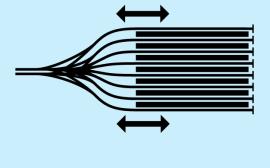
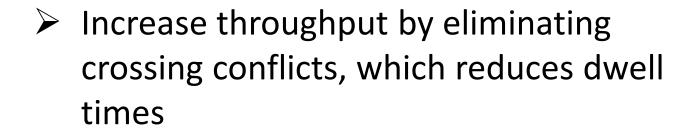


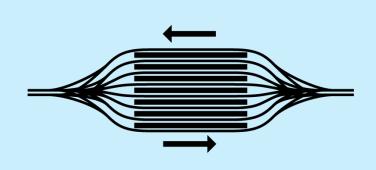


Potential Benefits of Through-Running



TERMINAL STATION



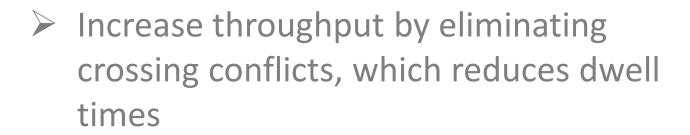


THROUGH-RUNNING STATION

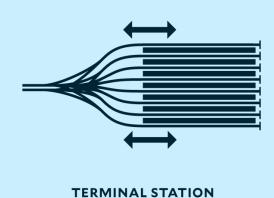


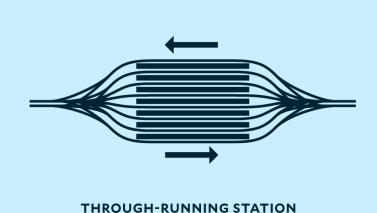


Potential Benefits of Through-Running

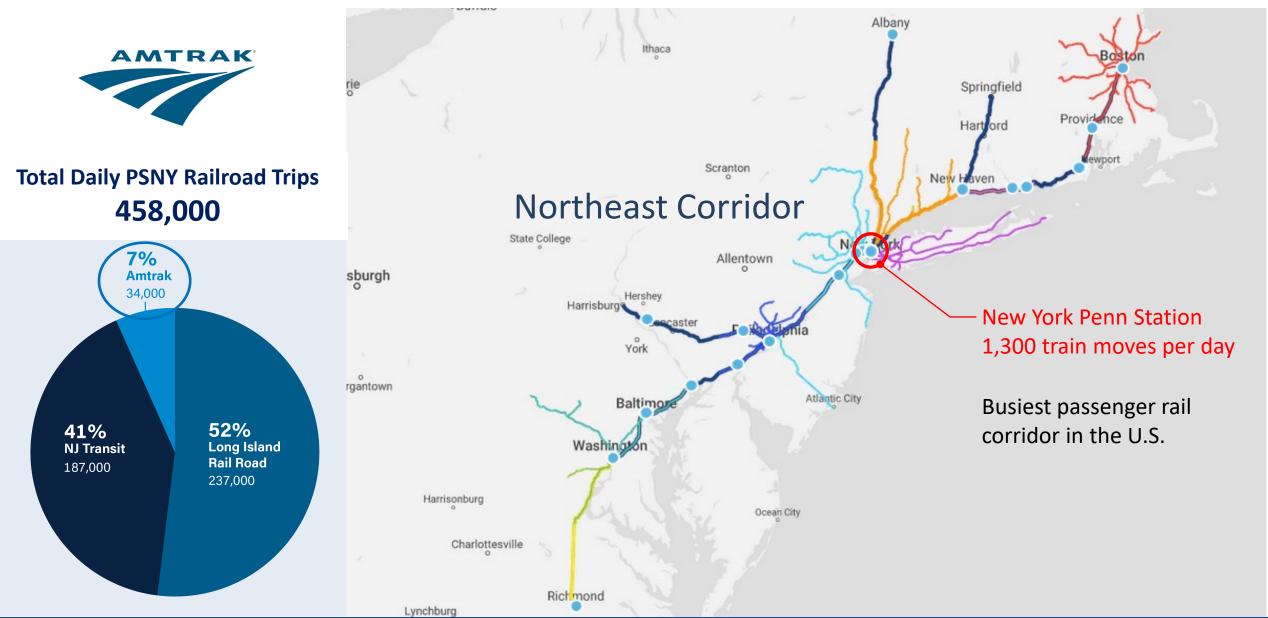


Improve regional mobility by connecting communities beyond a Central Business District to each other with one-seat rides



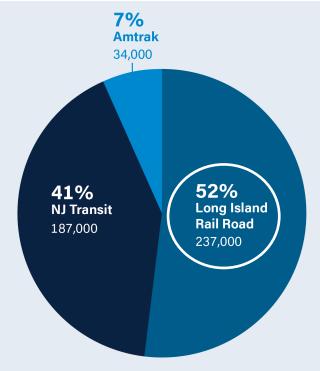


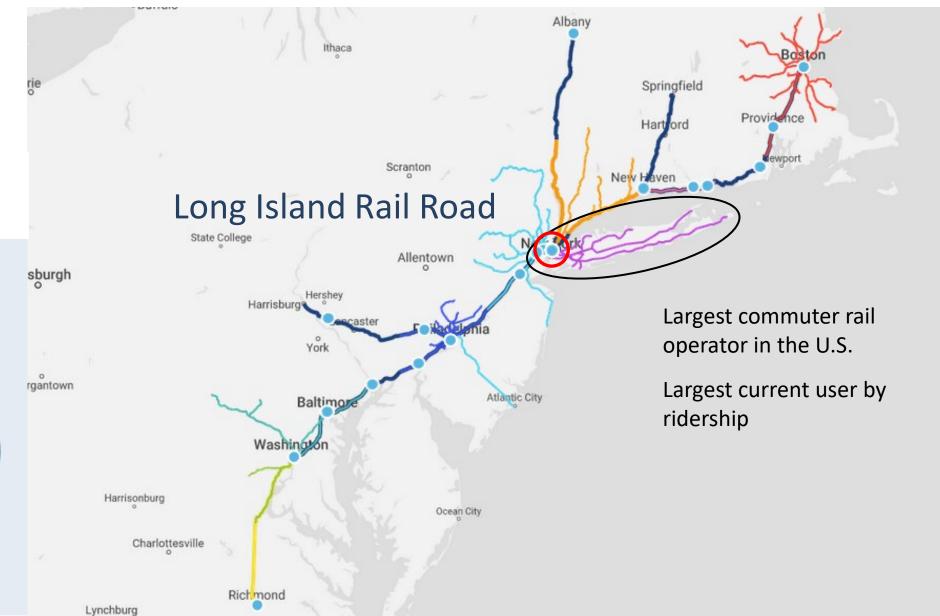




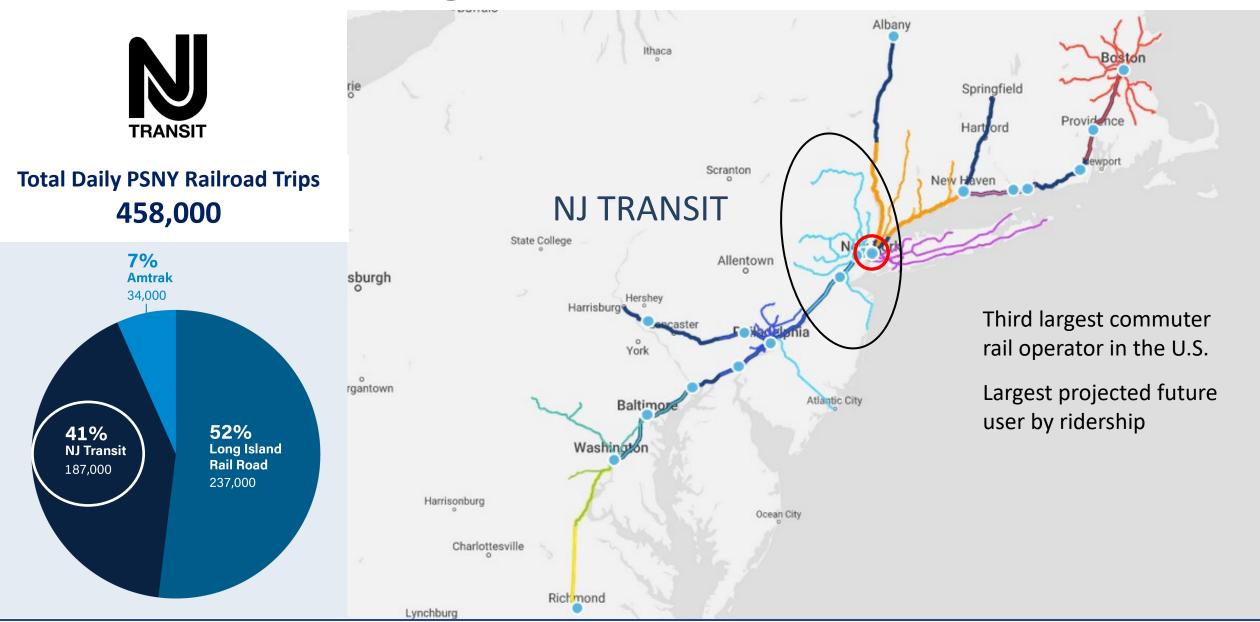








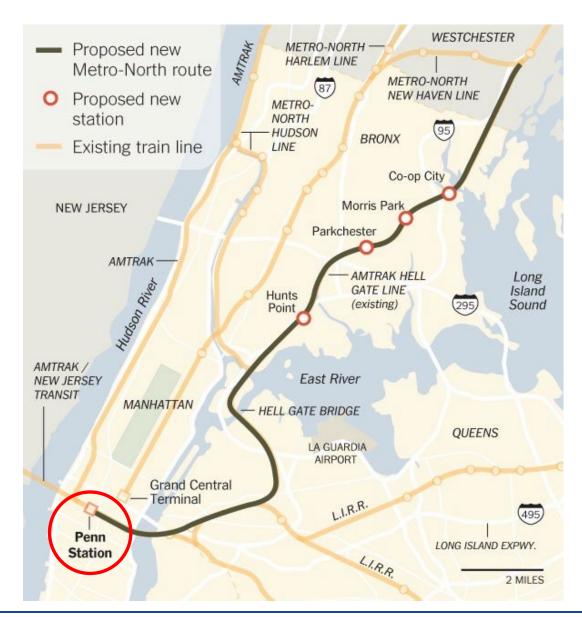








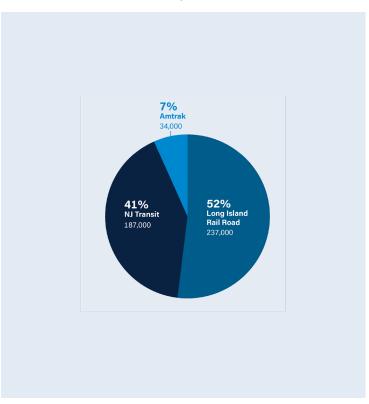
Metro-North Railroad



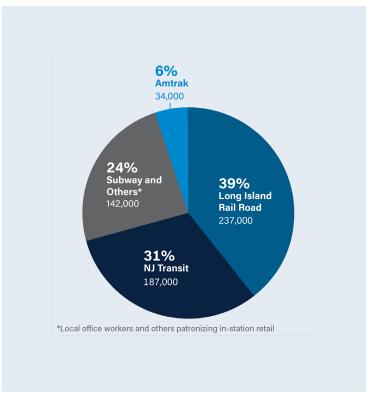


Ridership: 40% growth overall by 2038

Daily Railroad Trips Only 458,000

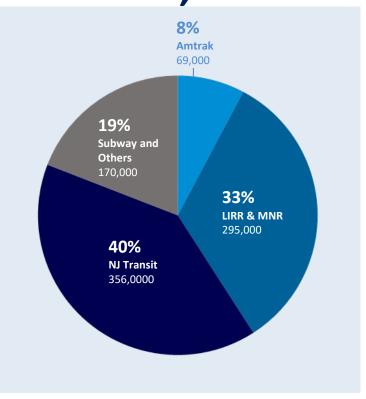


Daily Trips – All Users 600,000



Includes Moynihan Train Hall

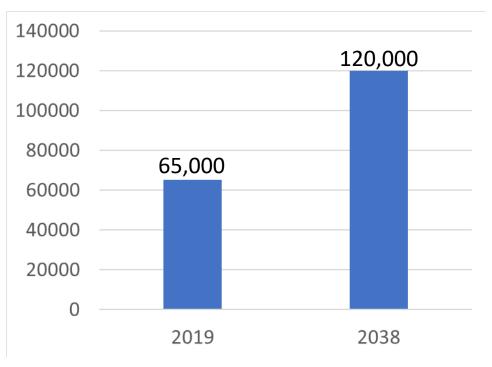
Daily Trips – All Users 890,000



2019 2038



Ridership: 85% growth in the am peak period by 2038



AM Peak Period Railroad Trips



Regional Mobility: RPA Fourth Regional Plan





Through-Running Studies

Analyzing the Potential for Commuter Train Run-Through Service at New York Penn Station

August 7, 2014

Prepared by Amtrak Northeast Corridor Infrastructure Investment and Development
And Amtrak Operations Research Groups

NY Penn Station Master Plan

WHITE PAPER

Through-Running

Final — April 2021



wsp fxcollaborative





1st Question:

Is it feasible to convert existing Penn Station and the Moynihan Train Hall to all, or substantially all, through-running?



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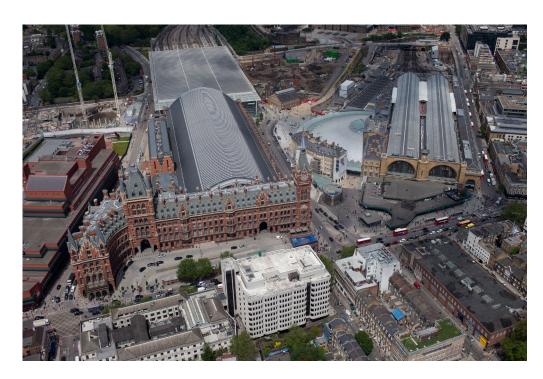
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Expansion and Integration of St. Pancras Station, London

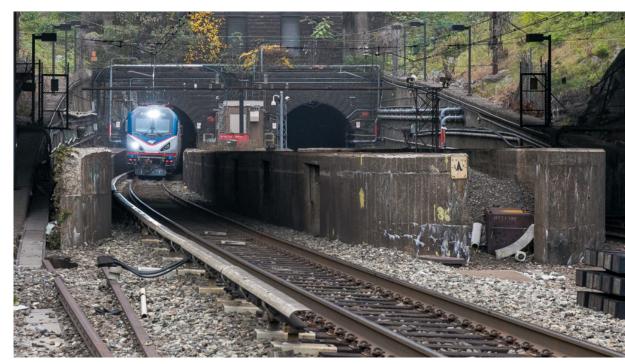




- > Expanded from 6 platform tracks to 15 platform tracks
- > Terminus for Eurostar service to continental Europe via the Channel Tunnel and HS1
- > Became a through station on the Thameslink regional rail line



Capacity Constraints: Tunnel capacity is maxed-out

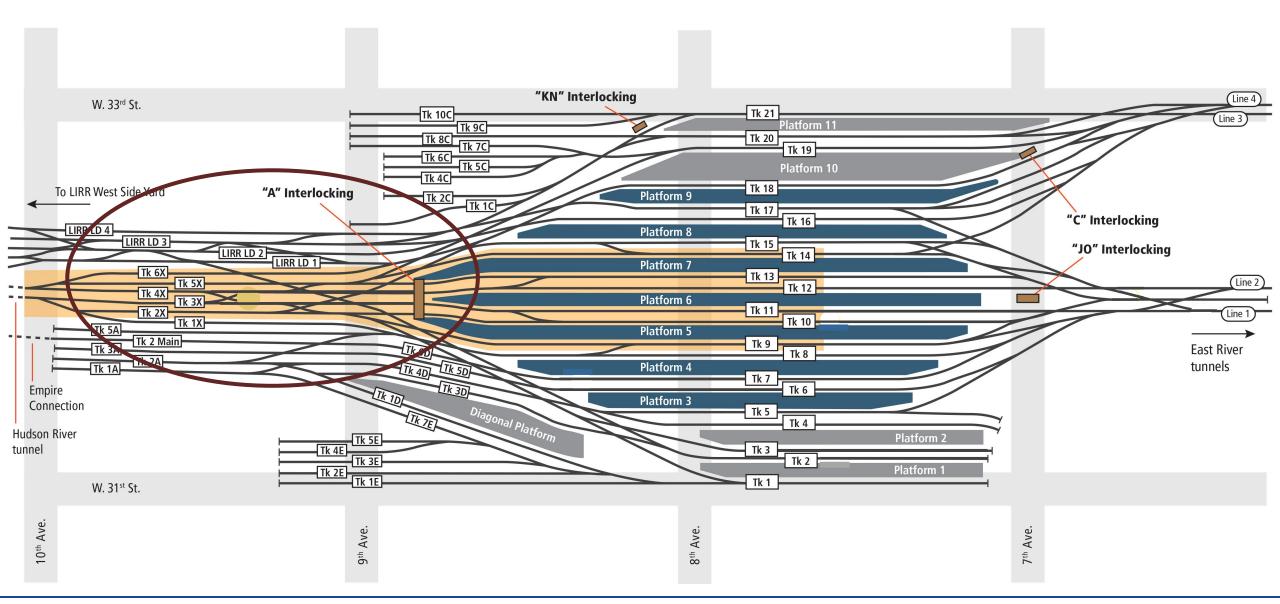


North River (Hudson River) Tunnels (2 tracks) (Amtrak and NJT)



East River Tunnels (4 tracks) (Amtrak, NJT and LIRR)

Capacity Constraints: "A" interlocking; number of tracks (21)



Capacity Constraints: Average dwell times

Amtrak: 22 minutes

Baggage, commissary, boarding from one escalator

> LIRR: 6 minutes

More stairs, fewer escalators

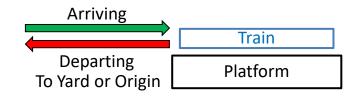
➤ NJ TRANSIT: 12 minutes

Fewer stairs, more escalators, operational differences



Turning at the Station

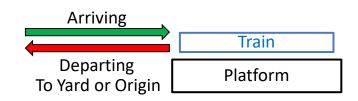
Revenue to Non-Revenue (deadheading)



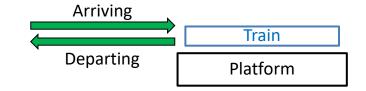


Turning at the Station

Revenue to Non-Revenue (deadheading)

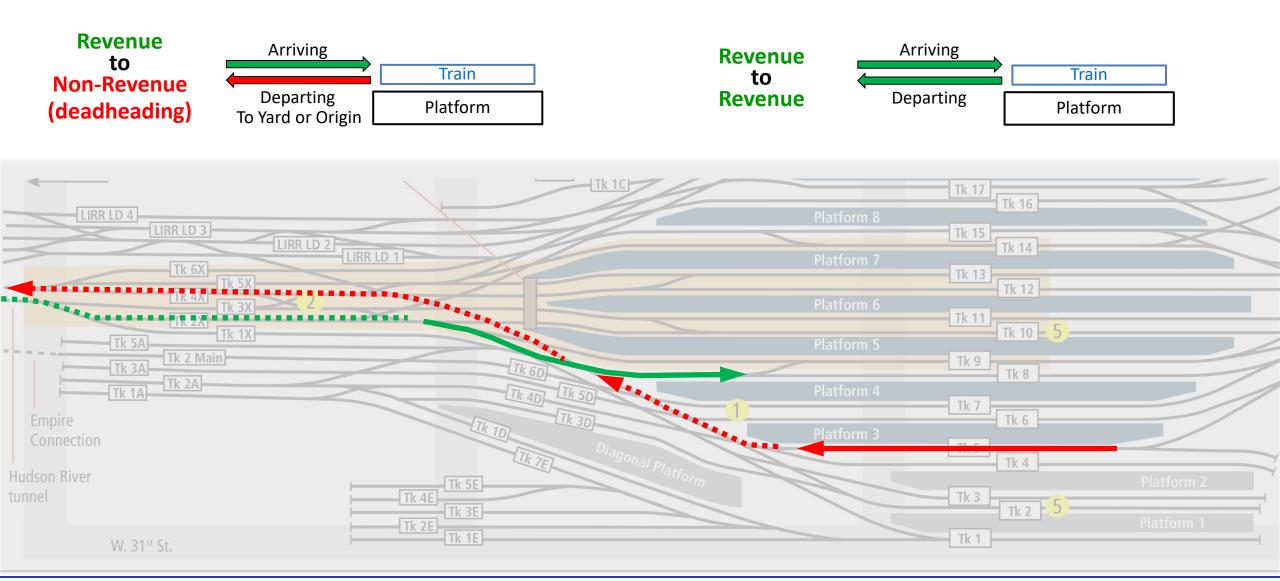


Revenue to Revenue



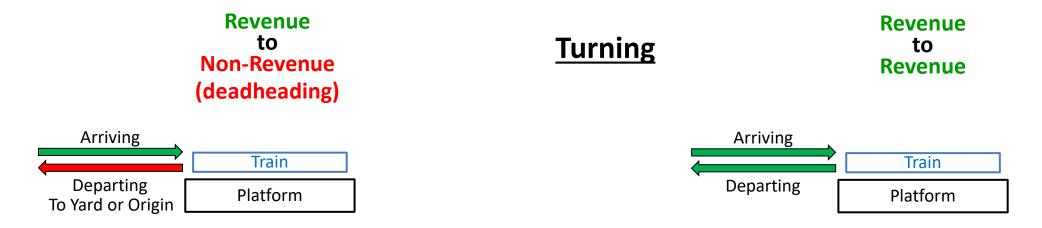


Turning at the Station: Crossing conflicts



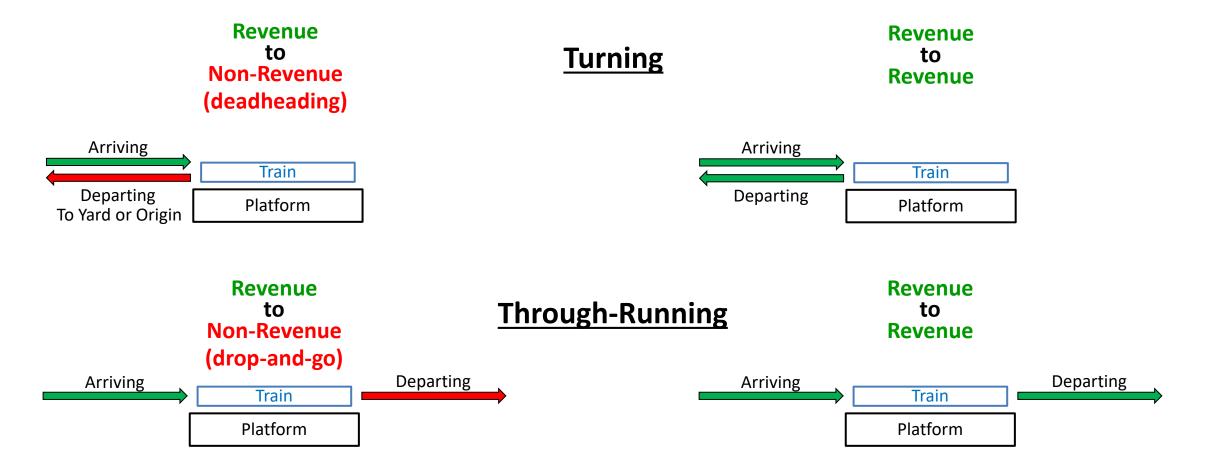


Through-Running: Eliminating crossing conflicts



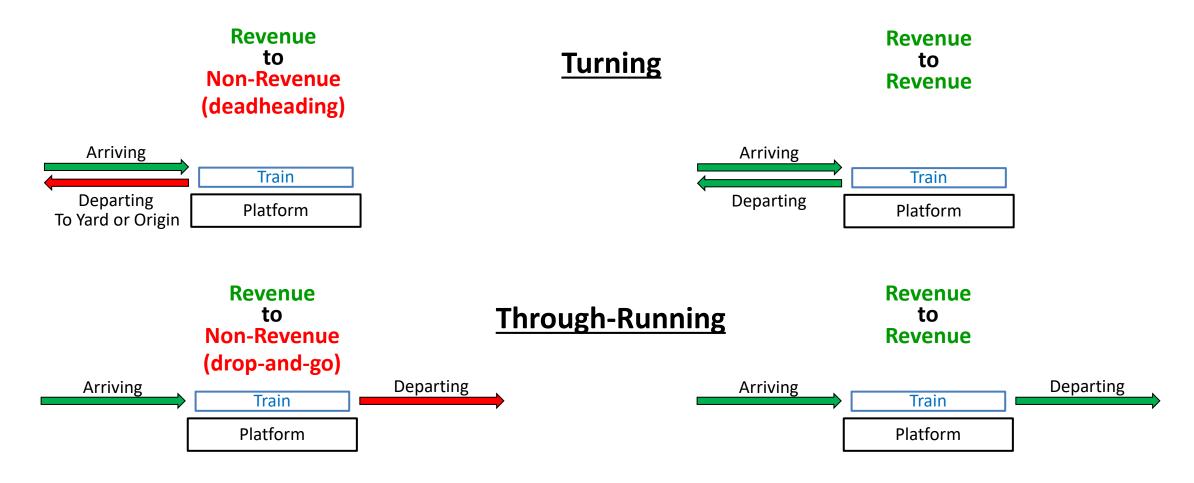


Through-Running: Eliminating crossing conflicts





Through-Running: Eliminating crossing conflicts



How much more throughput can we get by making these conversions at Penn Station?



Hybrid Operation at Penn Station

Operator	Type of Service	AM Peak Trains	PM Peak Trains	Peak Periods Total
LIRR	Run Through Turn	36 28	35 54	153
NJT	Run Through Turn	21 39	19 36	115
Amtrak	Run Through Turn	28 -	31	59
Totals	Run Through Turn	85 67	85 90	170 157



Revenue-to-Non-Revenue Service: Yard capacity is maxed-out



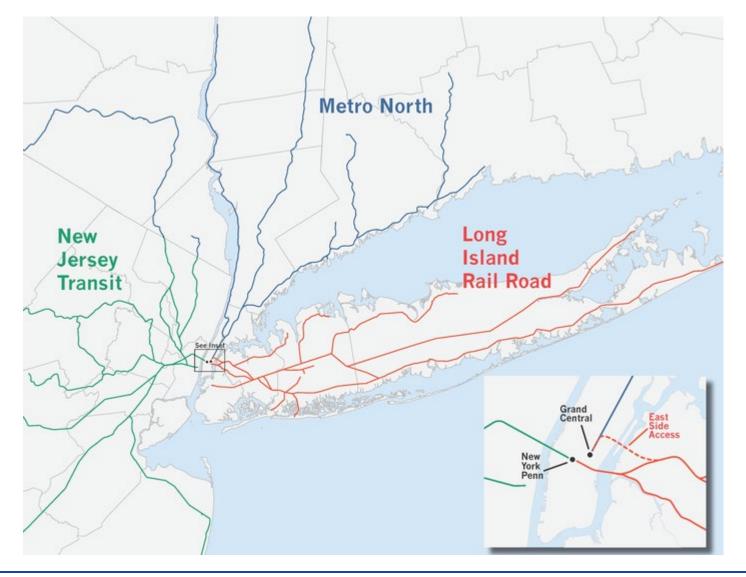
West Side Yard (LIRR)



Sunnyside Yard (Amtrak and NJT)



Revenue-to-Revenue Through-Running: Regional integration





Revenue-to-Revenue Through-Running: Regional integration

What would it take to implement all revenue-to-revenue through-running at Penn Station?





Platforms: Too narrow to board and alight riders simultaneously















Platforms: Crowded even without simultaneous boarding and alighting











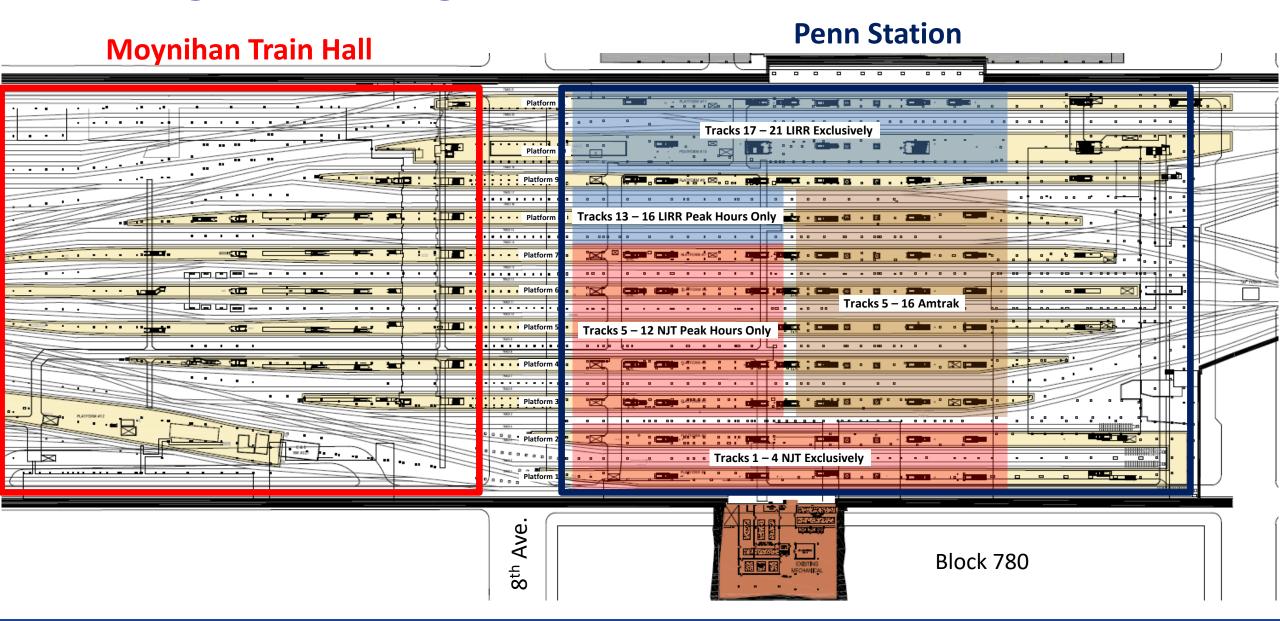




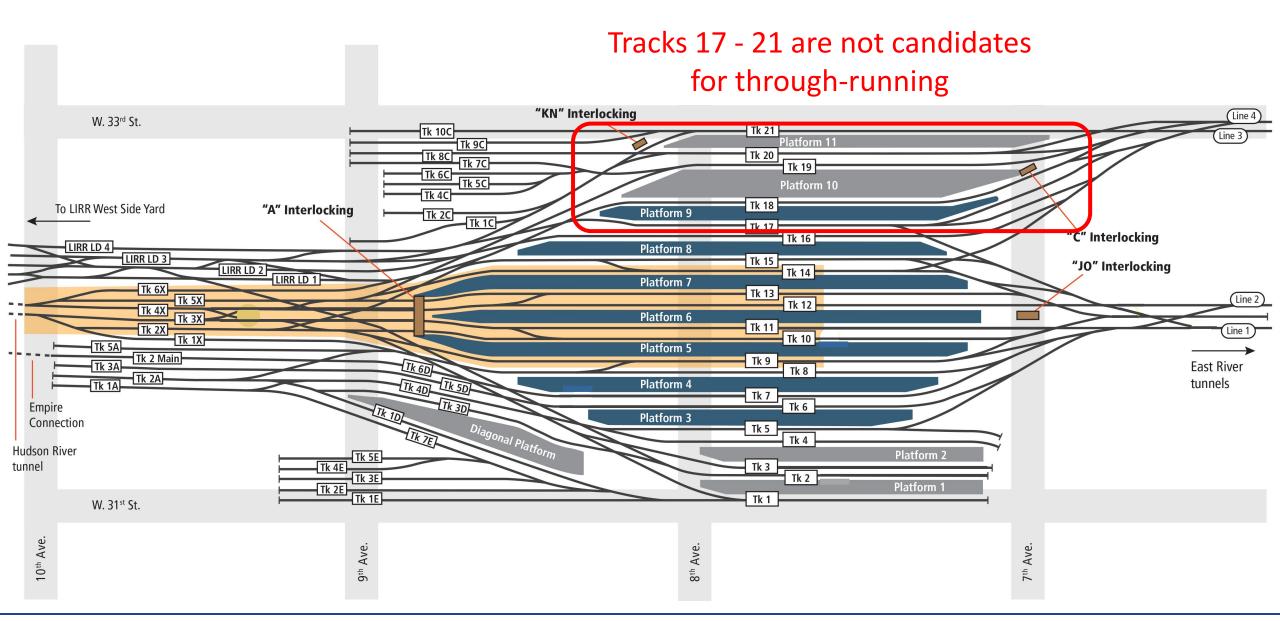
Through-Running Without Widening the Platforms

Amtrak estimated in their 2014 study that converting drop-and-go trains to revenue-to-revenue through-running would *decrease* peakperiod throughput by up to 17%

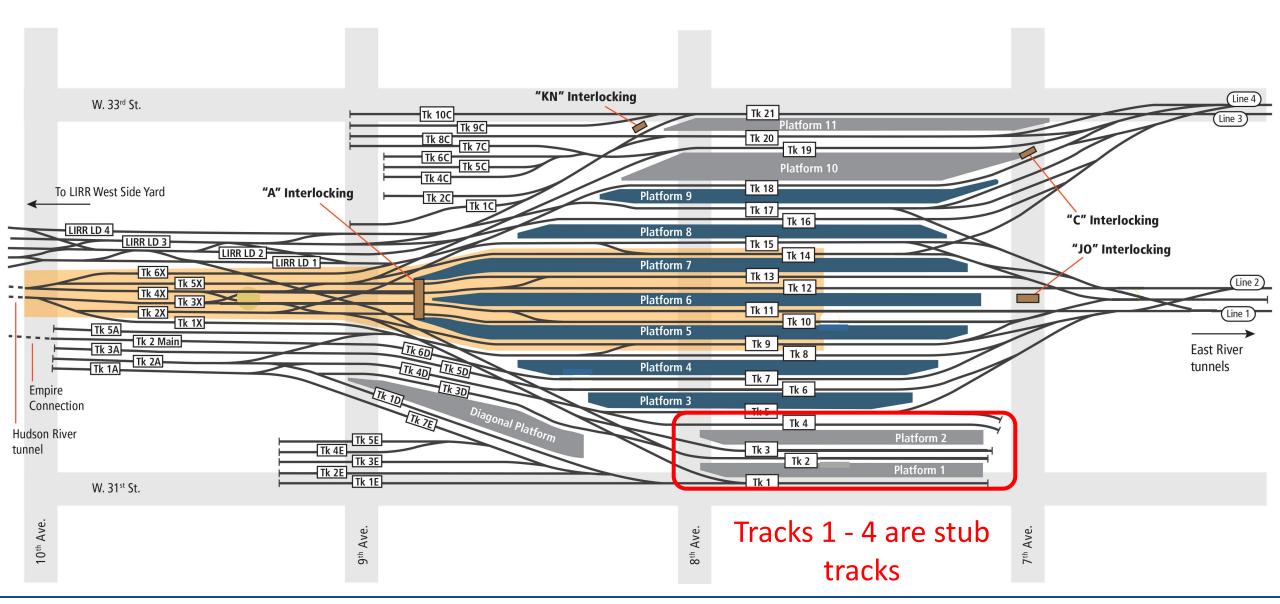
Existing Track Assignments



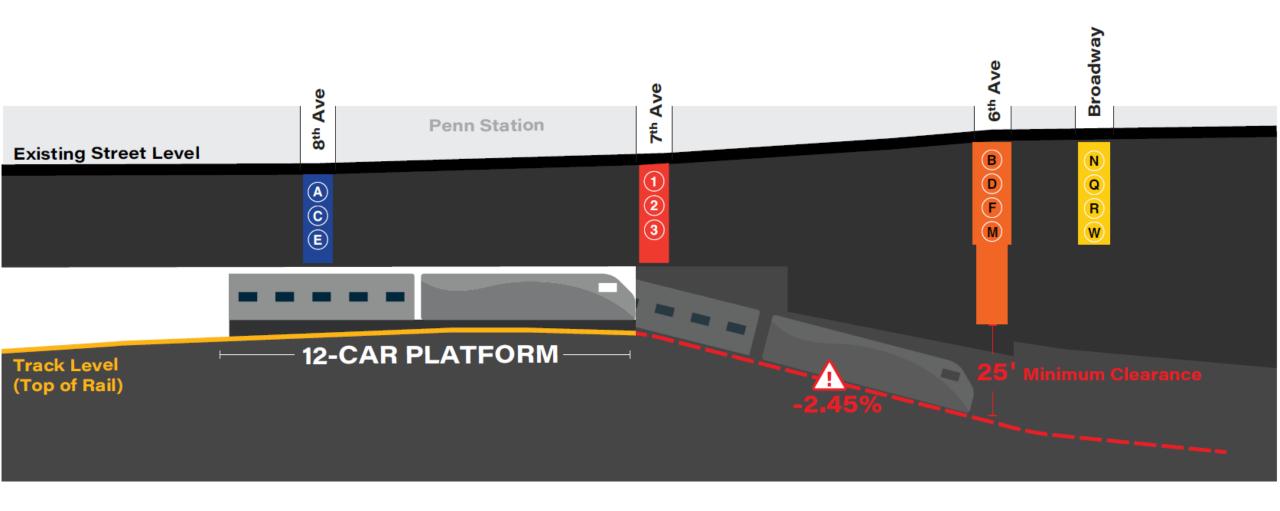
Which Tracks Can Support Through-Running?



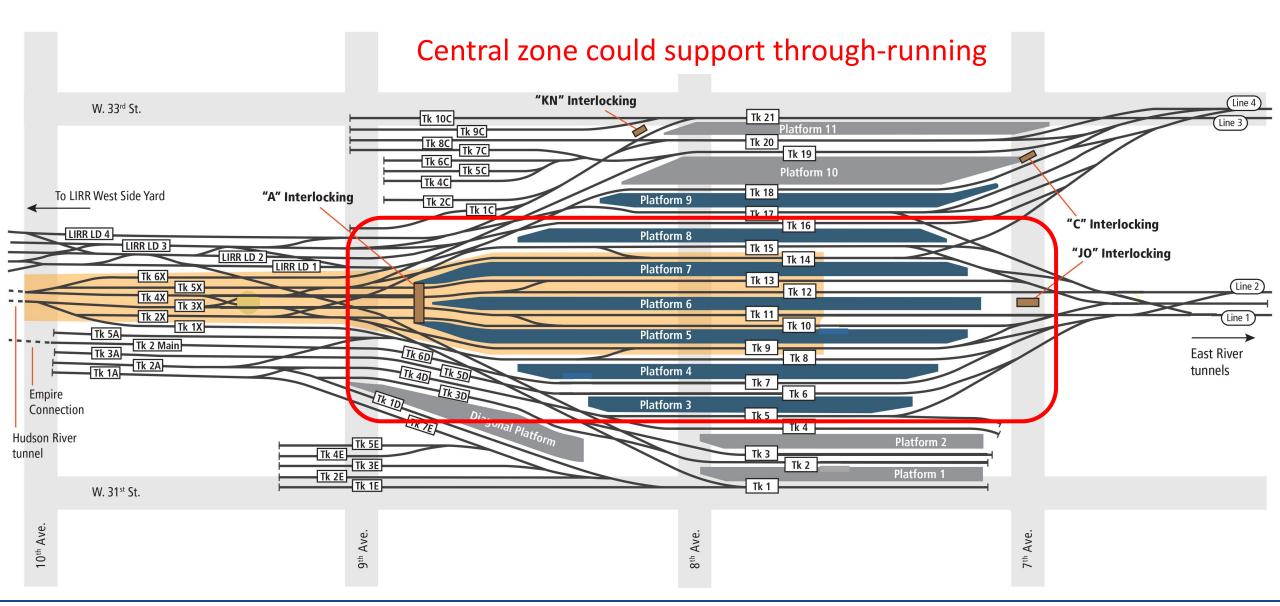
Which Tracks Can Support Through-Running?



Tracks 1 – 4 Cannot Pass Under the 6th Avenue Subway

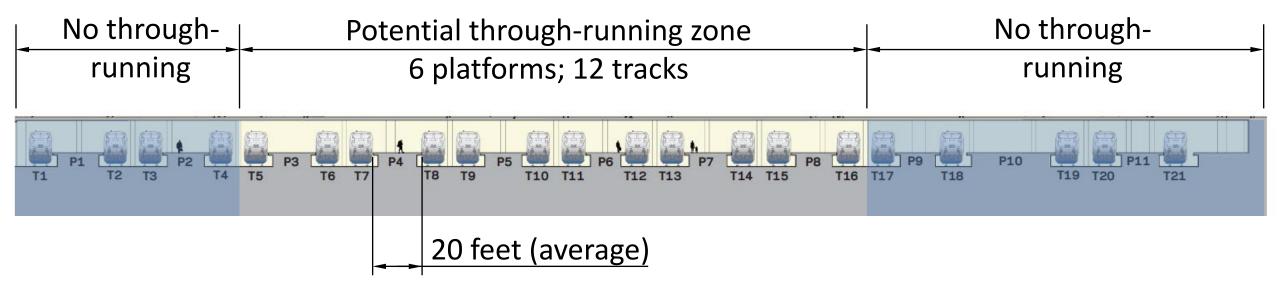


Which Tracks Can Support Through-Running?

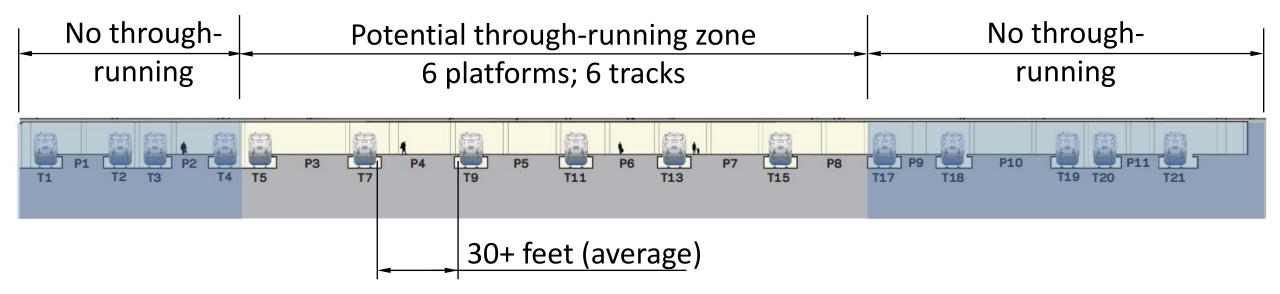




Existing Configuration: 11 platforms; 21 tracks

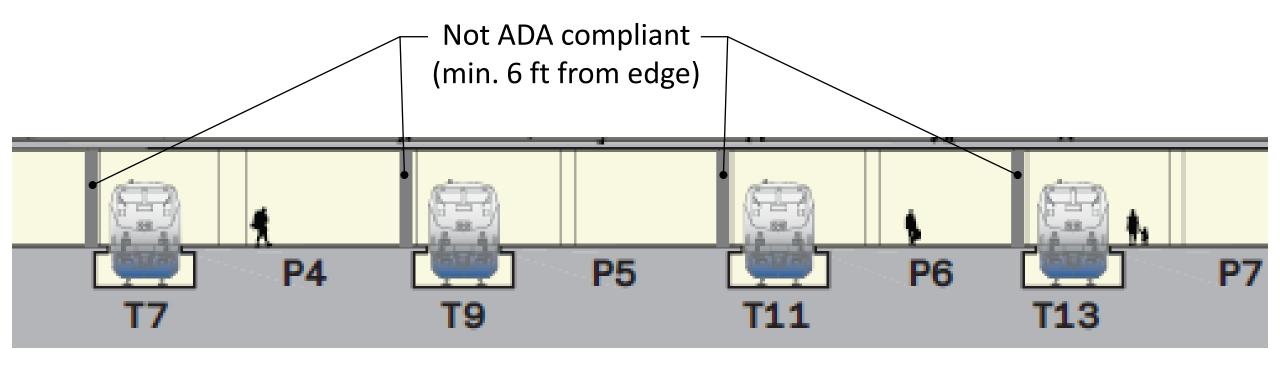


Widened Platforms: Eliminate one track at each of 6 platforms



Based on a configuration proposed by ReThinkNYC

Widened Platforms: Eliminate one track at each of 6 platforms



Based on a configuration proposed by ReThinkNYC



Widened Platforms: Eliminate one track at each of 6 platforms

Existing peak periods throughput on these 12 tracks: (assuming equal use of all tracks)

 $12/21 \times 327 = -187 \text{ trains}$

Maximum capacity of 6 through-running tracks: (assuming an average dwell time of 8 minutes)

 $6 \times 7.5 \times 4 = +180 \text{ trains}$

Net loss:

180 - 187 = -7 trains

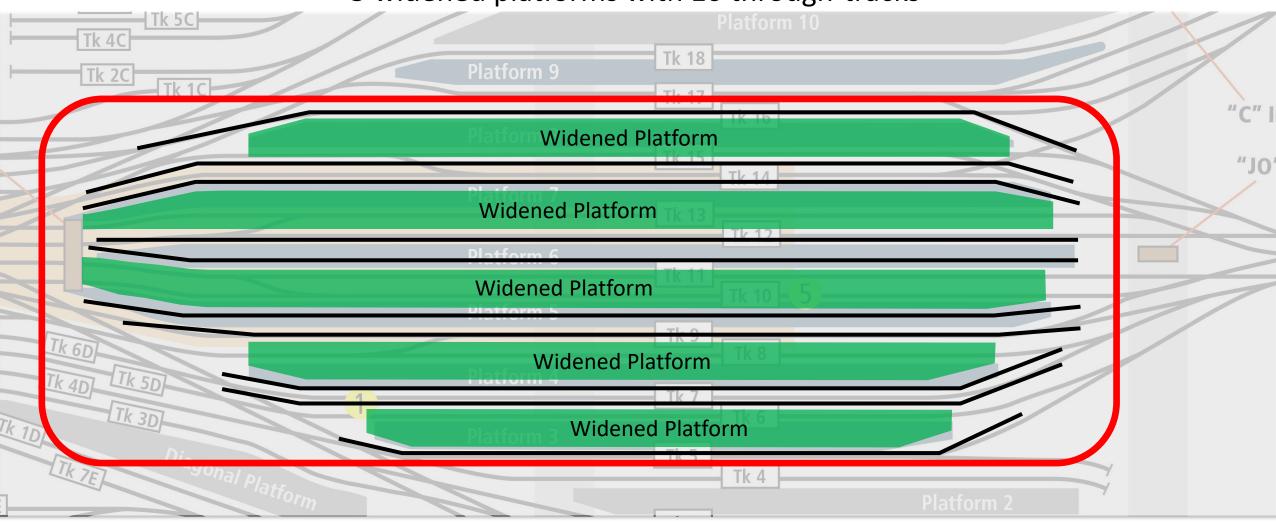
% gain:

-7/327 = -2%

Not an appreciable improvement

Widening the Platforms: Moving tracks and platforms

5 widened platforms with 10 through-tracks





Widening the Platforms: Moving tracks and platforms

Existing peak periods throughput on these 12 tracks: (assuming equal use of all tracks)

 $12/21 \times 327 = -187 \text{ trains}$

Maximum capacity of 10 through-running tracks: (assuming an average dwell time of 8 minutes)

 $10 \times 7.5 \times 4 = 300 \text{ trains}$

Net gain:

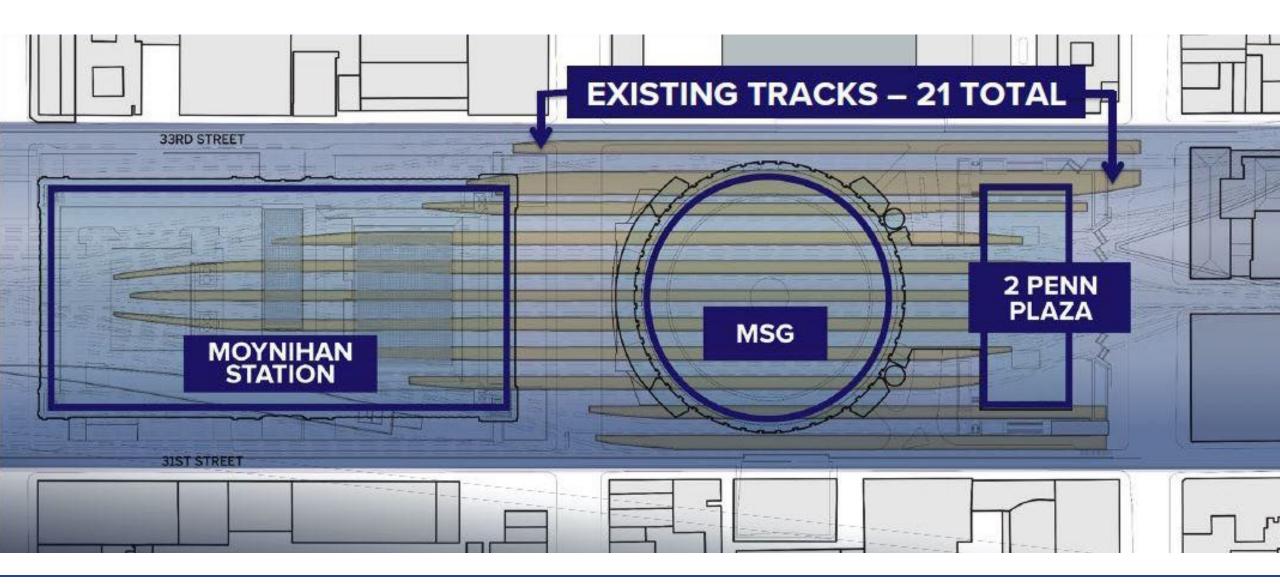
300 - 187 = +113 trains

% gain:

113 / 327 = +35%

A more appreciable improvement, but still not enough

Impacts to Buildings Above



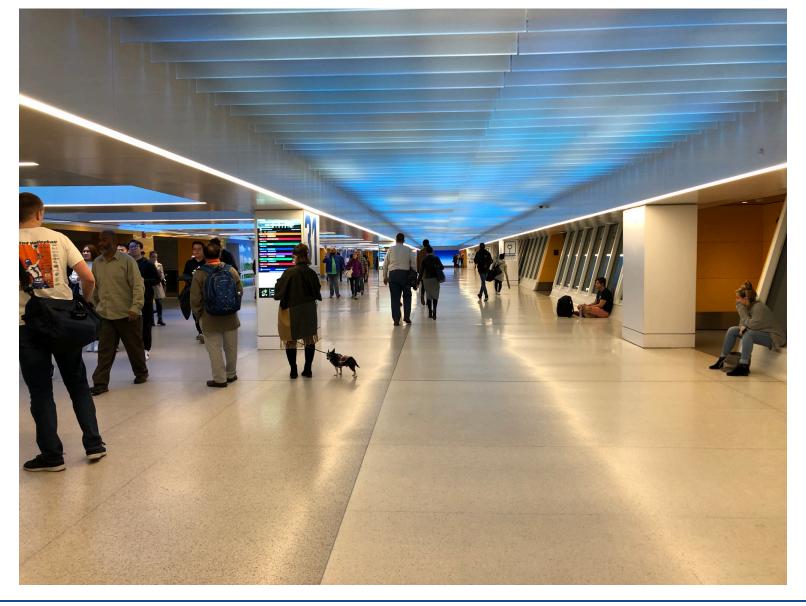


Moynihan Train Hall Would Have to be Re-built





The West End Concourse Too





Through-Running at Empire Station Complex

1st Question:

Is it feasible to convert existing Penn Station and the Moynihan Train Hall to all, or substantially all, through-running?

Conclusion:

No. There are too many physical constraints and fatal flaws, the costs would be highly disproportionate to the limited benefits and the implications for the Moynihan Train Hall would be untenable.





Through-Running at Empire Station Complex

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Would an all through-running regime at Penn Station increase throughput by enough to no longer need to expand the station?

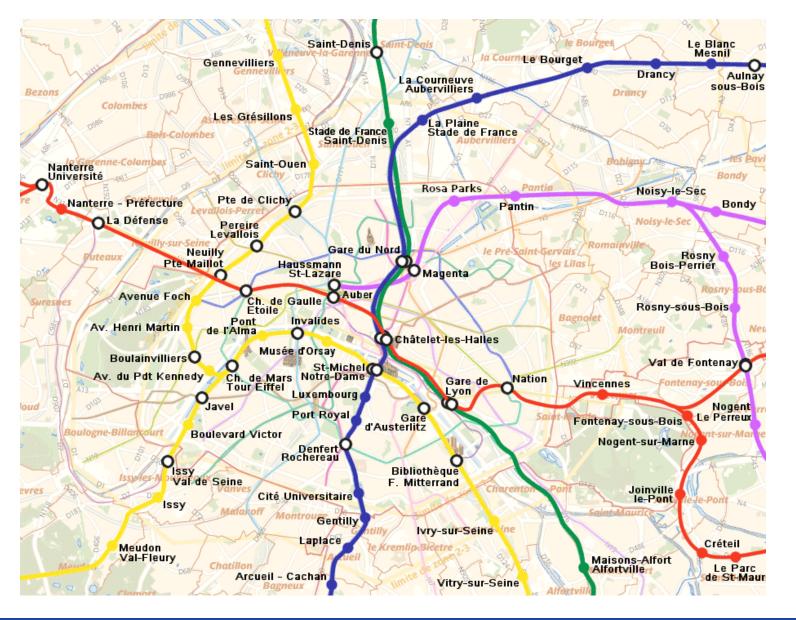
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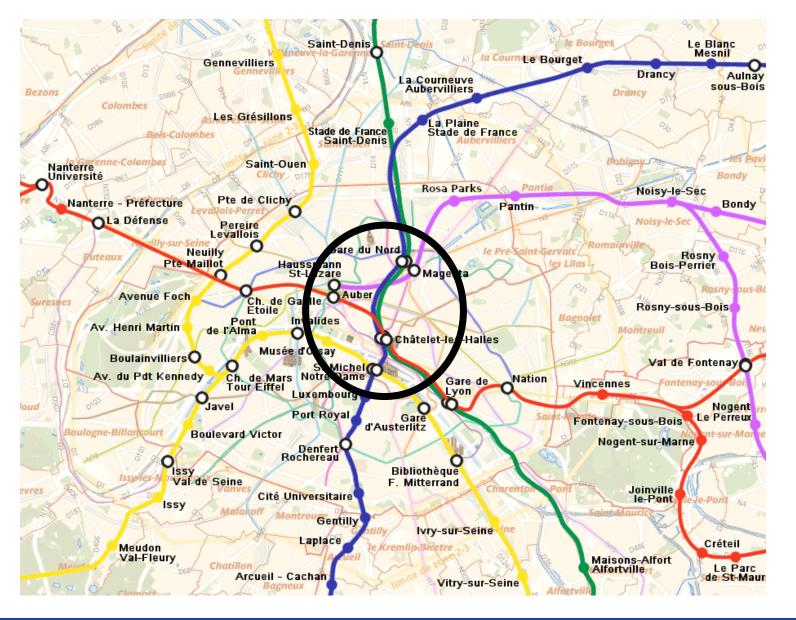


Paris Regional Rail Network (RER)



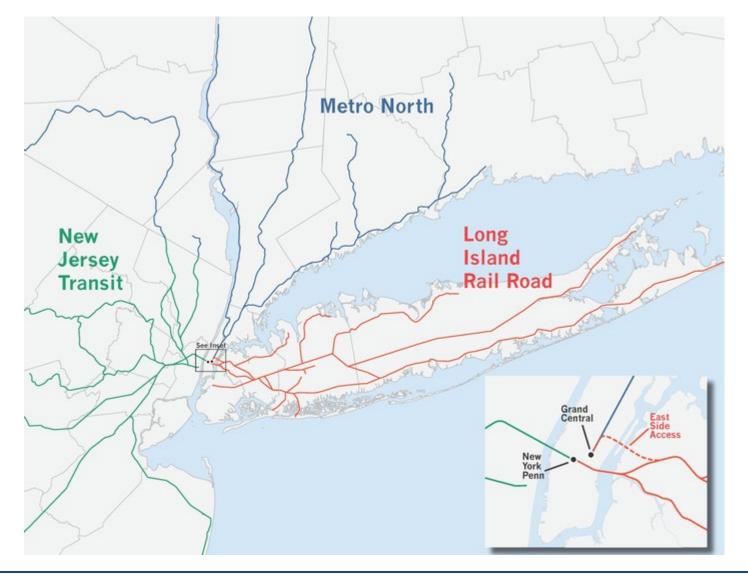


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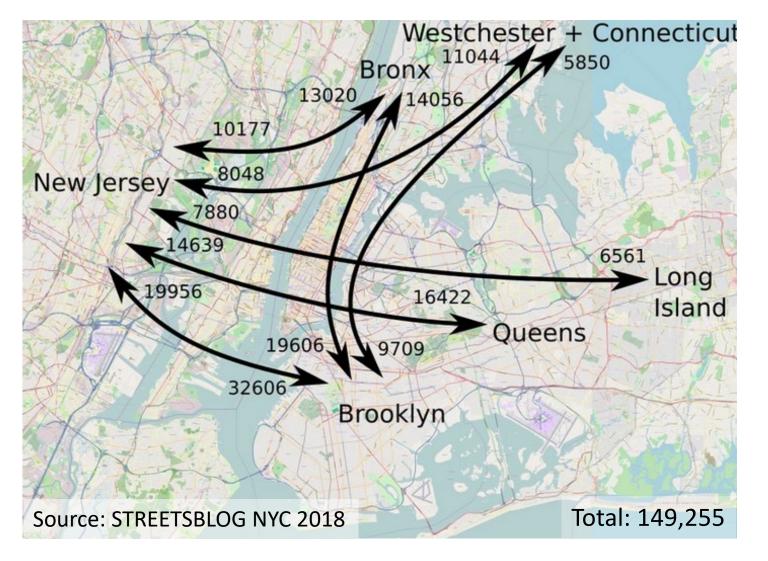


Regional Railroad Network





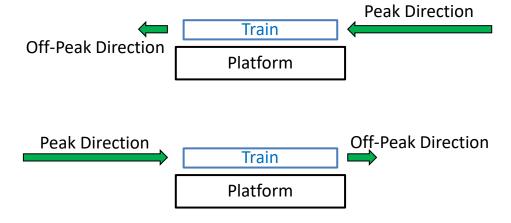
Revenue-to-Revenue Through-Running: Regional integration



Census counts of how many people in counties outside of Manhattan commute to the other counties outside Manhattan



Regional Through-Running: Unbalanced demand





Revenue-to-Revenue Through-Running



Market

 Compatibility of passenger demand, service levels, and maximum train lengths between branches on opposite sides of Penn Station

Operations

- Labor agreements
- Train crew availability and training
- Institutional and governance framework

Network Infrastructure

- Track capacity on trunk lines
- Traction power infrastructure
- Signaling system and PTC
- Rolling stock interoperability
- Storage yard and maintenance facility capacity

Tunnels

Penn Station

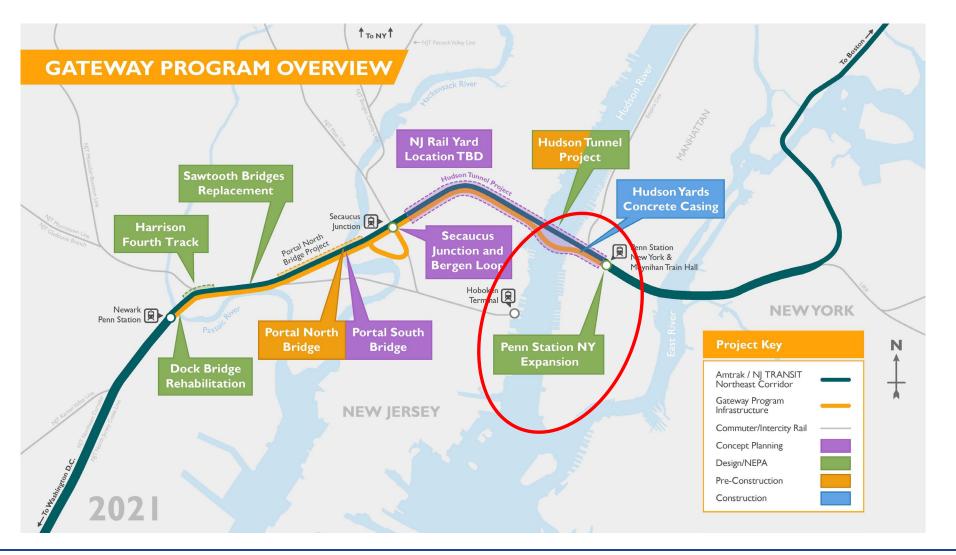
Platform lengths and heights





Gateway is Coming

❖ The Empire Station Complex is the NYC anchor of the Gateway Program





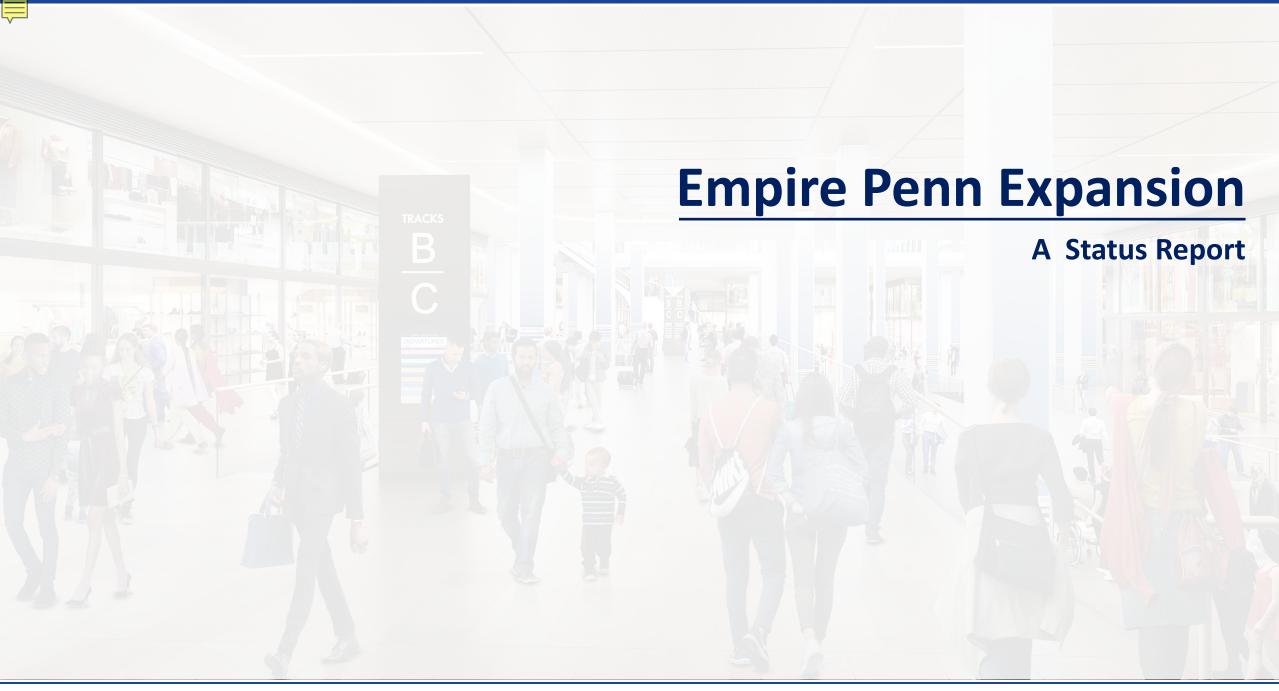
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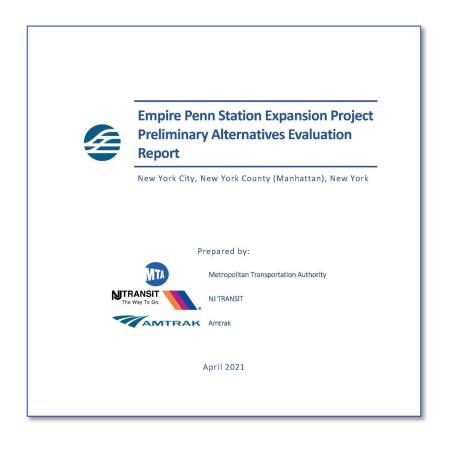
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Empire Penn Expansion - Alternatives Analysis



- > Introduce the Project
- Identify Project's draft purpose, needs, goals, and objectives
- Identify a preliminary list of Project alternatives
- Describe a process to evaluate alternatives
- Present the initial evaluation of alternatives (Steps 1 and 2)
- Recommend next steps

Expansion Project Goals

- Provide increased capacity for Amtrak, NJ TRANSIT and MTA at the station complex to accommodate future growth in travel demand
- Maximize operational flexibility within the station complex to manage daily rail operations, service disruptions, and emergency situations
- Integrate the expansion with existing Penn Station and Moynihan Train Hall
- Accommodate increased through-running in the future



Alternatives Evaluation Process

Step 1

Consistency with NEC FUTURE Purpose and Goals

Step 2

Consistency with Expansion Project Purpose and Goals Step 3

Comparison of benefits and detriments during NEPA



Preliminary List of Alternatives









