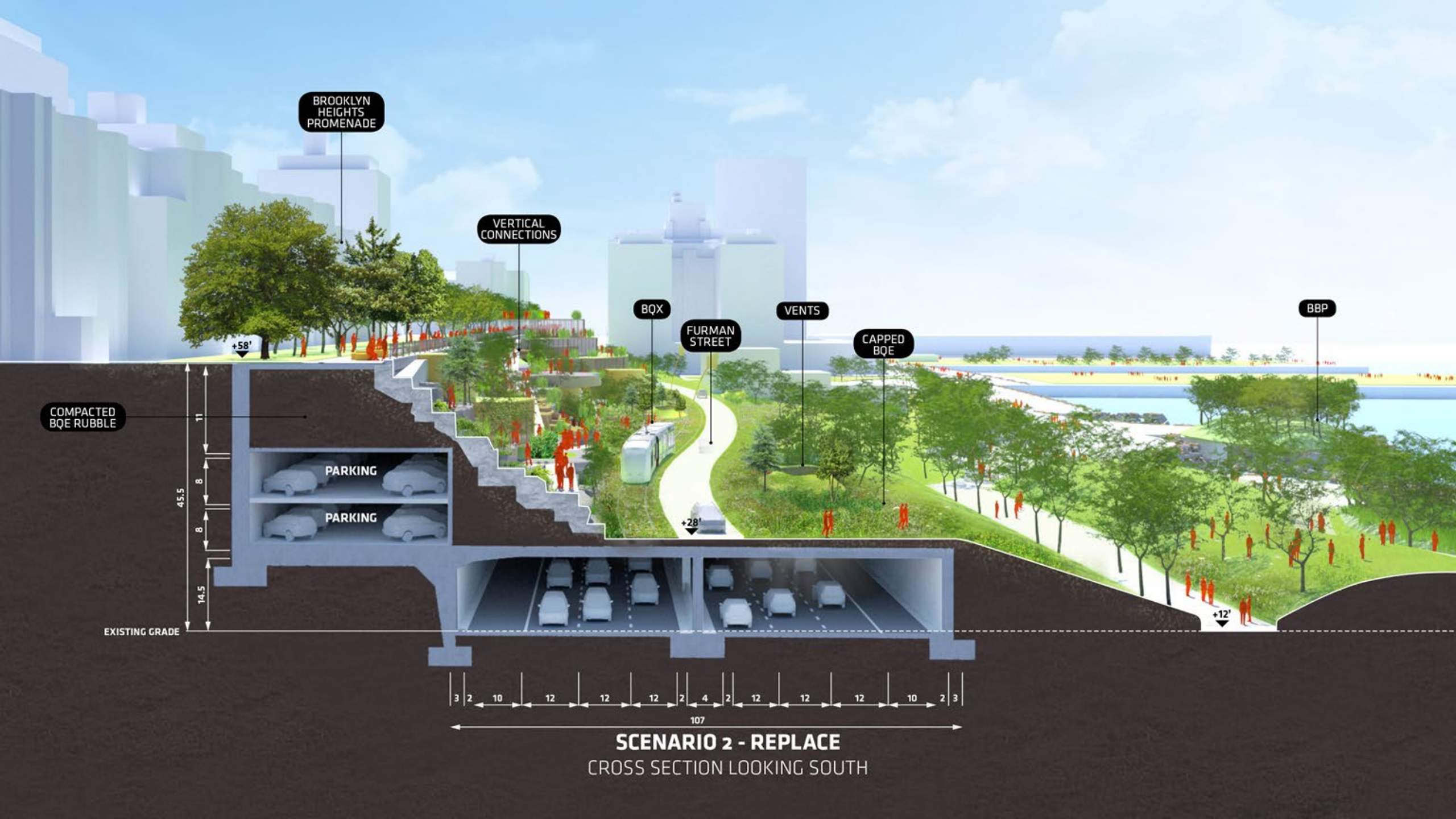
FURMAN
STREET

BROOKLYN
BRIDGE PARK

SCENARIO 1 - REPAIR
OVERVIEW

SCENARIO 2

REPLACE



BROOKLYN HEIGHTS PROMENADE

VERTICAL CONNECTIONS

BQX

VENTS

BBP

+58'

FURMAN STREET

CAPPED BQE

COMPACTED BQE RUBBLE

45.5
11
8
8
14.5

PARKING

PARKING

+28'

+12'

EXISTING GRADE

3 2 10 12 12 12 2 4 2 12 12 12 10 2 3

107

SCENARIO 2 - REPLACE
CROSS SECTION LOOKING SOUTH



CONNECTION
TO COLUMBIA
HEIGHTS

BROOKLYN
HEIGHTS
PROMENADE

BQE RUBBLE
REUSED FOR SLOPE

AMENITIES

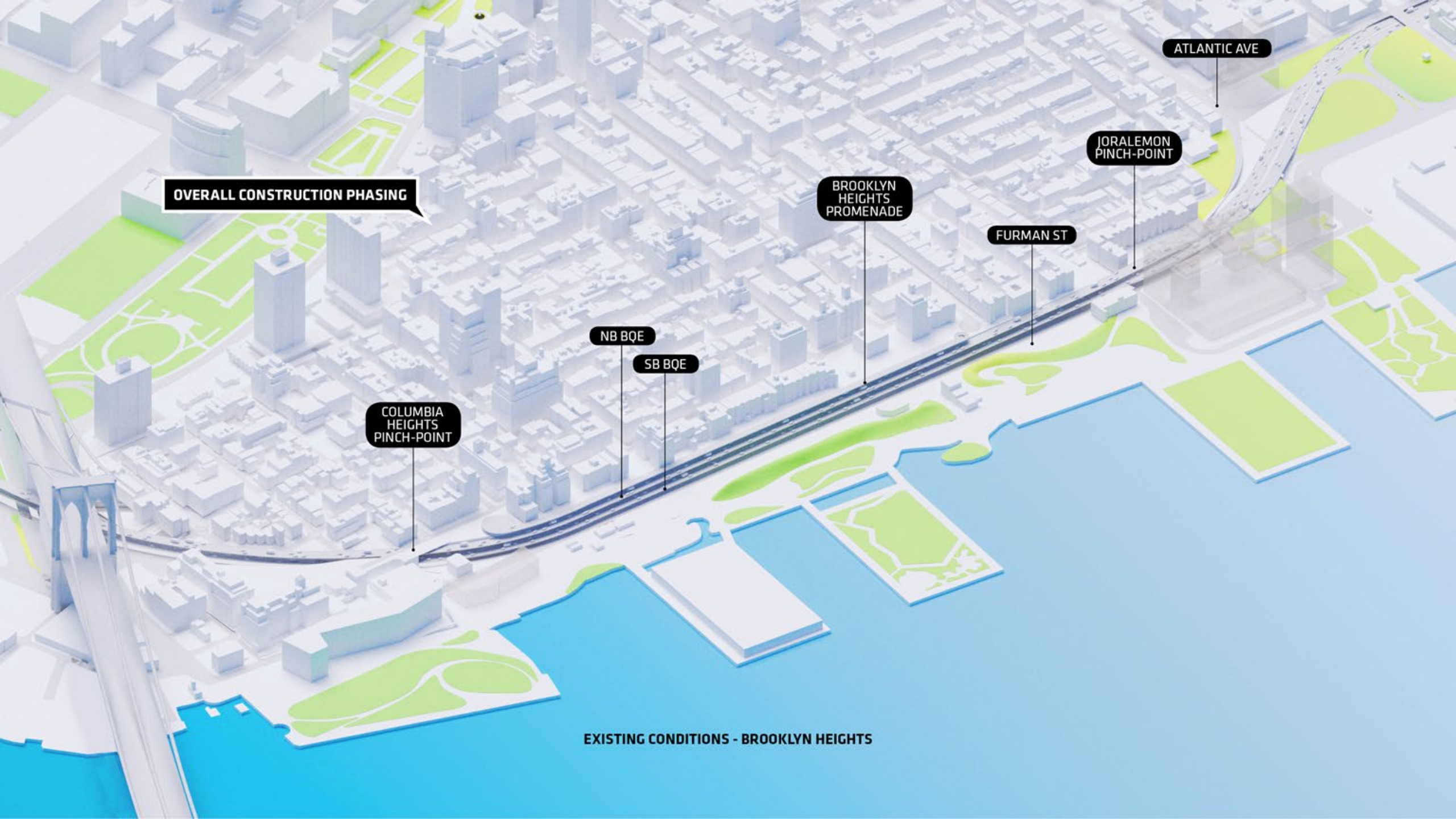
VERTICAL
CONNECTIONS

FURMAN
STREET

BROOKLYN
BRIDGE PARK

SCENARIO 2 - REPLACE
OVERVIEW

PROJECT PHASING



OVERALL CONSTRUCTION PHASING

COLUMBIA HEIGHTS PINCH-POINT

NB BQE

SB BQE

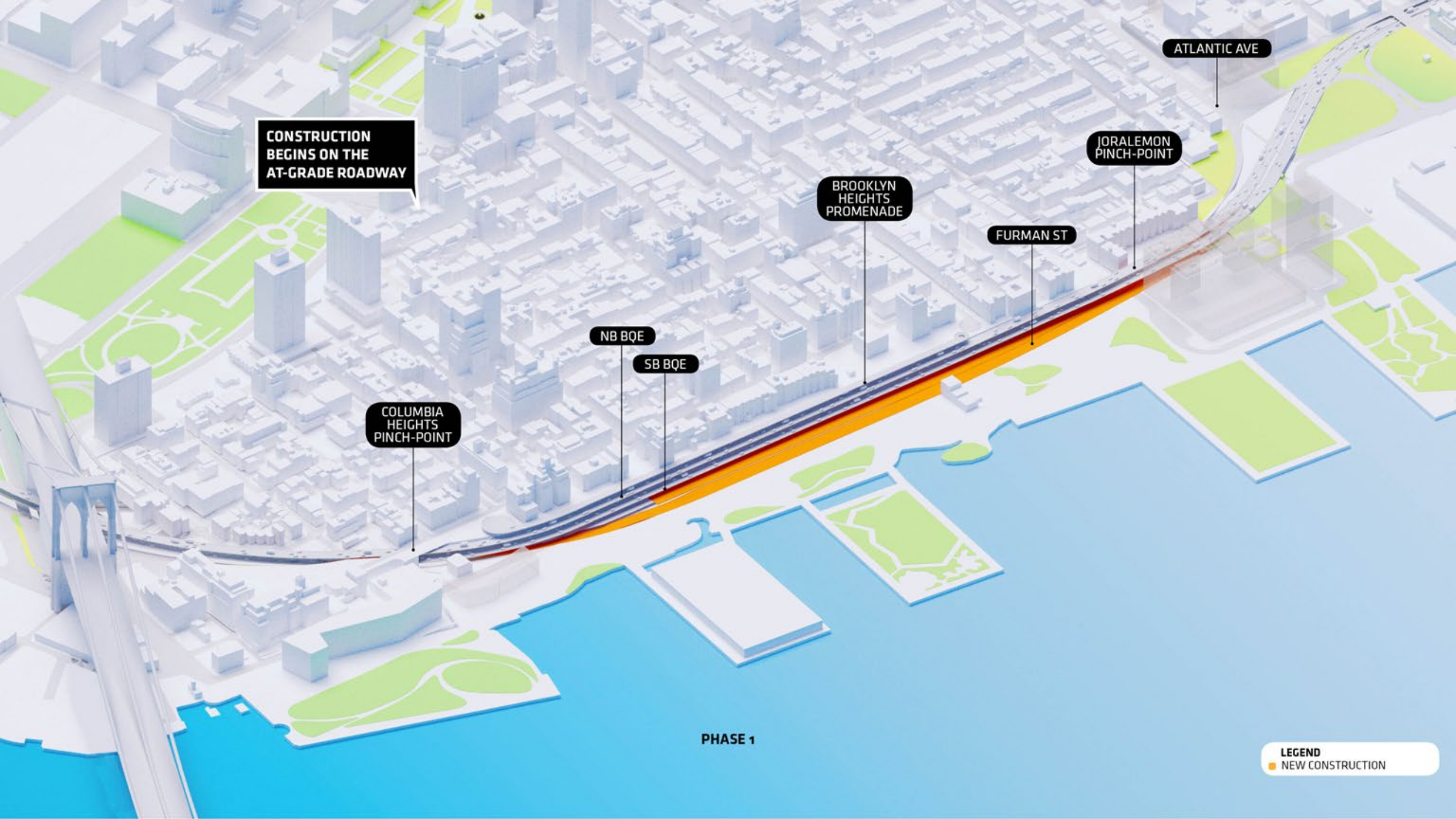
BROOKLYN HEIGHTS PROMENADE

FURMAN ST

JORALEMON PINCH-POINT

ATLANTIC AVE

EXISTING CONDITIONS - BROOKLYN HEIGHTS



CONSTRUCTION BEGINS ON THE AT-GRADE ROADWAY

COLUMBIA HEIGHTS PINCH-POINT

NB BQE

SB BQE

BROOKLYN HEIGHTS PROMENADE

FURMAN ST

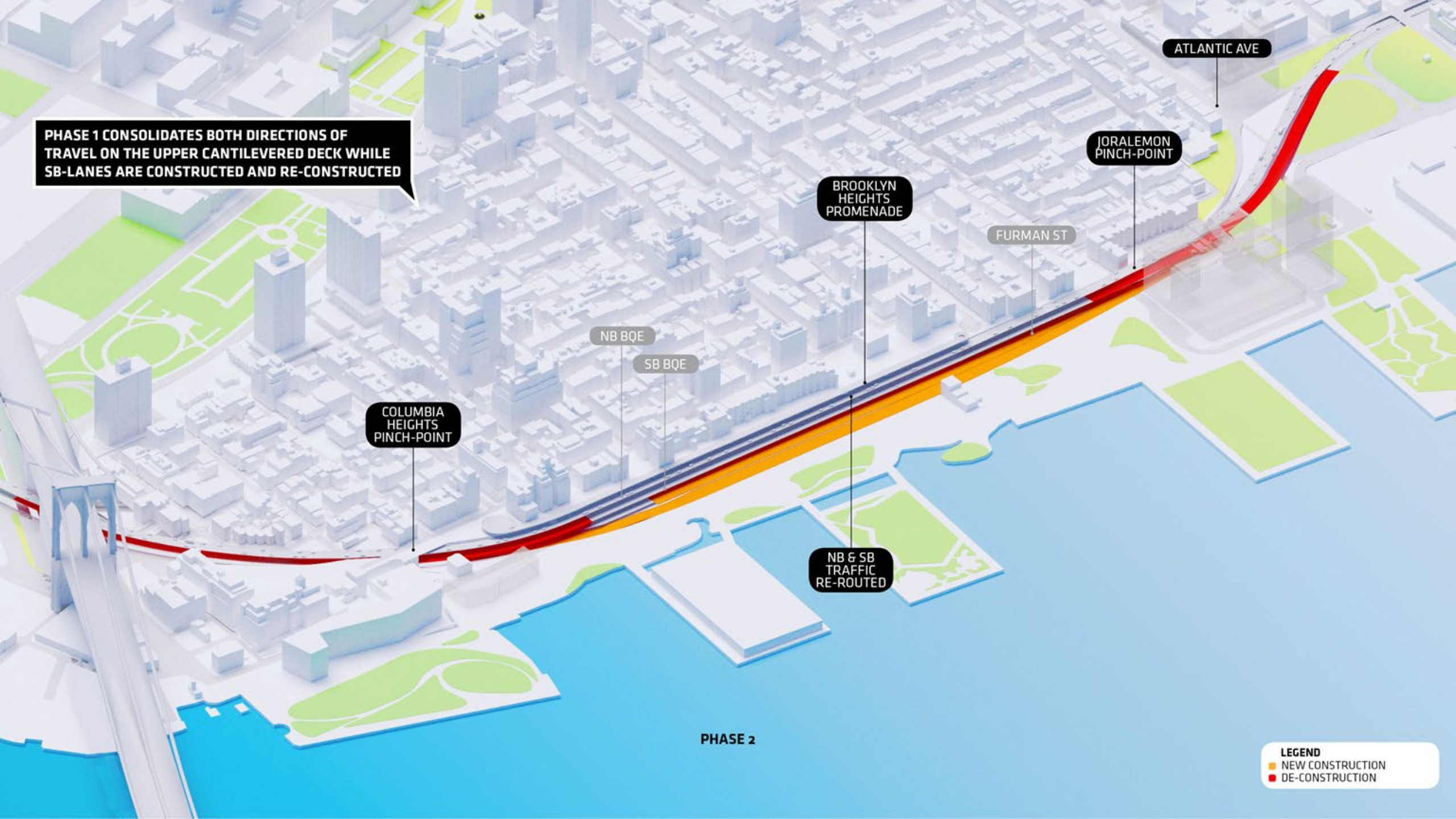
JORALEMON PINCH-POINT

ATLANTIC AVE

PHASE 1

LEGEND
■ NEW CONSTRUCTION

PHASE 1 CONSOLIDATES BOTH DIRECTIONS OF TRAVEL ON THE UPPER CANTILEVERED DECK WHILE SB-LANES ARE CONSTRUCTED AND RE-CONSTRUCTED



COLUMBIA HEIGHTS PINCH-POINT

NB BQE

SB BQE

BROOKLYN HEIGHTS PROMENADE

FURMAN ST

JORALEMON PINCH-POINT

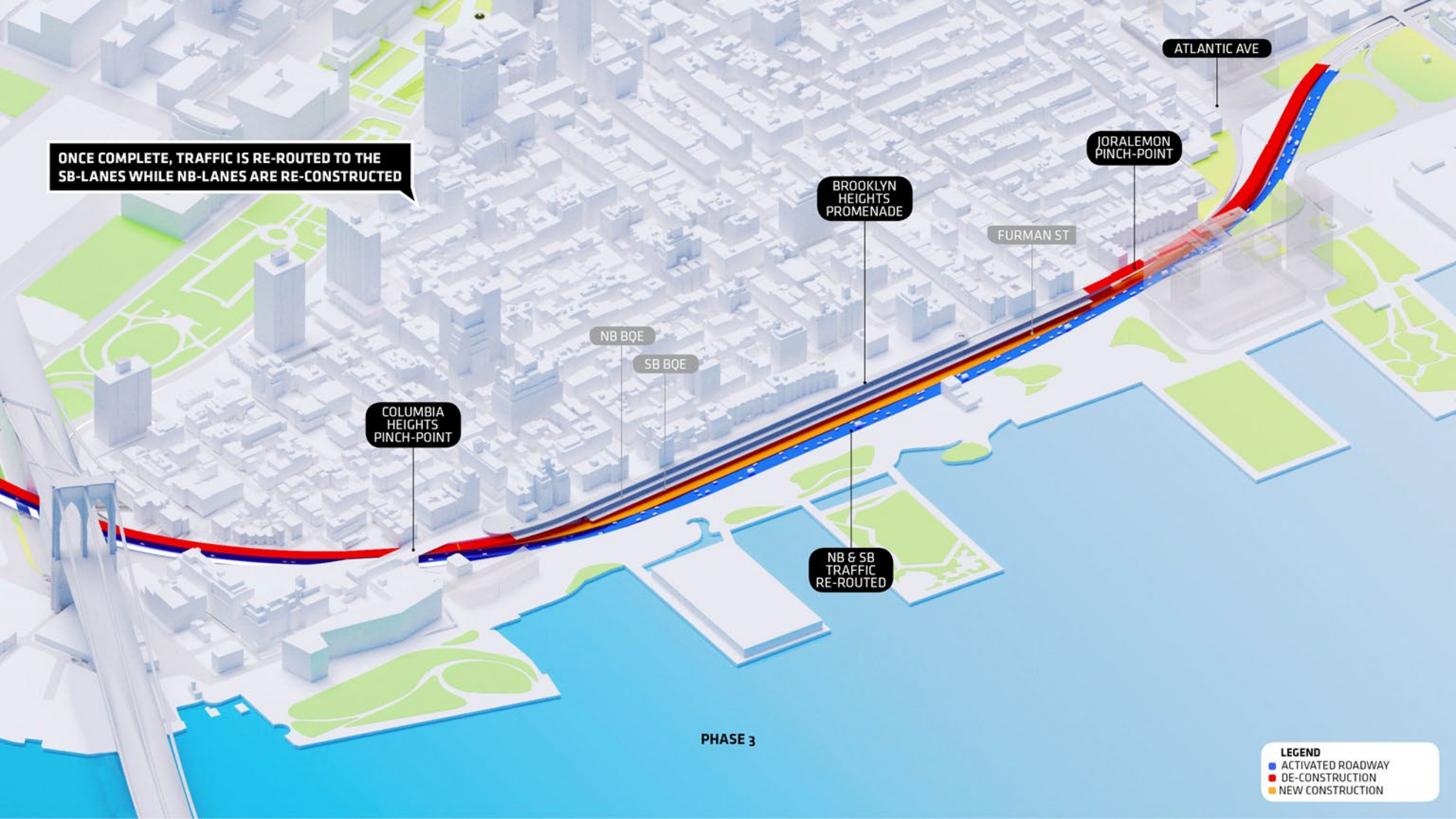
ATLANTIC AVE

NB & SB TRAFFIC RE-ROUTED

PHASE 2

LEGEND
■ NEW CONSTRUCTION
■ DE-CONSTRUCTION

ONCE COMPLETE, TRAFFIC IS RE-ROUTED TO THE SB-LANES WHILE NB-LANES ARE RE-CONSTRUCTED



COLUMBIA HEIGHTS PINCH-POINT

NB BQE

SB BQE

BROOKLYN HEIGHTS PROMENADE

FURMAN ST

JORALEMON PINCH-POINT

ATLANTIC AVE

NB & SB TRAFFIC RE-ROUTED

PHASE 3

LEGEND

- ACTIVATED ROADWAY
- DE-CONSTRUCTION
- NEW CONSTRUCTION

ATLANTIC AVE

JORALEMON PINCH-POINT

BROOKLYN HEIGHTS PROMENADE

FURMAN ST

NB BQE

SB BQE

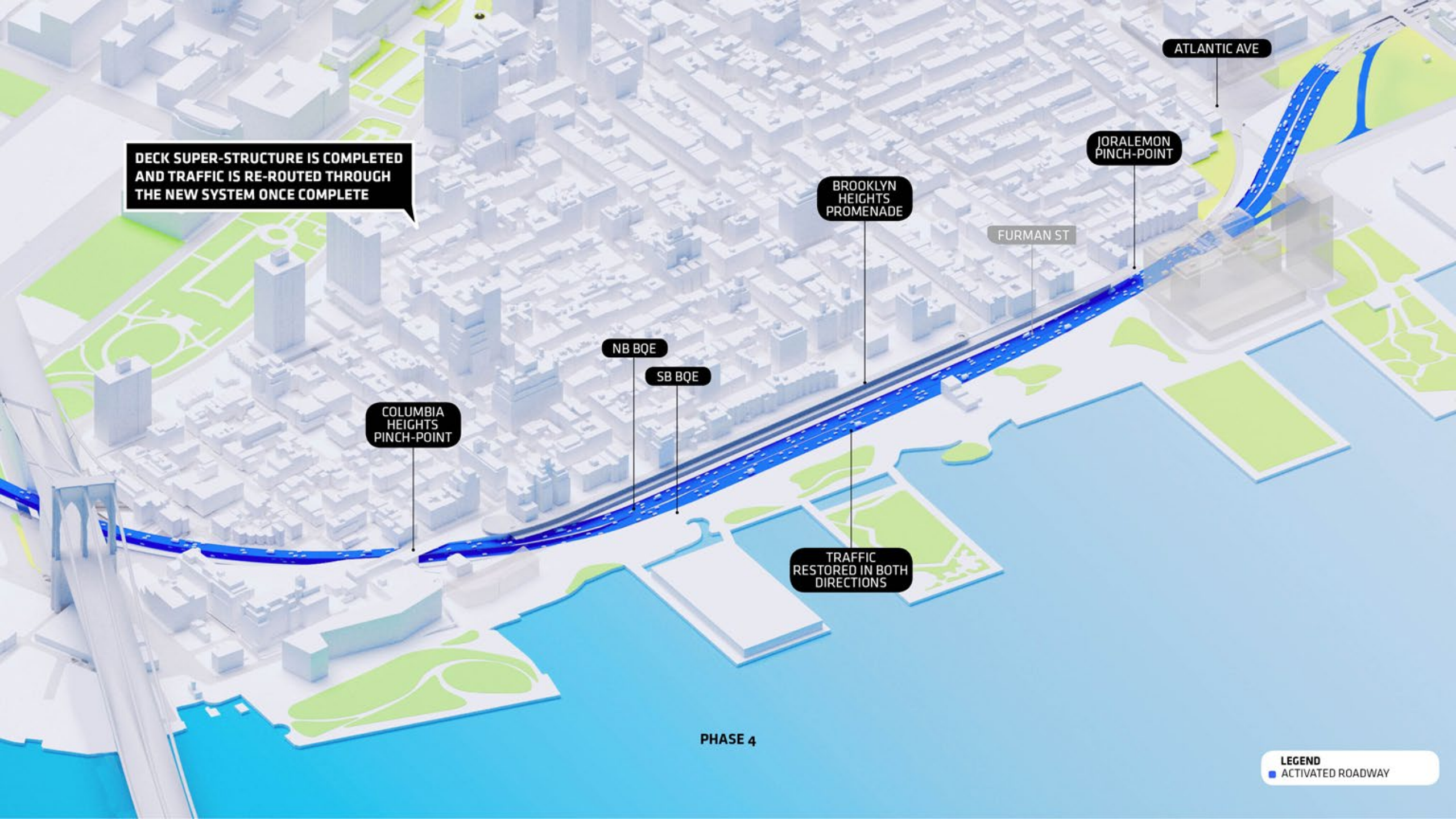
COLUMBIA HEIGHTS PINCH-POINT

TRAFFIC RESTORED IN BOTH DIRECTIONS

DECK SUPER-STRUCTURE IS COMPLETED AND TRAFFIC IS RE-ROUTED THROUGH THE NEW SYSTEM ONCE COMPLETE

PHASE 4

LEGEND
■ ACTIVATED ROADWAY





DECK SYSTEM IS TOPPED OUT AND PARKLAND IS COMPLETED AS FINAL PHASE

COLUMBIA HEIGHTS PINCH-POINT

BROOKLYN HEIGHTS PROMENADE

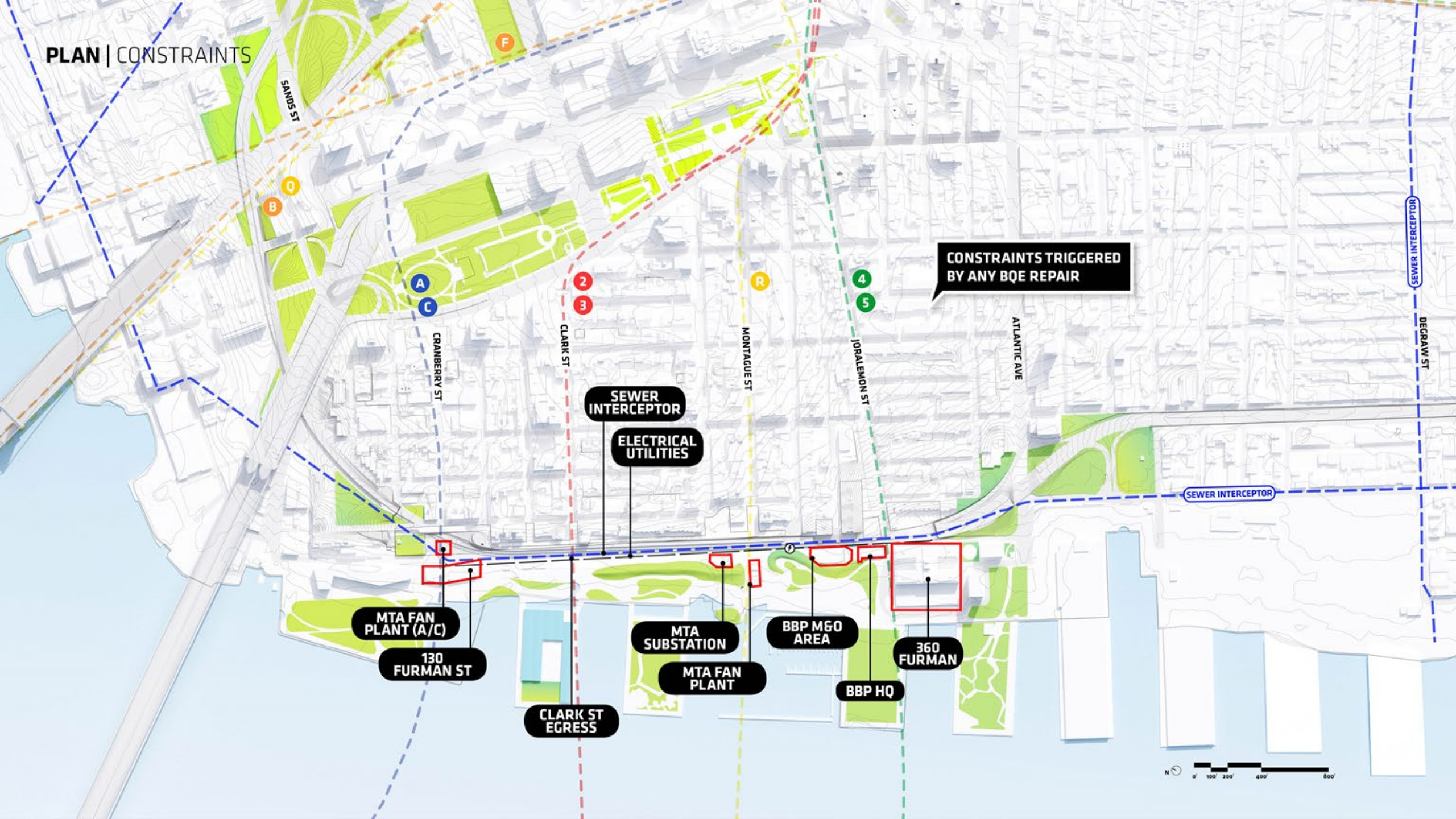
FURMAN ST

JORALEMON PINCH-POINT

ATLANTIC AVE

FUTURE BQP CAP

PLAN | CONSTRAINTS



CONSTRAINTS TRIGGERED BY ANY BQE REPAIR

SEWER INTERCEPTOR

ELECTRICAL UTILITIES

MTA FAN PLANT (A/C)

130 FURMAN ST

MTA SUBSTATION

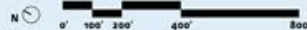
MTA FAN PLANT

BBP M&O AREA

BBP HQ

360 FURMAN

CLARK ST EGRESS



A cityscape featuring a multi-level highway with traffic, a waterfront area with a rocky shoreline, and a body of water in the foreground. The scene is overlaid with a semi-transparent dark grey filter. The text 'BQP BENEFITS' is centered in the middle of the image.

BQP BENEFITS



FEASIBILITY



COST



**COMMUNITY
BENEFITS**



COORDINATION



FEASIBILITY

- SIMPLE STRUCTURAL APPROACH
- DE-CONFLICTS CONSTRUCTION FROM COMMUNITY AND ACTIVE TRAFFIC
- MINIMIZES OR ELIMINATES TEMPORARY ROADWAY ELEMENTS
- AVOIDS SENSITIVE HISTORICAL AREAS COMPLETELY
- MINIMIZES PARKLAND ALIENATION

The background image shows a city street scene. In the foreground, there is a large pile of grey rocks, possibly a construction site or a waterfront area. Behind the rocks, a multi-level highway with several lanes of traffic is visible. In the background, there are several tall, multi-story buildings, some with red brick facades and others with more modern, grey facades. The sky is a clear, light blue.

\$ COST

- REDUCED ROADWAY CONSTRUCTION COSTS – BUILD IT ONCE, NOT TWICE
- REDUCED COST OF STRUCTURAL SYSTEM - AT-GRADE, SIMPLE DECK
- OPPORTUNITIES FOR DIVERSIFIED FUNDING



COMMUNITY BENEFITS

- REDUCED CONSTRUCTION IMPACTS - PRESERVES HISTORICAL PROMENADE
- VASTLY IMPROVED WATERFRONT CONDITION
- CREATION OF NEW PARKLAND - 12+ ACRES
- IMPROVED N-S AND E-W CONNECTIVITY
- IMPROVED SOUND AND AIR QUALITY - CAPPING, CARBON RE-CAPTURE
- OPPORTUNITIES FOR NEW COMMUNITY AMENITIES
- POTENTIAL FOR BQX/LIGHT RAIL
- CREATES POTENTIAL FOR A CONTINUOUS LINEAR PARK CONNECTING THE BROOKLYN BRIDGE TO RED HOOK

BROOKLYN QUEENS EXPRESSWAY (BQE)



ALIGNMENT OPTIONS

High-Level Risks to Program Success	DOT #1 - Temporary Elevated Road			DOT #2 - Incremental Replacement			BHA - Alt. - Temporary Elevated Road			BIG Option - Covered At-Grade Road		
	Cost - \$3.6B Duration - 72 Mo.			Cost - \$4.0B Duration - 96 Mo.			Cost - \$3.6B Duration - 72 Mo.			Cost - < \$3.6B Duration - < 72 Mo.		
	Likelihood	Severity	Total	Likelihood	Severity	Total	Likelihood	Severity	Total	Likelihood	Severity	Total
Original Project Cost	50	50	2,500	50	100	5,000	50	50	2,500	0	0	0
Limiting Cost Overruns	100	50	5,000	100	100	10,000	100	50	5,000	50	50	2,500
Project Duration	100	50	5,000	100	100	10,000	100	25	2,500	0	0	0
Limiting Time Overruns	100	50	5,000	100	100	10,000	100	50	5,000	50	50	2,500
Procurement - Approvals from Other Agencies	10	10	100	50	50	2,500	10	10	100	100	100	10,000
Procurement - Suitability to Design-Build Delivery	50	100	5,000	50	50	2,500	50	50	2,500	10	-10	-100
Procurement - Requires Site Acquisition	10	50	500	10	10	100	10	10	100	50	50	2,500
Procurement - Opportunity for Mitigating Revenue	10	-100	-1,000	10	100	1,000	50	-100	-5,000	100	-100	-10,000
Changes - Unforeseen Conditions	100	50	5,000	100	100	10,000	100	50	5,000	50	100	5,000
Changes - Unpredictable Construction Delays	50	50	2,500	100	100	10,000	50	50	2,500	50	50	2,500
Traffic - Impacts on Other Roads/Bridges/Tunnels	100	100	10,000	100	50	5,000	100	50	5,000	50	50	2,500
Residents - Access to Promenade	100	100	10,000	10	50	500	10	50	500	100	-100	-10,000
Residents - Impact to Open Space	100	100	10,000	50	100	5,000	50	50	2,500	100	-100	-10,000
Residents - Temporary Loss of Facilities	100	50	5,000	100	10	1,000	50	10	500	10	10	100
Environmental - Impact	100	100	10,000	10	50	500	10	40	400	10	-100	-1,000
Environmental - Tunnel Preference (Conceal Traffic)	100	100	10,000	100	100	10,000	100	100	10,000	10	10	100
Safety - Working over Active Traffic	100	100	10,000	50	50	2,500	100	50	5,000	25	25	625
Cumulative Risk Exposure	17 Risks 94,600			85,600			44,100			-2,775		

Risk Likelihood
 0 - No Risk to +100 - Certainty
Severity Range
 0 - No Consequence to +100 - Severe Consequence
 Opportunity Exploitation - 0 - None to -100 - Strong

Relative Scoring (New Option as Benchmark)	-3409%	-3085%	-1589%	100%
Options are	(34.1)	(30.8)	(15.9)	times the conceptual risk of the RPA Option
Recommendation Based on Minimum Risk Exposure	3	4	2	1

DISCLAIMER: Risk Evaluations are Conceptual and Based on Limited Study; More in-Depth Investigation is Recommended to Validate Risk Concepts



COORDINATION

- **CROSS-JURISDICTIONAL COORDINATION - CITY/STATE (BBP)**
- **CROSS-AGENCY COORDINATION - DOT/EDC/PLANNING/PARKS**
- **PERMITTING, SCHEDULE, DESIGN-BUILD, APPROVALS**

NYC Dept. of Transportation

Brooklyn Borough President Eric L. Adams
City Councilmember Stephen T. Levin
Office of City Comptroller Scott M. Stringer
Office of US Congresswoman Nydia Velazquez
Office of State Senator Brian Kavanaugh
Office of State Assemblywoman Jo Anne Simon

Brooklyn Bridge Park Corporation
Brooklyn Bridge Park Conservancy Board
Brooklyn Bridge Park Development Corporation

A Better Way
Brooklyn Heights Association
Downtown Brooklyn Partnership
DUMBO Improvement District
Cobble Hill Association

360 Furman St. Board
Cadman Towers

Michael Van Valkenburgh Associates, Inc.

Regional Plan Association
NY Landmarks Conservancy
Historic Districts Council
Brooklyn Community Foundation
Municipal Arts Society

(Outreach Ongoing)

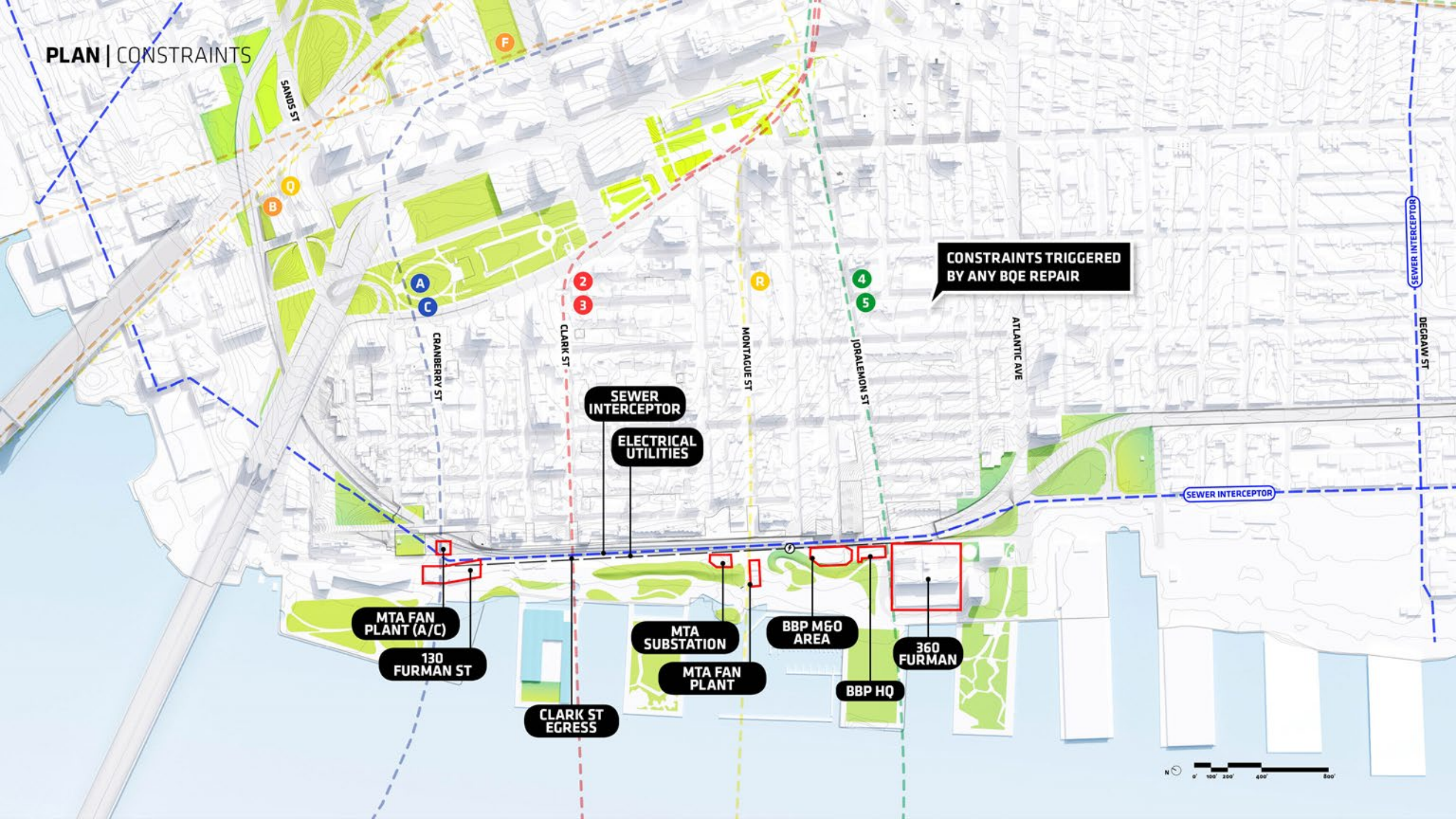
OUTREACH AND INPUT TO DATE

*INCLUDING STAFF, REPRESENTATIVES, OR RETIREES OF LISTED ORGANIZATIONS
(DOES NOT INDICATE ORGANIZATION'S ENDORSEMENT OF PROPOSAL)



TECHNICAL CONSTRAINTS

PLAN | CONSTRAINTS



CONSTRAINTS TRIGGERED BY ANY BQE REPAIR

SEWER INTERCEPTOR

ELECTRICAL UTILITIES

MTA FAN PLANT (A/C)

130 FURMAN ST

MTA SUBSTATION

MTA FAN PLANT

BBP M&O AREA

BBP HQ

360 FURMAN

CLARK ST EGRESS



PLAN | CONSTRAINT CROSS SECTIONS

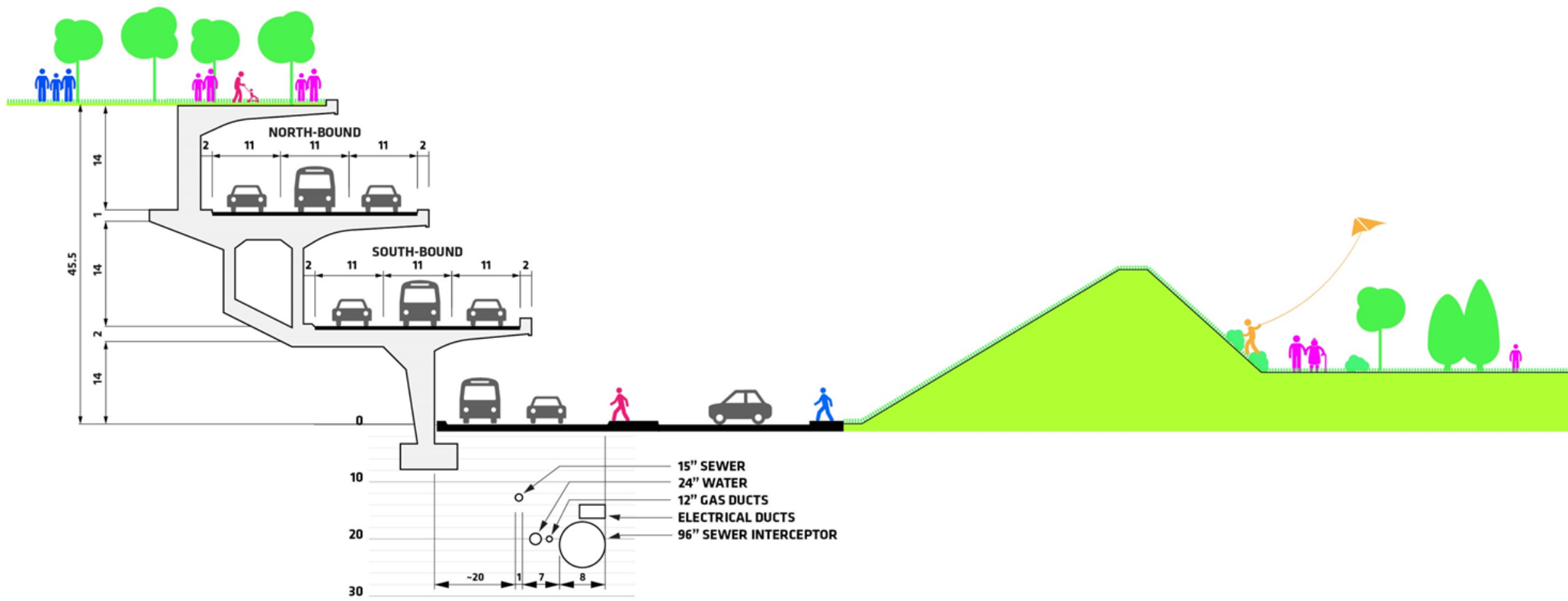


- 1. DEP & CON ED INFRASTRUCTURE**
- 2. MTA INFRASTRUCTURE**
- 3. 360 FURMAN & PARK BUILDINGS**
- 4. COLUMBIA HEIGHTS**
- 5. HIGHWAY VENTING**

TECHNICAL CONSTRAINTS

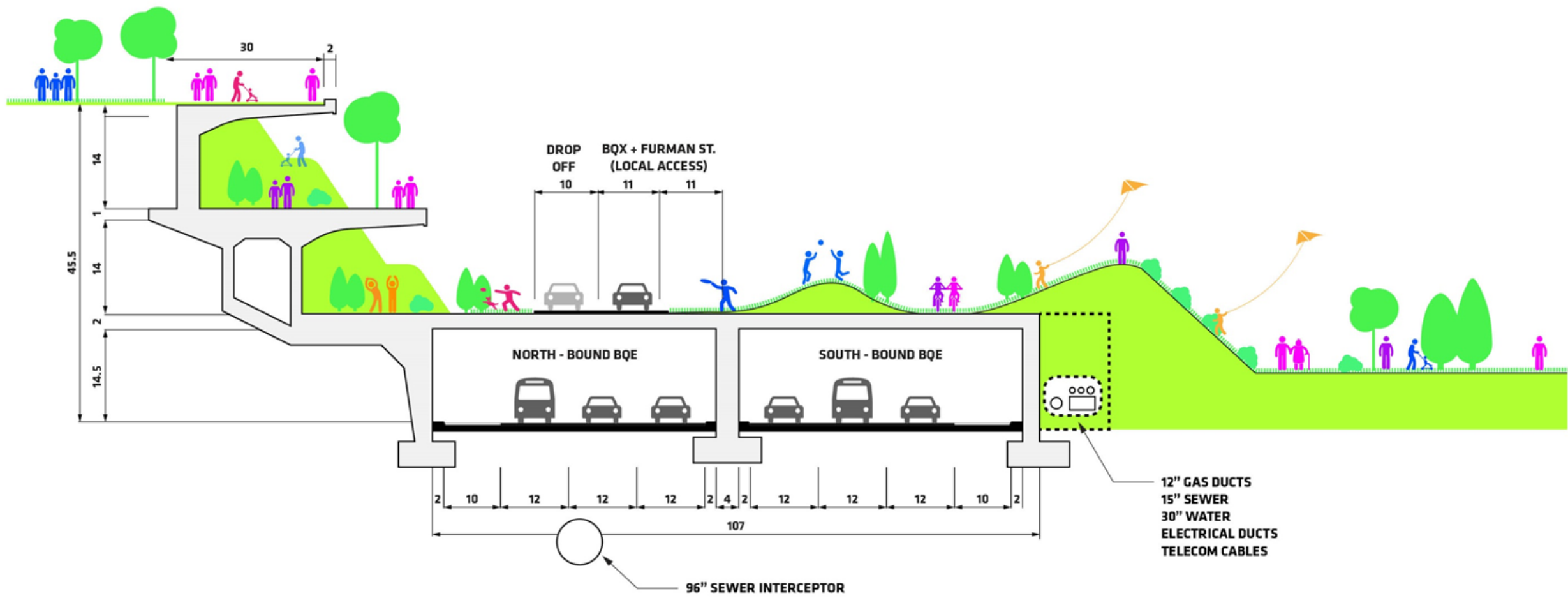
- 1. DEP & CON ED INFRASTRUCTURE**
- 2. MTA INFRASTRUCTURE**
- 3. 360 FURMAN & PARK BUILDINGS**
- 4. COLUMBIA HEIGHTS**
- 5. HIGHWAY VENTING**

TECHNICAL CONSTRAINTS



SECTION AT PIER 3 UPLAND

* CONCEPTUAL DIAGRAM - TO BE VERIFIED BY COMPLETE SURVEY



SECTION AT PIER 3 UPLAND

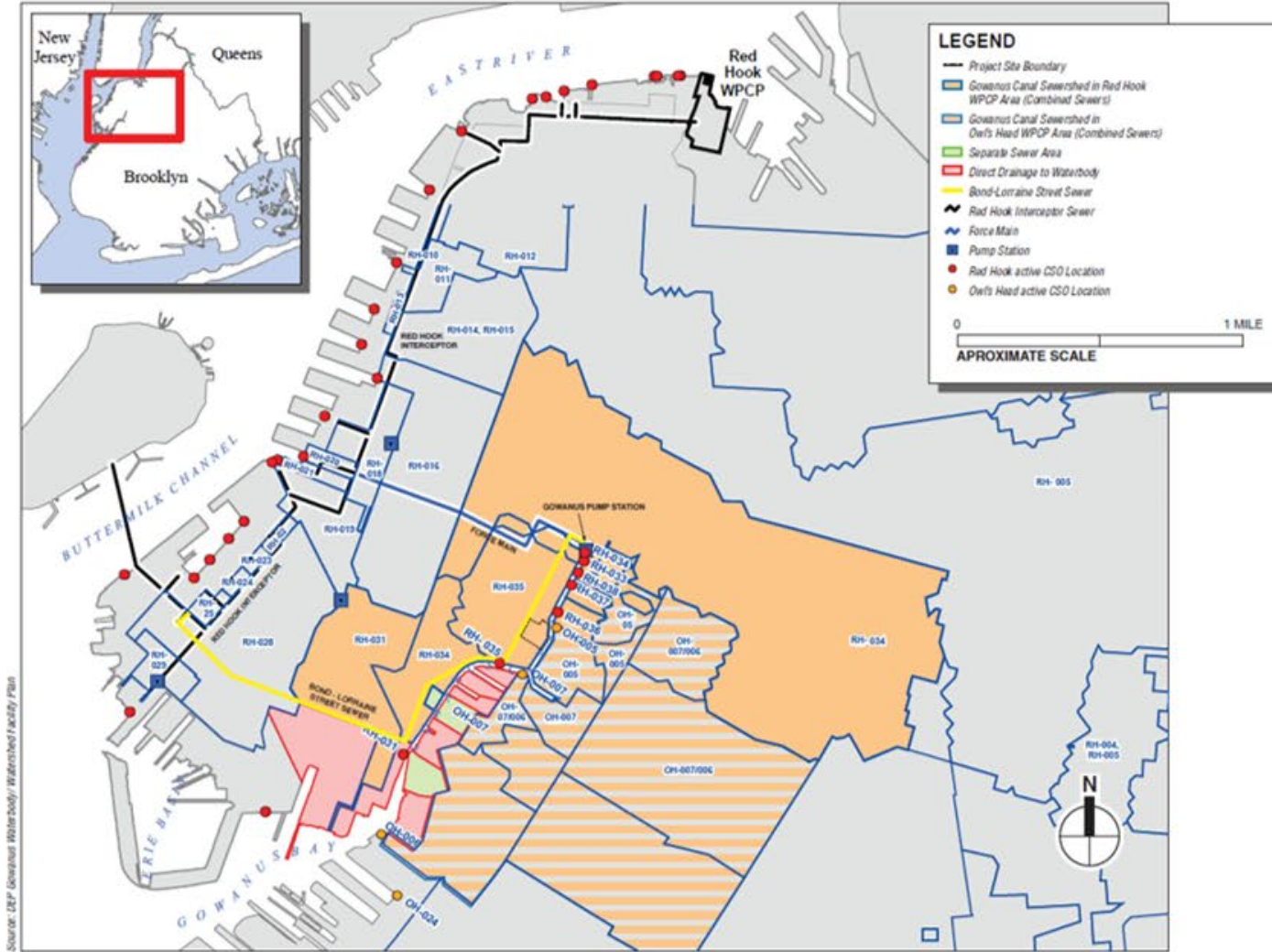
* CONCEPTUAL DIAGRAM - TO BE VERIFIED BY COMPLETE SURVEY

RED HOOK WPCP

- DRY WEATHER FLOW 60 MGD
- WET WEATHER FLOW 120 MGD

INTERCEPTOR

- BUILT IN 1970
- 10"5" IN DIAMETER
- 8,600 FT AS CONSTRUCTED
- \$425M (2019)
- \$50,000/LF (2019)
- SLURRY SHIELD
- NO CURRENT BYPASS

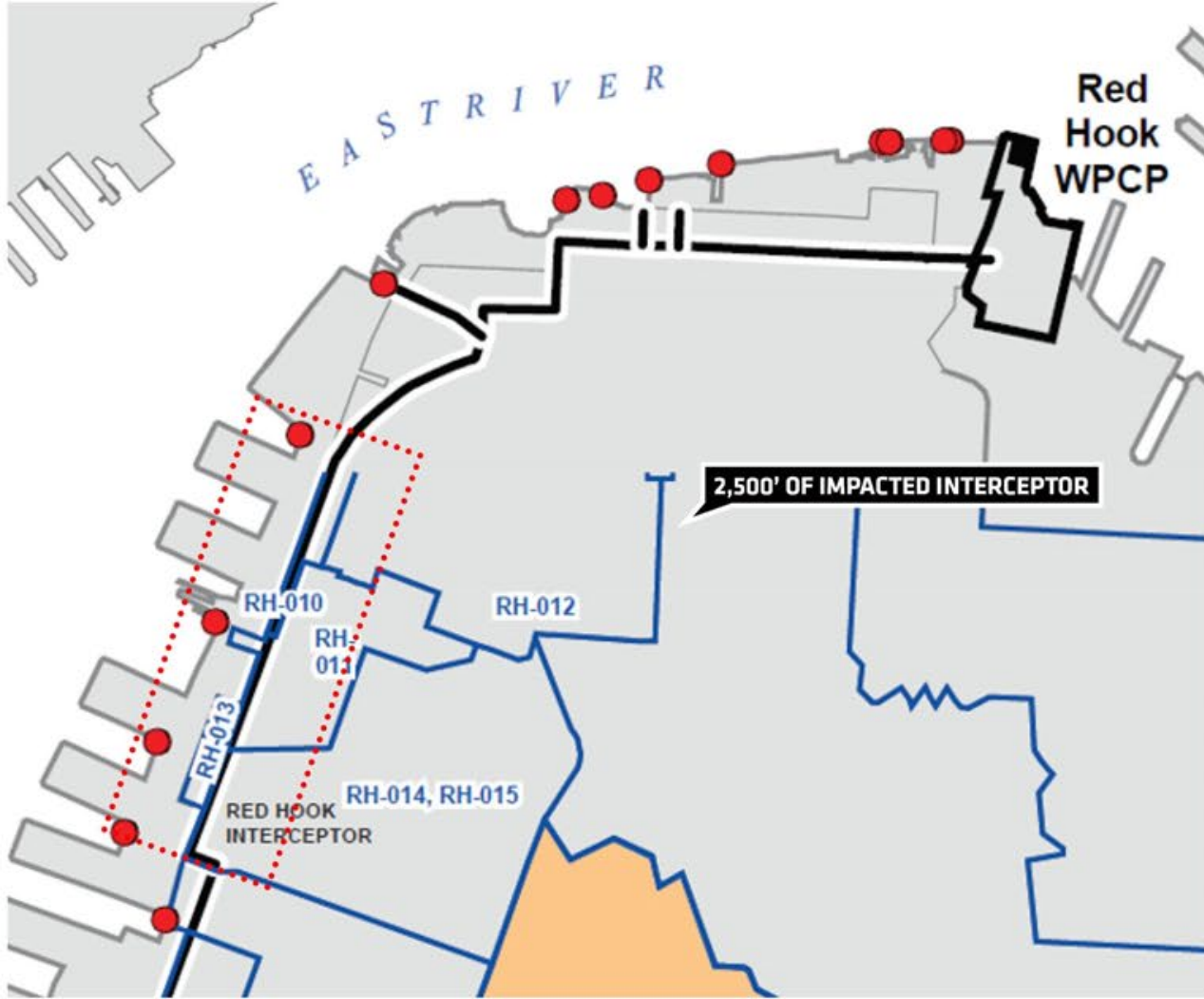


RED HOOK WPCP

UTILITY CHALLENGE I : SEWER INTERCEPTOR

1. CONFIRM THAT WE CANNOT BUILD OVER IT
2. PARALLEL THE INTERCEPTOR WITH AN EASTWARD ALIGNMENT (\$150 - 200M USING \$50,000/LF, LIKELY LESS WITH MODERN CONSTRUCTION TECHNIQUES)

COMPARABLE PROJECT: NASSAU COUNTY DIVERSION PROJECT (2X 10' DIA SOFT GROUND MICRO TBM, EACH 10,000 FEET LONG, CONSTRUCTION COST EACH IS ~100M)



UTILITY CHALLENGE I : POSSIBLE SOLUTION

FRANCHISE AREA

- ALL OF THESE ASSETS ARE LOCATED IN NYC FRANCHISE AREA, WHICH MEANS THAT ANY PUBLIC IMPROVEMENT PROJECT THAT THE CITY INITIATES, THE UTILITIES MUST ACCOMMODATE ANY REQUEST FOR RELOCATION OF THE ASSETS IF REQUIRED. THIS PROCESS IS PERFORMED UNDER A NEGOTIATION BETWEEN THE UTILITIES, NYC, AND CONTRACTORS UNDER A "SECTION U" PROGRAM THAT HAS BEEN ESTABLISHED FOR THESE TYPES OF ROADWAY PROJECTS.

FURMAN STREET UTILITIES

- UTILITIES LOCATED IN FURMAN STREET ARE FOR THE SUPPLY OF ELECTRIC POWER TO VARIOUS NYC STRUCTURES, INCLUDING 2 MTA FAN PLANTS, AND 1 MTA SUBSTATION
- APPROXIMATELY 50/60 UTILITY STRUCTURES, MANHOLE AND SERVICE BOXES, ARE LOCATED IN THE TARGETED EXPANSION PROJECT IN FURMAN STREET WHICH ARE USED AS SPLICE CHAMBERS THAT PROVIDE UTILITY POWER TO THE CUSTOMER'S POINT OF ENTRY
- SEVERAL VAULTS, WHICH INCLUDE TRANSFORMERS, ARE ALSO PRESENT FOR THE VARIOUS HIGH-TENSION FACILITIES

MTA STRUCTURES



UTILITY CHALLENGE II : ELECTRICAL UTILITIES

1. DEP & CON ED INFRASTRUCTURE
- 2. MTA INFRASTRUCTURE**
3. 360 FURMAN & PARK BUILDINGS
4. COLUMBIA HEIGHTS
5. HIGHWAY VENTING

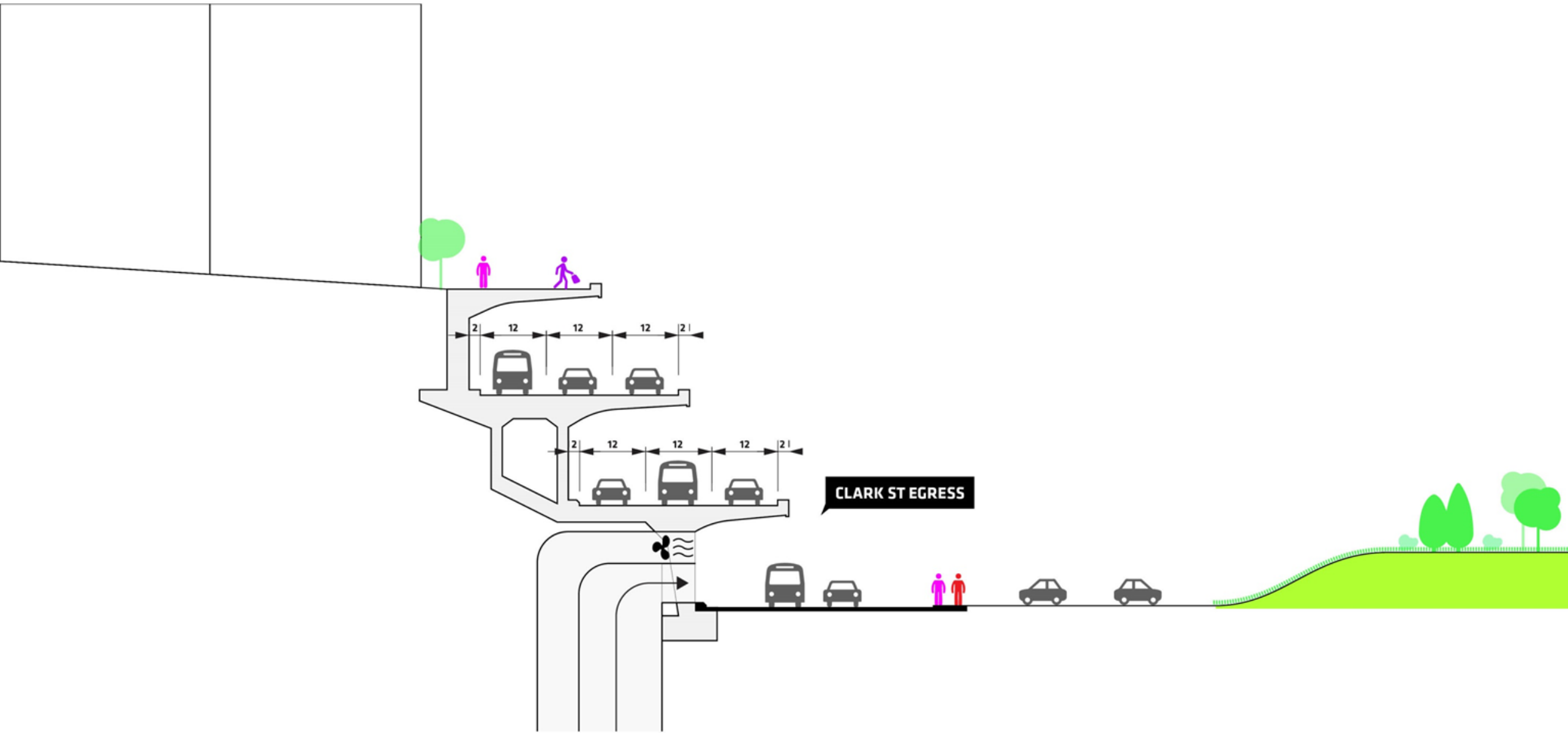
PLAN | CONSTRAINT CROSS SECTIONS



CLARK ST. EMERGENCY EGRESS & VENTILATION (2/3 TRAIN MTA)

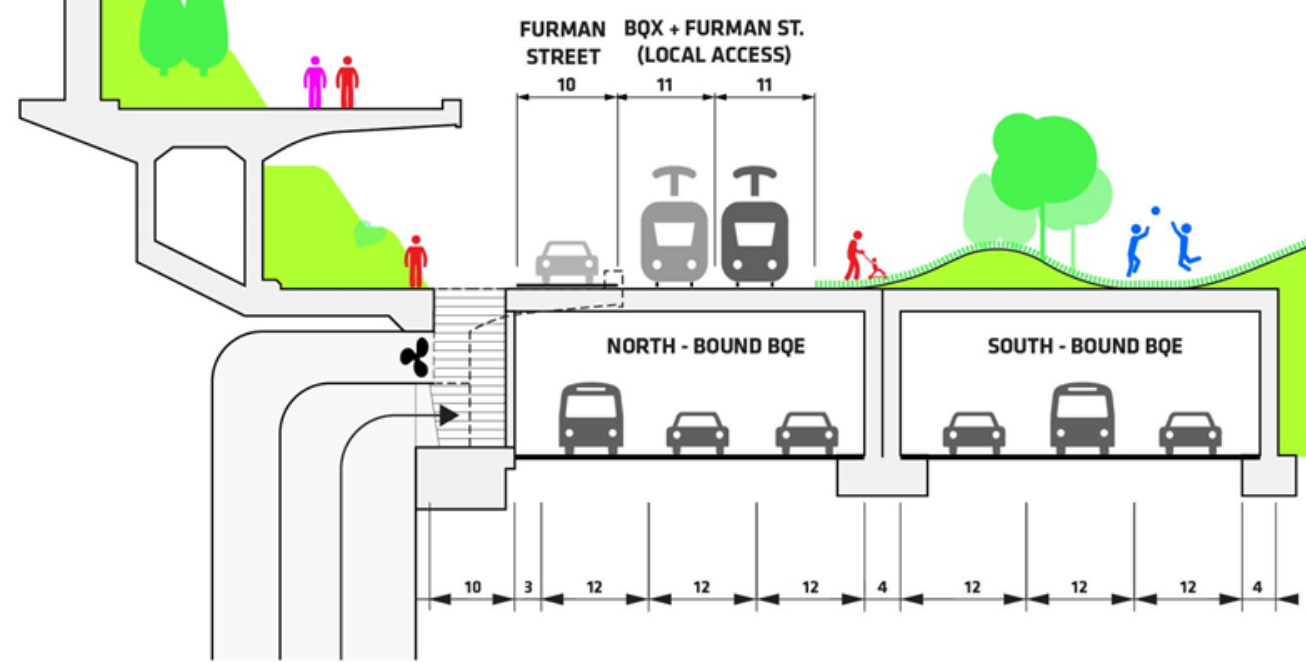
- 3 DOORWAYS (TOTAL WIDTH 9 FT)
- 2 VENTILATION GRILLS (TOTAL AREA 800 SF)
- UTILITIES AND ACCESS PANELS





CAP INTERSECT WITH CLARK STREET SUBWAY EGRESS

CLARK ST EGRESS



CAP INTERSECT WITH CLARK STREET SUBWAY EGRESS

PLAN | CONSTRAINT CROSS SECTIONS



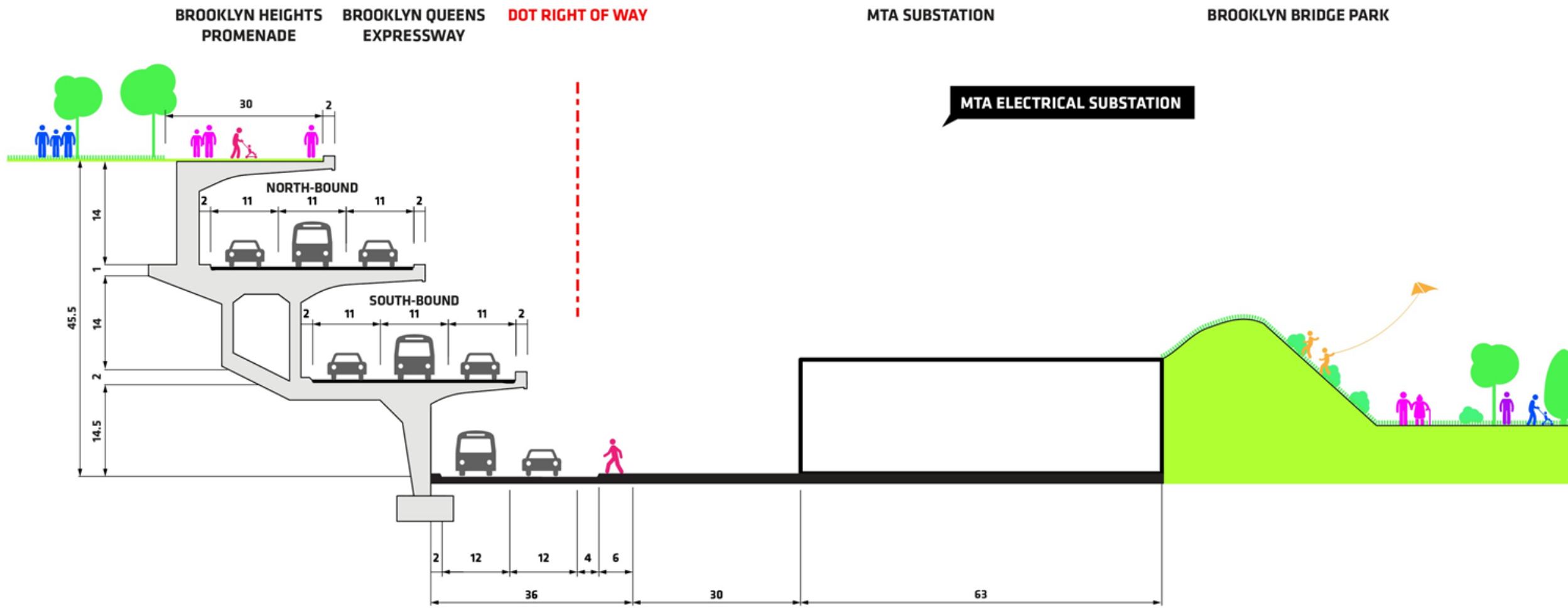
304 FURMAN STREET SUBSTATION (MTA)

- THE MTA SUBSTATION LOCATED ON THE WEST SIDE OF FURMAN STREET IS RESPONSIBLE FOR FEEDING THE LOCAL TRAIN LINES THEIR STATION LIGHTS, AND TRACK SIGNALS
- TYPICAL MTA STATION WHICH MEANS IT IS A PERMANENT STRUCTURE, THE UTILITY IS FEEDING THIS STATION WITH 4 FEEDERS, WHICH SUPPLIES POWER TO 4 UTILITY 1000 KVA TRANSFORMERS LOCATED IN A UTILITY VAULT
- THESE TRANSFORMERS PROVIDE POWER TO THE MTA SUBSTATION, THIS STATION IS PROBABLY EQUIPPED WITH 8 TRANSFORMERS, APPROPRIATE NETWORK PROTECTORS, SWITCH GEAR, AND BUS COMPARTMENT, CONSISTENT WITH THE STANDARD UTILITY/MTA PROTOCOLS AND STANDARDS DESIGNS
- ALTHOUGH THIS IS IMPORTANT TO THE MTA, THERE IS NO REASON THIS STATION CAN'T BE RELOCATED, HOWEVER IT WOULD NEED STRONG COORDINATION
- AN EXAMPLE OF THIS PERFORMED RECENTLY WAS FOR THE MTA, EAST SIDE ACCESS PROGRAM ON THE QUEENS SIDE OF THE 59 STREET BRIDGE WITH ESTIMATED COST LESS THAN \$50M

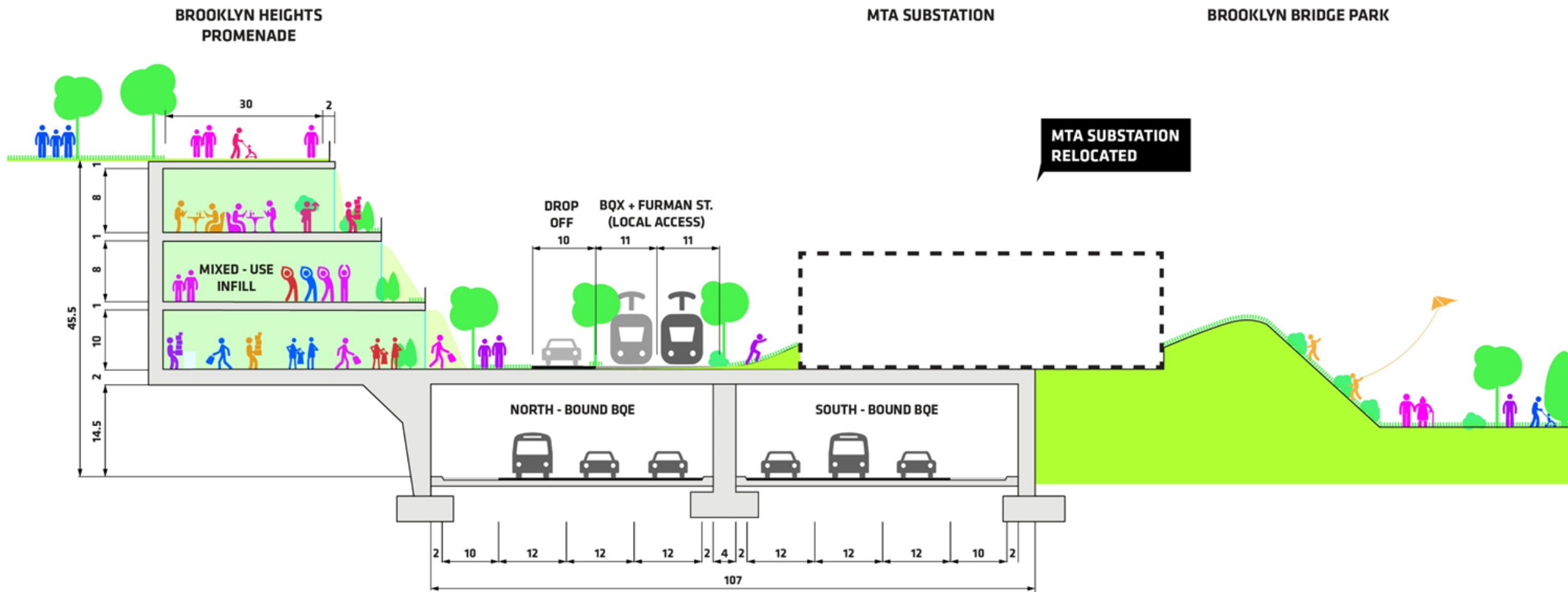


304 FURMAN STREET SUBSTATION (MTA)

UTILITY CHALLENGE II : ELECTRICAL UTILITIES



CAP INTERSECT WITH MTA SUBSTATION
 BQE SECTION AT BBP



PROPOSED CAP INTERSECTION AT THE MTA SUBSTATION
 BQE SECTION AT BBP

PLAN | CONSTRAINT CROSS SECTIONS



SANDS ST

A
C

CRANBERRY ST

CLARK ST

2
3

MONTAGUE ST

R

JORALEMON ST

4
5

ATLANTIC AVE

SEWER INTERCEPTOR

DECRAW ST

SEWER INTERCEPTOR

MTA FAN PLANT

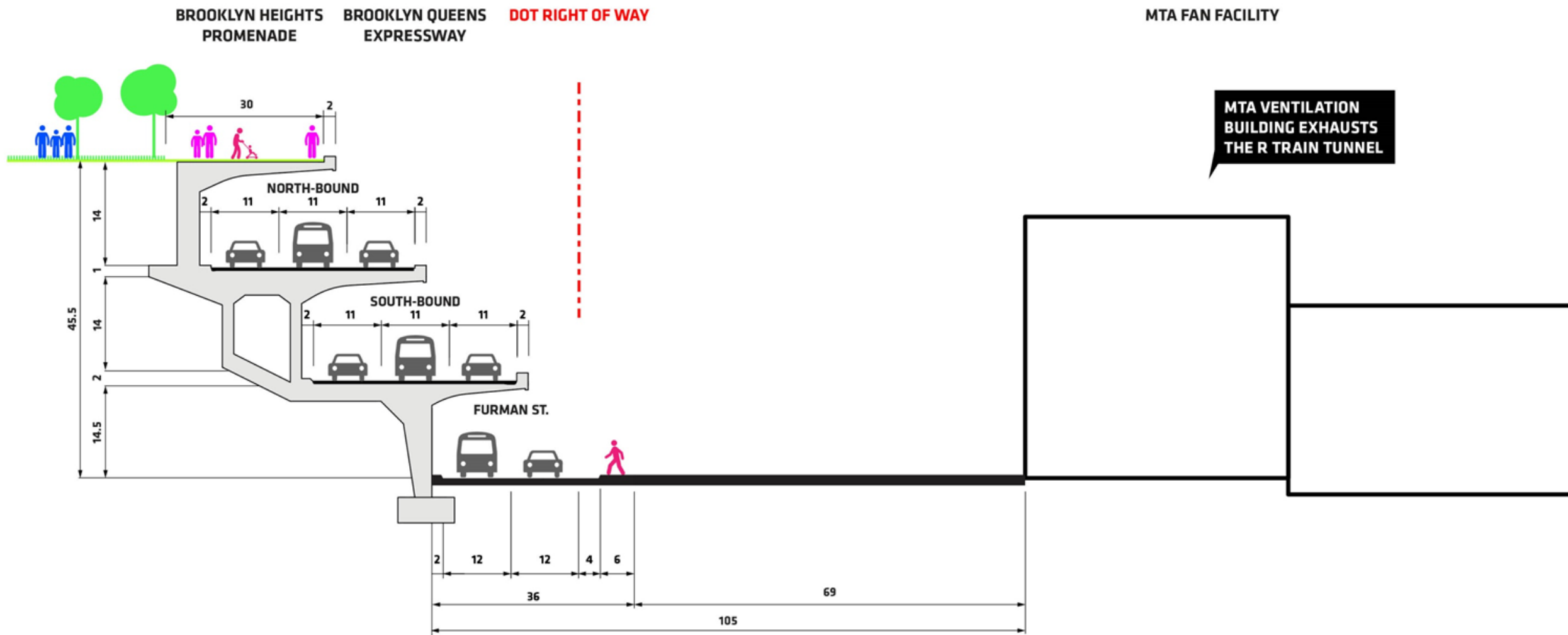


11 MONTAGUE STREET FAN PLANT (R TRAIN MTA)

- 5,000 SF FOOTPRINT
- VENTILATION AND EMERGENCY EGRESS FOR R TRAIN
- APPROX. 3,500 SF ACCESS APRON TO EAST INCLUDING +/-15 MANHOLES FOR SUBSURFACE ACCESS



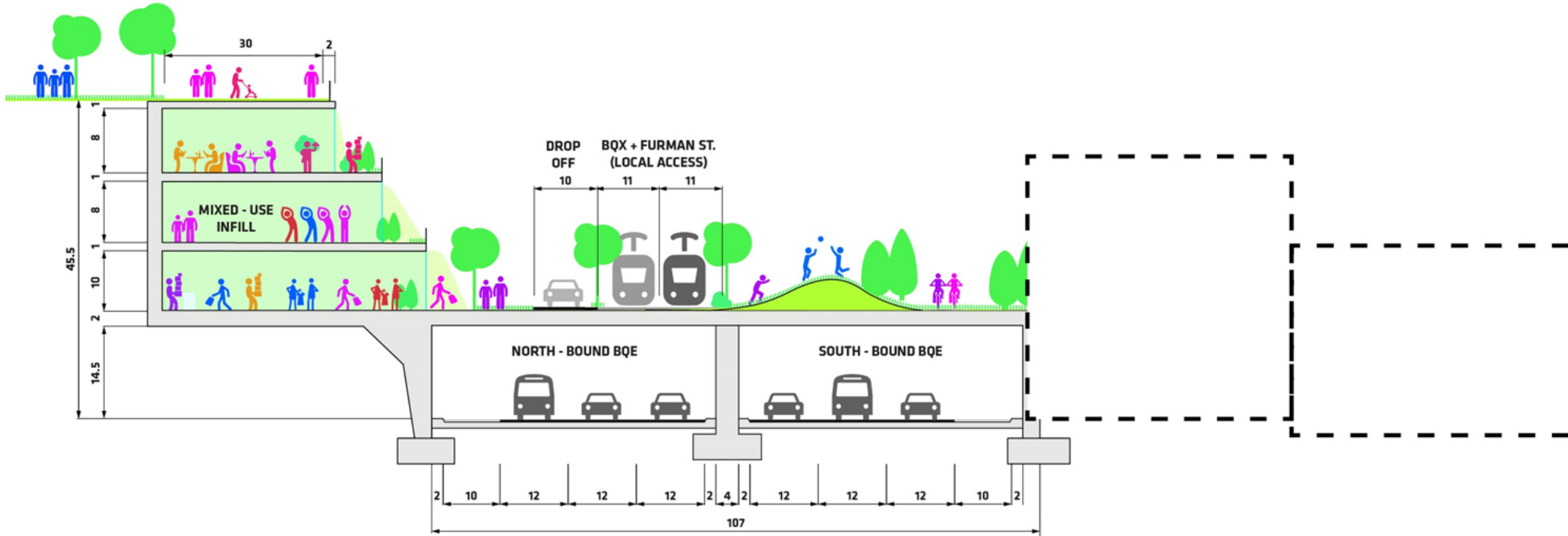
11 MONTAGUE STREET FAN PLANT



CAP INTERSECT WITH MTA VENTILATION BUILDING

**BROOKLYN HEIGHTS
PROMENADE**

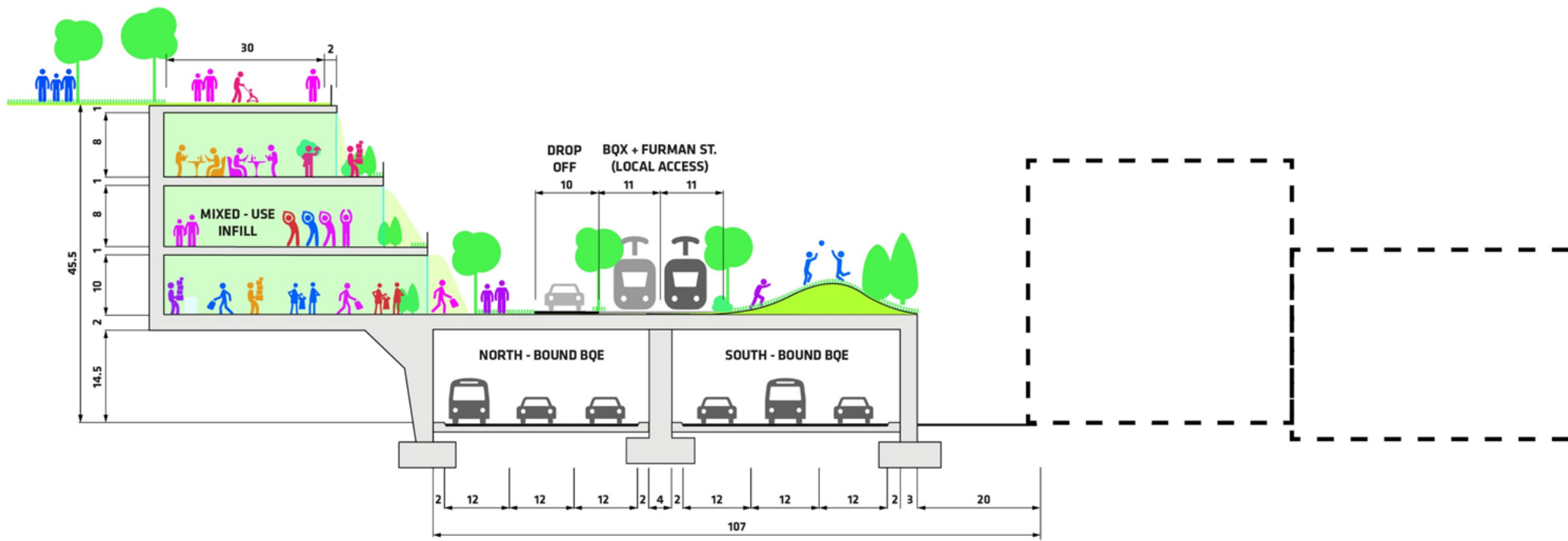
MTA FAN FACILITY



PROPOSED CAP INTERSECT WITH MTA VENTILATION BUILDING

**BROOKLYN HEIGHTS
PROMENADE**

MTA FAN FACILITY



PROPOSED CAP INTERSECT WITH MTA VENTILATION BUILDING



SANDS ST

CRANBERRY ST

CLARK ST

MONTAQUE ST

JOBALMON ST

ATLANTIC AVE

SEWER INTERCEPTOR

DEGRAW ST

SEWER INTERCEPTOR

POTENTIAL NEW R-TRAIN STOP



A

C

B

C

F

2

3

2

4

5

P



SANDS ST

CRANBERRY ST

CLARK ST

MONTAQUE ST

JOBLEMON ST

ATLANTIC AVE

SEWER INTERCEPTOR

DEGRAW ST

SEWER INTERCEPTOR

POTENTIAL NEW R-TRAIN STOP

POTENTIAL NEW R-TRAIN STOP



1. DEP & CON ED INFRASTRUCTURE
2. MTA INFRASTRUCTURE
- 3. 360 FURMAN & PARK BUILDINGS**
4. COLUMBIA HEIGHTS
5. HIGHWAY VENTING

TECHNICAL CONSTRAINTS

PLAN | CONSTRAINT CROSS SECTIONS



SANDE ST

A

C

CRANBERRY ST

CLARK ST

2

3

MONTAGUE ST

R

JORALEMON ST

4

5

ATLANTIC AVE

SEWER INTERCEPTOR

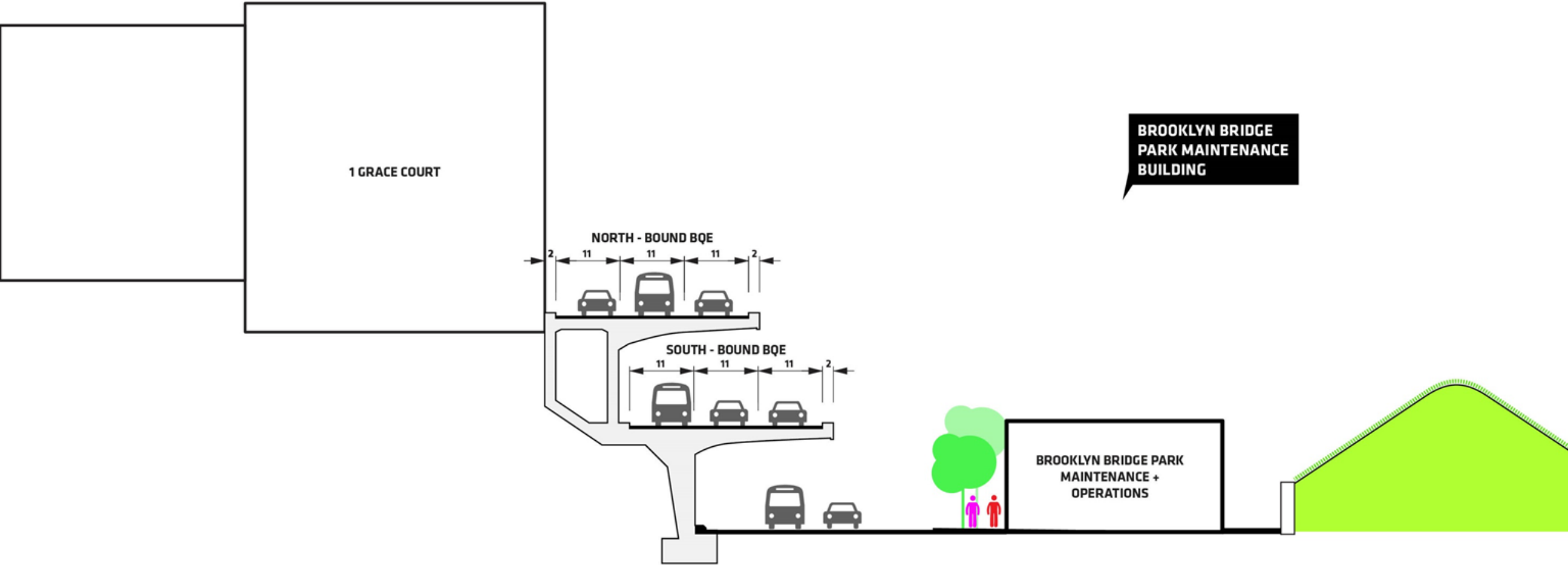
DECRAW ST

SEWER INTERCEPTOR

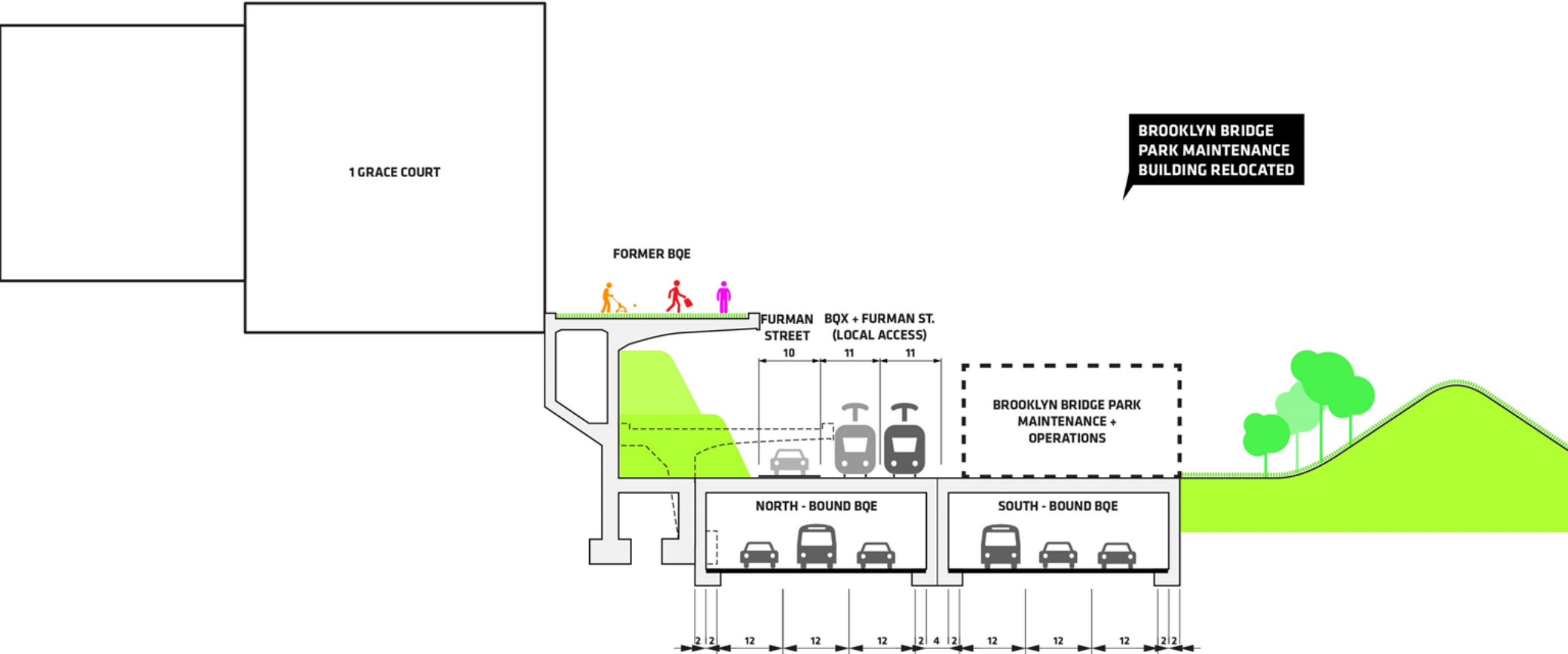
BBP M&O AREA

F

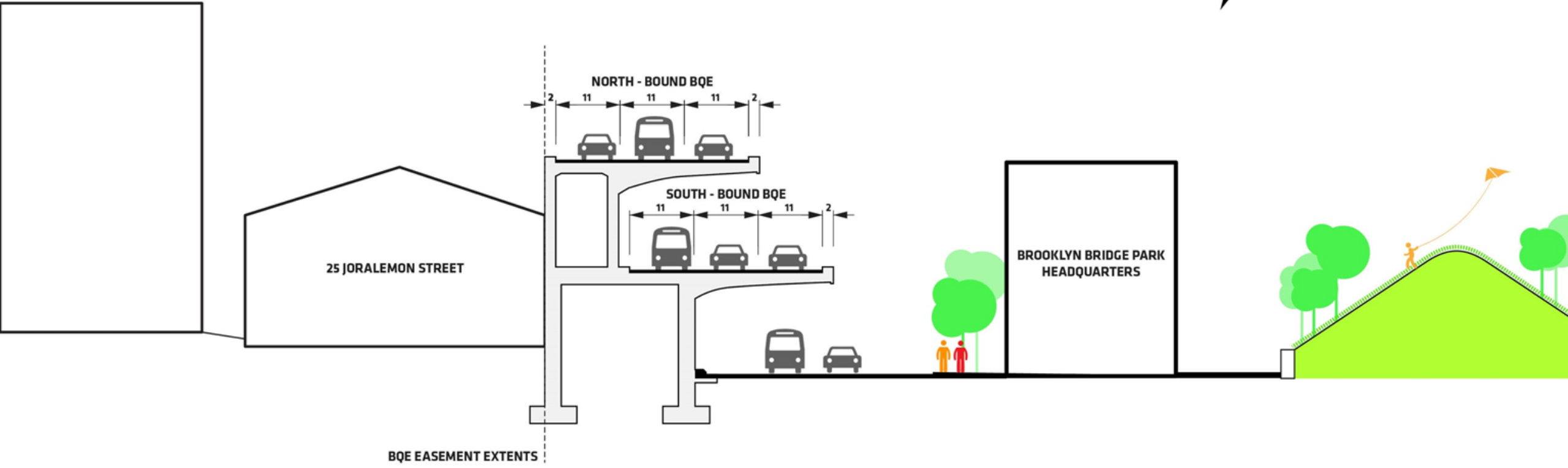




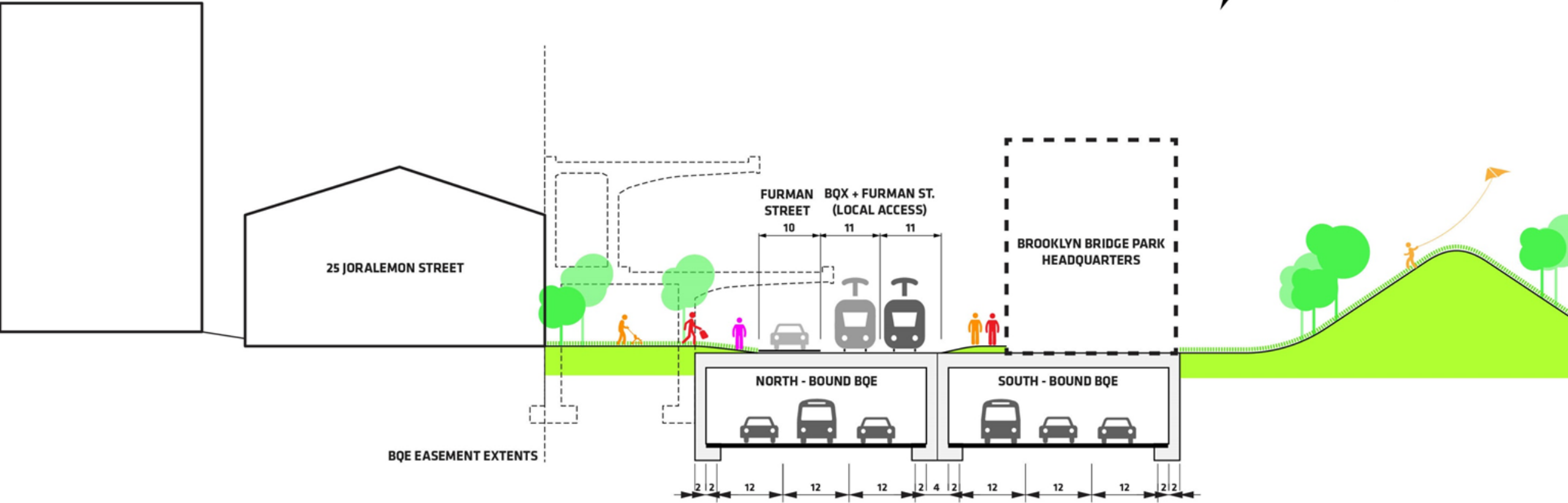
CAP INTERSECT WITH BBP M&O BUILDING



CAP INTERSECT WITH BBP M&O BUILDING



EXISTING PINCH POINT NORTH OF JORALEMON ST. BRIDGE



**BBP HEADQUARTERS
TO BE RELOCATED**

PROPOSED PINCH POINT NORTH OF JORALEMON ST. BRIDGE

PLAN | CONSTRAINT CROSS SECTIONS



SANDS ST

B

C

A

C

CRANBERRY ST

CLARK ST

2

3

MONTAGUE ST

R

JORALEMON ST

4

5

ATLANTIC AVE

SEWER INTERCEPTOR

DECRAW ST

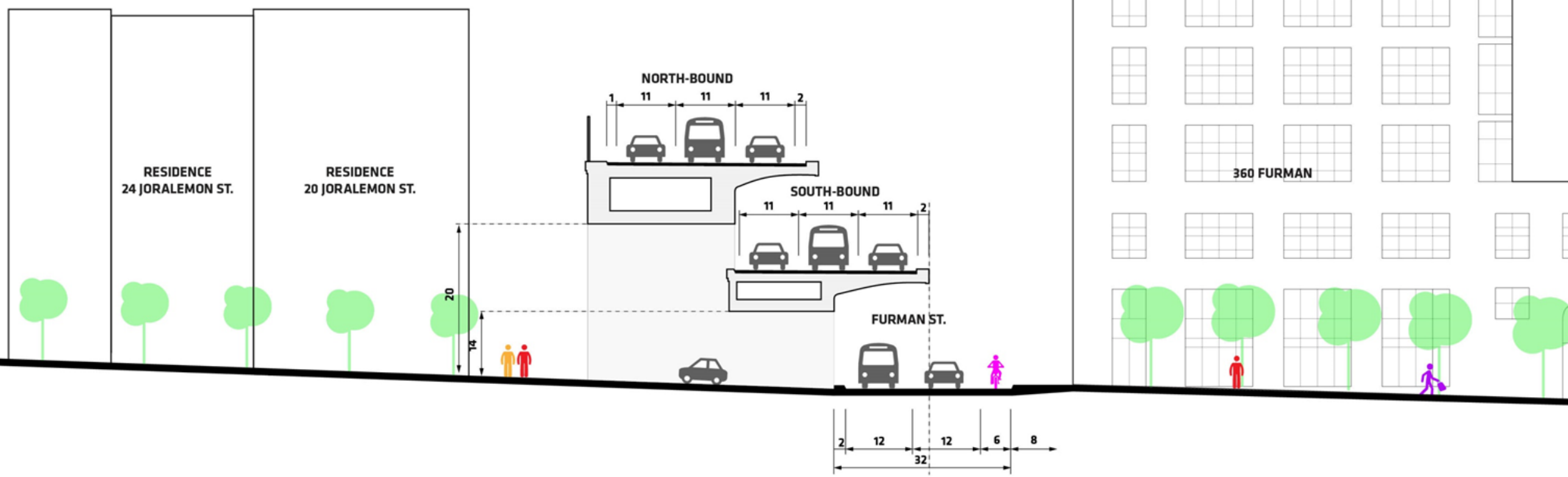
SEWER INTERCEPTOR

360 FURMAN

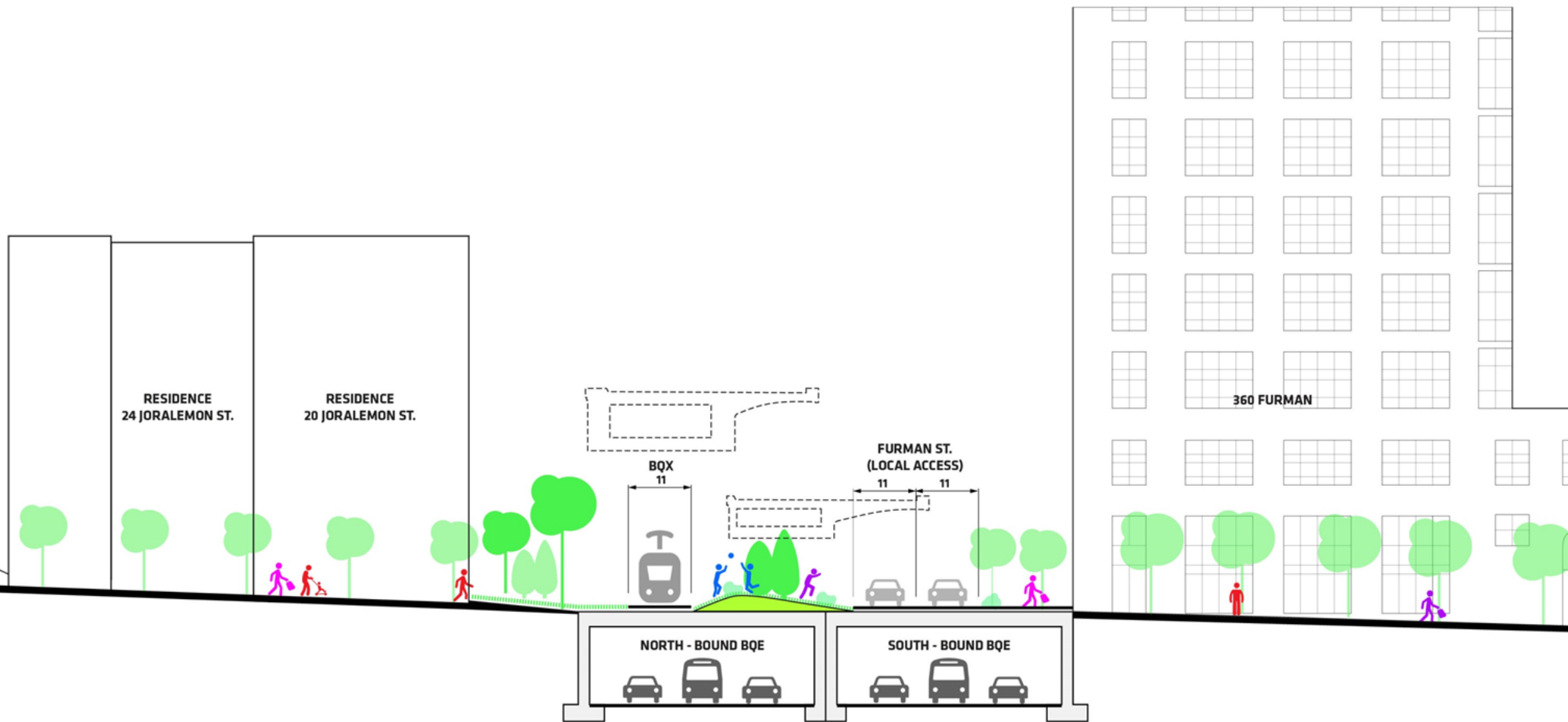
BBP HQ



JORALEMON ST. CROSSING



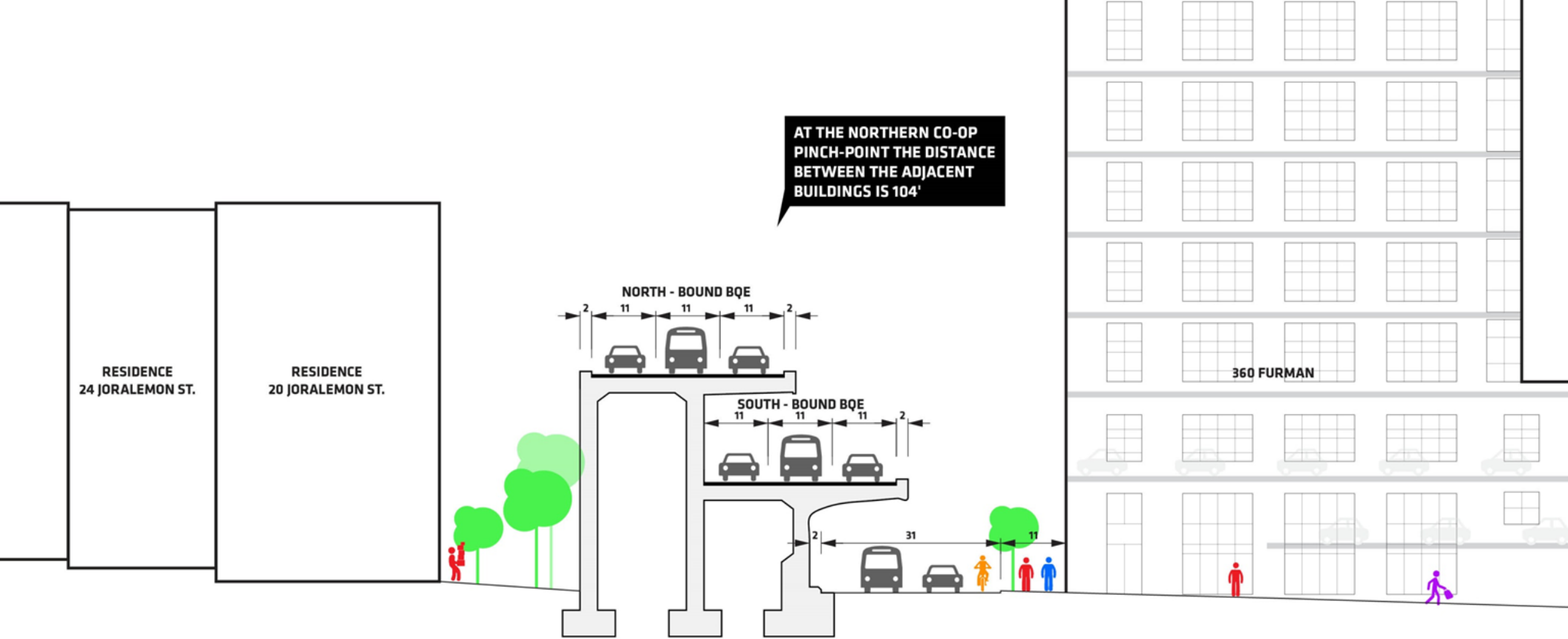
EXISTING PINCH POINT NORTH OF JORALEMON ST. BRIDGE



PROPOSED PINCH POINT THROUGH JORALEMON ST. BRIDGE

PLAN | CONSTRAINT CROSS SECTIONS

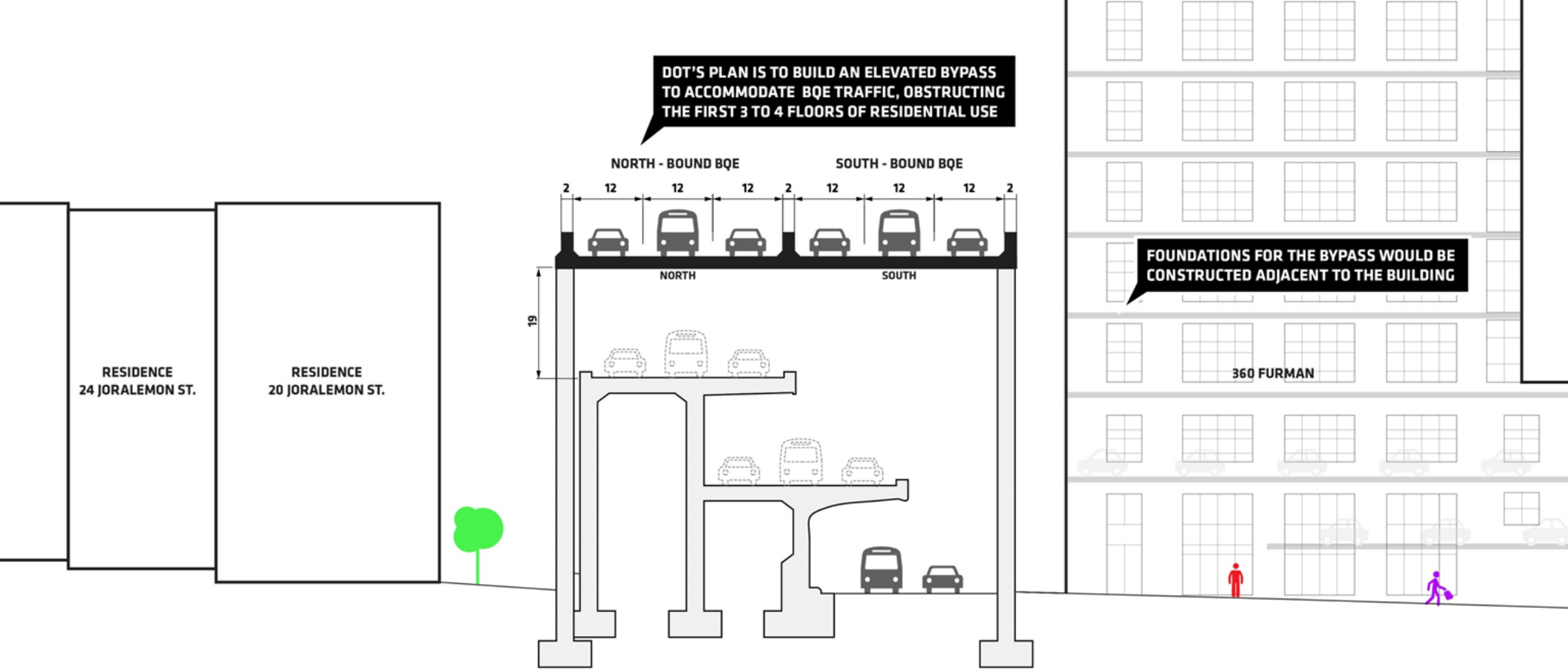




EXISTING PINCH POINT AT NORTHERN CO-OP BUILDING

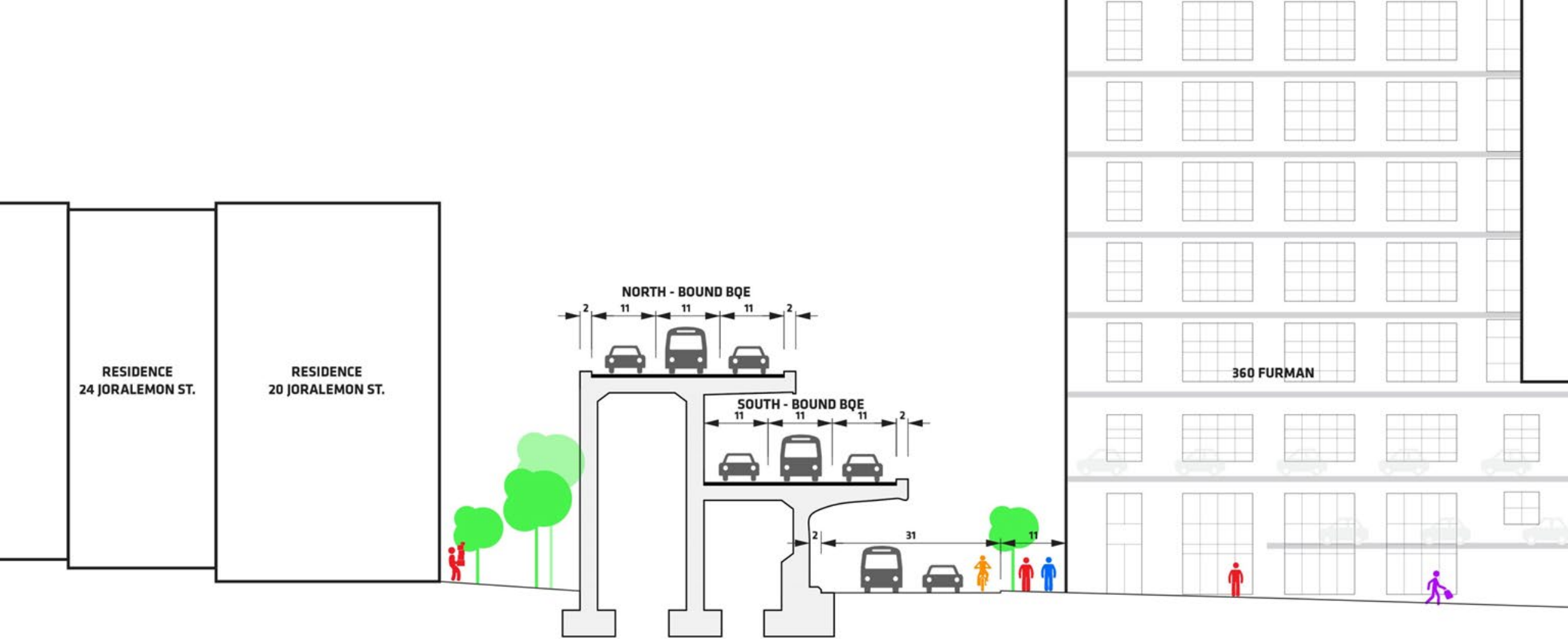
* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.

DOT'S PLAN IS TO BUILD AN ELEVATED BYPASS TO ACCOMMODATE BQE TRAFFIC, OBSTRUCTING THE FIRST 3 TO 4 FLOORS OF RESIDENTIAL USE

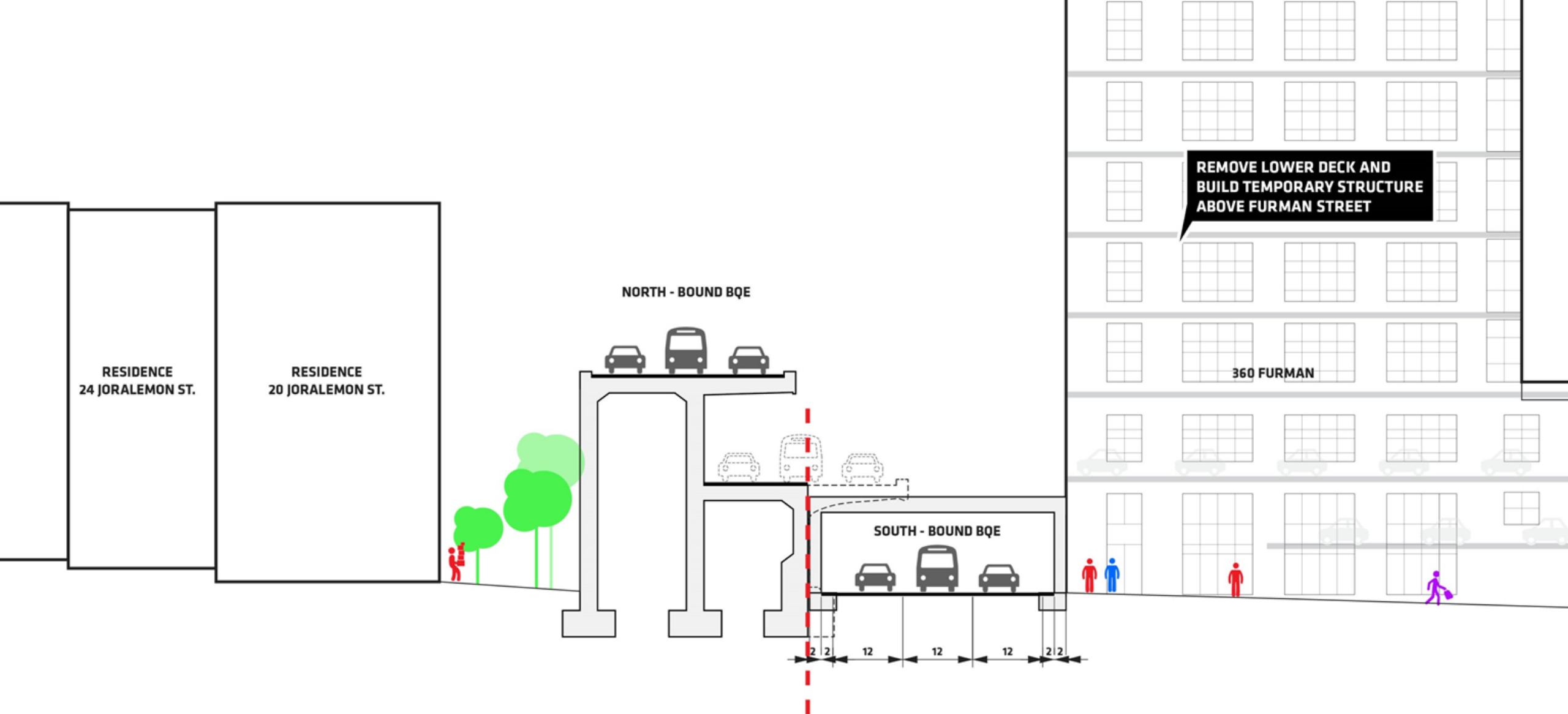


FOUNDATIONS FOR THE BYPASS WOULD BE CONSTRUCTED ADJACENT TO THE BUILDING

DOT TEMPORARY AT NORTHERN CO-OP BUILDING

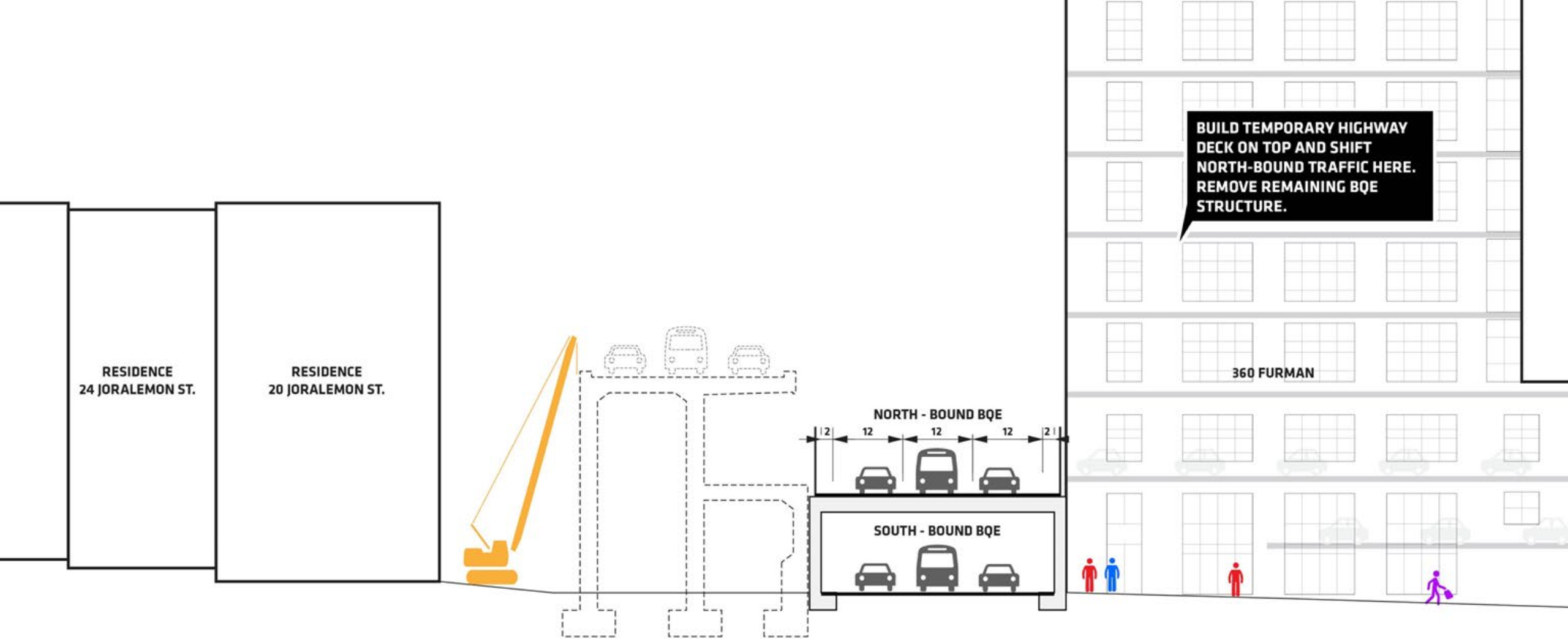


DOT OPTION AT NORTHERN CO-OP BUILDING



LANE BY LANE CONSTRUCTION PHASING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.



BUILD TEMPORARY HIGHWAY DECK ON TOP AND SHIFT NORTH-BOUND TRAFFIC HERE. REMOVE REMAINING BQE STRUCTURE.

RESIDENCE
24 JORALEMON ST.

RESIDENCE
20 JORALEMON ST.

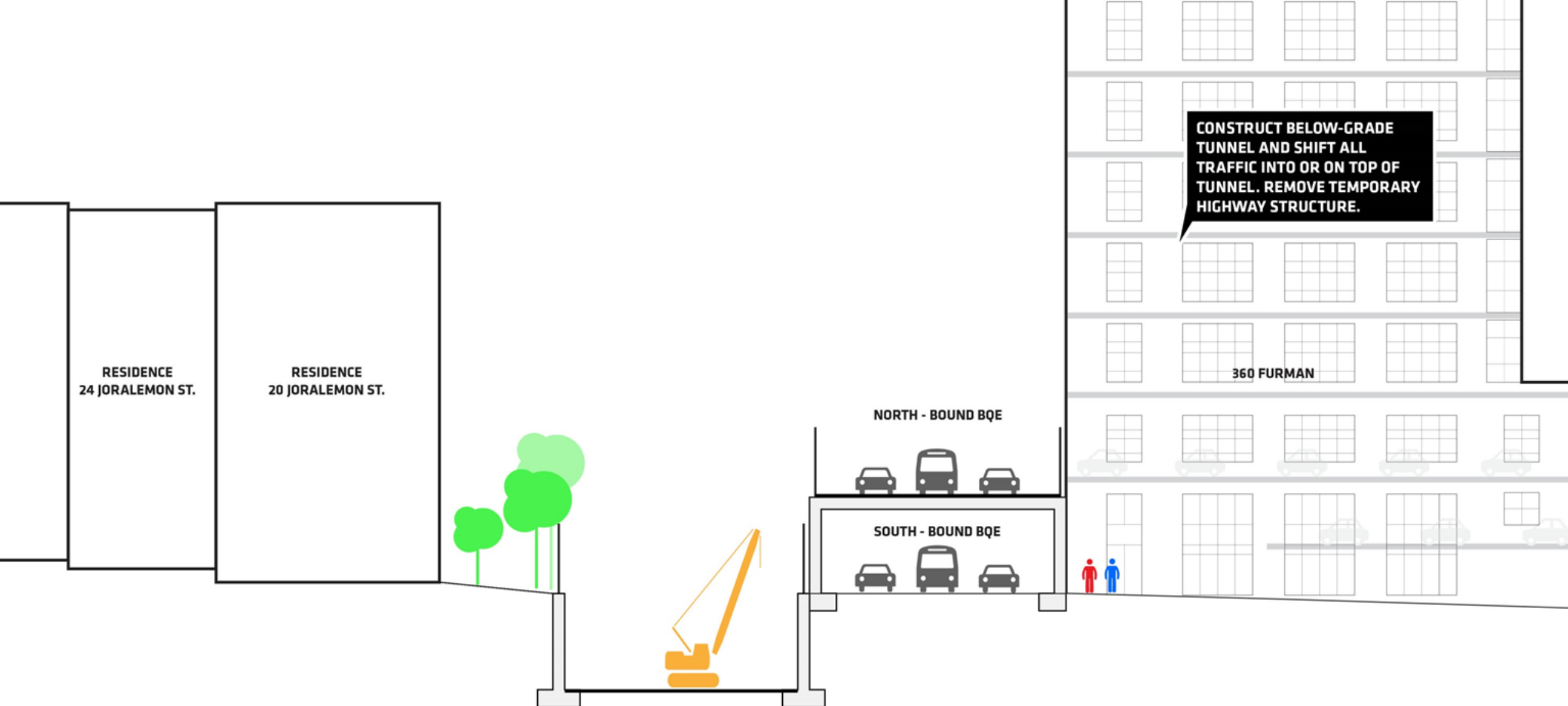
360 FURMAN

NORTH - BOUND BQE

SOUTH - BOUND BQE

LANE BY LANE CONSTRUCTION PHASING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.



RESIDENCE
24 JORALEMON ST.

RESIDENCE
20 JORALEMON ST.

NORTH - BOUND BQE

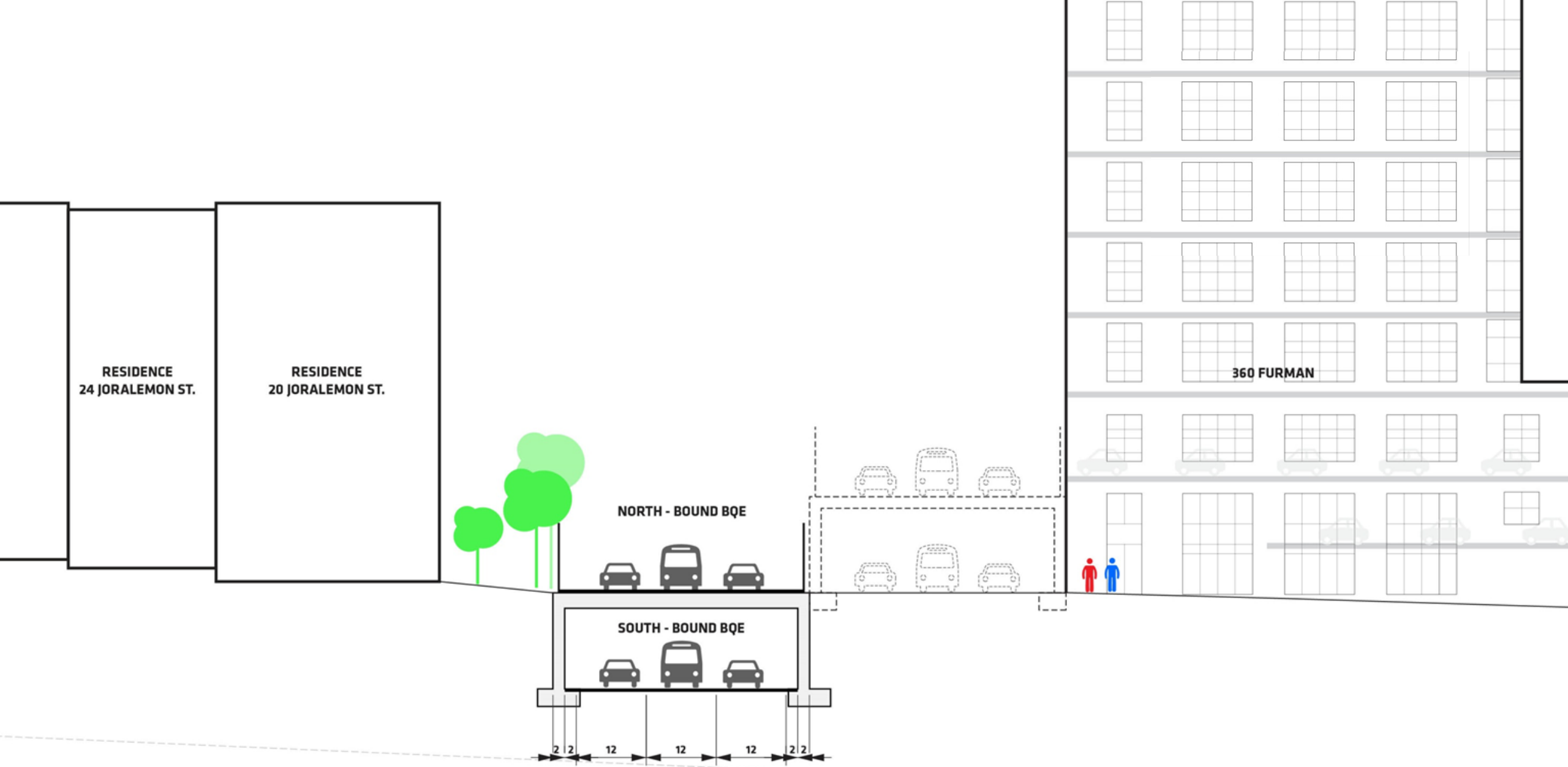
SOUTH - BOUND BQE

360 FURMAN

CONSTRUCT BELOW-GRADE
TUNNEL AND SHIFT ALL
TRAFFIC INTO OR ON TOP OF
TUNNEL. REMOVE TEMPORARY
HIGHWAY STRUCTURE.

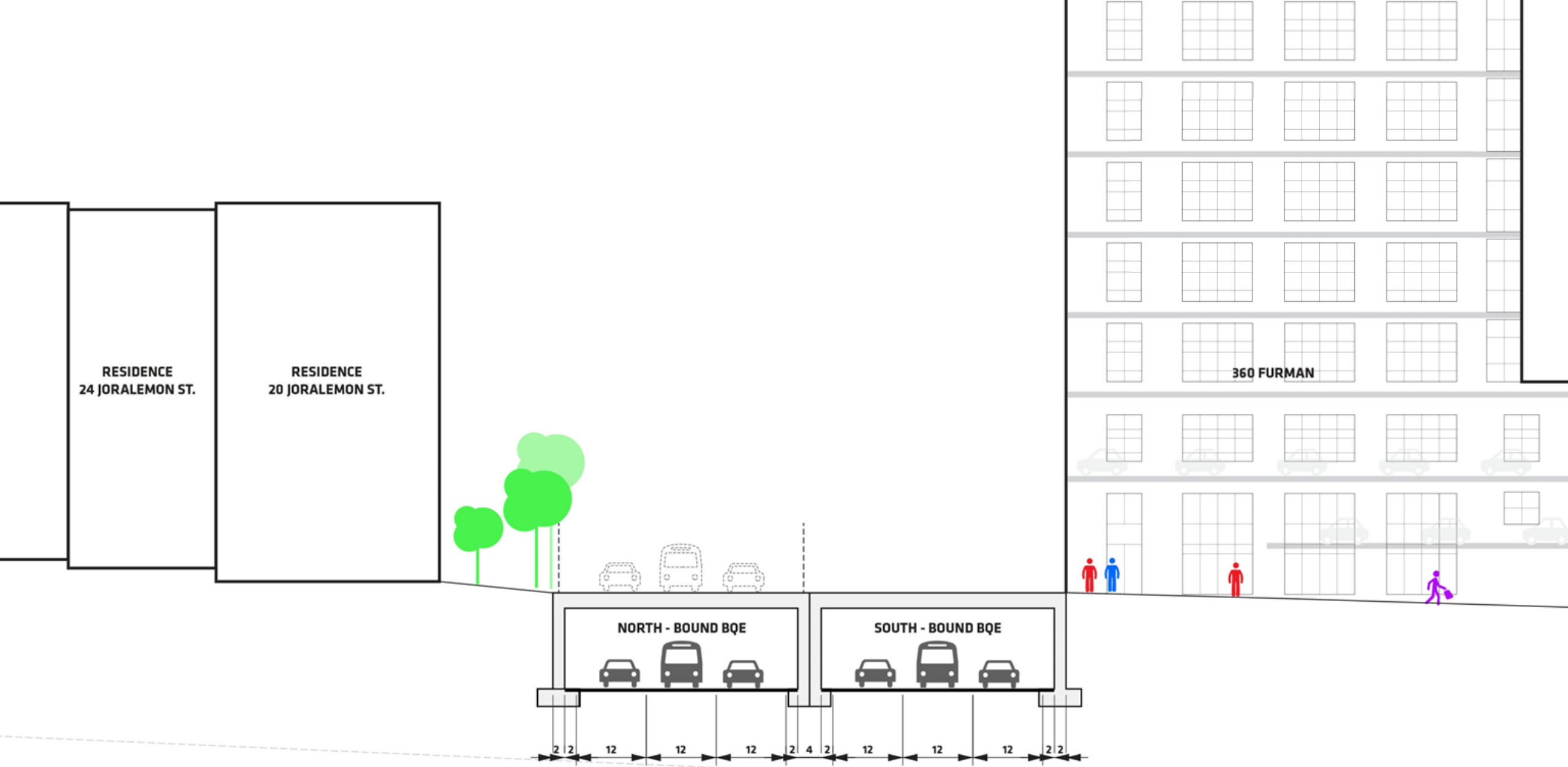
STACKED CONSTRUCTION PHASING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.



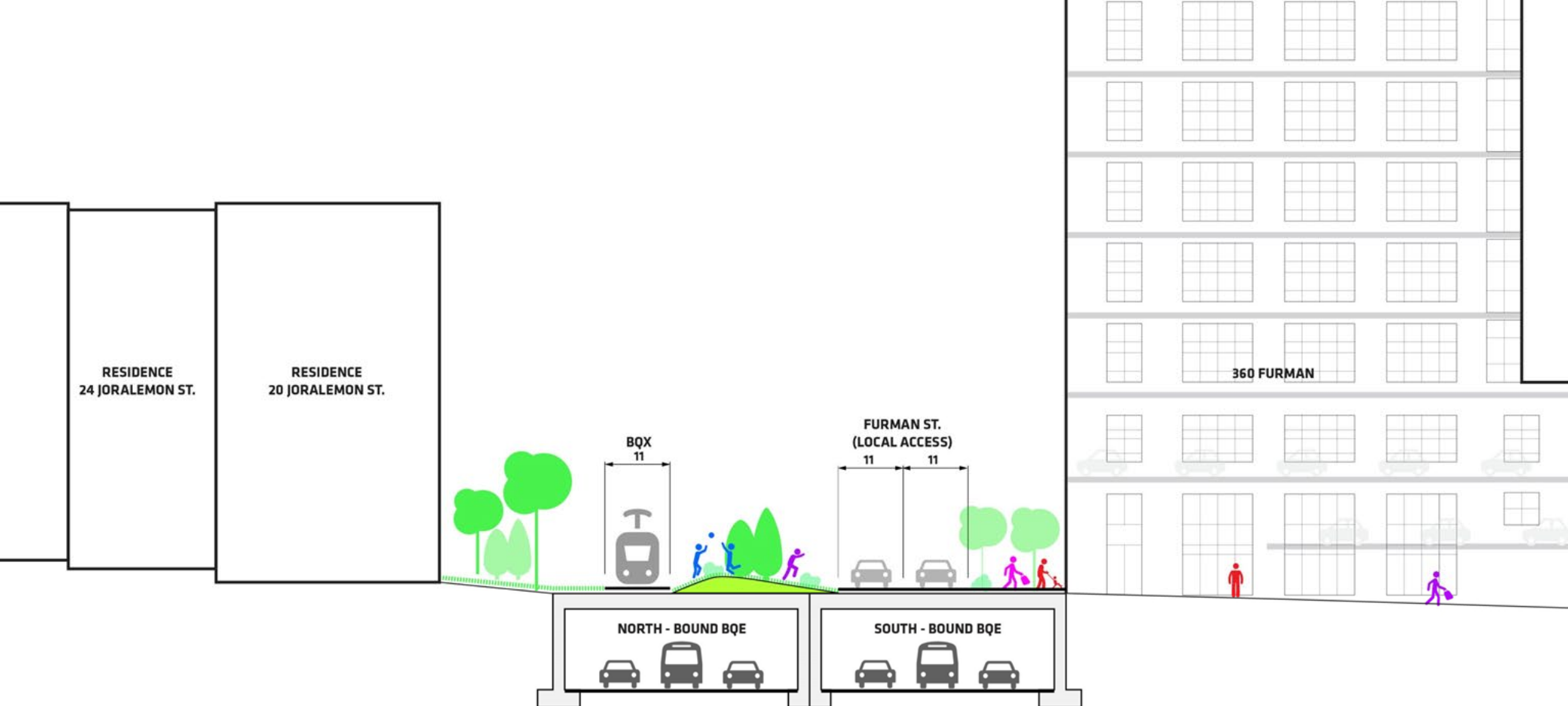
PROPOSED PINCH POINT AT NORTHERN CO-OP BUILDING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.



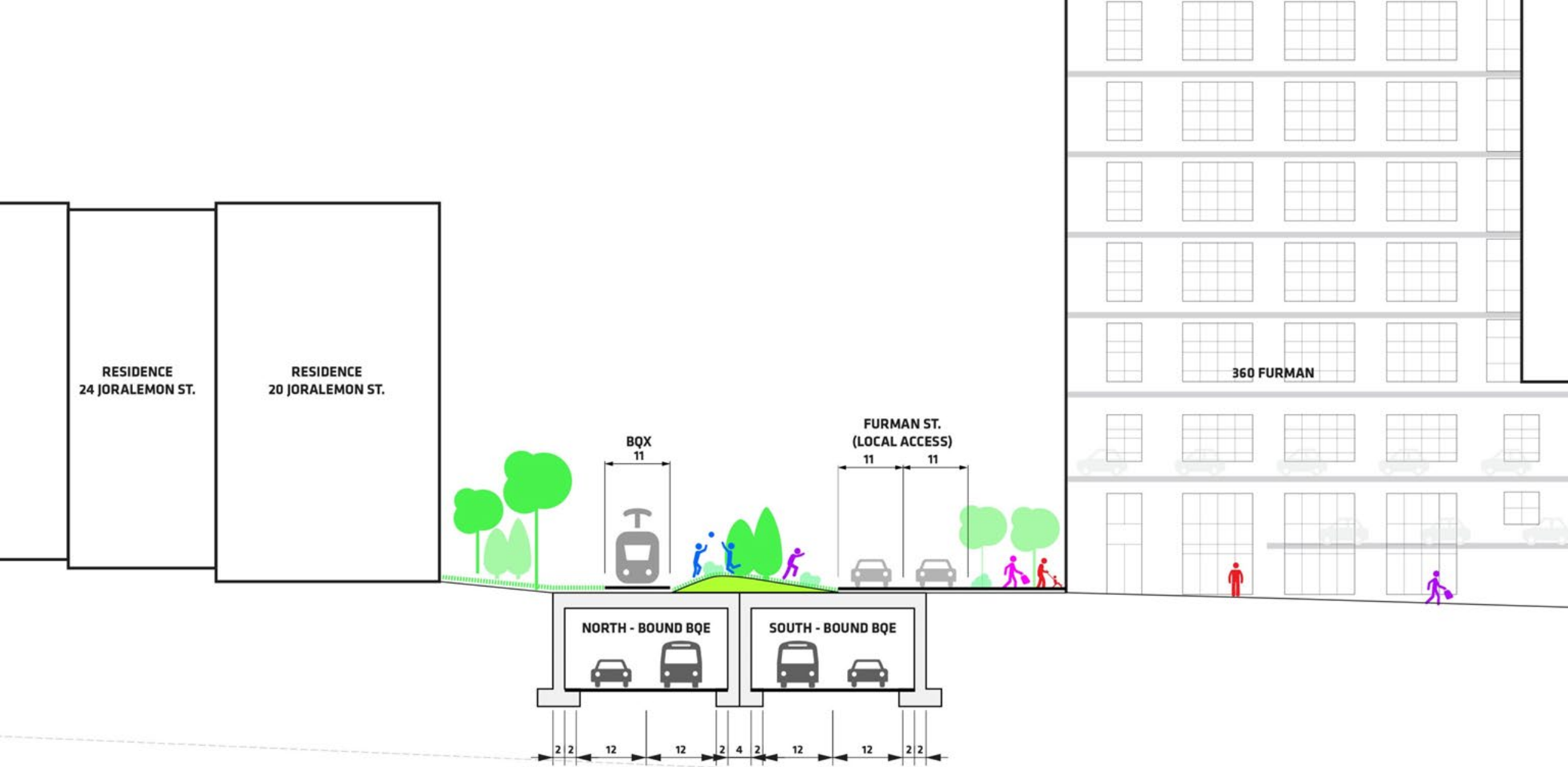
PROPOSED PINCH POINT AT NORTHERN CO-OP BUILDING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.



ELEVATED HIGHWAY CONSTRUCTION PHASING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.



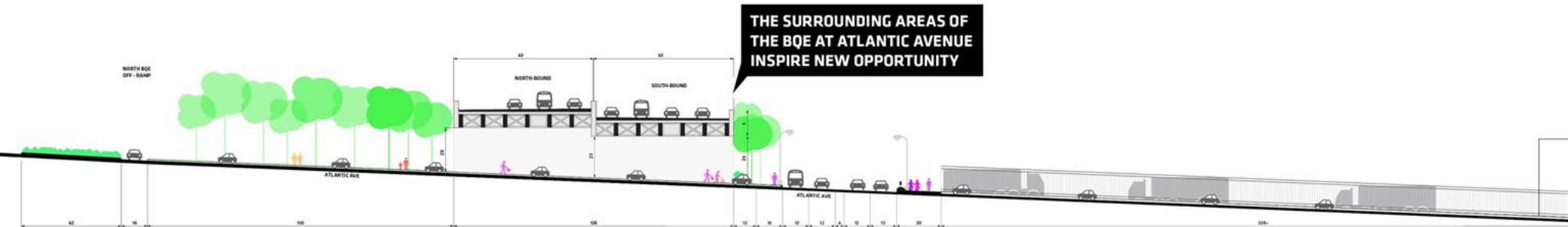
ELEVATED HIGHWAY CONSTRUCTION PHASING

* CONCEPTUAL DIAGRAM - PRECISE DIMENSIONS NEED TO BE VERIFIED BY AS-BUILT DRAWINGS.

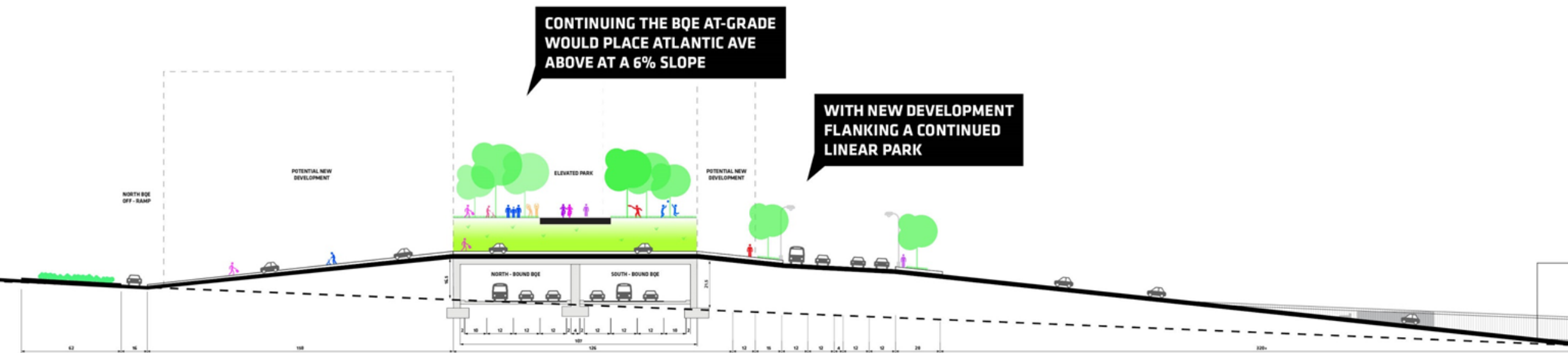
PINCH-POINTS
ATLANTIC AVENUE

PLAN | CONSTRAINT CROSS SECTIONS

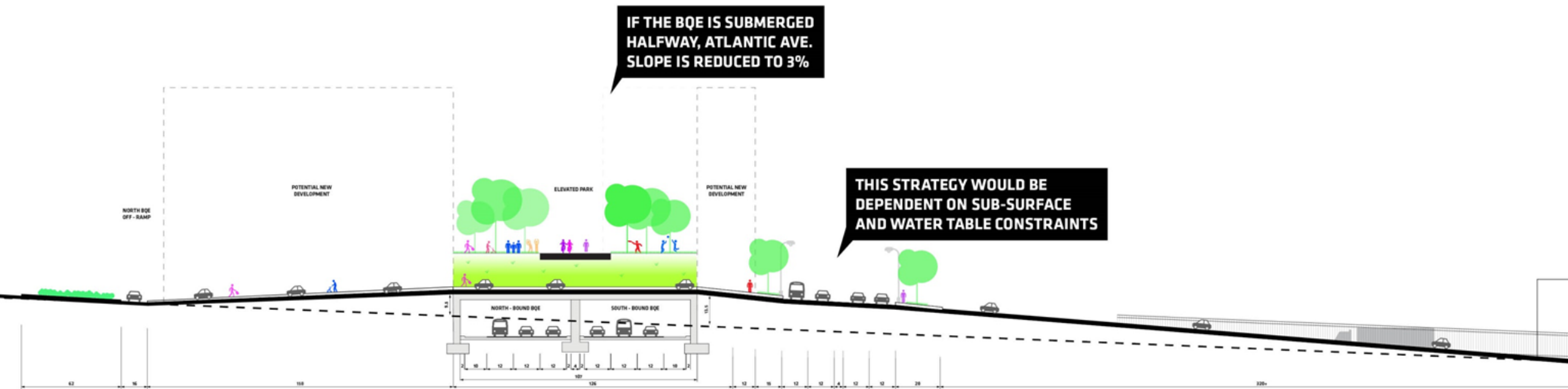




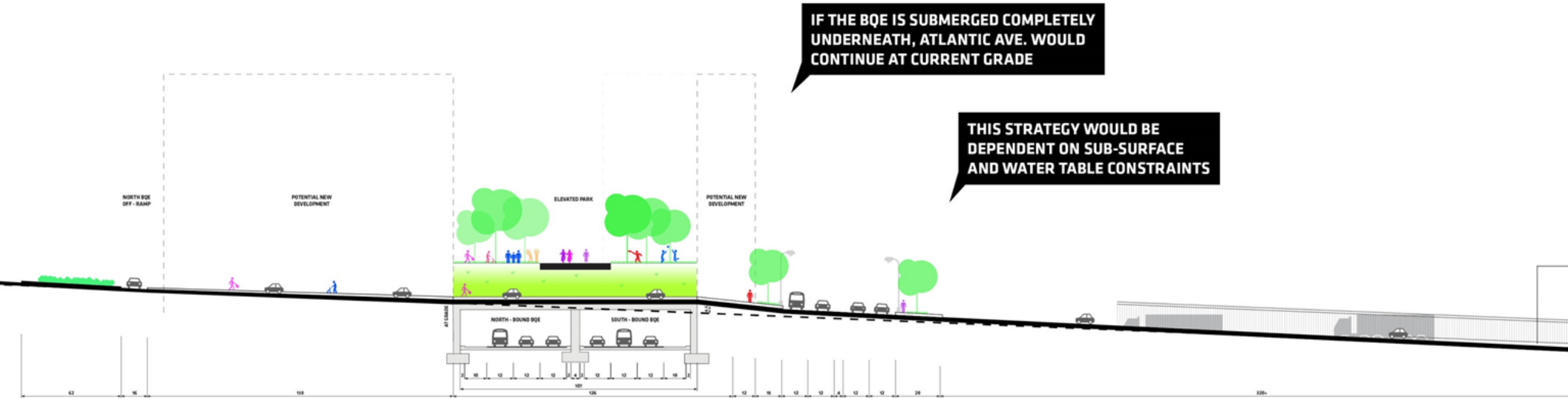
EXISTING CROSS SECTION ATLANTIC AVE.
 BQE SECTION AT BBP



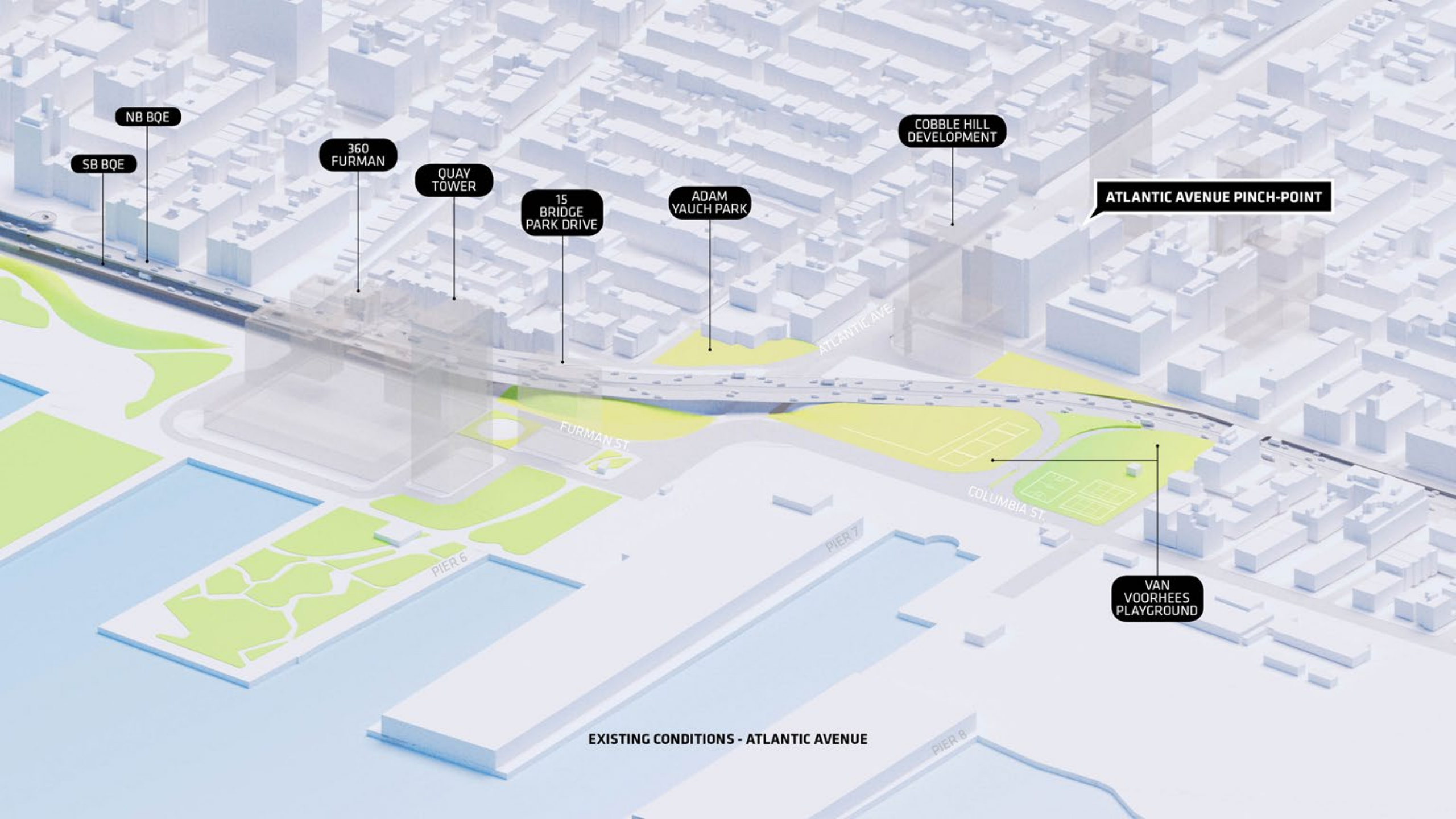
PROPOSED CROSS SECTION ATLANTIC AVE.
 BQE SECTION AT BBP



PROPOSED CROSS SECTION ATLANTIC AVE.
 BQE SECTION AT BBP



PROPOSED CROSS SECTION ATLANTIC AVE.
 BQE SECTION AT BBP



NB BQE

SB BQE

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

ATLANTIC AVENUE PINCH-POINT

FURMAN ST.

ATLANTIC AVE.

COLUMBIA ST.

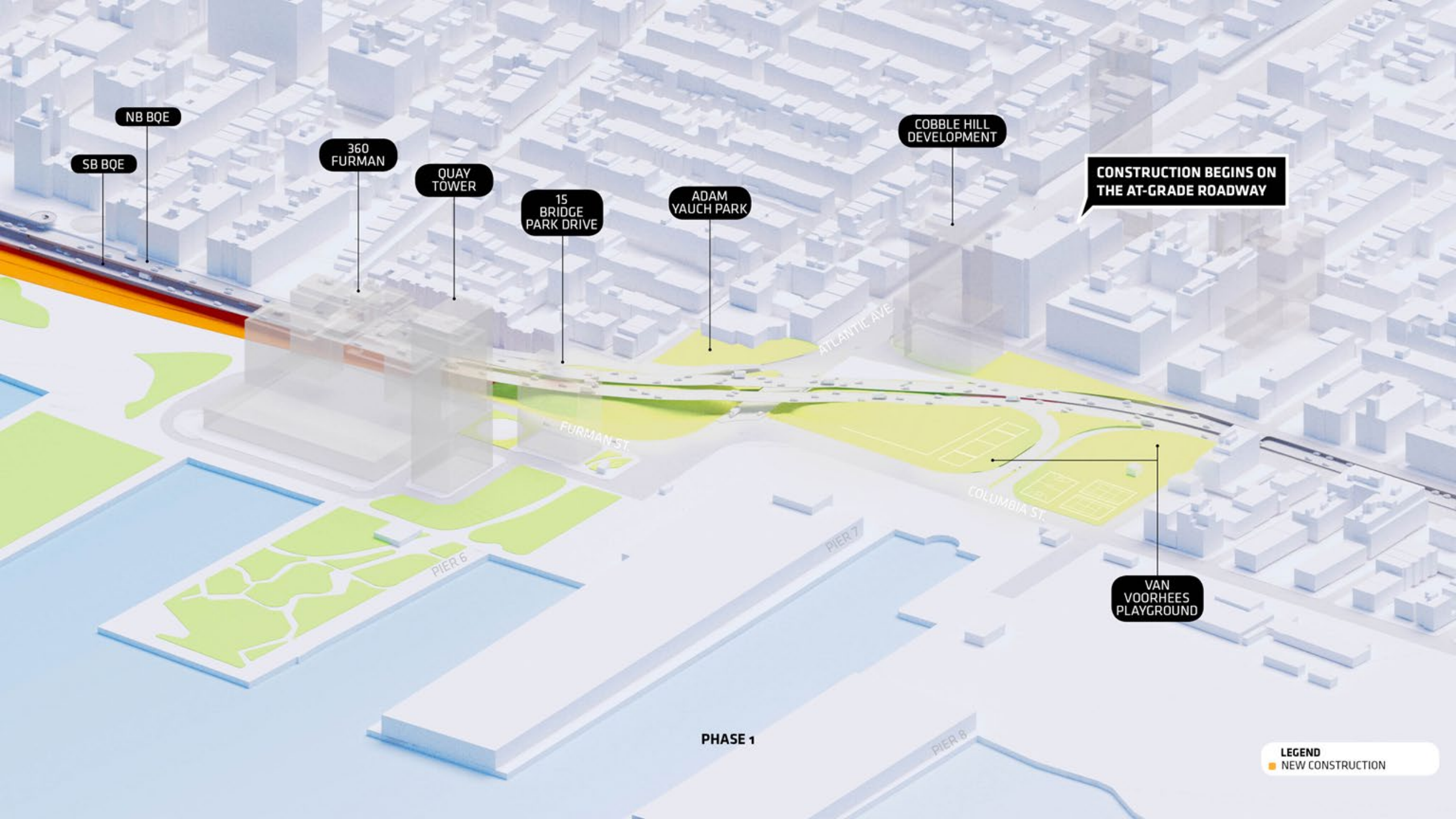
PIER 6

PIER 7

VAN VOORHEES PLAYGROUND

EXISTING CONDITIONS - ATLANTIC AVENUE

PIER 8



NB BQE

SB BQE

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

CONSTRUCTION BEGINS ON THE AT-GRADE ROADWAY

ATLANTIC AVE

FURMAN ST.

COLUMBIA ST.

PIER 6

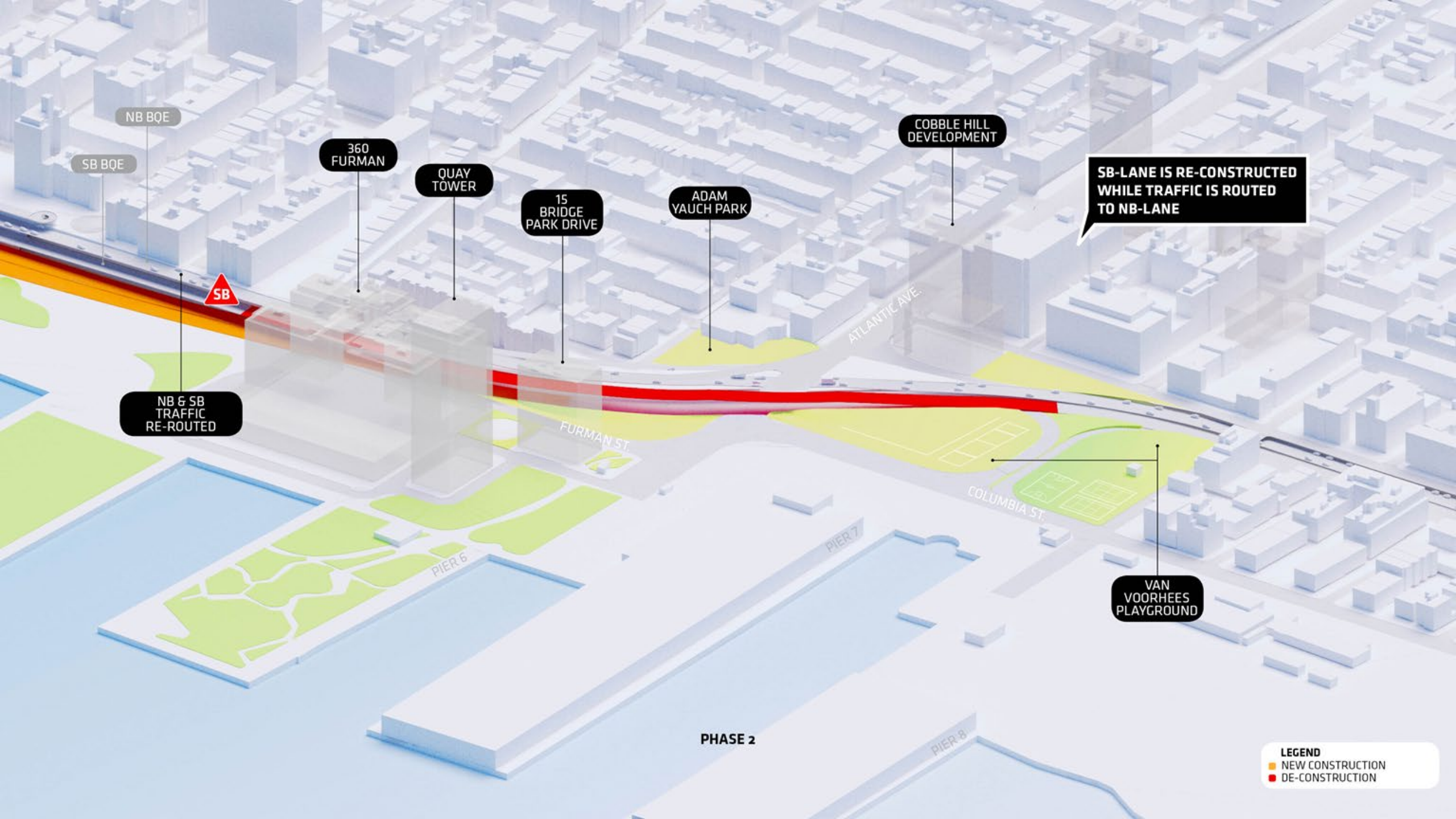
PIER 7

PIER 8

VAN VOORHEES PLAYGROUND

PHASE 1

LEGEND
■ NEW CONSTRUCTION



NB BQE

SB BQE

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

SB-LANE IS RE-CONSTRUCTED WHILE TRAFFIC IS ROUTED TO NB-LANE

SB

NB & SB TRAFFIC RE-ROUTED

FURMAN ST.

ATLANTIC AVE.

COLUMBIA ST.

PIER 6

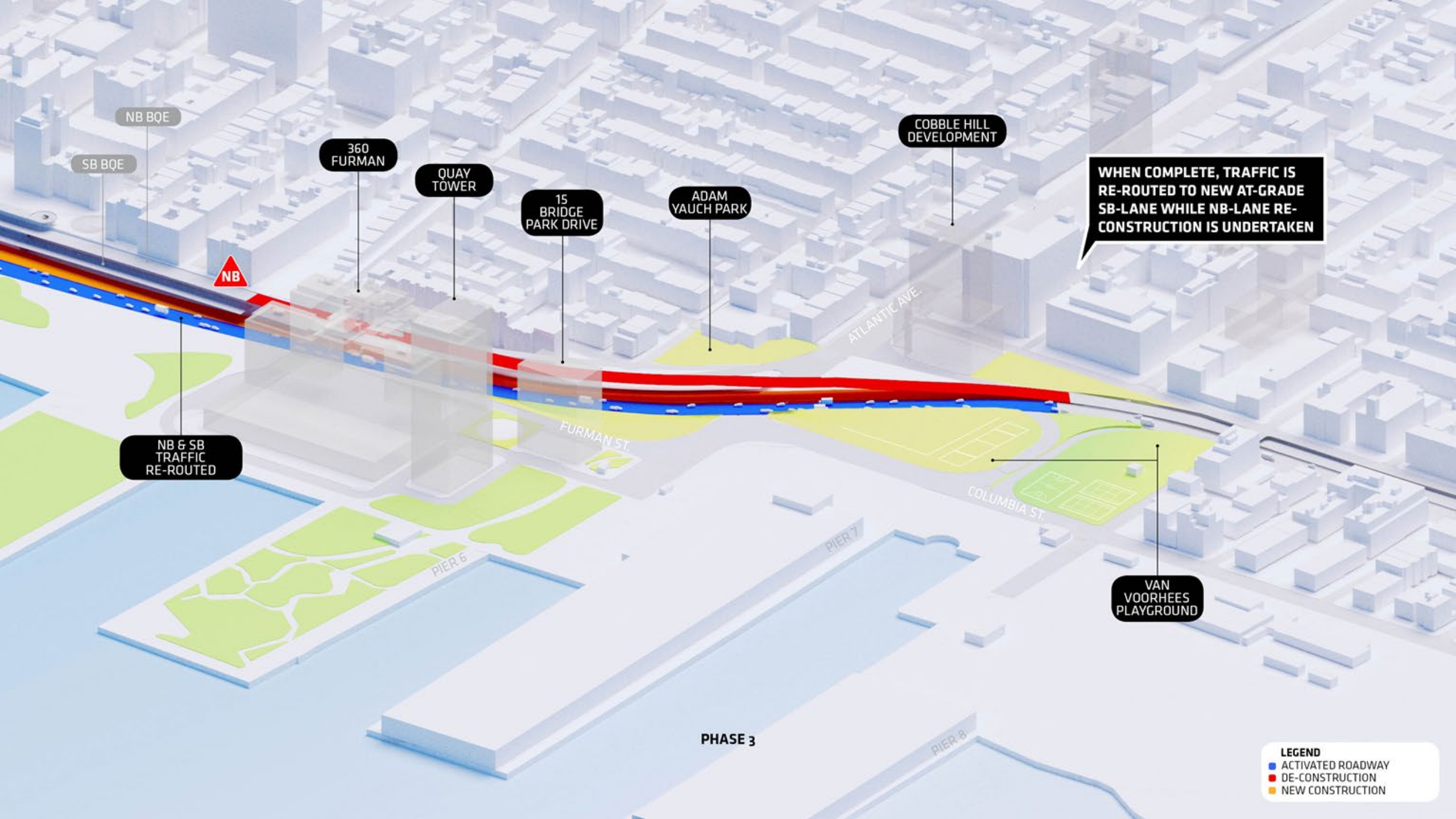
PIER 7

VAN VOORHEES PLAYGROUND

PHASE 2

PIER 8

LEGEND
■ NEW CONSTRUCTION
■ DE-CONSTRUCTION



NB BQE

SB BQE

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

WHEN COMPLETE, TRAFFIC IS RE-ROUTED TO NEW AT-GRADE SB-LANE WHILE NB-LANE RE-CONSTRUCTION IS UNDERTAKEN

NB

NB & SB TRAFFIC RE-ROUTED

ATLANTIC AVE.

FURMAN ST.

COLUMBIA ST.

PIER 6

PIER 7

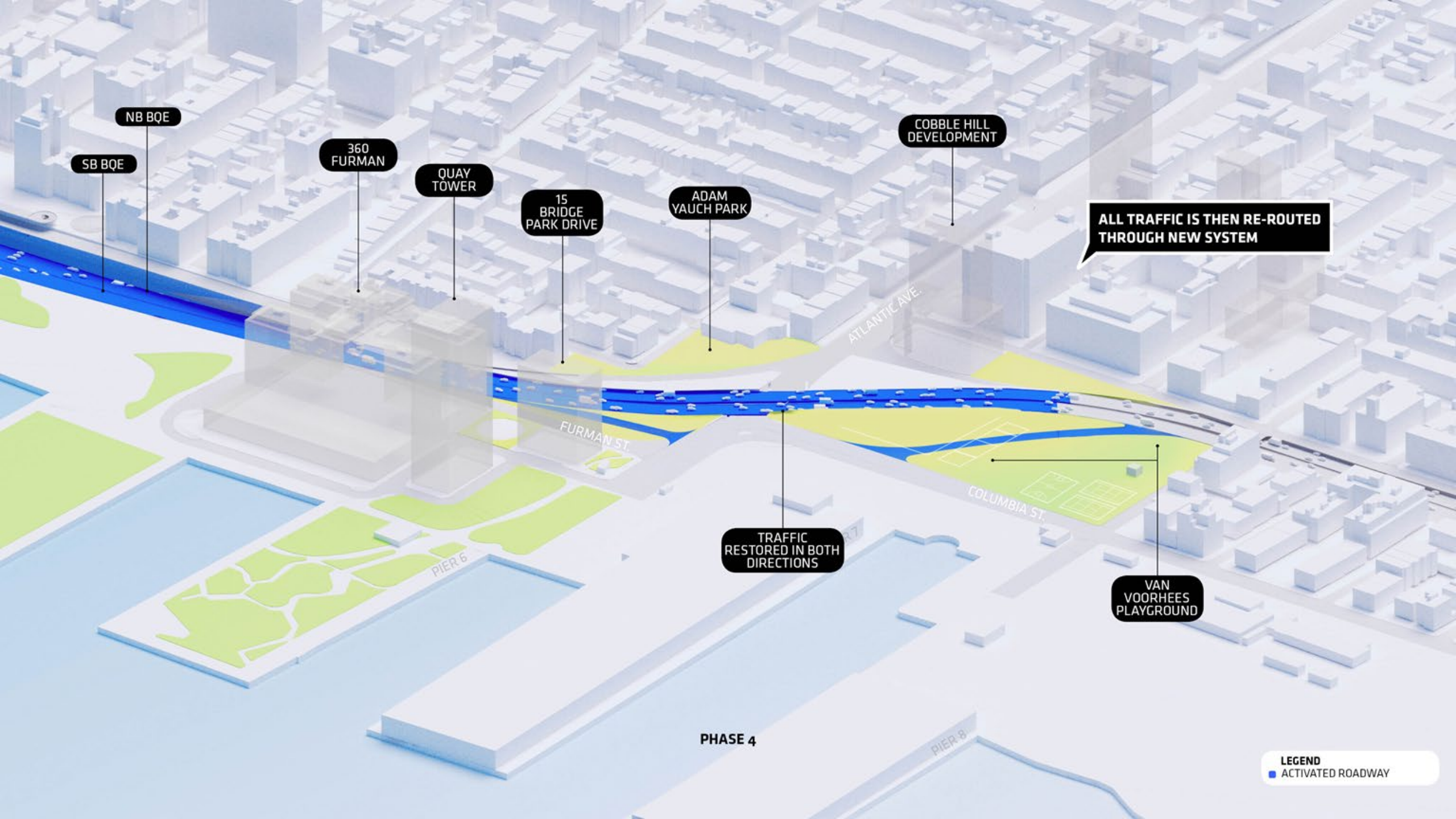
VAN VOORHEES PLAYGROUND

PHASE 3

PIER 8

LEGEND

- ACTIVATED ROADWAY
- DE-CONSTRUCTION
- NEW CONSTRUCTION



NB BQE

SB BQE

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

ALL TRAFFIC IS THEN RE-ROUTED THROUGH NEW SYSTEM

ATLANTIC AVE.

FURMAN ST.

COLUMBIA ST.

PIER 6

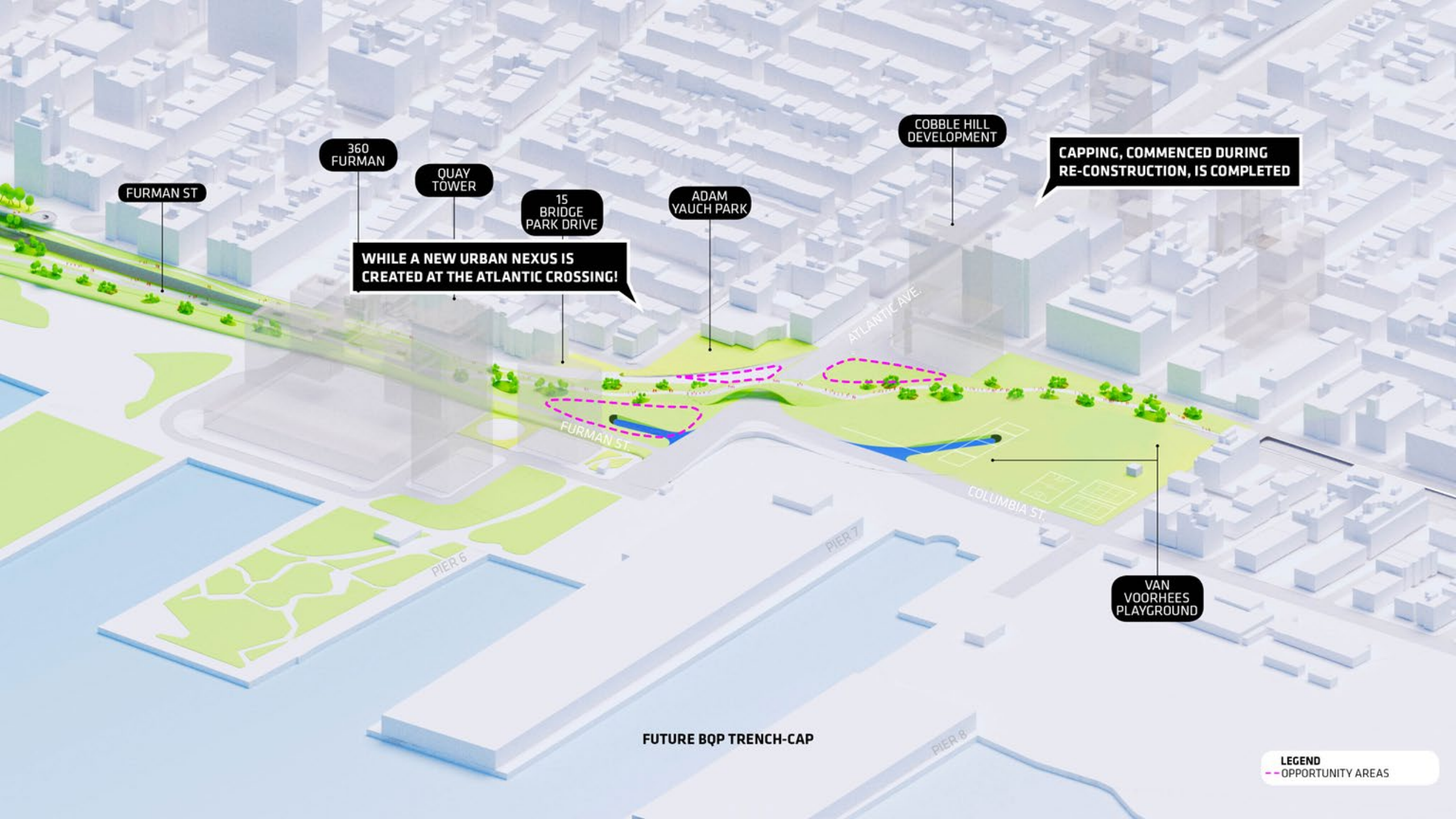
TRAFFIC RESTORED IN BOTH DIRECTIONS

VAN VOORHEES PLAYGROUND

PHASE 4

PIER 8

LEGEND
■ ACTIVATED ROADWAY



FURMAN ST

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

CAPPING, COMMENCED DURING RE-CONSTRUCTION, IS COMPLETED

WHILE A NEW URBAN NEXUS IS CREATED AT THE ATLANTIC CROSSING!

ATLANTIC AVE.

FURMAN ST.

COLUMBIA ST.

PIER 6

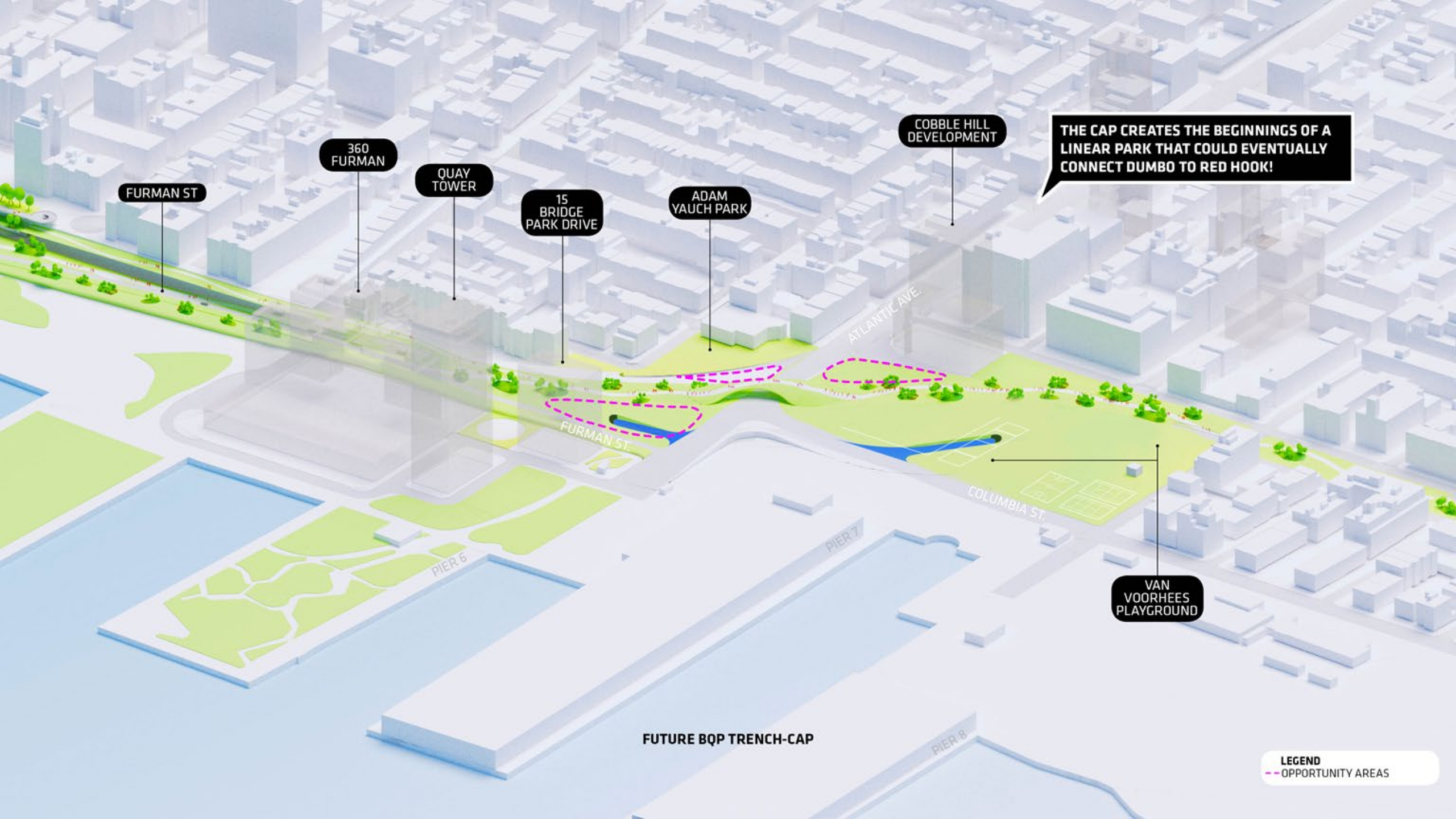
PIER 7

VAN VOORHEES PLAYGROUND

FUTURE BQP TRENCH-CAP

PIER 8

LEGEND
-- OPPORTUNITY AREAS



FURMAN ST

360 FURMAN

QUAY TOWER

15 BRIDGE PARK DRIVE

ADAM YAUCH PARK

COBBLE HILL DEVELOPMENT

ATLANTIC AVE.

FURMAN ST.

COLUMBIA ST.

PIER 6

PIER 7

VAN VOORHEES PLAYGROUND

FUTURE BQP TRENCH-CAP

PIER 8

THE CAP CREATES THE BEGINNINGS OF A LINEAR PARK THAT COULD EVENTUALLY CONNECT DUMBO TO RED HOOK!

LEGEND
-- OPPORTUNITY AREAS

BQP
2.4 MILES

BROOKLYN BRIDGE!

BROOKLYN HEIGHTS

DOWNTOWN BROOKLYN

ATLANTIC AVE

COBBLE HILL

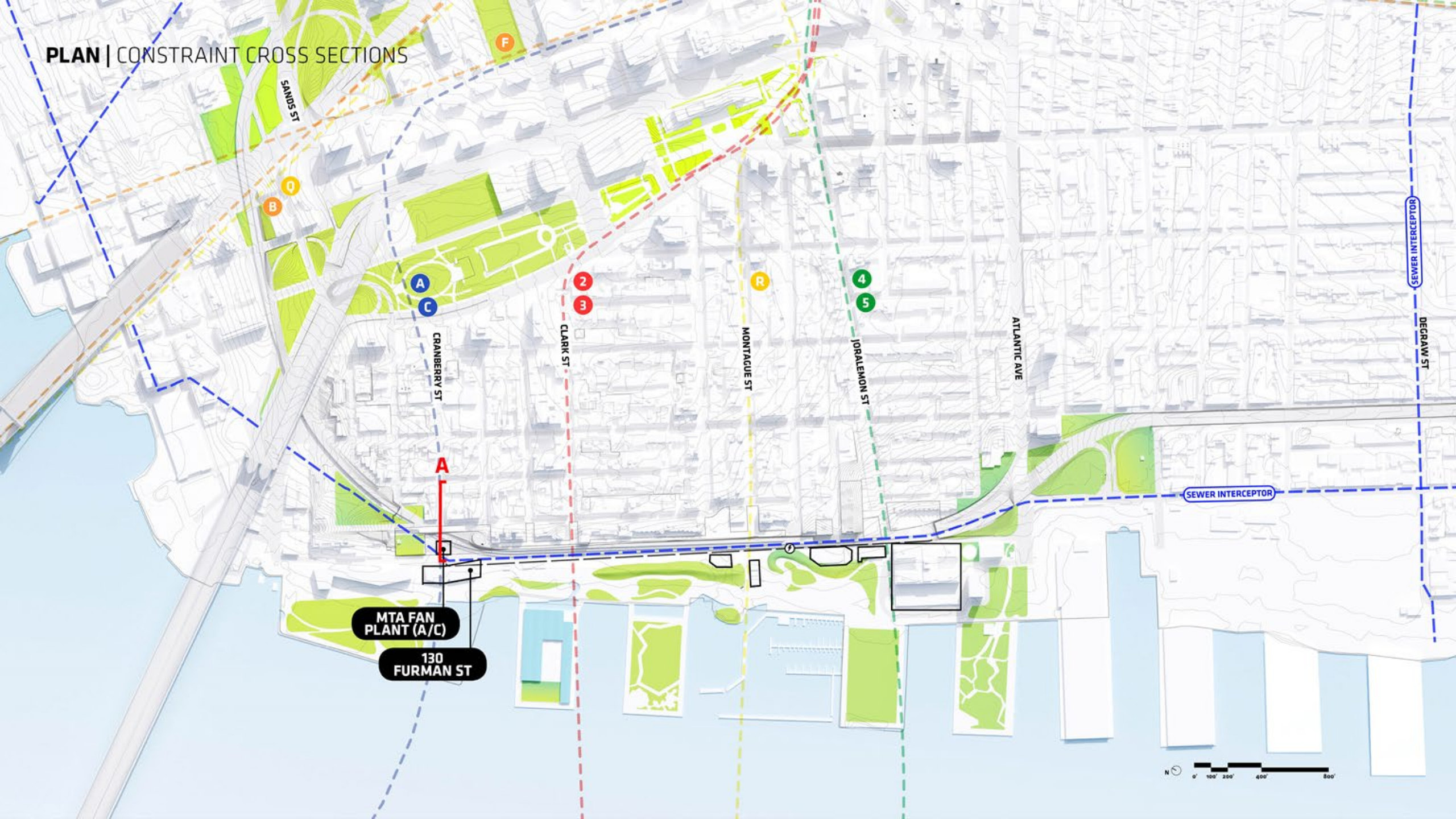
COLUMBIA STREET
WATERFRONT DISTRICT

CARROLL GARDENS

RED HOOK!

1. DEP & CON ED INFRASTRUCTURE
2. MTA INFRASTRUCTURE
3. 360 FURMAN & PARK BUILDINGS
- 4. COLUMBIA HEIGHTS**
5. HIGHWAY VENTING

PLAN | CONSTRAINT CROSS SECTIONS



SANDE ST

B

C

A

C

CRANBERRY ST

CLARK ST

2

3

MONTAGUE ST

R

JORALEMON ST

4

5

ATLANTIC AVE

SEWER INTERCEPTOR

DECRAW ST

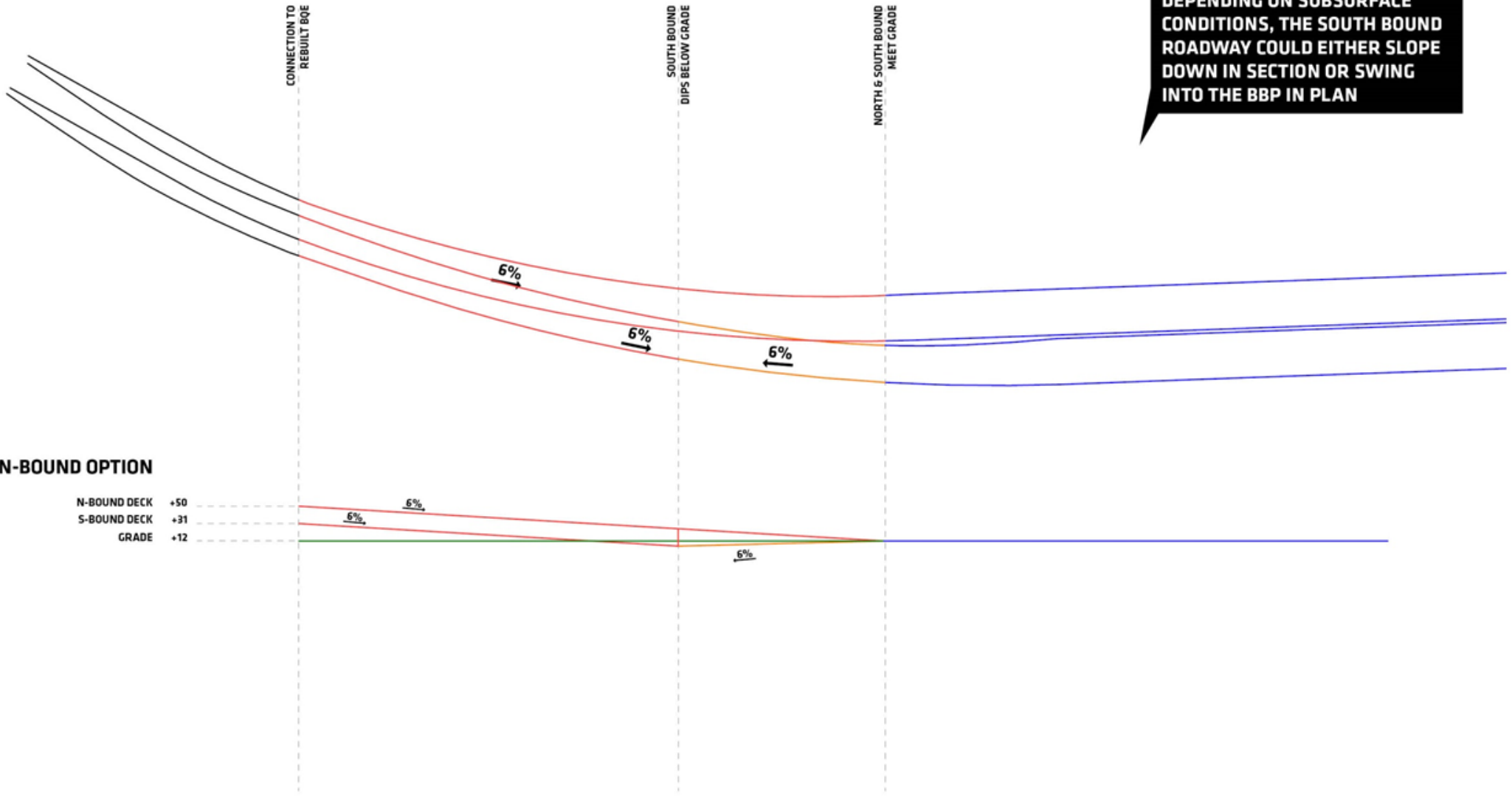
SEWER INTERCEPTOR

MTA FAN PLANT (A/C)

130 FURMAN ST



DEPENDING ON SUBSURFACE CONDITIONS, THE SOUTH BOUND ROADWAY COULD EITHER SLOPE DOWN IN SECTION OR SWING INTO THE BBP IN PLAN

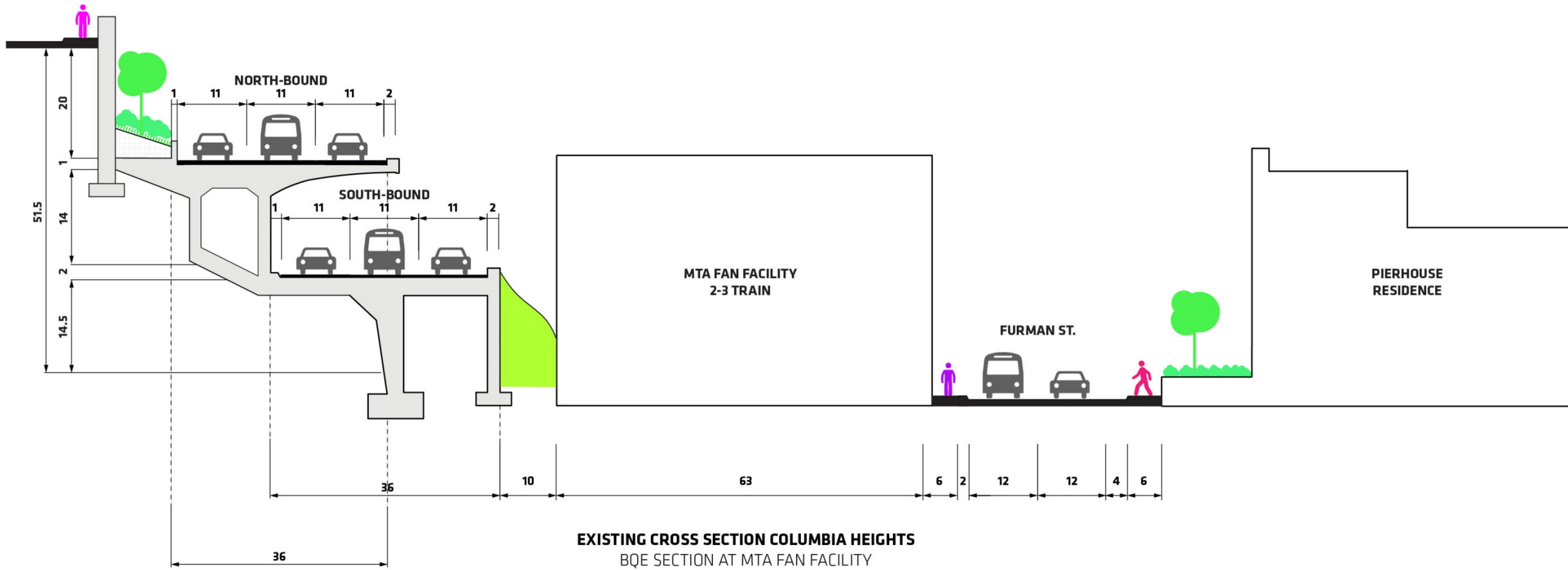


S-BOUND & N-BOUND OPTION

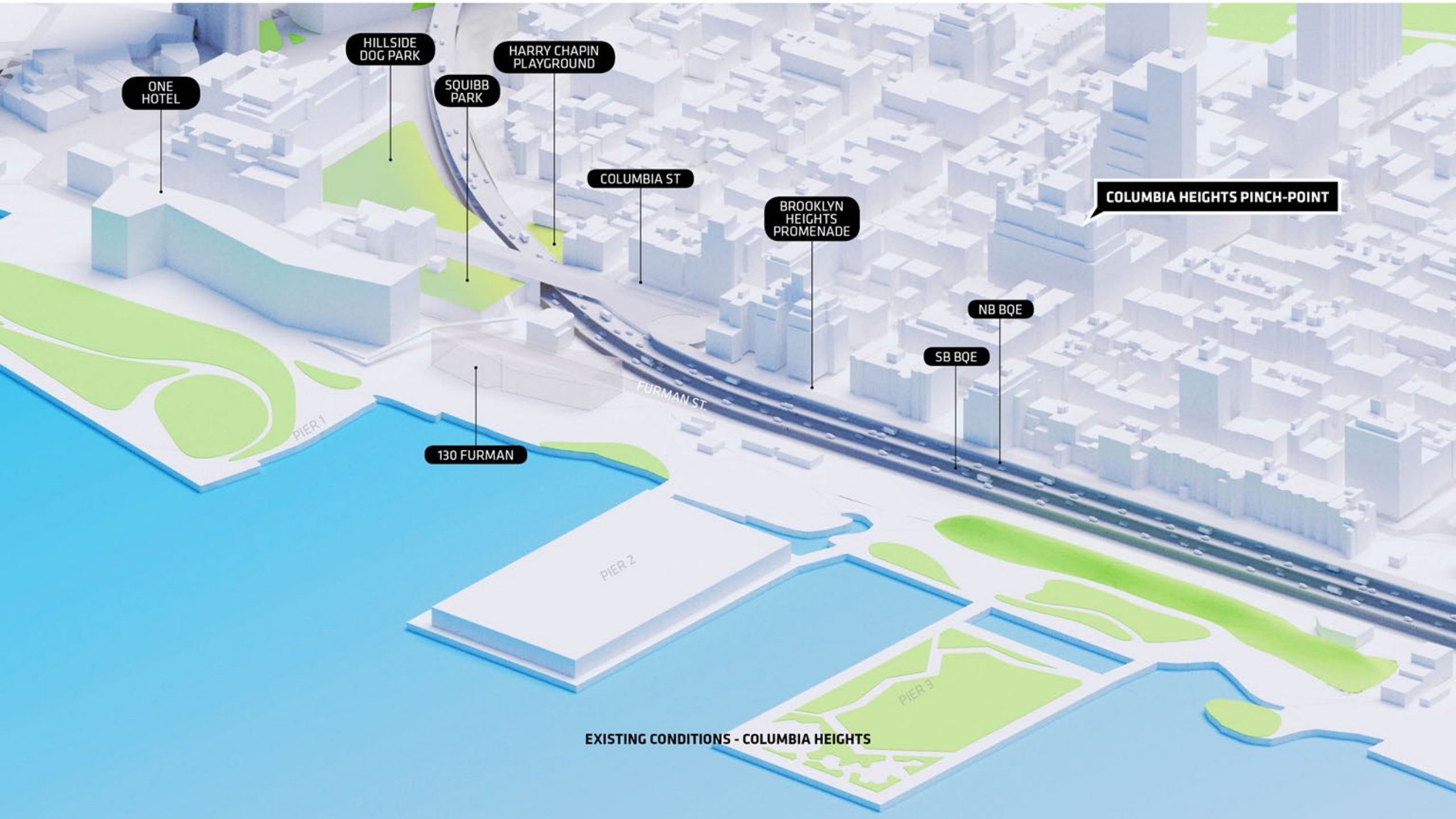
N-BOUND DECK +50
S-BOUND DECK +31
GRADE +12

PINCH-POINT ROADWAY

**BROOKLYN HEIGHTS
PROMENADE**



EXISTING CROSS SECTION COLUMBIA HEIGHTS
BQE SECTION AT MTA FAN FACILITY



ONE HOTEL

HILLSIDE DOG PARK

SQUIBB PARK

HARRY CHAPIN PLAYGROUND

COLUMBIA ST

BROOKLYN HEIGHTS PROMENADE

COLUMBIA HEIGHTS PINCH-POINT

NB BQE

SB BQE

FURMAN ST

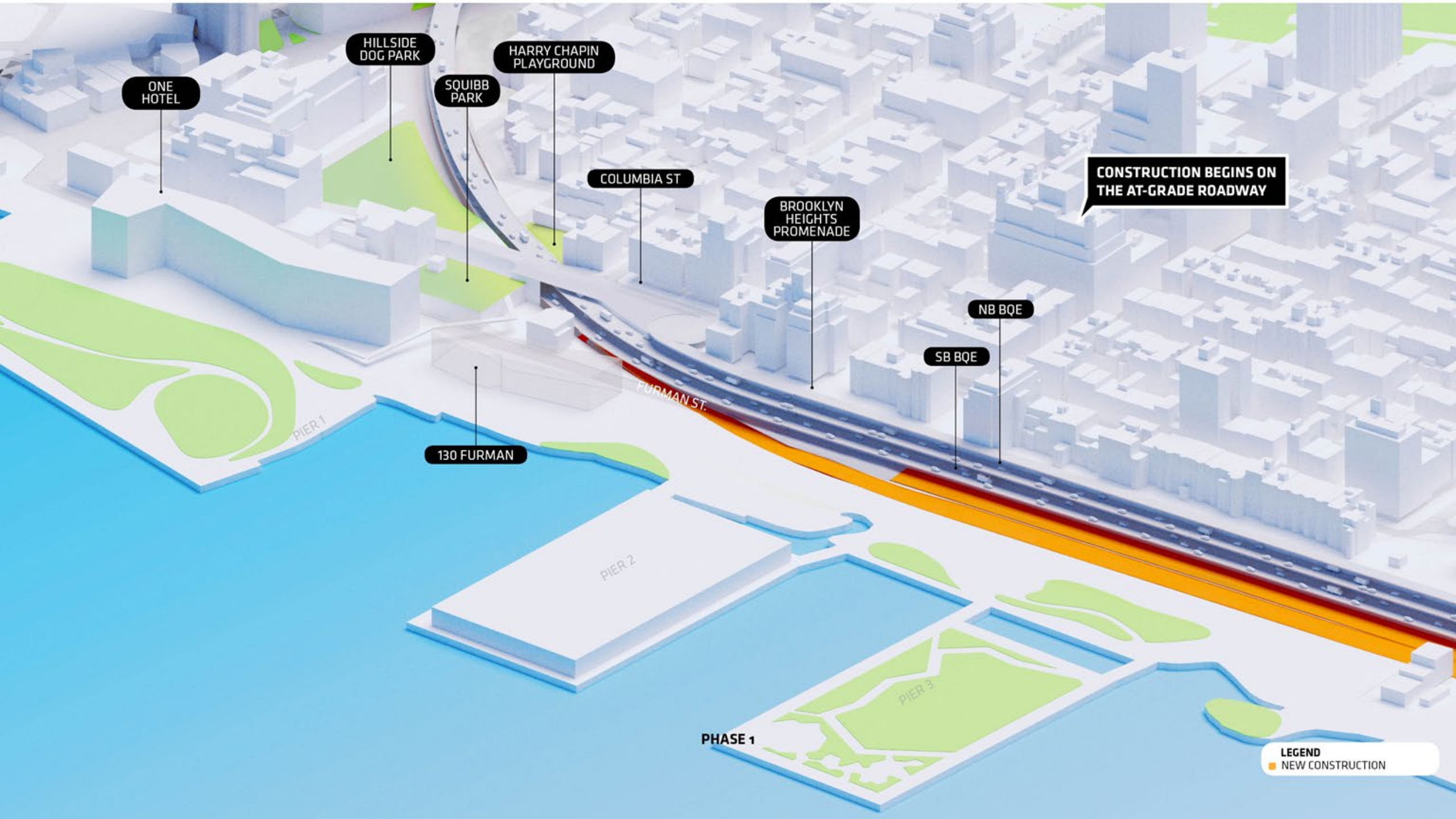
130 FURMAN

PIER 1

PIER 2

PIER 3

EXISTING CONDITIONS - COLUMBIA HEIGHTS



ONE HOTEL

HILLSIDE DOG PARK

HARRY CHAPIN PLAYGROUND

SQUIBB PARK

COLUMBIA ST

BROOKLYN HEIGHTS PROMENADE

CONSTRUCTION BEGINS ON THE AT-GRADE ROADWAY

NB BQE

SB BQE

FURMAN ST.

130 FURMAN

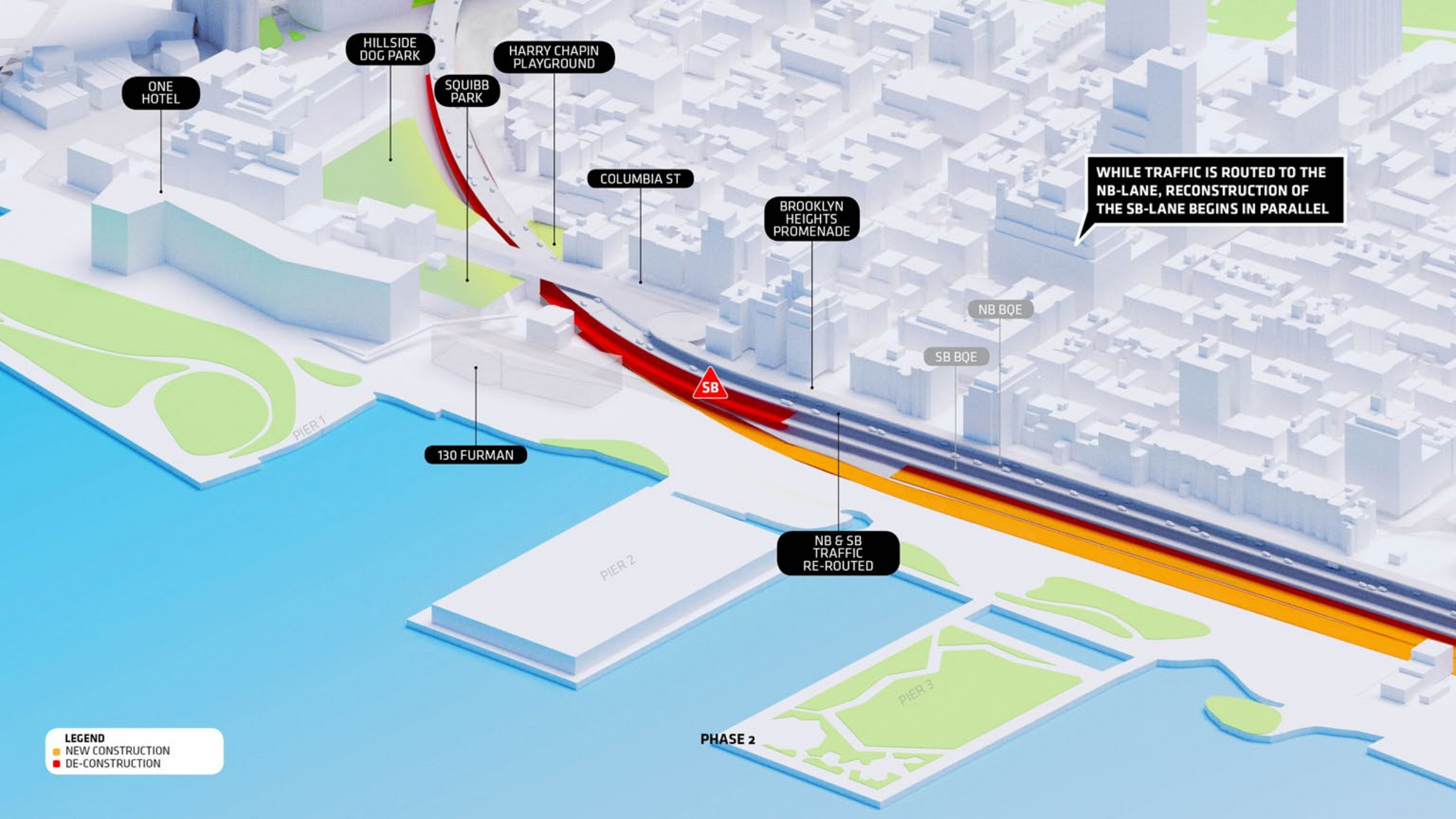
PIER 1

PIER 2

PIER 3

PHASE 1

LEGEND
NEW CONSTRUCTION



ONE HOTEL

HILLSIDE DOG PARK

HARRY CHAPIN PLAYGROUND

SQUIBB PARK

COLUMBIA ST

BROOKLYN HEIGHTS PROMENADE

NB BQE

SB BQE

130 FURMAN

SB

NB & SB TRAFFIC RE-ROUTED

WHILE TRAFFIC IS ROUTED TO THE NB-LANE, RECONSTRUCTION OF THE SB-LANE BEGINS IN PARALLEL

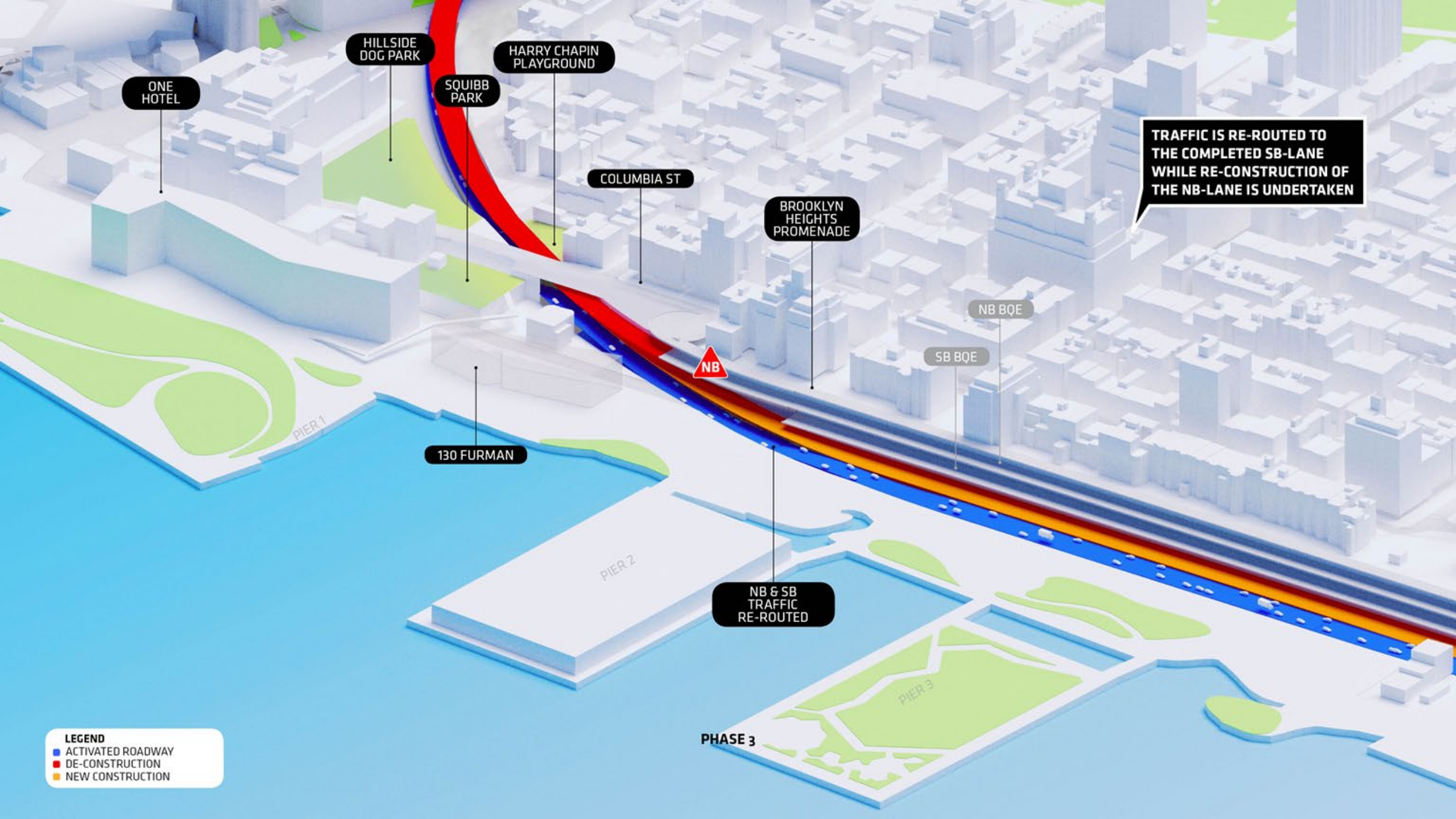
LEGEND
NEW CONSTRUCTION
DE-CONSTRUCTION

PHASE 2

PIER 1

PIER 2

PIER 3



ONE HOTEL

HILLSIDE DOG PARK

HARRY CHAPIN PLAYGROUND

SQUIBB PARK

COLUMBIA ST

BROOKLYN HEIGHTS PROMENADE

NB BQE

SB BQE

130 FURMAN

NB

NB & SB TRAFFIC RE-ROUTED

TRAFFIC IS RE-ROUTED TO THE COMPLETED SB-LANE WHILE RE-CONSTRUCTION OF THE NB-LANE IS UNDERTAKEN

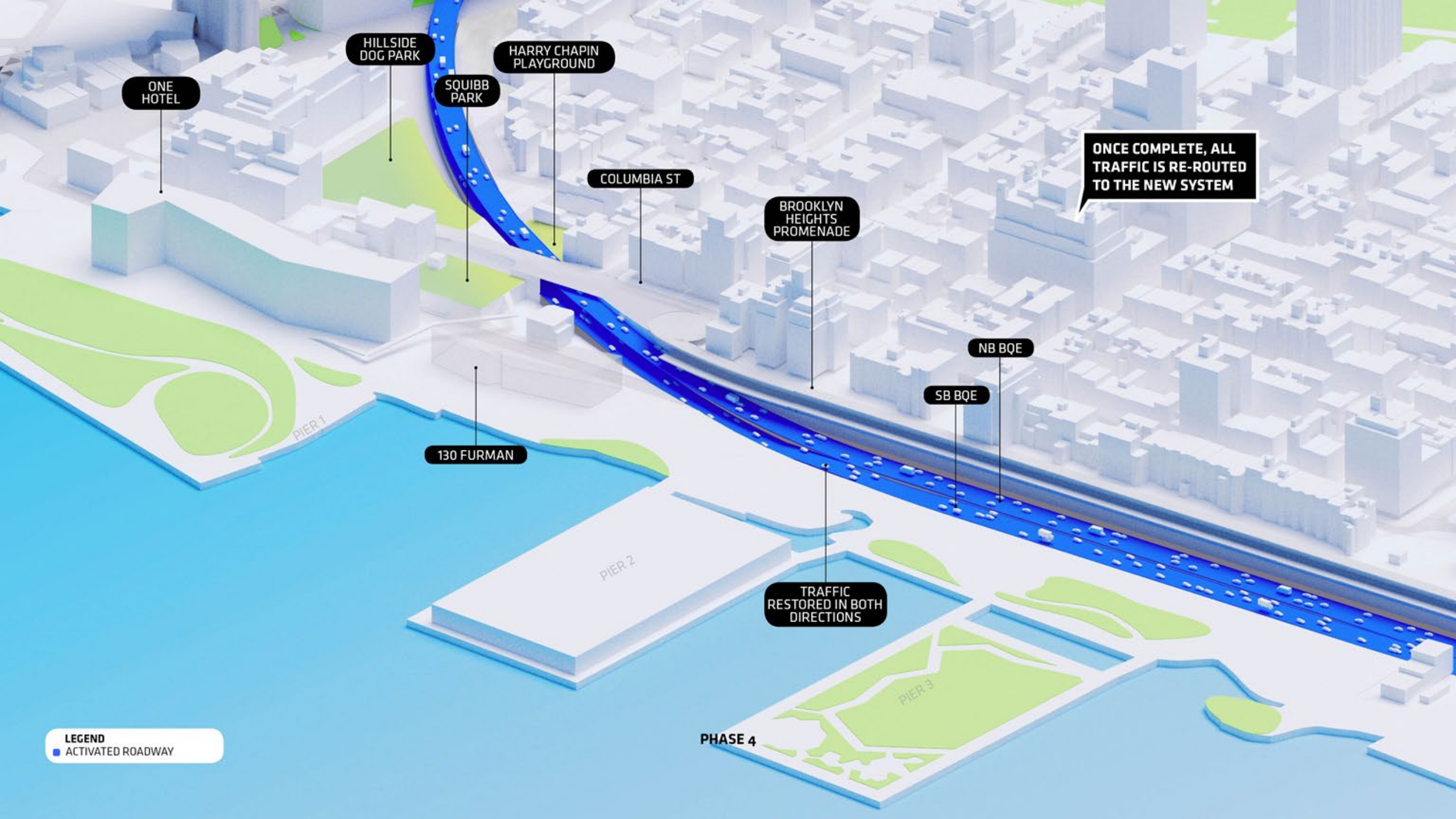
LEGEND
■ ACTIVATED ROADWAY
■ DE-CONSTRUCTION
■ NEW CONSTRUCTION

PHASE 3

PIER 1

PIER 2

PIER 3



ONE HOTEL

HILLSIDE DOG PARK

HARRY CHAPIN PLAYGROUND

SQUIBB PARK

COLUMBIA ST

BROOKLYN HEIGHTS PROMENADE

ONCE COMPLETE, ALL TRAFFIC IS RE-ROUTED TO THE NEW SYSTEM

NB BQE

SB BQE

130 FURMAN

TRAFFIC RESTORED IN BOTH DIRECTIONS

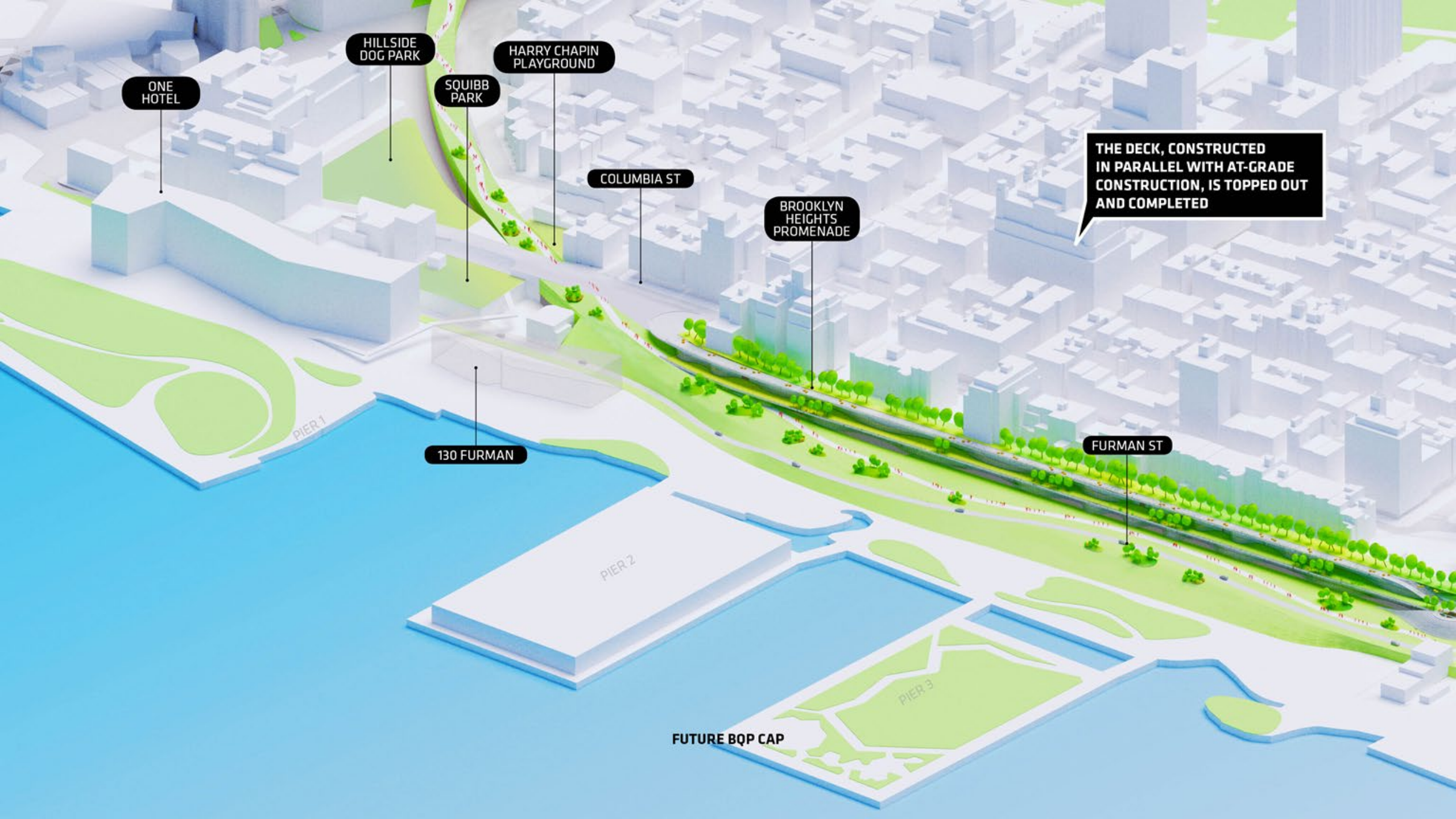
LEGEND
■ ACTIVATED ROADWAY

PHASE 4

PIER 1

PIER 2

PIER 3



ONE HOTEL

HILLSIDE DOG PARK

HARRY CHAPIN PLAYGROUND

SQUIBB PARK

COLUMBIA ST

BROOKLYN HEIGHTS PROMENADE

THE DECK, CONSTRUCTED IN PARALLEL WITH AT-GRADE CONSTRUCTION, IS TOPPED OUT AND COMPLETED

PIER 1

130 FURMAN

PIER 2

FURMAN ST

PIER 3

FUTURE BQP CAP

1. DEP & CON ED INFRASTRUCTURE
2. MTA INFRASTRUCTURE
3. 360 FURMAN & PARK BUILDINGS
4. COLUMBIA HEIGHTS
- 5. HIGHWAY VENTING**

ROADWAY VENTS

- ESTIMATED 6-8 VENTS FOR 0.5 MILE STRETCH OF THE BURIED ROADWAY ALONG BBP.
- VENTS APPROXIMATELY 200 SQUARE FEET EACH
- SPACING APPROXIMATELY EVERY 400-500 FEET



BROOKLYN BATTERY TUNNEL VENTS - BATTERY PARK

ROADWAY VENTING



SANDS ST

B

C

A

C

CRANBERRY ST

CLARK ST

2

3

MONTAGUE ST

R

JORALEMON ST

4

5

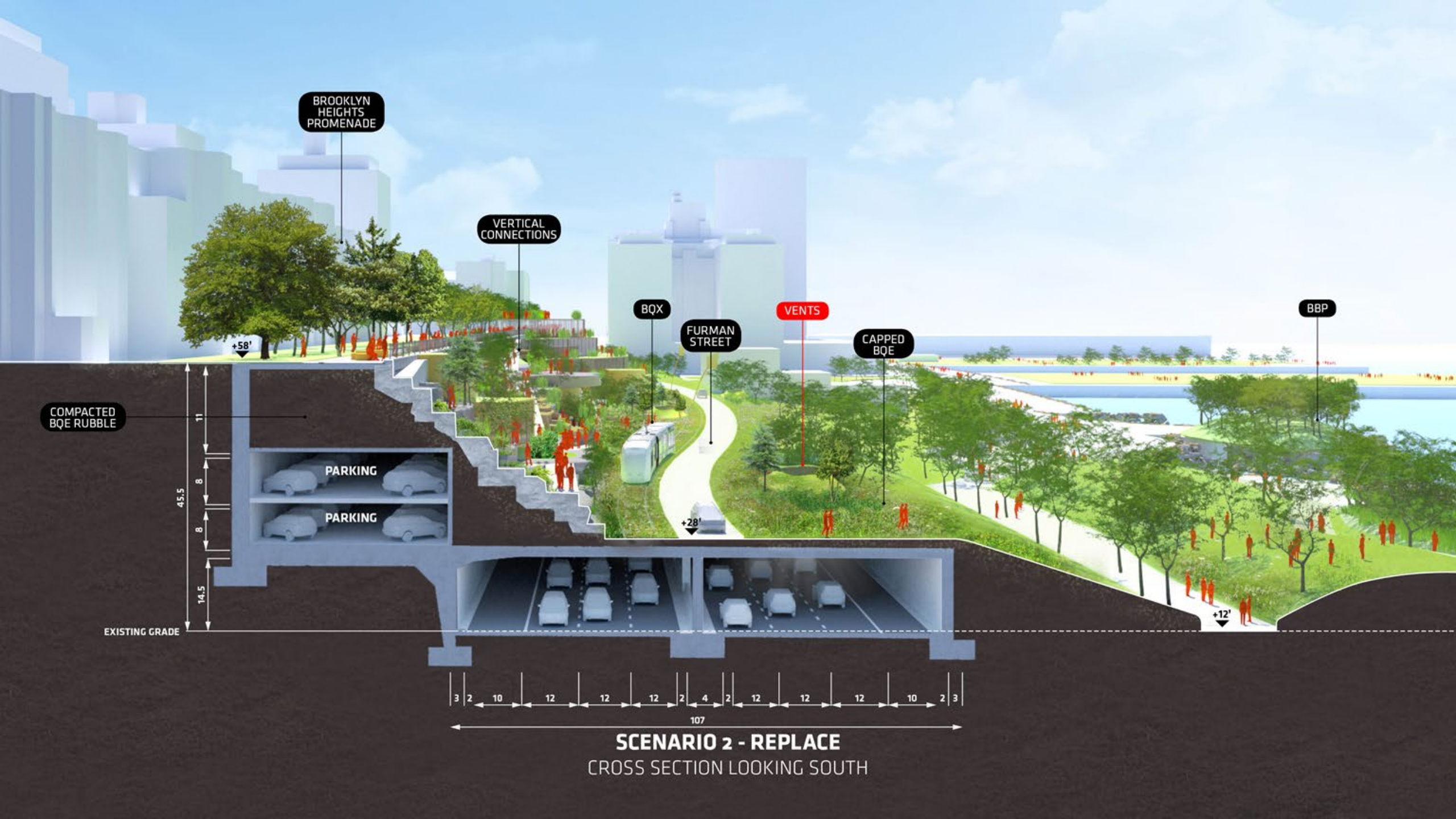
ATLANTIC AVE

DEGRAW ST

500'

PROPOSED VENTING LOCATIONS





BROOKLYN HEIGHTS PROMENADE

VERTICAL CONNECTIONS

BQX

FURMAN STREET

VENTS

CAPPED BQE

BBP

+58'

+28'

+12'

COMPACTED BQE RUBBLE

PARKING

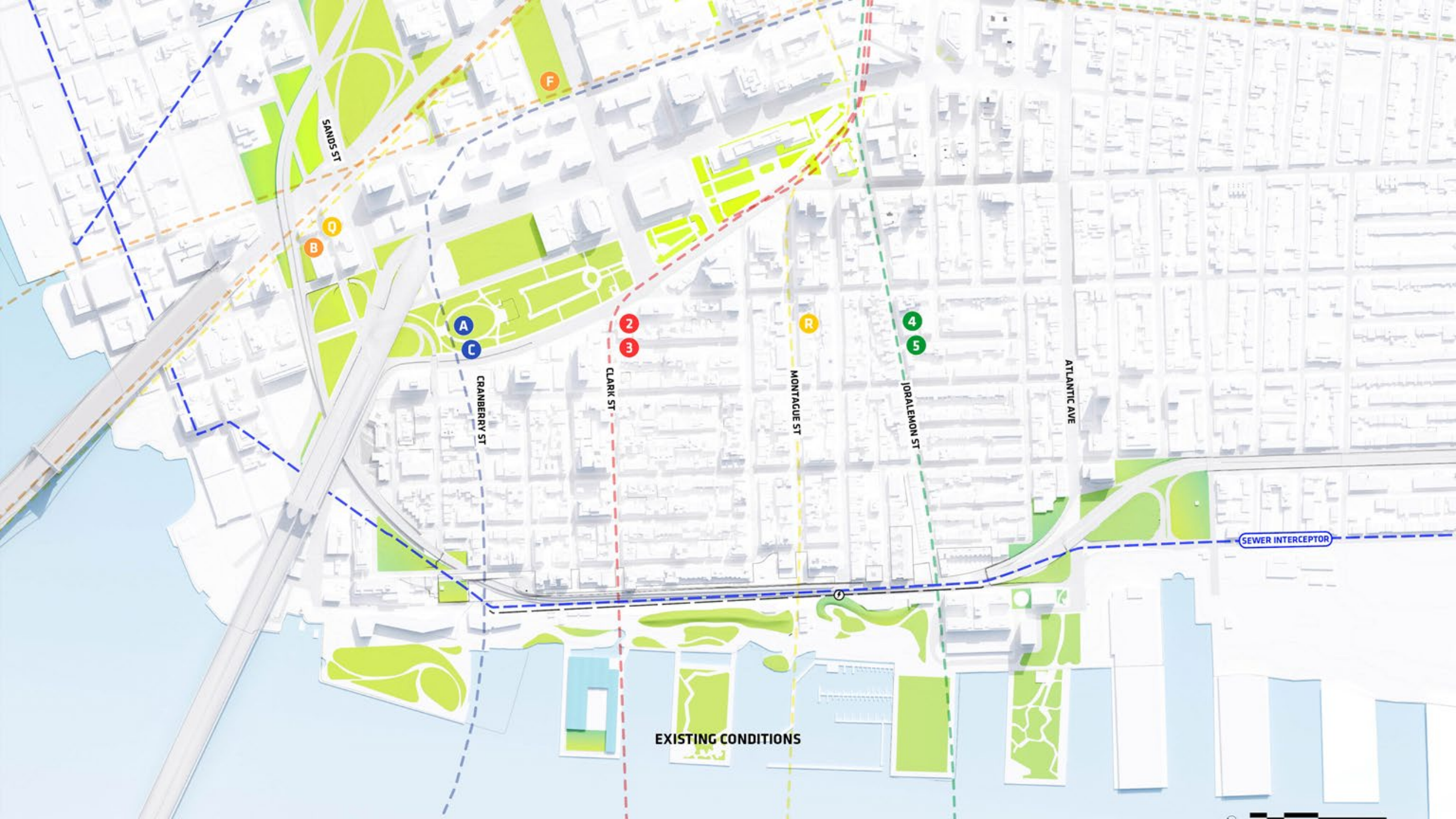
PARKING

EXISTING GRADE

3 2 10 12 12 12 2 4 2 12 12 12 10 2 3

107

SCENARIO 2 - REPLACE
CROSS SECTION LOOKING SOUTH



SAND ST

CRANBERRY ST

CLARK ST

MONTAGUE ST

JORALEMON ST

ATLANTIC AVE

SEWER INTERCEPTOR

EXISTING CONDITIONS

B

C

A

C

2

3

R

4

5

F



CRANBERRY ST

CLARK ST

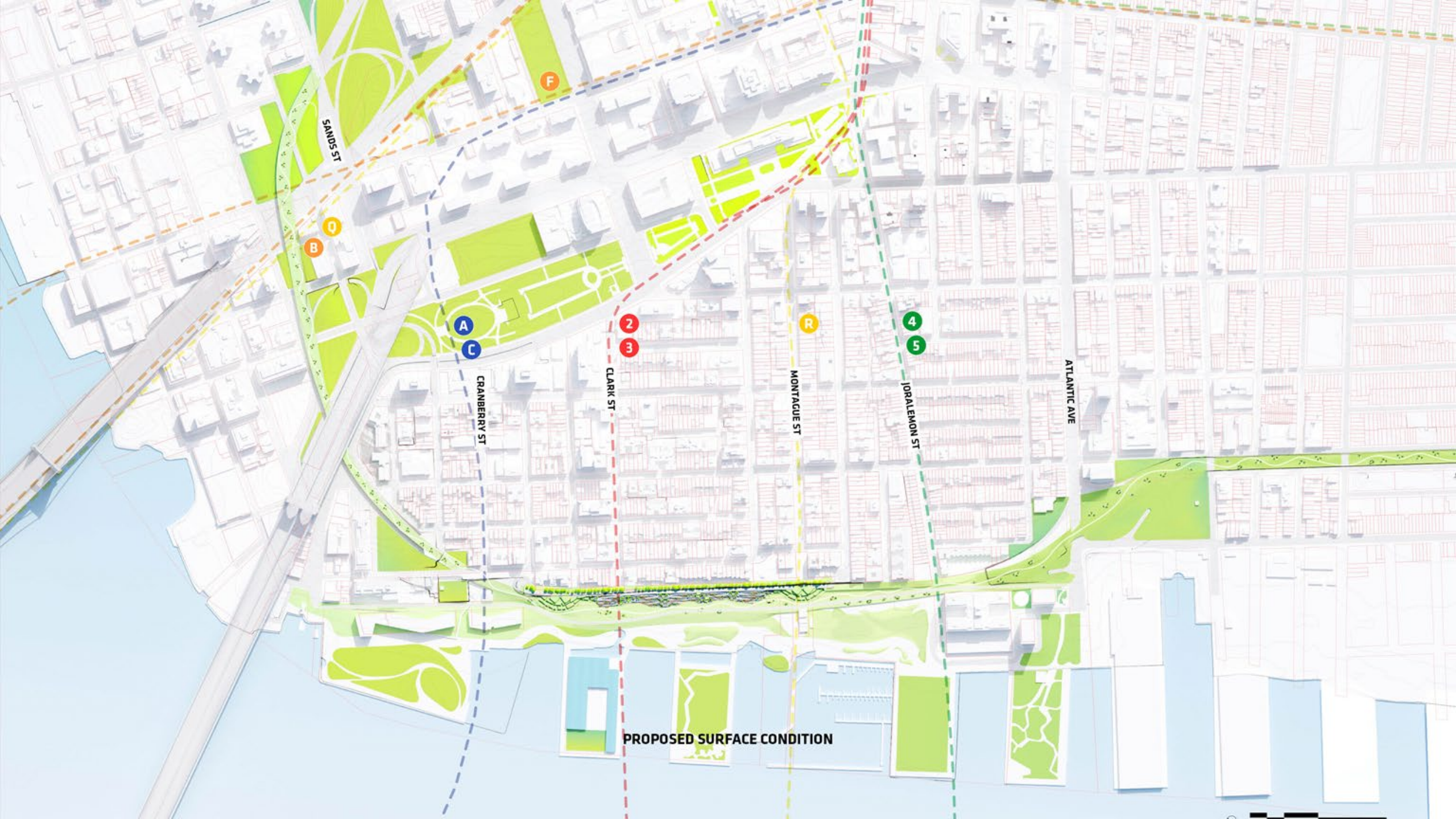
MONTAGUE ST

JERUSALEM ST

ATLANTIC AVE

PROPOSED SUBSURFACE CONDITION





SAND ST

CRANBERRY ST

CLARK ST

MONTAGUE ST

JORALEMON ST

ATLANTIC AVE

PROPOSED SURFACE CONDITION

F

B

C

A

C

2

3

R

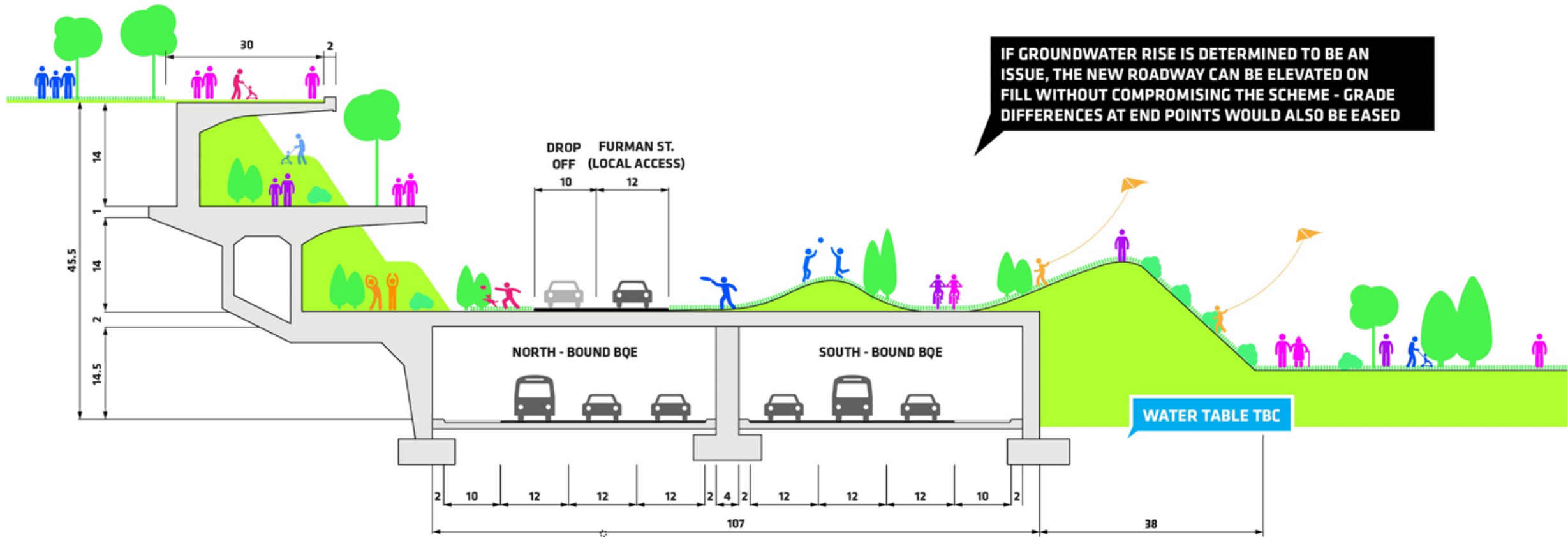
4

5

RESILIENCY

**BROOKLYN HEIGHTS
PROMENADE**

BROOKLYN BRIDGE PARK

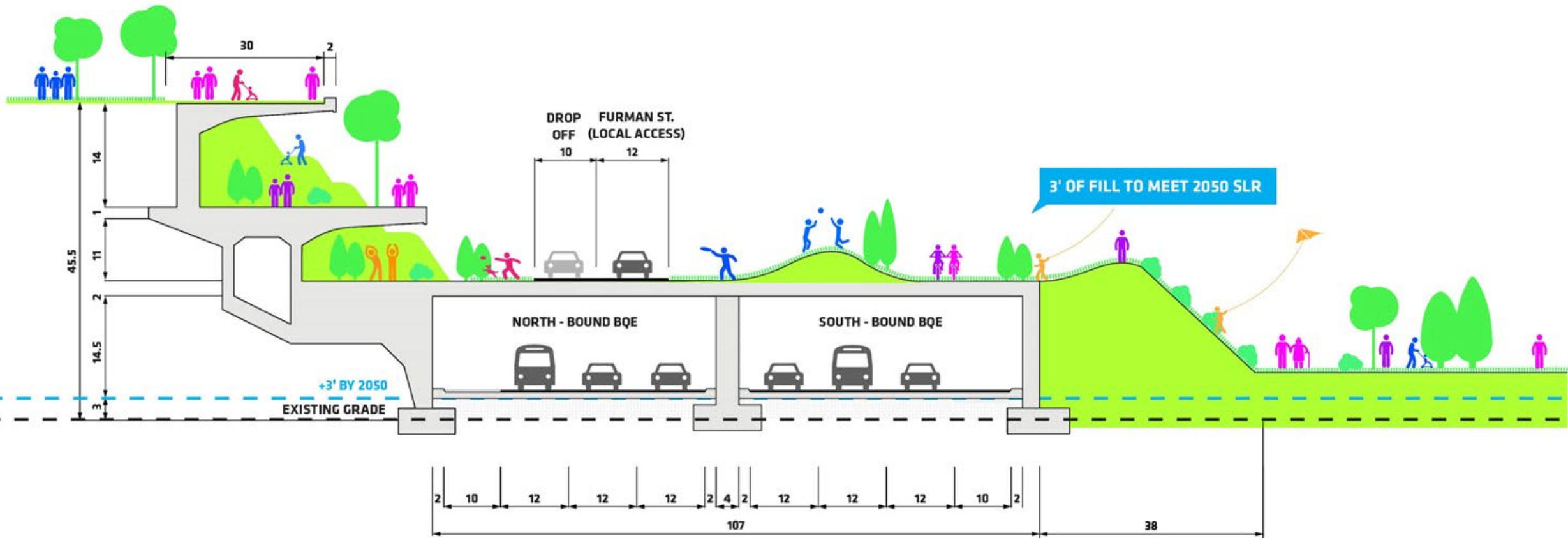


IF GROUNDWATER RISE IS DETERMINED TO BE AN ISSUE, THE NEW ROADWAY CAN BE ELEVATED ON FILL WITHOUT COMPROMISING THE SCHEME - GRADE DIFFERENCES AT END POINTS WOULD ALSO BE EASED

**RESILIENCY
BQE AT BBP**

**BROOKLYN HEIGHTS
PROMENADE**

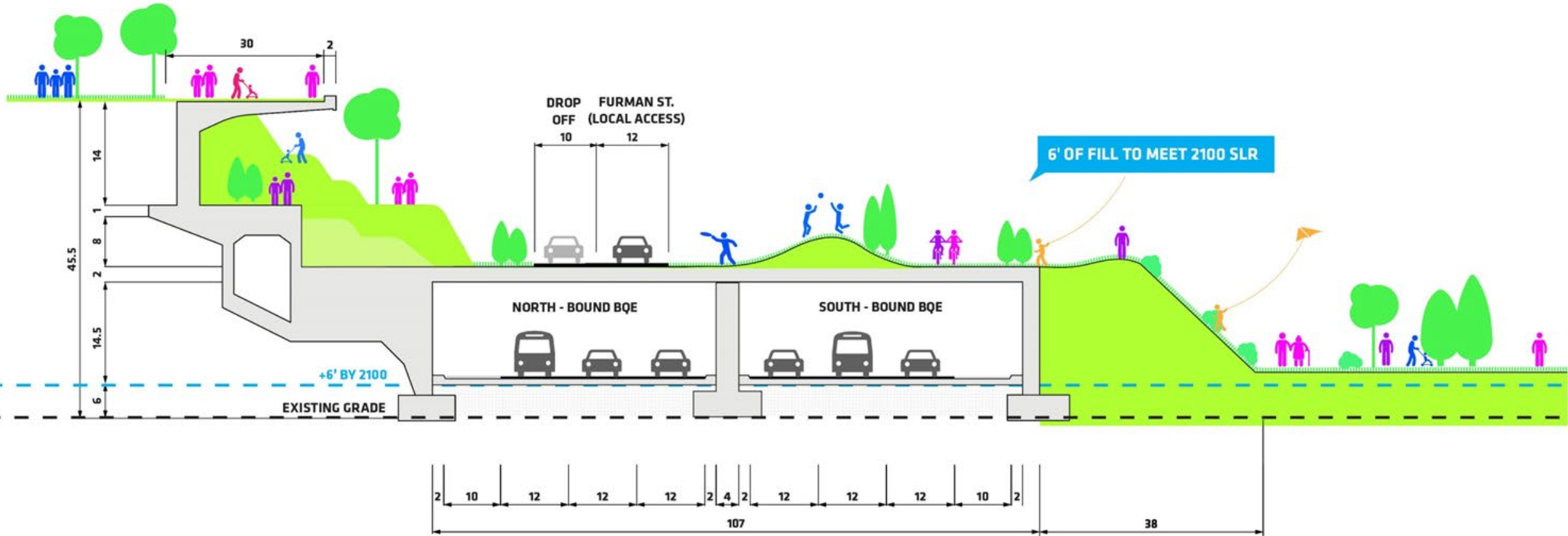
BROOKLYN BRIDGE PARK



RESILIENCY
BQE AT BBP

**BROOKLYN HEIGHTS
PROMENADE**

BROOKLYN BRIDGE PARK



RESILIENCY
BQE AT BBP