

CONCLUSIONS OF THE SYSTEM-WIDE PSD FEASIBILITY STUDY

Background: Legacy transit systems, such as those in London and Paris, have retrofitted station platforms with barrier systems to create a safer environment for passengers. Platform Screen Doors (PSDs), including all types of platform barrier systems, effectively create a barrier between the trackway and passengers on the platforms, and serve to reduce the number of incidents of people coming into contact with trains caused by: leaning over the platform edge; slips, trips and falls; and intentionally or unintentionally entering tracks. Some other benefits of PSDs include improved security by preventing unauthorized entry onto the tracks, fewer track fires and incidents of clogged drains by reducing debris accumulation, faster entry of trains into stations, and reduced dwell times.

Starting in October 2014, NYCT followed up on earlier initiatives to improve customers' platform safety and began to research, study, and plan a pilot PSD system installation in the subway. The international research and study, spearheaded by a consultant, concluded in September 2016, with the release of a report on the state of the PSD industry. The report provided NYCT with critical information and a greater understanding of the requirements for installing, operating, and maintaining various types of PSDs. The types of PSDs identified in use by various transit agencies worldwide were:

1. Platform Screen Doors (PSD): full height
2. Automatic Platform Gates (APG): half height
3. Rope Platform Screen Doors (RPSD): vertically opening gate system

Through this research, challenges to installing PSDs in our century-old subway system were identified. These challenges include but are not limited to:

- Platform width
- Distance of staircases and columns from platform edge
- Americans with Disabilities Act (ADA) requirements
- Room/space availability for placement of door control equipment
- Sufficient power available to accommodate additional load
- Air flow dynamics within the station
- Multiple car classes with varying door opening positions
- Gaps between platform edges and trains
- Structural integrity of platform edges to support weight load

In March 2017, NYCT began a comprehensive study of all 472 subway stations with the assistance of a consultant, to determine the feasibility of installing PSDs, APGs, and/or RPSDs. The PSD feasibility study entailed a Line by Line and Station by Station, system-wide survey and analysis of the platforms at all 472 stations in the NYCT subway system.

At the start of the study in March 2017, a schedule duration of 39 months was established with a completion date of June 2020. The study was concluded in August 2019, 10 months ahead of schedule.

Feasibility Results: Currently, the NYCT Subway system features cars with three different door alignment profiles on the A Division and three on the B Division. With few exceptions, the car types in each division are freely mixed among Subway Lines within their respective Divisions. The spacings of doors on these cars are significantly different, making the installation of platform doors infeasible at most stations today. However, NYCT currently plans to complete the procurement of new rolling stock, per

division, with identical or nearly identical car geometries/door spacing, by 2033. Accordingly, the consultant was directed to conduct their feasibility assessment assuming homogenized car classes, per division, by the year 2033.

The feasibility results of the PSD study range from **3** to **75%** of stations per line, with overall system-wide feasibility at **27%**, or **128** of the **472** stations studied. Due to the various car types and related door misalignments as discussed above, PSDs could only be implemented today at 41 of the 128 stations, with implementation for the remainder being possible as car types (geometries/door spacings) in each Division/Line get progressively compatible out to the year 2033. The causative factors for infeasibility of stations are broken down in the table below:

REASONS FOR INFEASIBILITY		
Causative Factors	Number of Infeasible Stations*	Percentage of Infeasible Stations
ADA Clearance	154	43%
Pre-cast Platform	100	28%
Fleet Misalignment**	31	9%
Columns too close to edge	30	8%
Non-compliant Egress Path	24	7%
No Space for PSD Equipment Room	21	6%
Gap Fillers	1	<1%

*Some of the stations serving multiple Subway Lines may be feasible for one or more Lines (sets of platforms) but not all, therefore aggregating station counts for feasible and infeasible will exceed 472

**Car class compatibility will not be achieved on certain lines regardless of rolling stock changes due to dimensional differences between 8-car (M & G trains) and 10-car trains

The rough order of magnitude (ROM) costs for the **128** stations found feasible for the installation of PSDs/APGs is **\$7.01B** for the PSD option and **\$6.53B** for the APG option, with approximate annual maintenance costs of **\$119.16M**. These cost estimates are based on 2018-19 dollars. Since it is unknown when PSD and/or APG projects would be awarded, escalation costs out to possible year of award are not included and are expected to be around 4% per annum.