

Light Rail Vehicles Are Not the Best Choice for the Interborough Express

By John B. Pegram¹

When a New Yorker sees that the Interborough Express is expected to have “higher daily ridership than nearly any new transit line built in the U.S. over the last two decades,”² she probably expects a subway-type service. However, in spite of that expectation, the MTA has selected a Light Rail Transit (LRT) mode for the Interborough Express (IBX) transit line, saying “Light Rail will provide the best service for riders at the best value.”³ Most of the purported advantages of Light Rail Vehicles (LRVs), asserted in MTA reports, were not accurate or are no longer accurate or are at least questionable. For those reasons, the MTA should reconsider its choice of Light Rail and consider existing subway car designs for the Interborough Express line, such as those used on the NYC Transit A Division (numbered, former IRT lines) or PATH cars, operated by the Port Authority of New York and New Jersey.



In this paper, I focus on problems with the MTA’s assertions relating to characteristics of the different types of rail cars themselves and whether the LRT mode would “provide the best value.” In a future paper, I will address issues regarding the proposed IBX system characteristics, including track sharing with freight trains and relevant federal regulations.

A. BACKGROUND

The MTA has issued two public reports on the Interborough Express proposal. An [“Interim Report”](#) was published in January 2022.⁴ A year later, the “Planning & Environmental Linkages Study” or [“PEL Report”](#) was published in January 2023.⁵

The Interim Report considered six modes of operation, each using a different type of vehicle: Conventional Rail (CR), Diesel Multiple Units (DMUs), Heavy Rail, Automated Guideway Transit, Light Rail Transit (LRT) and Bus Rapid Transit (BRT).⁶ Both Conventional Rail and Heavy Rail modes would use subway-type rail cars, the difference being that Conventional Rail cars would comply with Federal Railway Administration regulations for sharing tracks with freight trains (such as PATH subway cars); whereas, Heavy Rail cars would not be FRA-compliant (such as NYC Transit subway cars).

The Interim Report revealed that three modes had been eliminated from consideration in “a ‘fatal flaw’ analysis and secondary screening.”⁷ The three modes selected in January 2022 for further consideration were Conventional Rail, LRT and BRT.⁸ Heavy Rail was one of the modes eliminated from consideration at the Interim Report stage. In January 2023, the PEL Report discussed the studies made during 2022 and announced the selection of the LRT mode for the IBX transit line, eliminating the CR and BRT modes from further consideration.

B. DETAILED COMMENTS

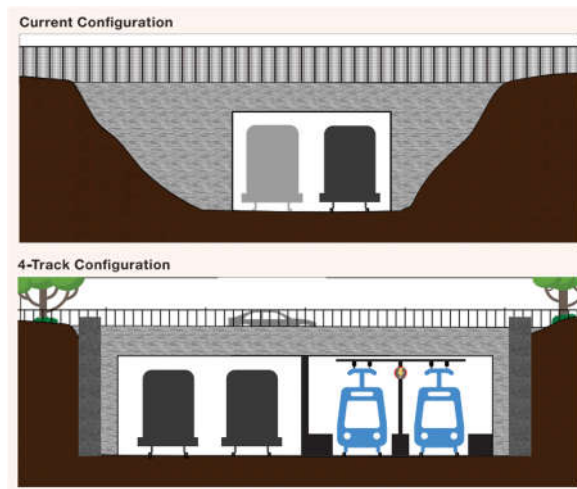
1. Subway-Type Rail Cars Should Be Considered

The apparent reasons why the Heavy Rail mode was eliminated from consideration in the Interim Report were “Due to federal regulations, this service would have to operate on dedicated tracks fully separated from freight traffic,”⁹ and “Many parts of the corridor are currently only wide enough for two tracks.”¹⁰

Conventional Rail was eliminated from consideration in the PEL Report primarily for reasons relating to a two-track width limitation in the existing Metropolitan Avenue tunnel (to be addressed in a future paper) and to the MTA’s assertions concerning the capabilities of LRT Vehicles, which are addressed here.

Now, however, circumstances have changed concerning the right-of-way width over most of the line, as discussed below.

- **Fact** – The PEL Report explained in January 2023 that the MTA had concluded narrow portions of the IBX right-of-way could be widened to permit four tracks, so that Light Rail Vehicles could run alongside freight tracks, apparently by excavating the sloping dirt sides of the right-of-way and erecting retaining walls. (See figure below from that report):¹¹



- **Fact** – The MTA did not reopen consideration of use of subway cars after it realized that almost the entire IBX right-of-way could be widened to permit up to four tracks.
- **Fact** – The only part of the IBX right-of-way that is too narrow to permit three or four tracks is the Metropolitan Avenue tunnel, under part of the All-Faiths Cemetery in Middle Village, Queens.¹²
- **Fact** – Time-sharing of tracks by PATH or NYC transit A Division subway cars with freight trains in the Metropolitan Avenue tunnel is possible. (See my paper, “[‘Subway’ Cars Could Share the Interborough Express Line with Freight Trains.](#)”)
- **Fact** - Time-sharing of tracks by transit and freight trains has been used successfully for many years on the NJ Transit River Line.¹³

Suggestion – The MTA should consider use of PATH or NYC transit A Division subway cars for the IBX line, in light of the ability to widen the right-of-way and the possibility of time-sharing the Metropolitan Avenue tunnel, and the absence of asserted LRT mode advantages, discussed below.

2. No “Off-the-Shelf” Vehicle Advantage for LRT

The PEL Report says, “Light Rail vehicles can be procured ‘off-the-shelf’ without modification.... Conventional Rail ... would require more extensive modifications.”¹⁴ In other places, it says, “CR would require specialized, FRA-compliant heavy rail rolling stock,”¹⁵ and CR “would require a new class of specialized vehicle not in use by other MTA services.”¹⁶ The IBX reports have given the LRT mode a positive rating and the CR mode a moderate rating for “Vehicle Specialization,”¹⁷ apparently for those reasons.

a. Regarding Light Rail Vehicles:

- **Fact** – Light Rail Vehicle manufacturers’ websites and literature indicate that Light Rail Vehicles are typically customized.¹⁸
- **Question** – When has the MTA ever purchased a passenger rail vehicle that was not customized?
- **Fact** – While the Interim Report states that the CR alternative “would have lower operating costs than the LRT option,”¹⁹ the PEL Report says that the Operation and Maintenance (O&M) cost for LRT would be similar to that for CR.²⁰
- **Question** – Would Light Rail Vehicle maintenance be more difficult and expensive than for subway cars, especially if low floor Light Rail Vehicles were used.?
- **Fact** – The PEL Report admits, “LRT would require operation of a new class of vehicle that is not used in other MTA services. The new class of vehicle would require new specialized maintenance and storage facilities to operate and maintain the vehicles and system. New operational arrangements would also be required.”²¹
- **Fact** – The MTA has no experience in operating and maintaining this new class of vehicle.²²

b. Regarding Subway-Type Rail Cars:

- **Fact** – Existing subway cars used on the NYC Transit A Division could be used with an FRA waiver. (See my paper, “[‘Subway’ Cars Could Share the Interborough Express Line with Freight Trains.](#)”)
- **Fact** – Existing design, FRA compliant PATH PA-5 rail cars could be used.

- **Fact** - The PEL Report admits that PATH cars, operated by the Port Authority of New York and New Jersey, are an example of FRA compliant vehicles.²³
- **Fact** – The PATH PA-5 rail cars apparently are updated versions of the MTA's R142A cars, used on the NYC Transit A Division (numbered, former IRT lines), and are made by the same manufacturer, Kawasaki.²⁴
- **Fact** - The MTA has experience in operating and maintaining subway-type cars.
- **Fact** – Existing MTA repair facilities could be used for IBX-line subway-type cars, but not for Light Rail Vehicles.

Suggestion – The MTA should give serious consideration to use of existing design, subway rail cars on the IBX line.

3. Train Capacity Favors Subway-Type Trains

The PEL Report rated both CR and LRT modes as “positive” for “capacity.”²⁵ The report,” says that that LRT “would carry a similar number of riders as CR,”²⁶ and that Light Rail Transit (LRT) and Conventional Rail (CR) “are expected to meet projected ridership estimates.”²⁷ The MTA proposes peak headways of five-minutes for both LRT and CR modes.²⁸

a. Regarding IBX Capacity Requirements:

- **Fact** - The PEL Report predicts that, in 2045, the Light Rail alternative would carry approximately 115,000 passengers each weekday²⁹ and that Conventional Rail would carry approximately 120,000 passengers.³⁰
- **Fact** - The PEL Report also says, “If built, the IBX would see higher daily ridership than nearly any new transit line built in the United States over the last two decades.”³¹
- **Fact** – No Light Rail line in the United States has anywhere near comparable ridership to that predicted for the IBX line.³²
- **Fact** – Transit lines having comparable ridership in the United States are typically served by Conventional Rail or Heavy Rail (like NYC Transit subways).³³

- **Question** – What is the probability that the MTA has underestimated the IBX capacity requirements?
- **Question** – What would the MTA do if it constructs the Light Rail mode and finds that it has underestimated the IBX capacity requirements?

b. Regarding Light Rail Vehicles:

- **Fact** – A typical Light Rail train with a capacity of 360 riders is made up of two articulated rail cars, totaling about 160-180 feet long.³⁴
- **Fact** – The PEL Report says, LRT “can lengthen trains to meet demand.”³⁵
- **Fact** – Lengthening a Light Rail train to add capacity would exacerbate the traffic obstruction problem when street-running Light Rail trains in Middle Village. (See my paper “[Street-Running LRVs on the Interborough Express Line is a Bad Idea.](#).)
- **Fact** – Typical Light Rail cars lack doors at the end to permit movement between cars or emergency exit. The operator is unable to walk through to rear cars.³⁶
- **Fact** - The MTA reports have not disclosed how it concluded that the LRT Mode is “expected to meet projected ridership estimates.”

c. Regarding Subway-Type Rail Cars:

- **Fact** – A five-car train of IRT-type subway cars has a capacity of about 900 riders.³⁷ The capacity of a five-car train of PATH subway cars is similar.
- **Fact** – 1,000 rider capacity trains on the NYC Transit G line in Brooklyn and Queens were often overcrowded at rush hours before COVID reduced ridership.³⁸
- **Fact** - The G line had approximately 150,000 riders per weekday in 2015.³⁹
- **Fact** – If five-car trains of subway cars turn out to have inadequate capacity for the IBX line, longer trains could easily be used.
- **Fact** – A ten-car train of IRT-type subway cars has a capacity of over 1,800 riders. The capacity of a ten-car train of PATH subway cars is similar.
- **Fact** – Most NYC Transit subway lines use eight to ten-car trains, except shuttles and the G line, which have shorter trains.⁴⁰

Suggestion – The MTA should disclose how it determined that the LRT mode could satisfy the ridership needs of the IBX line, and should reconsider its selection of the LRT mode in the light of its limited capacity and the other factors discussed in this paper.

4. No Dwell Time Advantage for LRT

The PEL Report says that Light Rail’s short dwell times contributes to making it the fastest of the three options.⁴¹

“Dwell time” is “the length of time that a vehicle spends in a station to allow passengers to board and alight.”⁴² Both IBX reports say that dwell time for the LRT mode is about 30 seconds.⁴³ The Interim Report says, “Conventional Rail dwell time is 45 seconds, contributing to a longer runtime.”⁴⁴ (The PEL Report is silent about a specific CR dwell time.)

- **Fact** – The IBX Reports say that the CR rail cars for the IBX line would be configured similarly to subway cars, allowing for faster boarding and alighting, as compared with other CR rail cars used in the region.⁴⁵
- **Fact** – Average dwell times measured by the author on NYC Transit and PATH subway lines are under 30 seconds.⁴⁶

Suggestion – The MTA should withdraw the assertions that the Light Rail mode would have significantly shorter dwell times than subway-type cars.

5. No Acceleration Advantage for LRT

The PEL Report says that Light Rail’s quick acceleration contributes to making it the fastest of the three options.⁴⁷

- **Fact** – In a letter to the author, the MTA has admitted, “LRT has comparable acceleration/deceleration characteristics to Conventional Rail.”⁴⁸

Suggestion – The MTA should withdraw the assertions that the Light Rail mode would have significantly quicker acceleration than subway-type cars.

6. No End-to-End Runtime Advantage for LRT

Both IBX reports repeatedly emphasized that runtime from end-to-end on the IBX line would be 39 minutes for the Light Rail mode, faster than the 45 minutes predicted for Conventional Rail.⁴⁹ That difference appears to be based on the contention, “Light Rail’s quick acceleration and short dwell times make it the fastest of the three options,” discussed above.

- **Fact** – Conventional Rail would *not* use vehicles requiring longer dwell times at stations, as compared with Light Rail. (See Dwell Time above.)
- **Fact** – In a letter to the author, the MTA has admitted, “LRT has comparable acceleration/deceleration characteristics to Conventional Rail.”⁵⁰ (See Acceleration above.)
- **Fact** – The IBX projected LRT runtime does not appear to include the likely, additional delays due to street-running of Light Rail Vehicles in Middle Village. (See my paper, “[Street-Running LRVs on the Interborough Express Line is a Bad Idea.](#)”)

Suggestion – The MTA should withdraw its assertion that the LRT mode would be the fastest of the options considered, should reevaluate and correct its end-to-end runtime projections, and publish the results.

C. CONCLUSION

Light Rail Vehicle characteristics have not been shown by the MTA reports to be superior to those of existing PATH and IRT-type subway cars for use on the Interborough Express transit line, and Light Rail trains are inferior to subway trains in terms of capacity.

The MTA should reconsider its selection of the Light Rail mode, and consider using existing designs of subway cars on the IBX line.

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² See, e.g., MTA, “The Inter-Borough Express, Planning & Environmental Linkages Study” (Jan. 2023) (PEL Report), pp. 37, available at <https://new.mta.info/document/103686>.

³ *Id.* at pp. 2, 3.

⁴ MTA, “Interborough Express, Feasibility Study and Alternatives Analysis, Interim Report” (Jan. 2022) (Interim Report) available at <https://new.mta.info/document/72081>.

⁵ *Supra*, note 2.

⁶ Interim Report, p. 9.

⁷ *Id.*

⁸ See Interim Report, pp. 9, 12.

⁹ Interim Report, p. 9.

¹⁰ Interim Report, p. 10.

¹¹ PEL Report, p. 34.

¹² PEL Report, p. 18.

¹³ See Federal Transit Administration, “Safe Transit in Shared Use,” FTA Report No. 0008 (July 2011), available at

https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA_Report_No._0008.pdf, pp. 7-9.

¹⁴ PEL Report, p. 3.

¹⁵ PEL Report, p. 24.

¹⁶ PEL Report, p. 29.

¹⁷ *Id.*

¹⁸ For example, brochures of Siemens Mobility, Inc., the principal supplier of LRVs used in the United States, indicate that LRV cars with approximately a 180 per car capacity are about 81

feet long: <https://assets.new.siemens.com/siemens/assets/api/uuid:8f100b64-dc6a-4cde-8e22-c0d8dcce6273/high-floor-light-rail-vehicle-packet.pdf>;

<https://assets.new.siemens.com/siemens/assets/api/uuid:3ce5a359-5933-4f0b-8877-6e9aa3df13bd/low-floor-light-rail-vehicle-packet.pdf>.

¹⁹ Interim Report, p. 14.

20 PEL Report, p. 22. *See id.*, p. 24.

21 PEL Report, p. 22.

22 *See id.*

23 PEL Report, p.20.

24 *See* Wikipedia, “PATH (rail system),” Rolling Stock, Current Roster, available at [https://en.wikipedia.org/wiki/PATH_\(rail_system\)](https://en.wikipedia.org/wiki/PATH_(rail_system)); Wikipedia, R142A (New York City Subway car) at [https://en.wikipedia.org/wiki/R142A_\(New_York_City_Subway_car\)](https://en.wikipedia.org/wiki/R142A_(New_York_City_Subway_car)).

25 PEL Report, pp. 3, 22, 29.

26 PEL Report, p. 22.

27 PEL Report, p. 28. *See id.*, p.3.

28 PEL Report, pp. 22, 24, 28.

29 PEL Report, pp. 3, 5, 15, 22, 37.

30 PEL Report, pp. 15, 24.

31 PEL Report, pp. 5, 37.

32 *See* <https://www.apta.com/wp-content/uploads/2022-Q4-Ridership-APTA.pdf> and https://en.wikipedia.org/wiki/List_of_United_States_light_rail_systems_by_ridership.

33 *Id.*

34 *Supra*, note 18.

35 PEL Report, p. 21.

36 *See supra*, note 18

37 Wikipedia, “R142A (New York City Subway car),” available at [https://en.wikipedia.org/wiki/R142A_\(New_York_City_Subway_car\)](https://en.wikipedia.org/wiki/R142A_(New_York_City_Subway_car)).

38 Author’s personal, rush hour commuting experience. Regarding G line car capacity, *see* Wikipedia, “R160 (New York City Subway car),” available at [https://en.wikipedia.org/wiki/R160_\(New_York_City_Subway_car\)](https://en.wikipedia.org/wiki/R160_(New_York_City_Subway_car)).

39 Wikipedia, “G (New York City Subway service0” [*sic.*], available at [https://en.wikipedia.org/wiki/G_\(New_York_City_Subway_service0](https://en.wikipedia.org/wiki/G_(New_York_City_Subway_service0).

40 Wikipedia, “New York City Subway rolling stock,” available at https://en.wikipedia.org/wiki/New_York_City_Subway_rolling_stock.

41 PEL Report, p. 3.

42 Interim Report, p. 22.

43 Interim Report, p. 22.

44 *Id.*

45 Interim Report, pp. 12, 14; PEL Report, pp. 2, 15.

46 Author's personal observations in March – May, 2023, primarily in Brooklyn and Queens on the 2, 3, B, L, M and Q lines.

47 PEL Report, p. 3.

48 The substance of the MTA letter and the author's response are reproduced in my paper, "Interborough Express: A Dialog with the MTA," available at <https://bqrail.substack.com/p/interborough-express-a-dialog-with>.

49 Interim Report, pp. 12, 14, 16, 22; PEL Report, pp. 15, 22, 24, 38.

50 *See supra*, note 47.