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ARROW STREET

massDOT  
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION




# Back Bay Station

COMMUNITY PRESENTATION - VENTILATION & CONCOURSE IMPROVEMENTS

SEPTEMBER 26, 2016, 6PM  
TRANSPORTATION BUILDING  
10 PARK PLAZA



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# AGENDA

- BACK BAY STATION YESTERDAY AND TODAY
- BACK BAY STATION FUTURE
- VENTILATION PROJECT
- CONCOURSE IMPROVEMENTS
- Q & A

ARROW STREET - SOUTH END

BACK BAY STATION

CONCOURSE

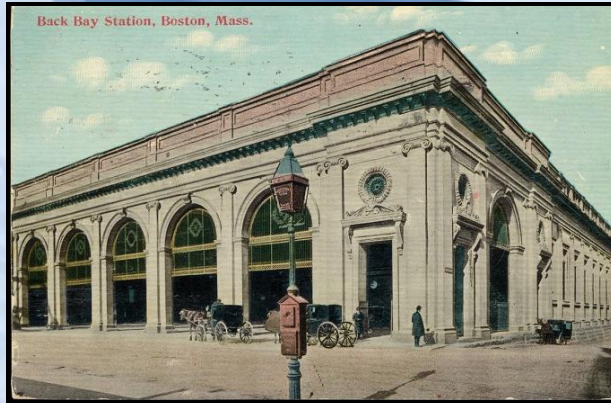
CONCOURSE

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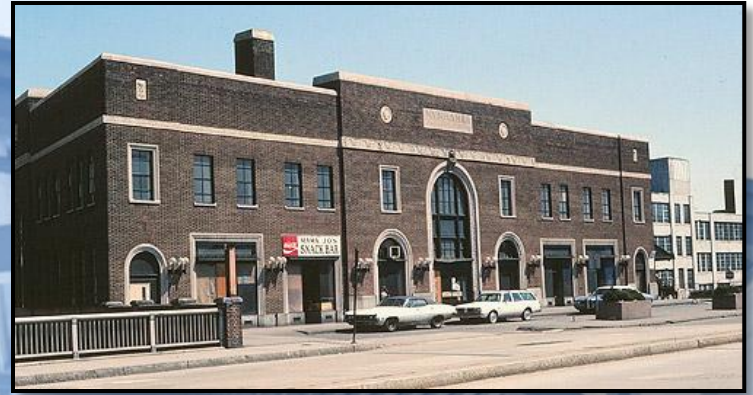
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# BACK BAY STATION YESTERDAY



1899



1928



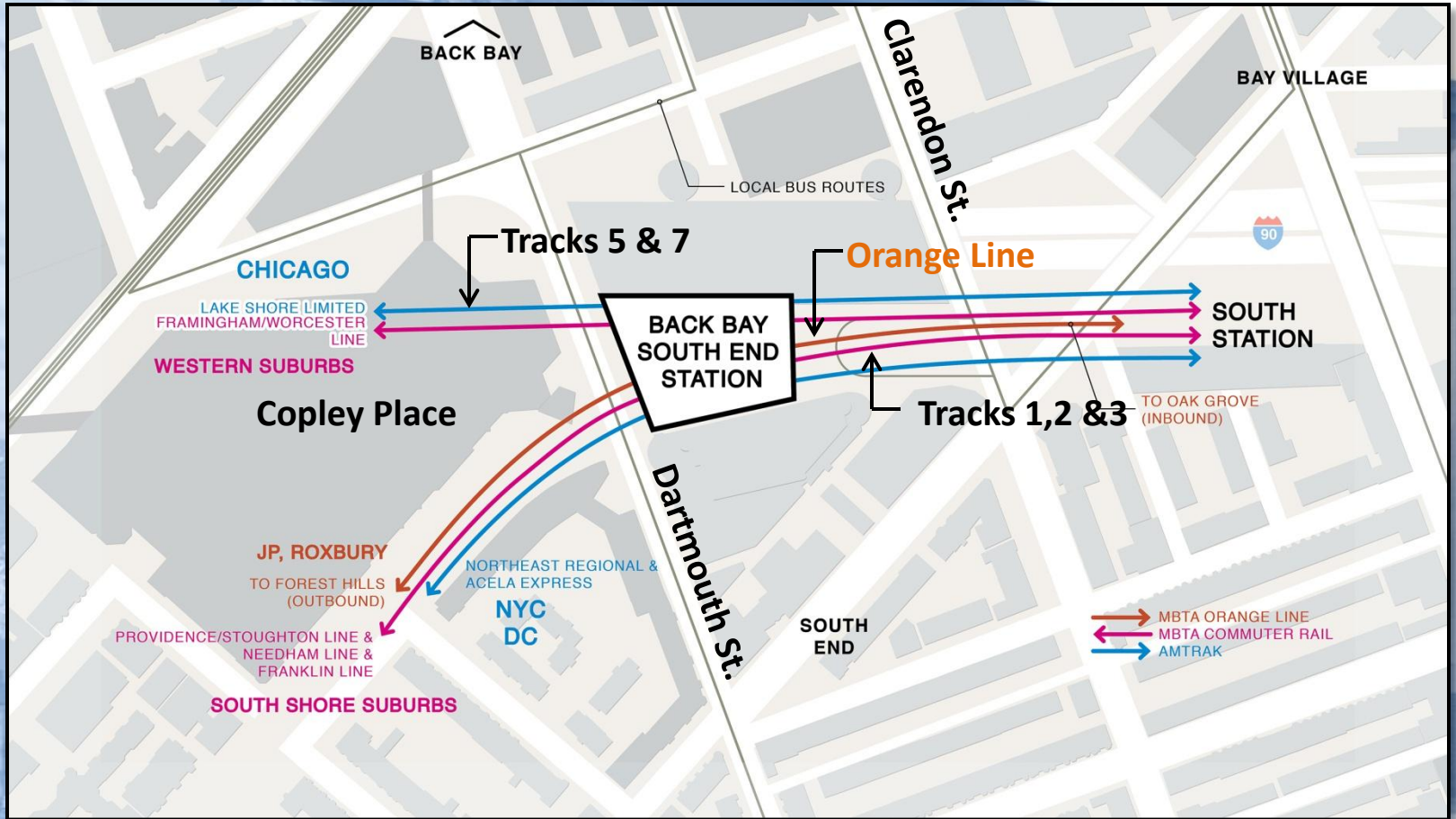
1987



1987



# BACK BAY STATION TODAY





# BACK BAY STATION TODAY



- Station lacks capital maintenance / budget
- Concourse cluttered, difficult wayfinding
- Track Level ventilation
  - Track level ventilation issues
  - Currently diesel fumes at concourse level

# BACK BAY STATION FUTURE

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Boston Properties (BP)



Clarendon Street



Dartmouth Street

Dartmouth and Stuart Streets

## Public Private Partnership

- BP Management & Renovation of Concourse
- BP New 99-yr lease and future development options
- BP contributes \$37 Million---(pre-paying rent on adj. garage)  
(\$32M concourse improve + \$5M vent)  
ventilation \$5M BP +\$5M MBTA = \$10M
- BP receives no management fee
  - Tenant coord., Clean, maintenance, supplemental security
  - Station retail revenue goes into management of Station

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# Back Bay Station Ventilation Improvements

## Public Briefing



Massachusetts Bay  
Transportation Authority

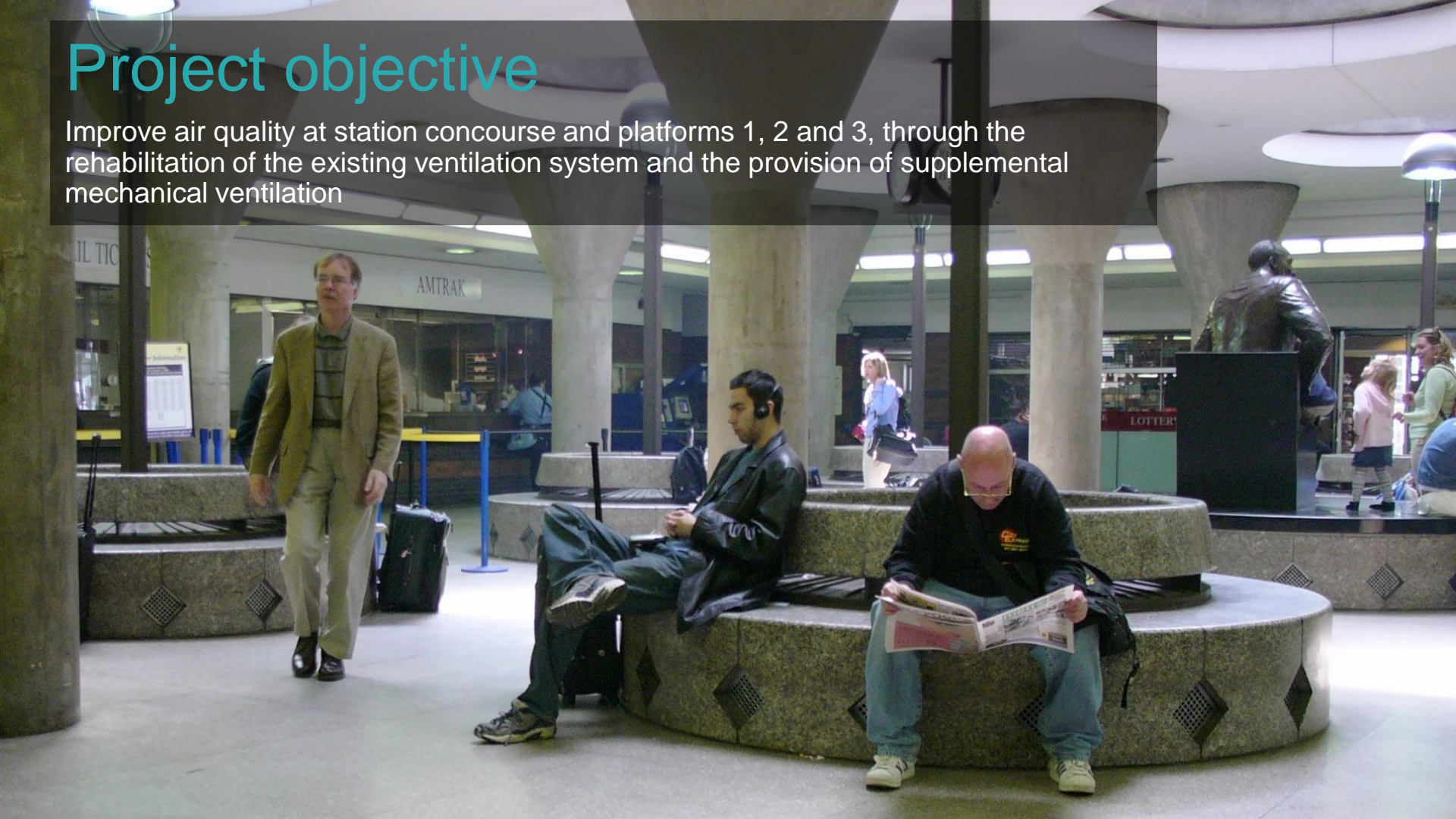
BAY SOUTH END  
ORANGE LINE - ALL TRAINS  
COMMUTER RAIL AMTRAK

THE MOST NONSTOPS OUT OF BOSTON

TAKE THE EXPRESS TO 61 DESTINATIONS

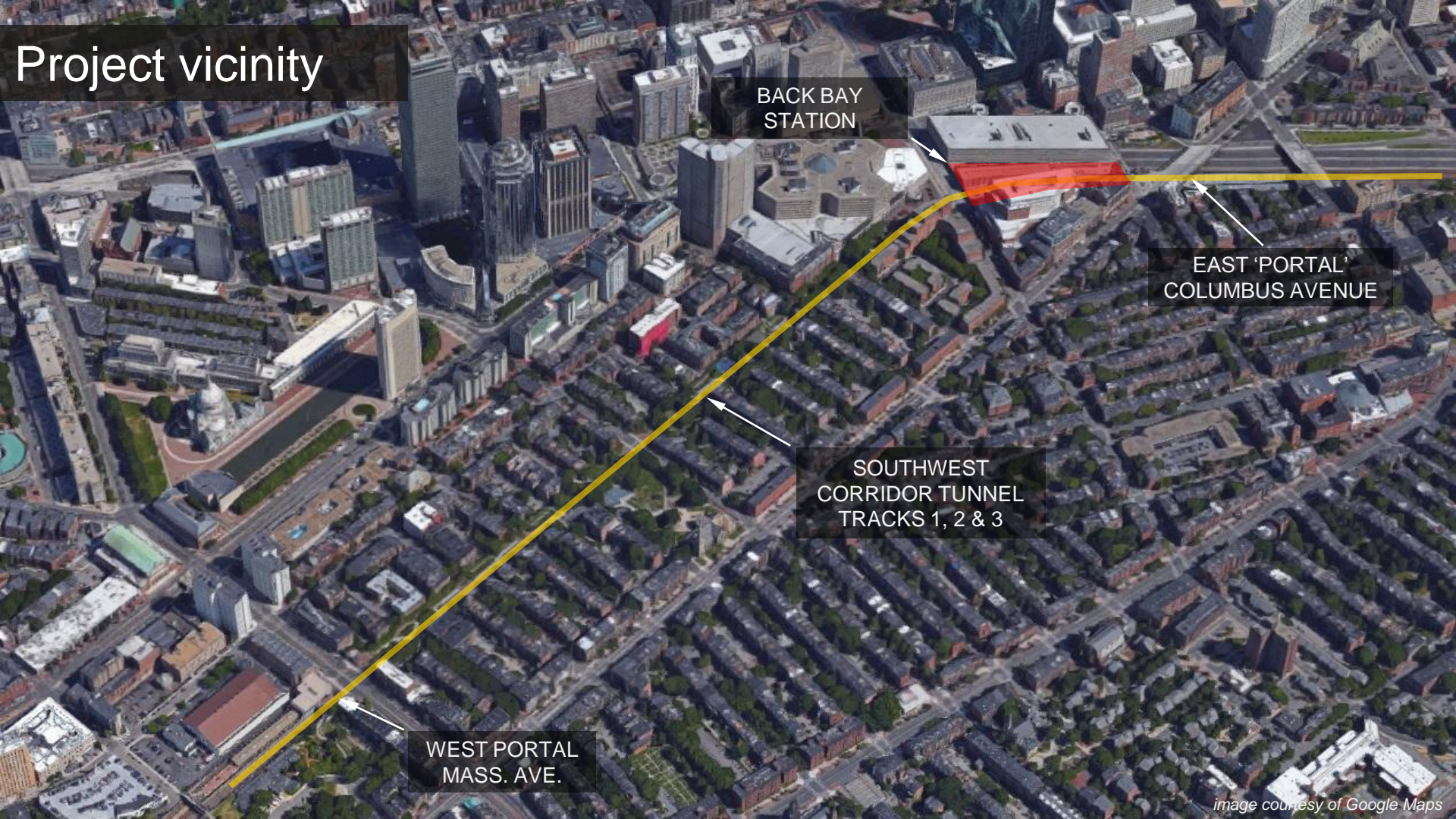
# Project objective

Improve air quality at station concourse and platforms 1, 2 and 3, through the rehabilitation of the existing ventilation system and the provision of supplemental mechanical ventilation





# Project vicinity



BACK BAY  
STATION

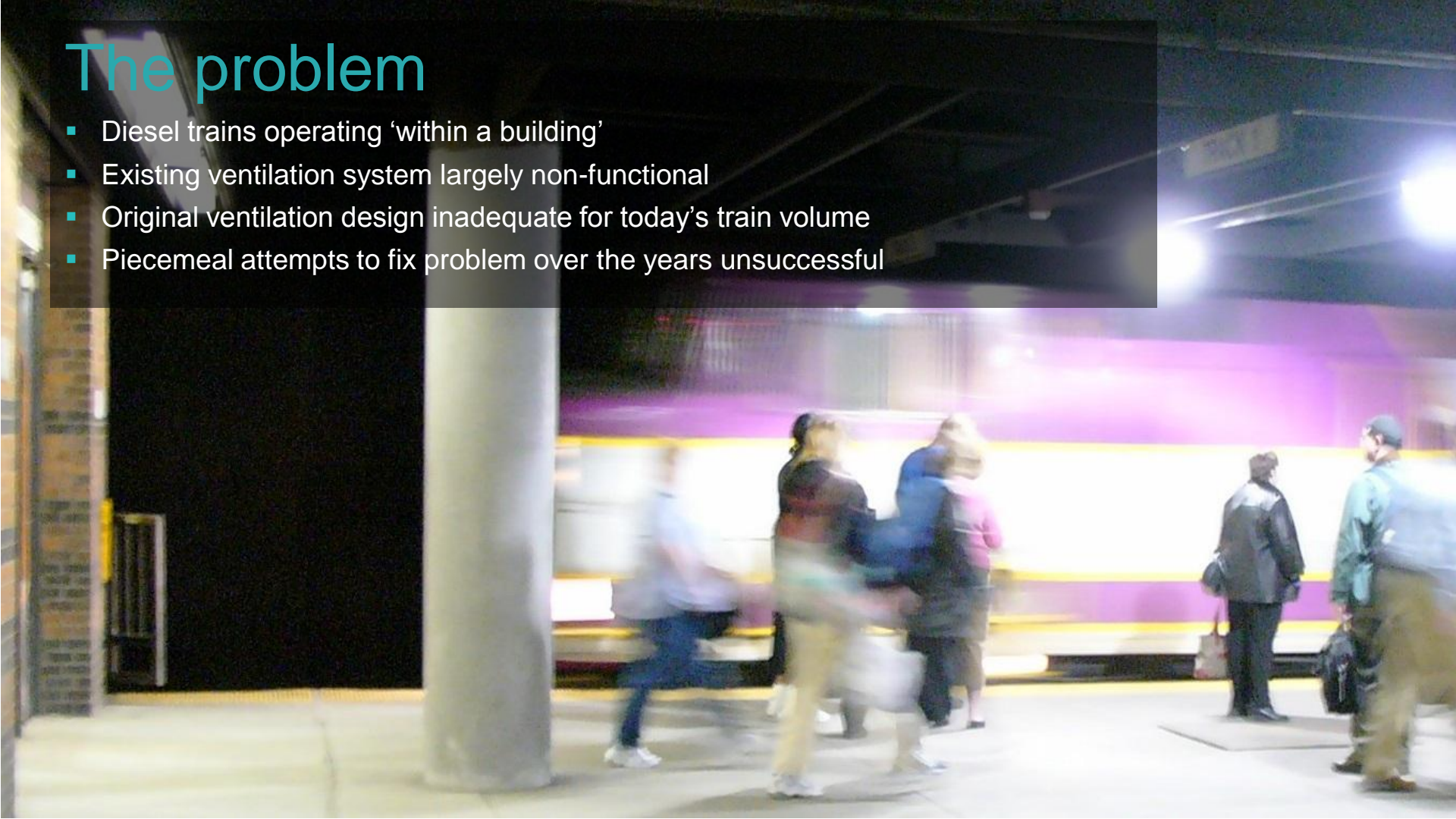
EAST 'PORTAL'  
COLUMBUS AVENUE

SOUTHWEST  
CORRIDOR TUNNEL  
TRACKS 1, 2 & 3

WEST PORTAL  
MASS. AVE.

# The problem

- Diesel trains operating 'within a building'
- Existing ventilation system largely non-functional
- Original ventilation design inadequate for today's train volume
- Piecemeal attempts to fix problem over the years unsuccessful



# The problem

- Tracks 1, 2 and 3 are source of poor air quality at concourse
- Tunnel captures and concentrates emissions
- Train piston effect, atmospheric conditions and buoyancy forces push diesel exhaust up stairs

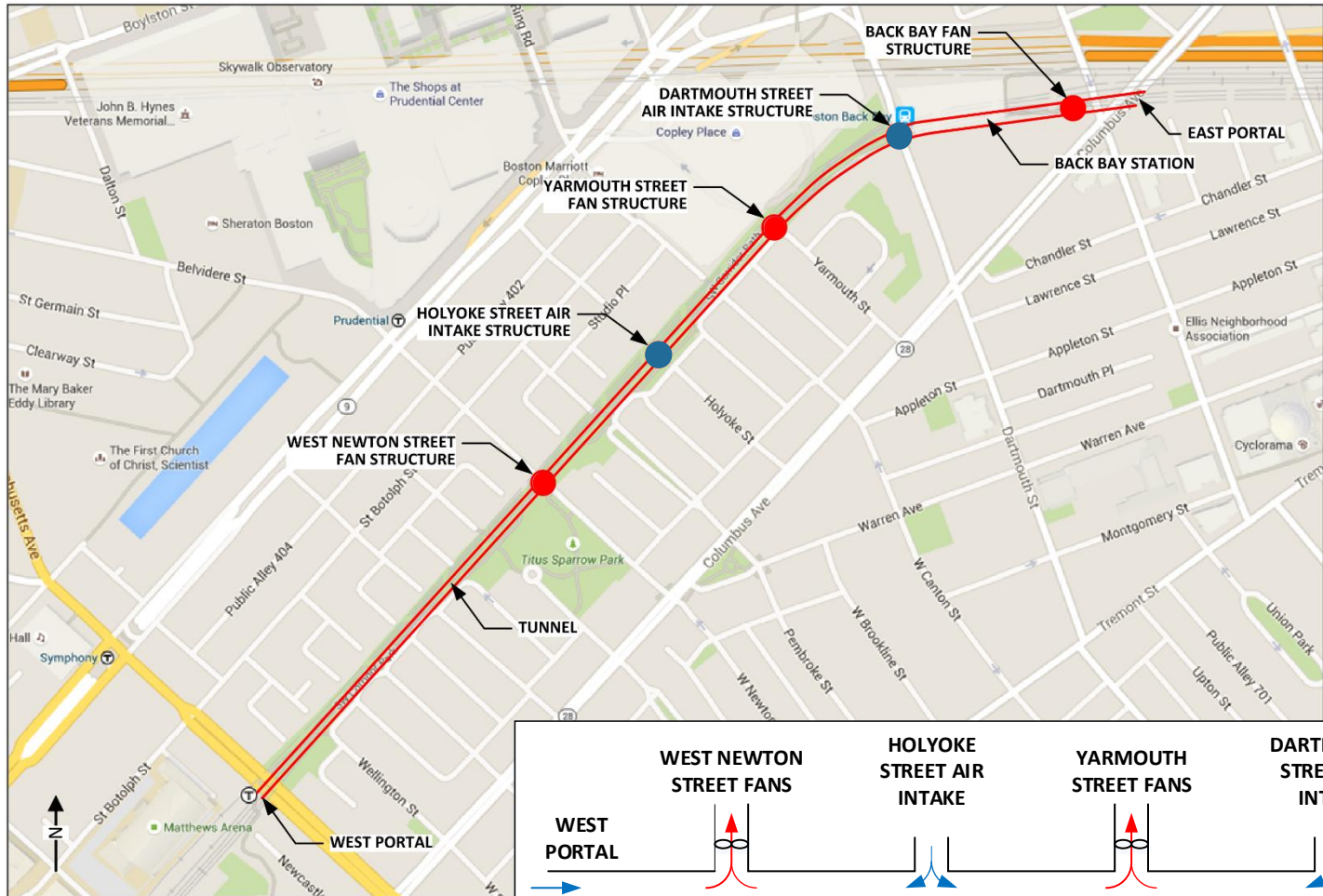


# Existing Ventilation



# Current ventilation system

- Exhaust system
- 3 fan structures
- 2 air-intake structures



Original Ventilation System Operation

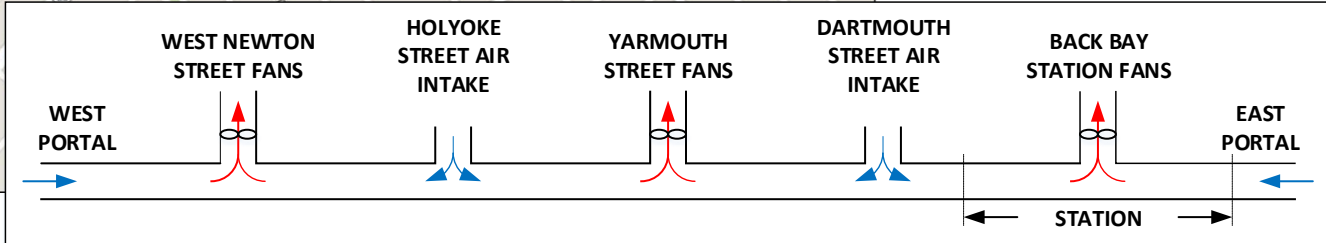


image courtesy of Google Maps

# Ventilation Structures



BACK BAY STATION FANS

YARMOUTH STREET FANS

WEST NEWTON STREET FANS

DARTMOUTH STREET INTAKE

HOLYOKE STREET INTAKE

BACK BAY  
STATION FANS



# Back Bay Station Fans

- 2 exhaust fans located in stacks connected to ductwork above platforms
- Fans are not run due to concerns over condition of ductwork

# Dartmouth Street Intake



DARTMOUTH  
STREET INTAKE

- 3 at-grade intakes each controlled by a pair of roller shutters
- Shutter drives do not work and must be replaced
- Shutters currently set in open position



# Yarmouth Street Fans



YARMOUTH  
STREET FANS

- 2 exhaust fans located in underground fan room
- Discharge through shaft disguised as end unit townhouse
- Fans are not run – reason(s) to be investigated

# Holyoke Street Intake

- Large elevated intake controlled by 3 roller shutters below grade
- Shutter drives do not work and must be replaced
- 2 shutters currently set in open position



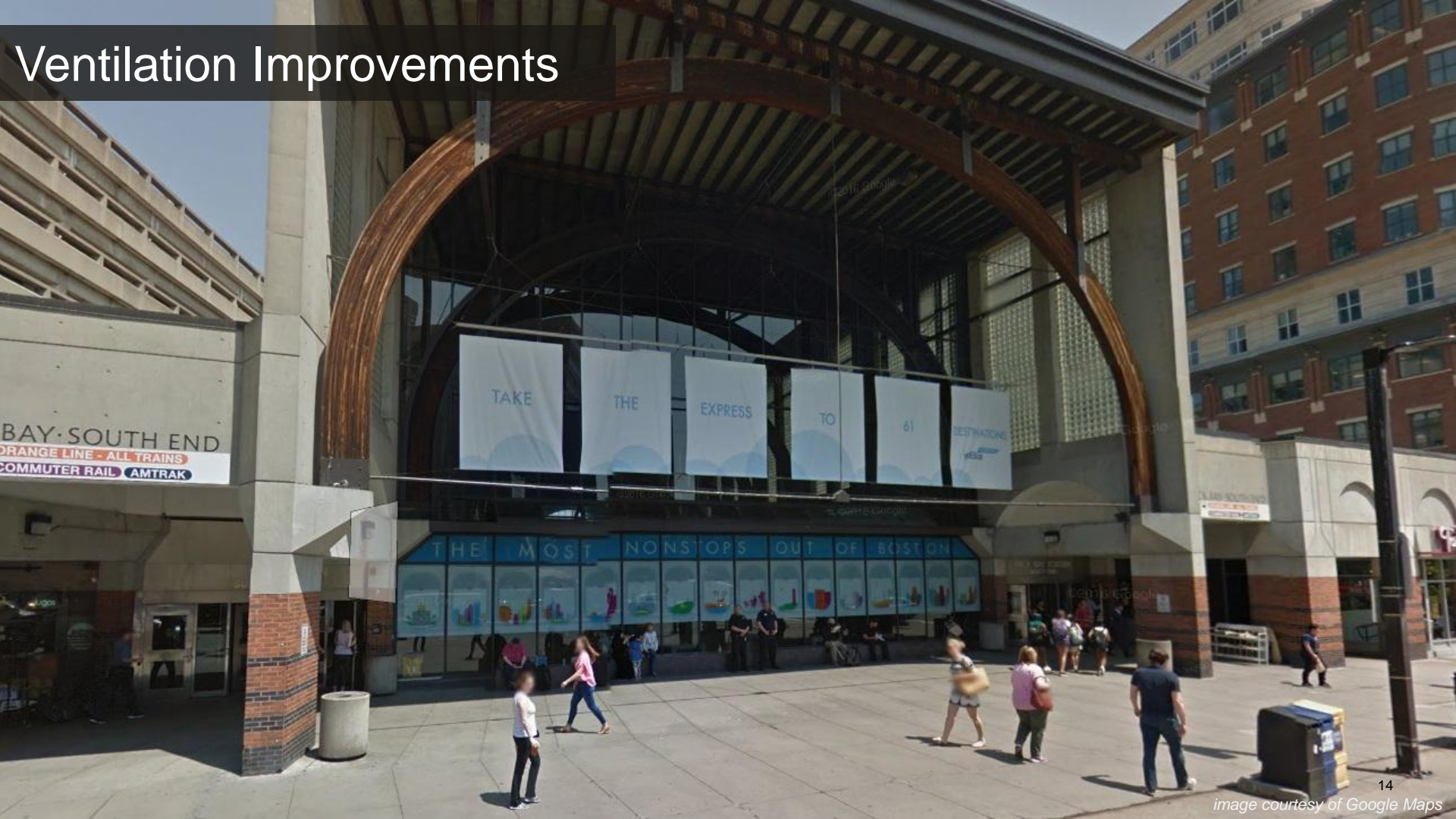
# West Newton Street Fans



WEST NEWTON  
STREET FANS

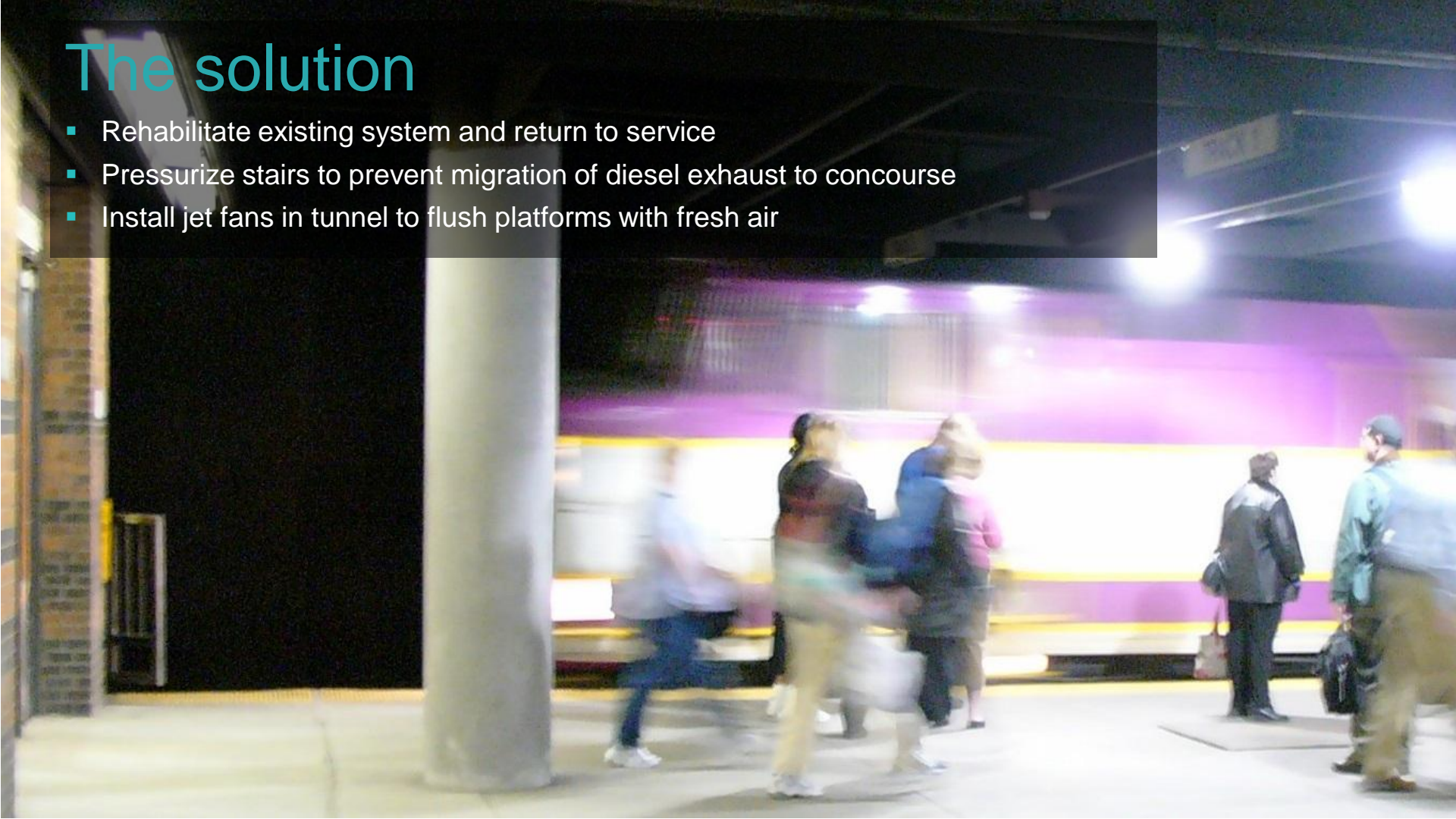
- 2 exhaust fans located in underground fan room
- Discharge through shaft disguised as end unit townhouse
- Fans are run by Station Inspector 'as-needed'
- Only fans currently run on regular basis

# Ventilation Improvements



# The solution

- Rehabilitate existing system and return to service
- Pressurize stairs to prevent migration of diesel exhaust to concourse
- Install jet fans in tunnel to flush platforms with fresh air



# Existing system rehab

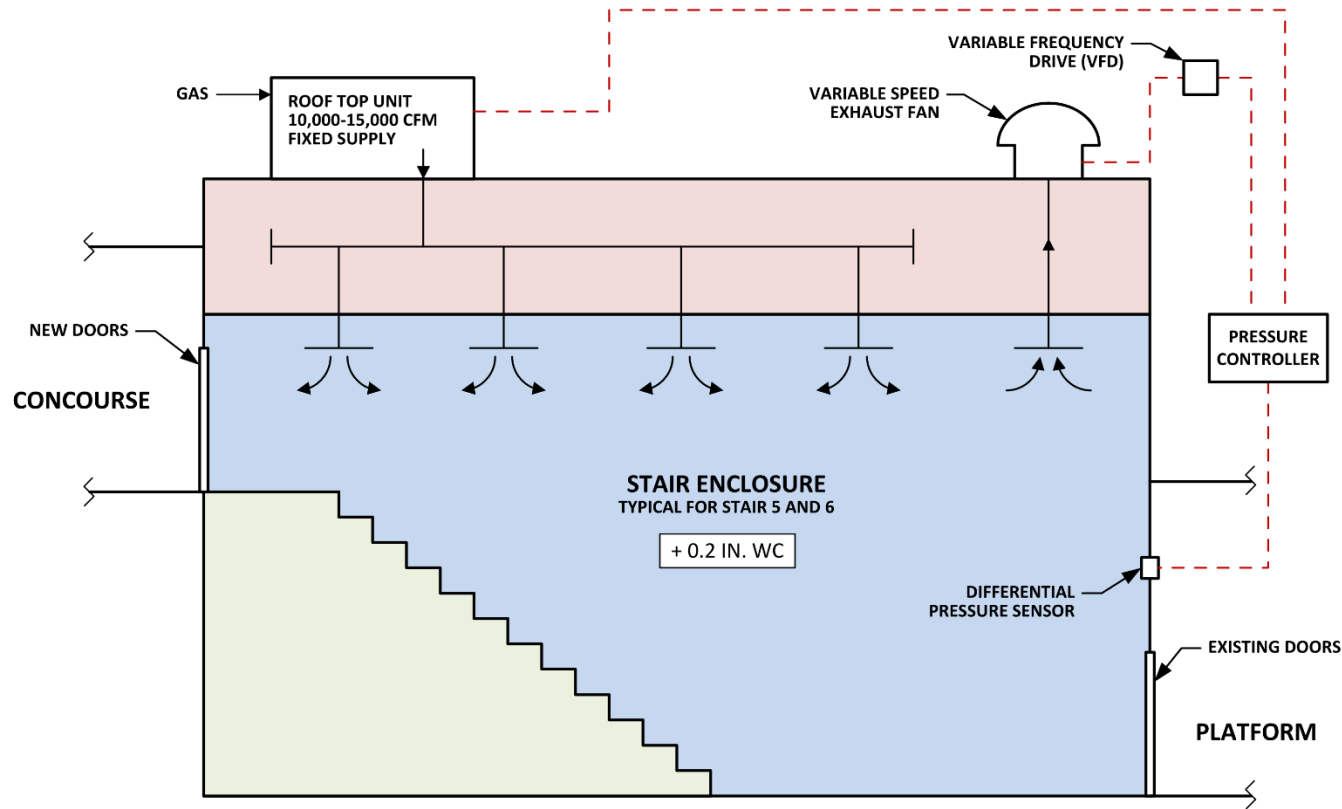
- Test and rehab fans
- Rehab roller shutters and replace drives
- Remove corroded platform ductwork
- Investigate Yarmouth Street fan operation

# Stair pressurization

- Install doors at concourse to enclose stairs to platform
- Positively pressurize enclosures so airflow is from stair to platform



# Pressurization concept



- Variable speed control to maintain constant enclosure pressure
- Air supplied to enclosure heated in winter for comfort

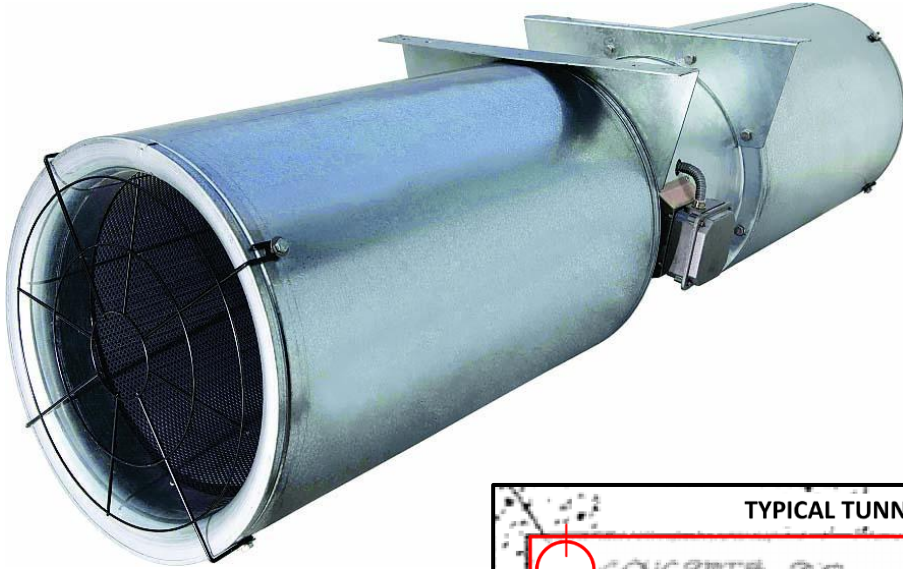




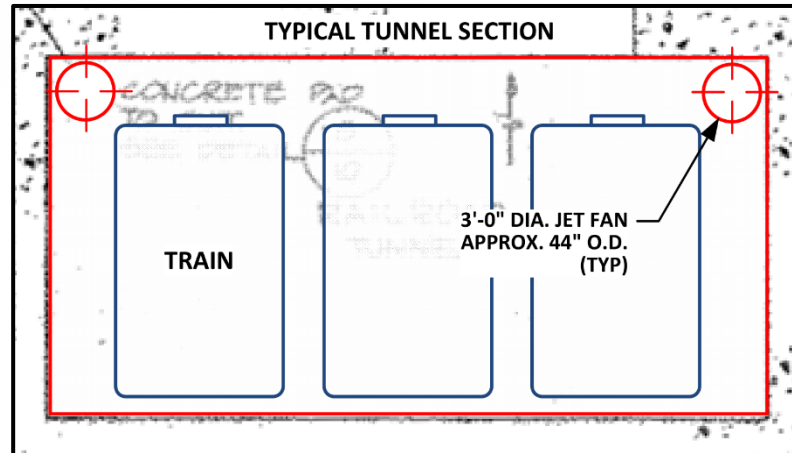
## Tunnel jet fans

- Install jet fans in Southwest Corridor Tunnel
- Ventilate from east to west to draw fresh air through platform
- Remove or relocate Back Bay Station fans

# Jet fans



- Unducted axial-flow fans
- Approx. 3' dia.
- Up to 18 total
- Reversible operation
- High temperature rated for smoke control



*Installation concept*

# Construction packages

- Package 1 – Stair pressurization

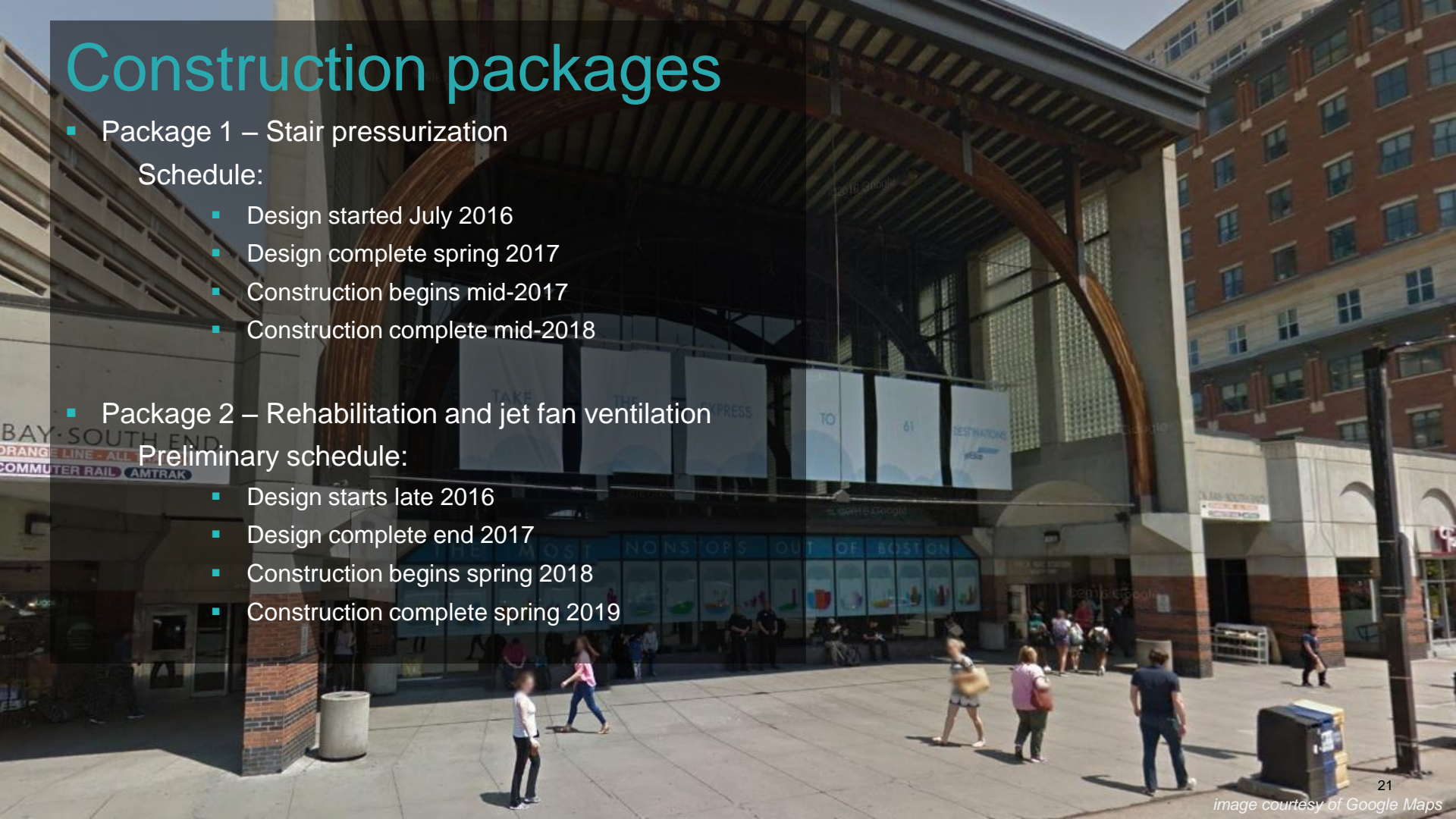
Schedule:

- Design started July 2016
- Design complete spring 2017
- Construction begins mid-2017
- Construction complete mid-2018

- Package 2 – Rehabilitation and jet fan ventilation

Preliminary schedule:

- Design starts late 2016
- Design complete end 2017
- Construction begins spring 2018
- Construction complete spring 2019



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# Back Bay Station Ventilation Improvements

## Public Briefing



Massachusetts Bay  
Transportation Authority

BAY SOUTH END  
ORANGE LINE - ALL TRAINS  
COMMUTER RAIL AMTRAK

THE MOST NONSTOPS OUT OF BOSTON

# BACK BAY STATION STATION RENOVATION



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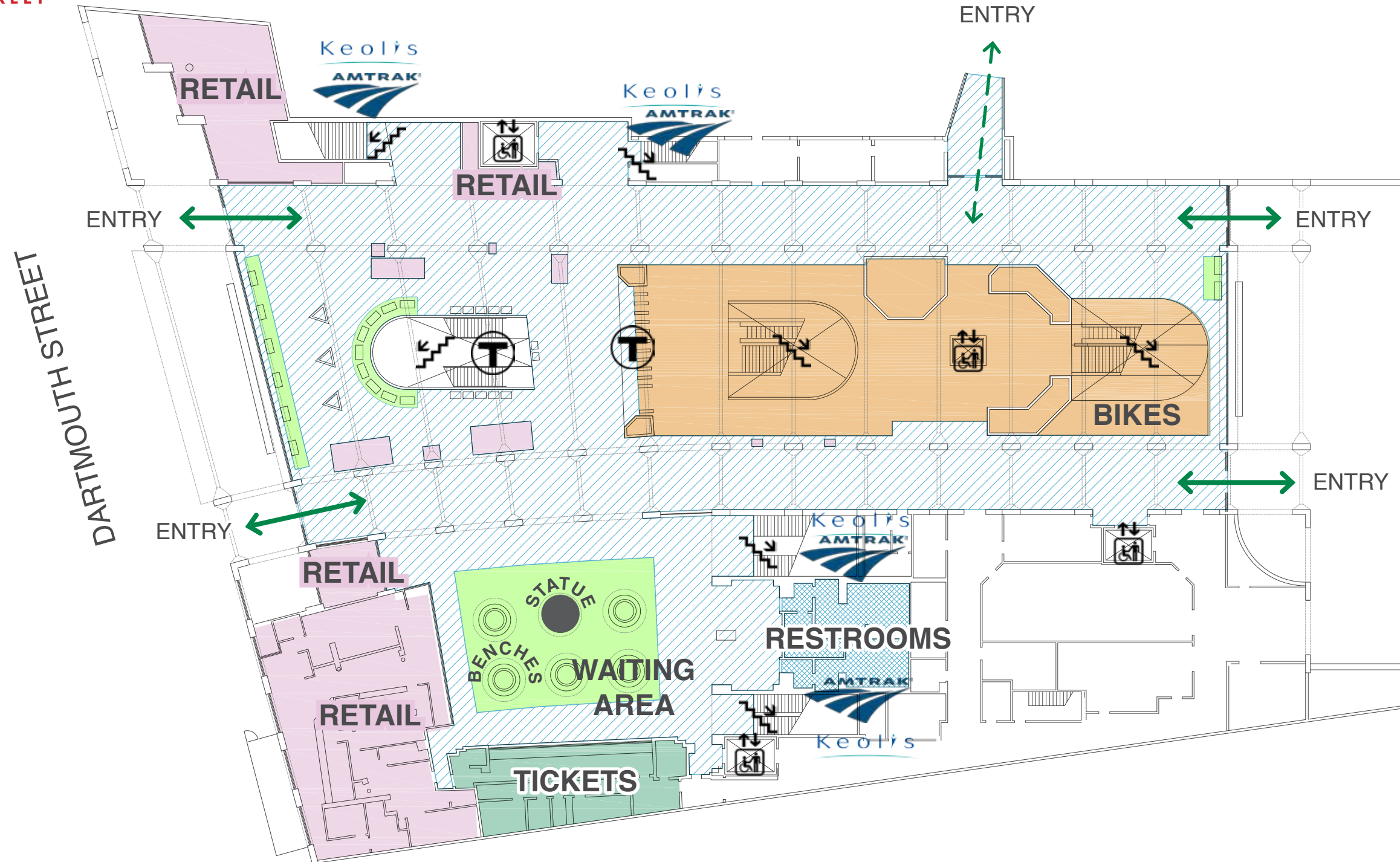


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# **STATION RENOVATION GOALS**

1. CREATE A FIRST-CLASS TRANSIT HUB OF “AIRPORT QUALITY”
2. IMPROVE CUSTOMER EXPERIENCE AND ACCESS
3. GENERATE REVENUE TO SUPPORT STATION OPERATIONS
4. ALLOW MBTA TO FOCUS ON TRAIN OPERATIONS;  
BOSTON PROPERTIES TO FOCUS ON PROPERTY MANAGEMENT



## BACK BAY STATION NOW

ENTRY AND CIRCULATION THROUGH LOW, DARK ARCADES

OVERSIZED ORANGE LINE AREA LIMITS CIRCULATION THROUGH STATION

ISOLATED AND CRAMPED WAITING AREAS

POOR VENTILATION

# EXISTING PLAN

# BACK BAY STATION FUTURE

NEW ENTRIES INTO CENTRAL HALL  
IMPROVE CIRCULATION, EGRESS, AND TAKE  
ADVANTAGE OF GREAT CIVIC SPACE

INCREASED AND BETTER DISTRIBUTED  
ORANGE LINE FARE GATES IMPROVE TRACK  
ACCESS

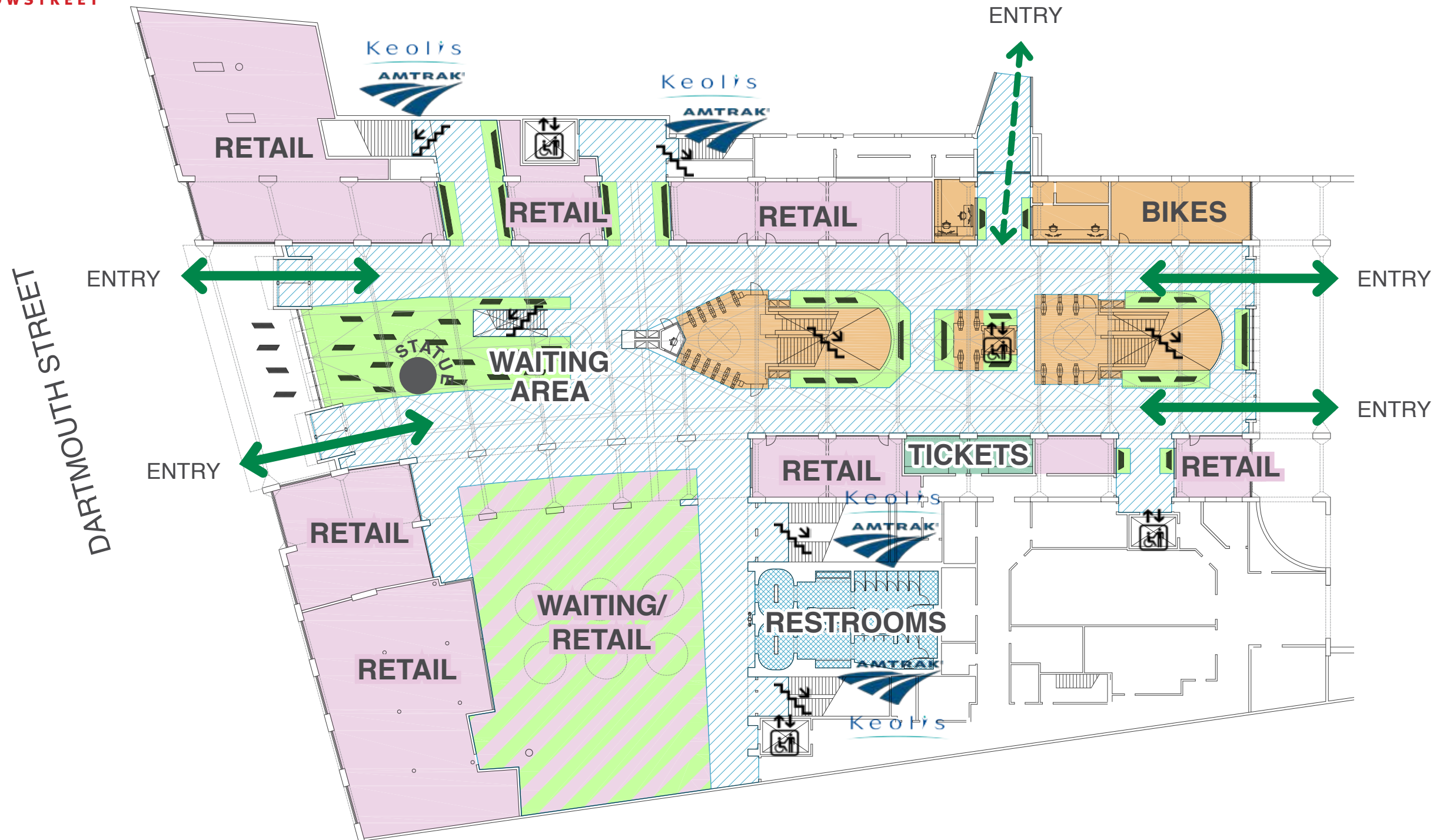
IMPROVED WAITING AREAS AND  
DISTRIBUTED BENCHES

AMTRAK AND KEOLIS TICKETING CENTRALLY  
LOCATED TO BE MORE VISIBLE

IMPROVED MBTA FUNCTIONS AND OFFICES

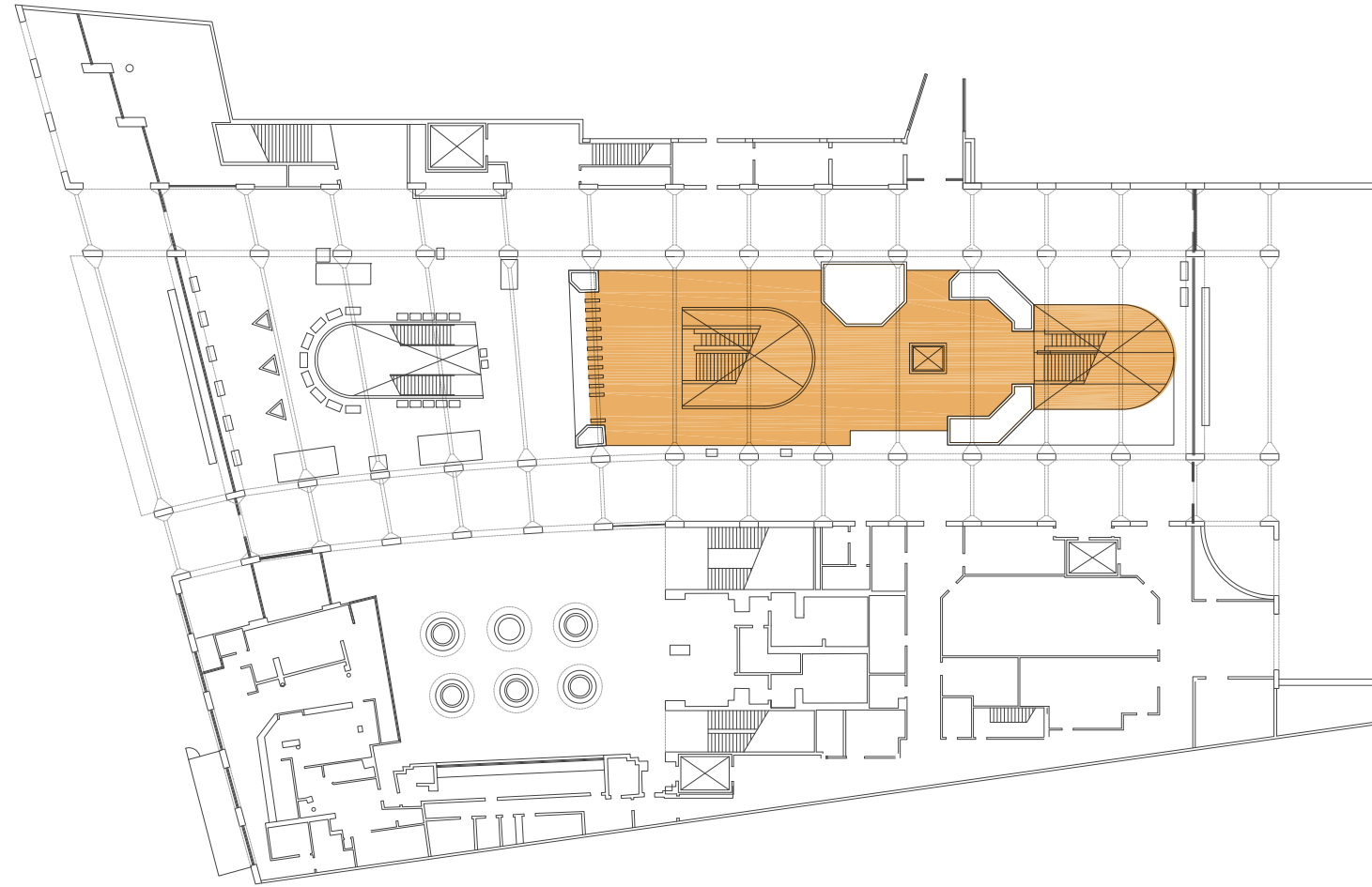
NEW EXPANDED AND DISTRIBUTED RETAIL  
TO ACTIVATE CENTRAL HALL AND IMPROVE  
STREETScape ENVIRONMENT

NEW PUBLIC ART STRATEGY



# PROPOSED PLAN



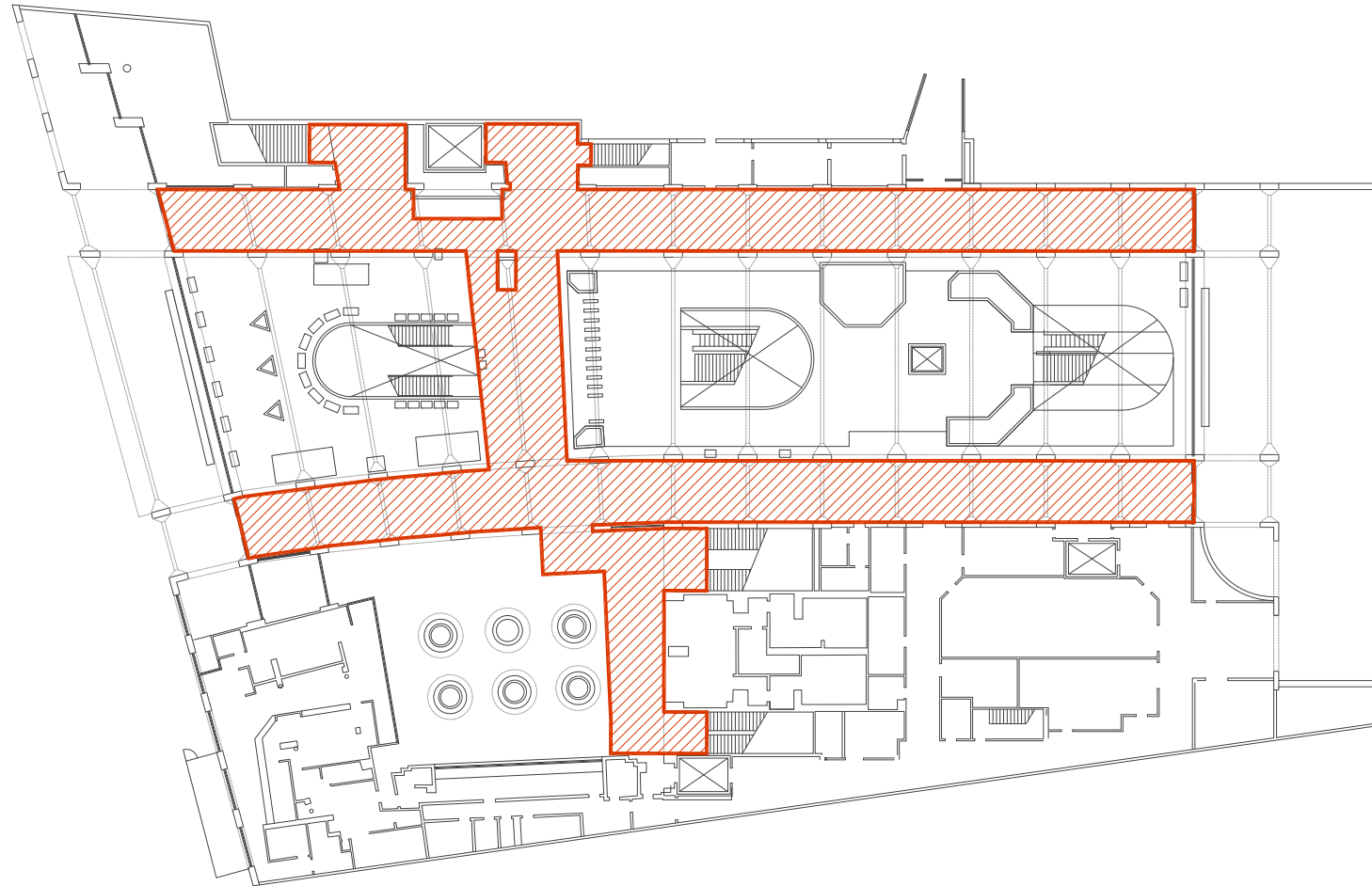


**EXISTING - 5,700 SF**

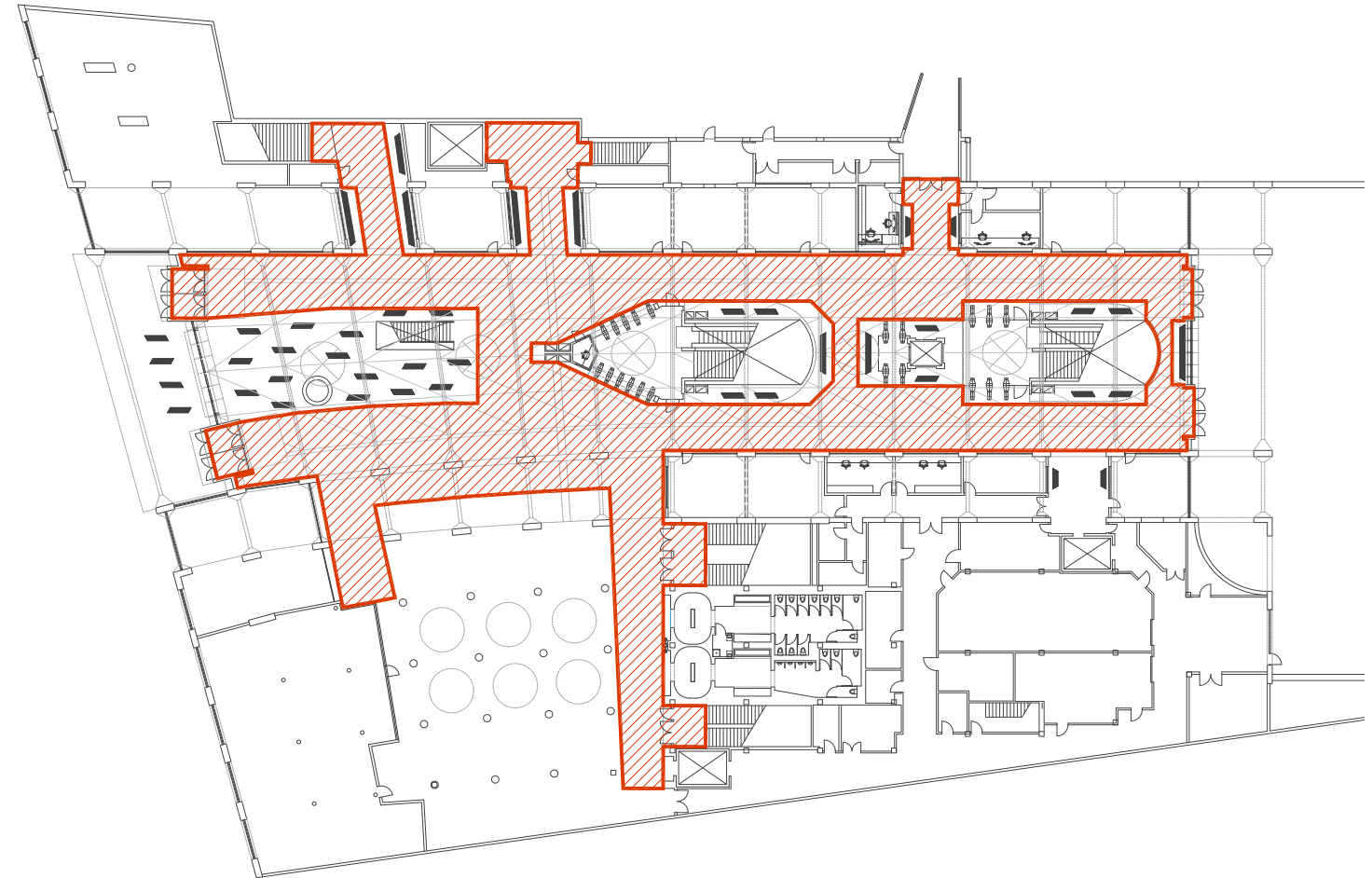


**PROPOSED - 2,500 SF**  
**(56% DECREASE)**

**ORANGE LINE ENCLOSURE**

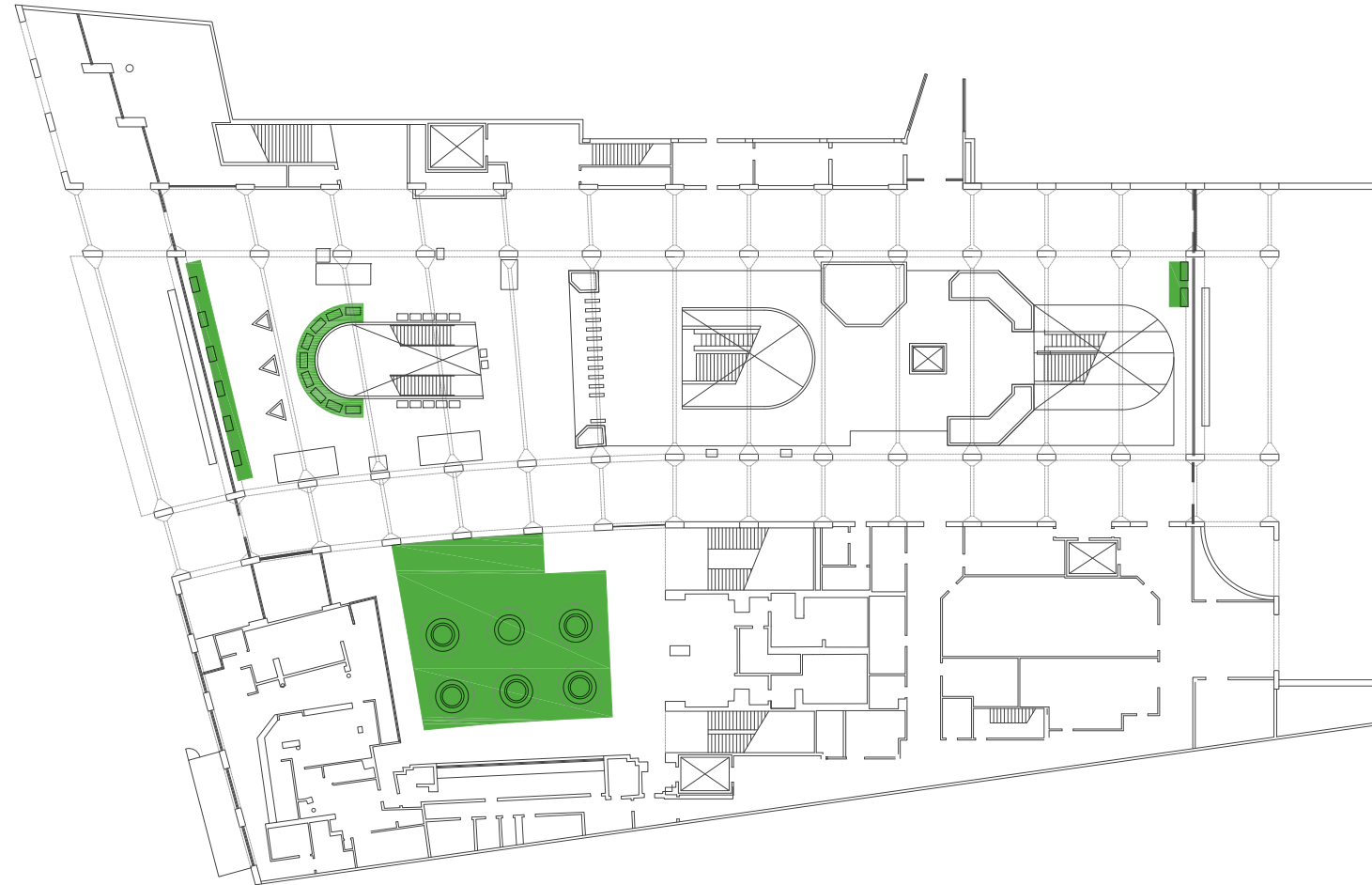


**EXISTING - 12,100 SF**

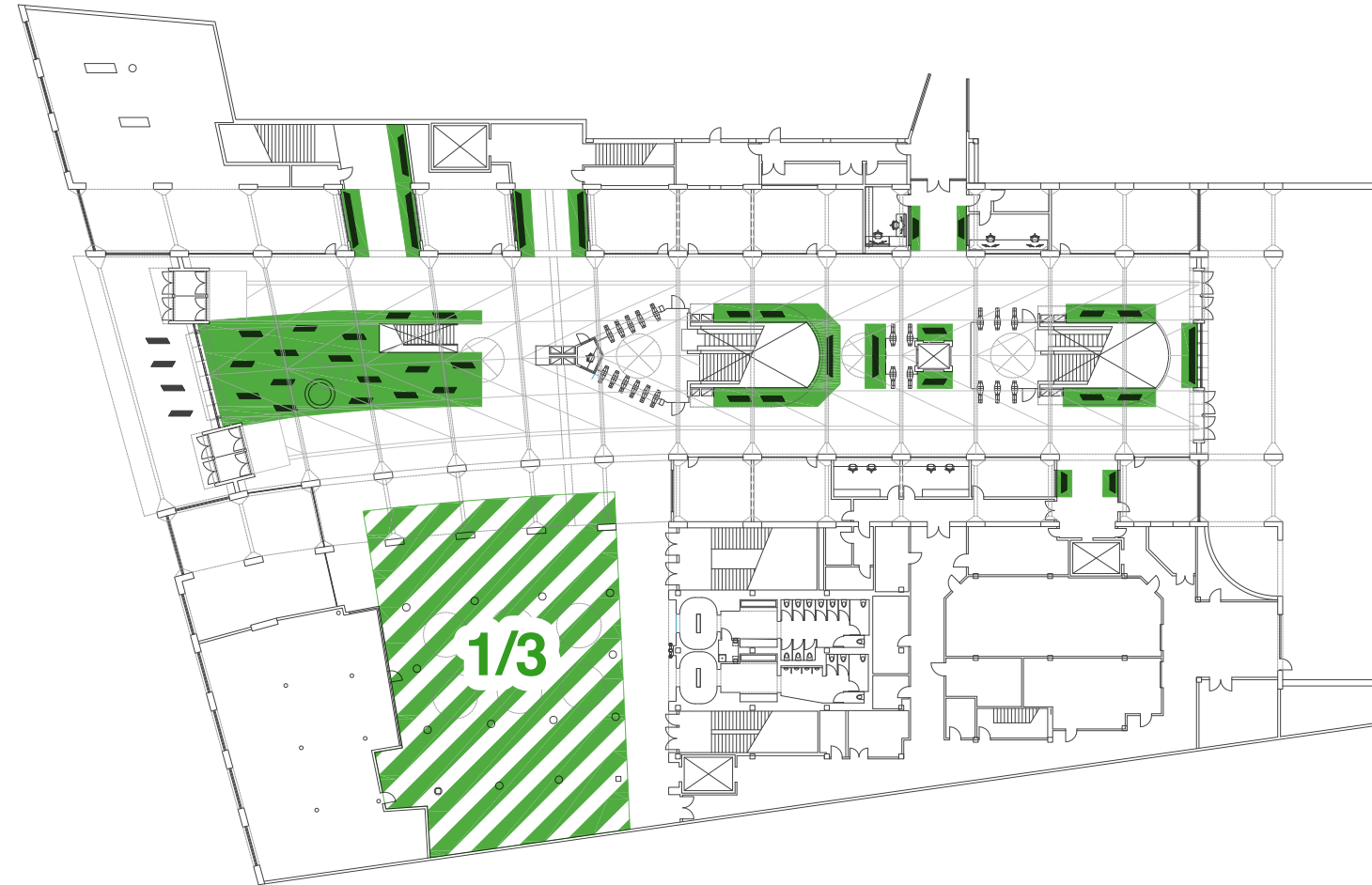


**PROPOSED - 12,900 SF**  
**(7% INCREASE)**

**PRIMARY CIRCULATION SPACE**

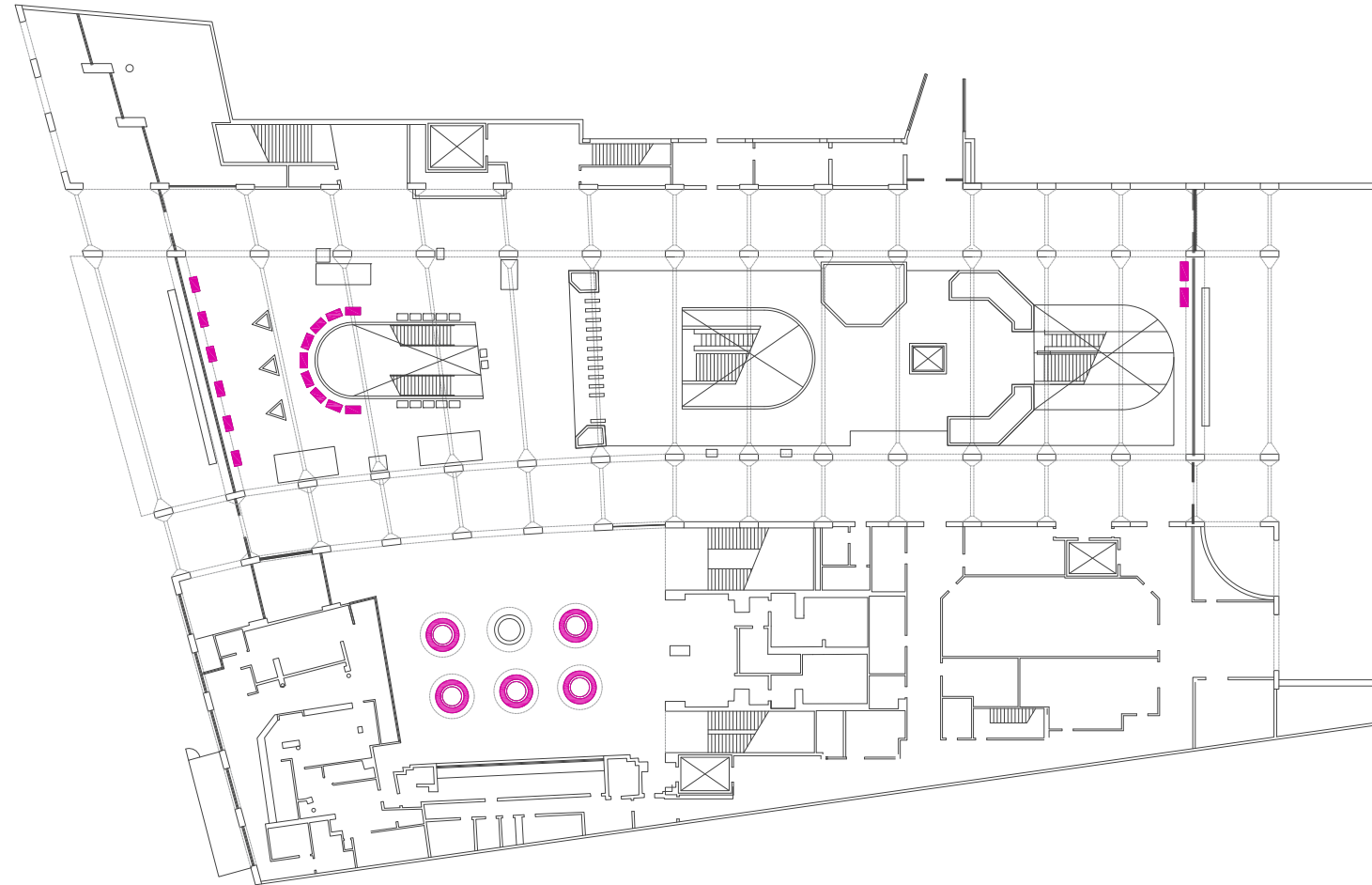


**EXISTING - 3,050 SF**



**PROPOSED - 5,150 SF**  
**(69% INCREASE)**

**DEDICATED WAITING SPACE**

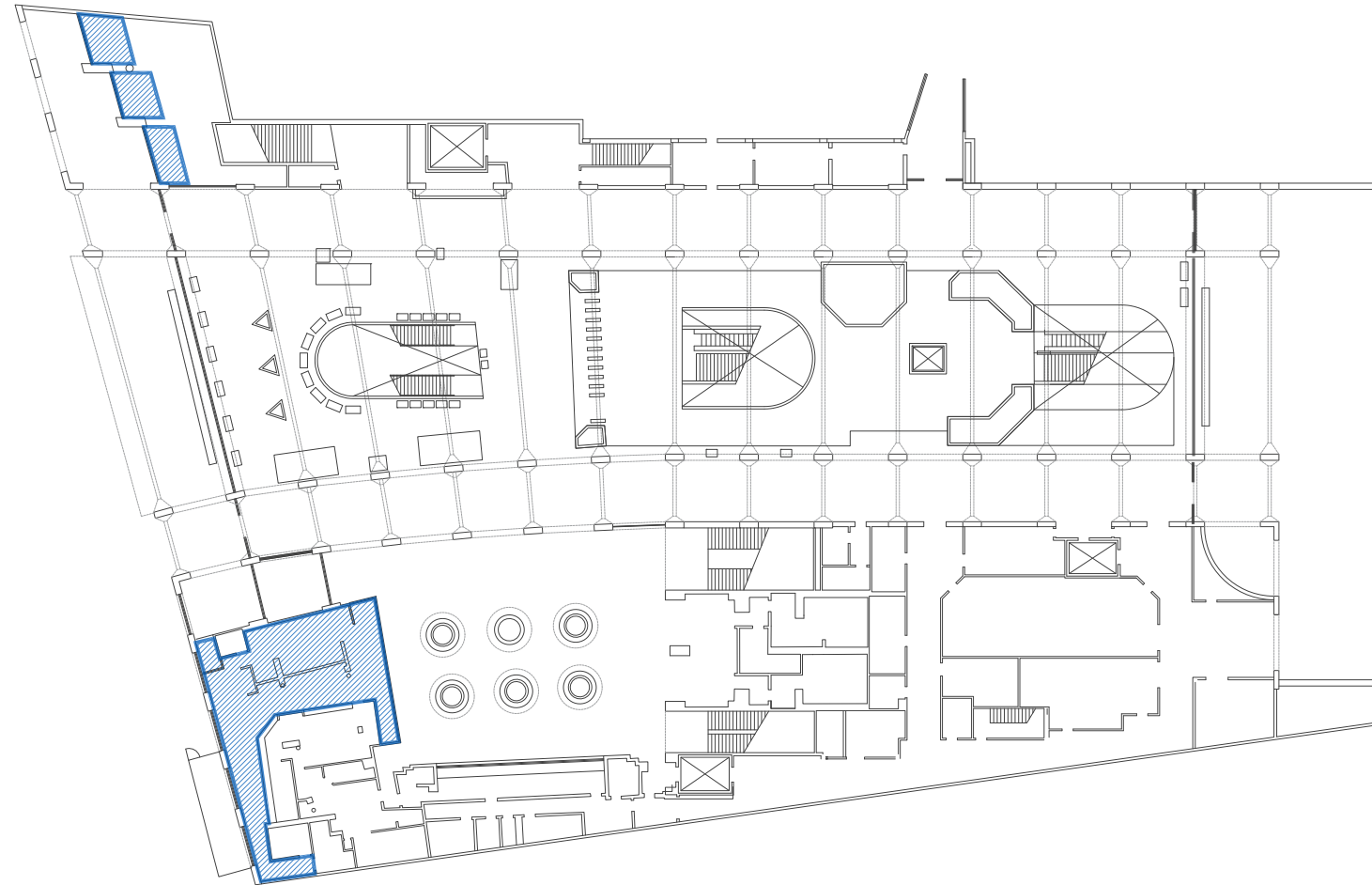


**EXISTING - 165 LF**

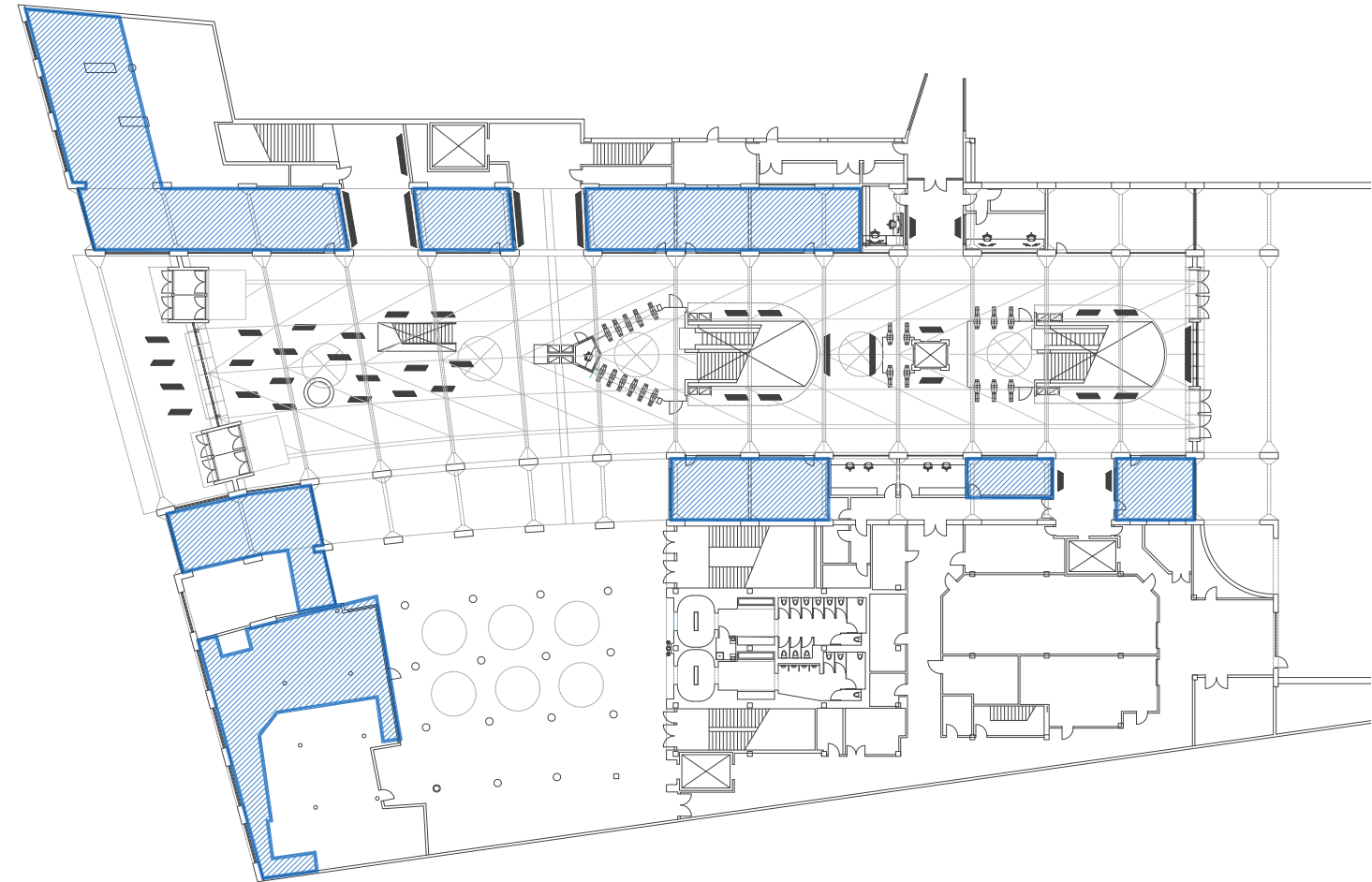


**PROPOSED - 250 LF + 160 INDIVIDUAL SEATS**  
**(52% INCREASE IN LF; PLUS 160 SEATS)**

**SEATING**



**EXISTING - 1,950 SF**



**PROPOSED - 7,550 SF**  
**(287% INCREASE)**

**HEATED/COOLED SPACE**

	EXISTING AREA		PROPOSED AREA	
<b>MBTA USES</b>				
AUTOMATED FARE COLLECTION	9 GATES	↑	15 GATES	67% increase
TICKETING MACHINES	12 UNITS	=	12 UNITS	
ORANGE LINE ENCLOSURE	5,700 SF	↓	2,500 SF	56% decrease
PEDAL AND PARK BIKE PARKING	450 SF	↑	670 SF	49% increase
<b>PUBLIC USES</b>				
PRIMARY CIRCULATION SPACE	12,100 SF	↑	12,900 SF	7% increase
DEDICATED WAITING SPACE	3,050 SF	↑	5,150 SF	69% increase
FIXED SEATING SPACE	165 LF	↑	250 LF	52% increase + 160 seats
HEATED/COOLED SPACE	1,950 SF	↑	7,550 SF	287% increase
<b>RETAIL USES</b>				
	4,800 SF	↑	14,850 SF	209% increase

## AREA COMPARISON SUMMARY

- » EXTERIOR CONCRETE HAS BEEN CLEANED
- » EXTERIOR ARCHES TO BE RESTORED SHORTLY



**EXISTING STATION ENTRY (WEST)**

- » MORE WELCOMING DARTMOUTH STREET ENTRANCE
- » DOUBLE NUMBER OF ENTRY DOORS
- » ENTRIES RELOCATED TO CENTER
- » IMPROVED STREETScape AND PEDESTRIAN ENVIRONMENT



**PROPOSED STATION ENTRY (WEST)**



- » ARRIVAL FROM DARTMOUTH STREET IS VISUALLY CUT OFF FROM TRAINS AND ORANGE LINE
- » POOR WAYFINDING AND LIGHTING



**EXISTING STATION HALL**



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- » NEW FLOOR FINISHES AND LIGHTING
- » EASIER WAYFINDING
- » IMPROVED CUSTOMER COMFORT IN CENTRALLY LOCATED WAITING AREA
- » IMPROVED AMENITIES



**PROPOSED STATION HALL**

- » VISUALLY CLUTTERED
- » DIFFICULT WAYFINDING
- » DETERIORATED GLASS BLOCK WINDOWS, GLULAM ARCHES, AND CONCRETE SURFACES



**EXISTING STATION HALL**



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- » APPROPRIATELY SIZED FARE ENCLOSURE
- » INCREASED NUMBER OF FARE GATES
- » VISIBLE NOTIFICATION BOARDS AND CLEAR WAYFINDING
- » GLASS BLOCK WINDOWS, GLULAM ARCHES, AND CONCRETE SURFACES CLEANED AND REPAIRED



**PROPOSED STATION HALL**



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- » UNUSED AND WASTED SPACE
- » VISUAL AND CIRCULATION OBSTRUCTIONS
- » UNINVITING APPEARANCE



EXISTING STATION HALL

- » TICKETING IN A PROMINENT AND CENTRAL LOCATION
- » IMPROVED CIRCULATION
- » RETAIL AND TRANSIT FUNCTIONS ACTIVATE CENTRAL HALL



**PROPOSED STATION HALL**



**CONCOURSE RETAIL**



**MARKETPLACE RETAIL**

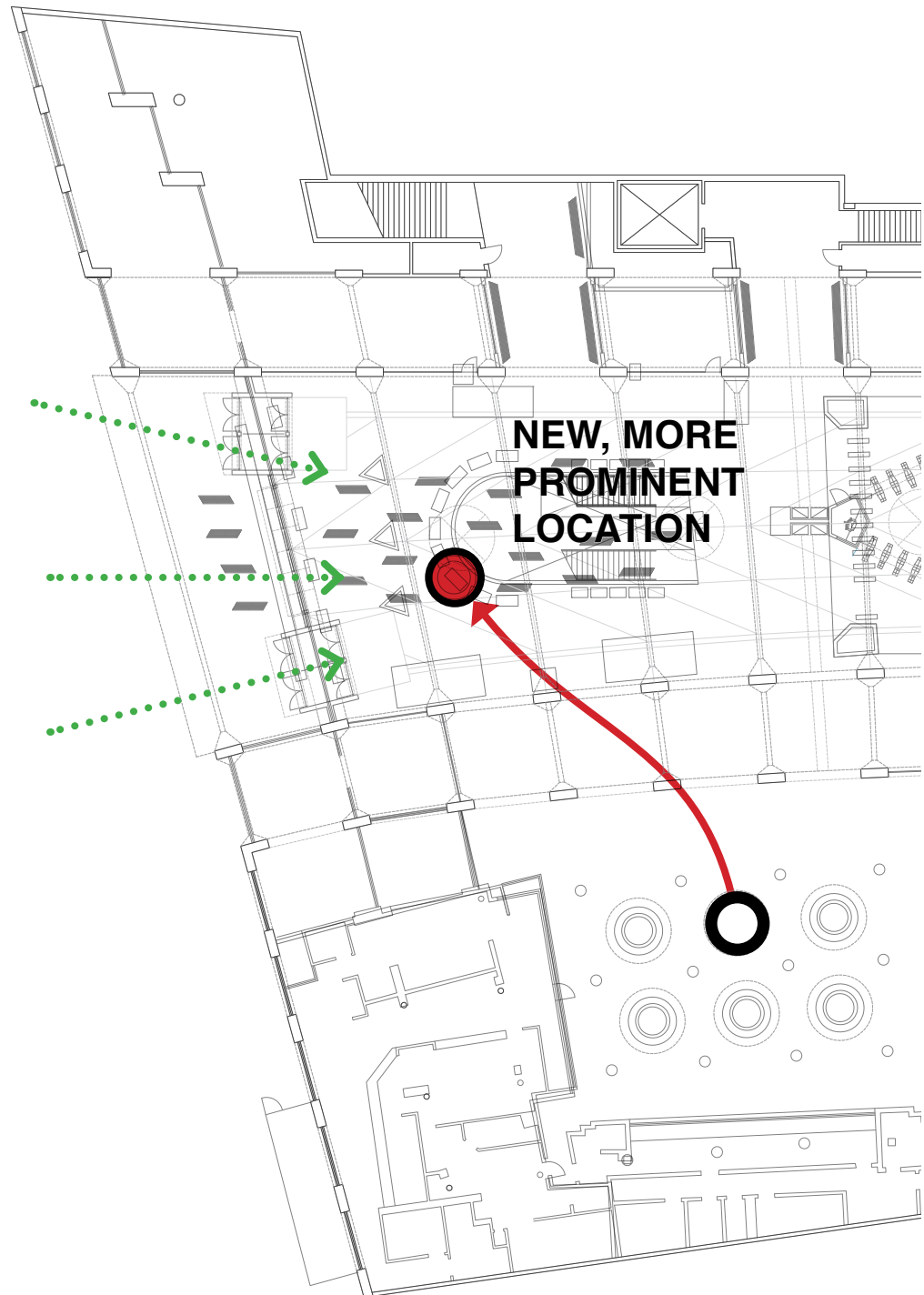
**STATION RETAIL PRECEDENTS**



**“NEONS FOR BACK BAY / SOUTH END STATION” THE ORANGE LINE  
ARTIST: STEPHEN ANTONAKOS / 1990**

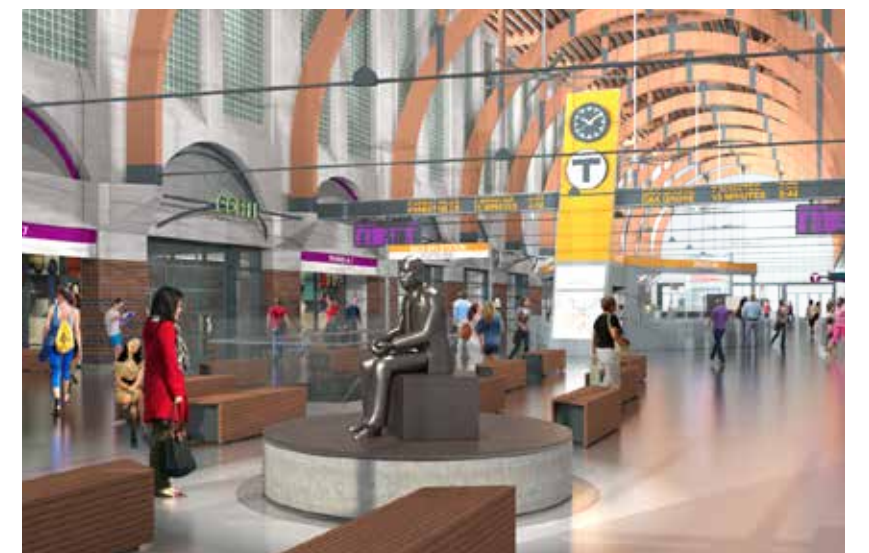
**PUBLIC ART PROGRAM**





Asa Philip Randolph (1889-1979) was a union organizer and early civil rights leader. In 1925 he organized the Brotherhood of Sleeping Car Porters, a union that gained better pay and working conditions for its members from the Pullman Company, operator of the then common railway sleeping cars. During World War II Randolph led a movement that achieved the ban on racial discrimination in war industries. Randolph also led the wartime movement to end racial segregation in the armed forces, an aim that was finally achieved in 1948. The bronze portrait of a seated Randolph is nine feet high. It is by the sculptor, Tina Allen (1949-2008). It was dedicated in 1986.

**A. PHILIP RANDOLPH SCULPTURE  
ARTIST: TINA ALLEN / 1986**





**INSIDE/OUT PROJECT**  
**ARTIST: JR / OCTOBER 2015**

Inspired by JR's large-format street "pastings", INSIDE OUT gives everyone the opportunity to share their portrait and make a statement for what they stand for. It is a global platform for people to share their untold stories and transform messages of personal identity into works of public art. Each INSIDE OUT group action around the world is documented, archived and exhibited online. Over 260,000 people have participated in 129 countries. The INSIDE OUT project has traveled from Ecuador to Nepal, from Mexico to Palestine, inspiring group actions on varied themes such as hope, diversity, gender-based violence, climate change.

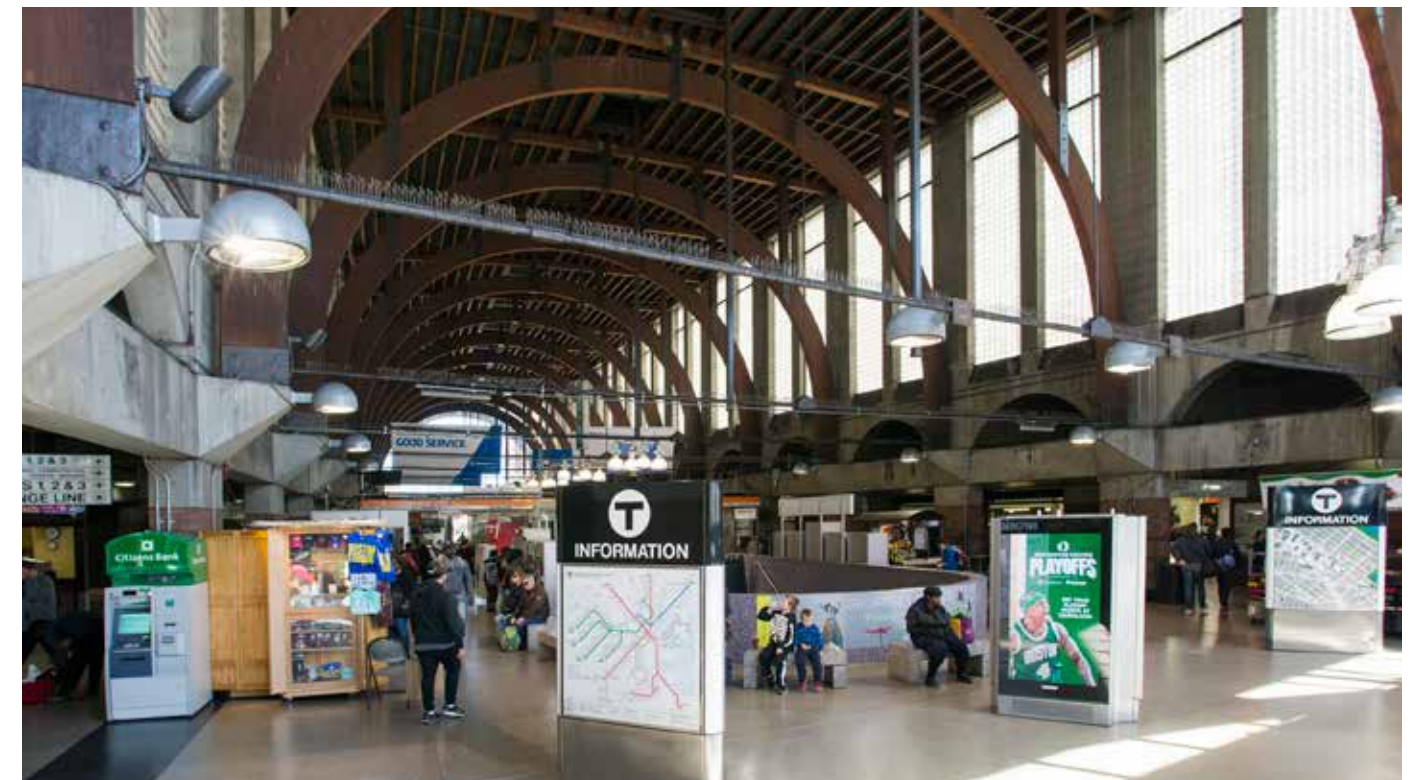
## **PUBLIC ART PROGRAM**



**INSIDE/OUT PROJECT  
ARTIST: JR / OCTOBER 2015**



**PUBLIC ART PROGRAM**



## ADVERTISING PROGRAM - EXISTING



# ADVERTISING PROGRAM - PRECEDENTS



**EXISTING RESTROOMS**

# RESTROOMS

TRAC



**PROPOSED RESTROOM ENTRY**  
START: FALL / WINTER 2016



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**PROPOSED RESTROOMS**  
**START: FALL / WINTER 2016**





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**THANK YOU!**

