

Bi-County Transitway/ Bethesda Station Access Demand Analysis

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EXECUTIVE SUMMARY

The addition of a new south entrance to the Bethesda Metrorail Station offers an opportunity to expand the accessibility of the station to the surrounding area. Likewise, the proposed Bi-County Transitway offers the prospect of improved transit connections between Bethesda and Silver Spring, College Park, and New Carrollton. This study determines the effects of a south entrance and the Bi-County Transitway on Bethesda-based transit ridership and on the infrastructure of the Bethesda Station.

Three options were considered in this study for the year 2030, as follows:

- Option 1: No-build scenario, where existing conditions remain unchanged
- Option 2: South Entrance scenario, where no new transitway is assumed, but the south entrance is assumed to provide access to the Metrorail platform
- Option 3: Bi-County Transitway scenario, where the transitway is assumed to be in place along with the new south entrance

Land Use

A comprehensive review of land use in the Bethesda Station area was conducted based on data from the Metropolitan Washington Council of Governments (MWCOC) and the Maryland-National Capital Park and Planning Commission (M-NCPPC). The forecast calls for a 37 percent increase in Bethesda-area jobs and a 55 percent increase in Bethesda-area households by 2030.

A new south entrance to the Bethesda Station would help serve the increased population and employment by reducing walking distances to and from the station. By 2030, the south entrance would increase the number of jobs within ¼ mile of a Metrorail Station entrance by 11 percent, and would increase the number of households within the same radius by 27 percent.

Existing Ridership

The Bethesda station currently handles about 9,500 Metrorail boardings per day, with a similar number of alightings; the station is in the top fourth of all Metrorail stations when ranked by ridership. Boardings and alighting volumes are nearly equal during much of the day, demonstrating that the Bethesda area attracts Metrorail passengers nearly equally from both residential and office land uses.

Walking is by far the most common access mode for passengers arriving at the Bethesda station. Over 70 percent of daily passengers walk to the station, increasing to nearly 90 percent during the afternoon peak period. About 10 percent of daily passengers arrive by bus, while 9 percent drive and park.

Future Ridership

Version 2.1 D of the MWCOC travel forecasting model was used to evaluate future ridership on Metrorail and the Bi-County Transitway in the year 2030, and the Metrorail Development-Related Ridership Survey was used to evaluate the ability of the south entrance to induce new ridership. Ridership results are presented in Table 1.

Table 1: Adjusted Ridership Summary, 2030

AM Peak Period	Entrance	Metrorail Bethesda Station		Bi-County Transitway Bethesda Station		Transfers between Metrorail and Bi-County		Total Access Demand (excludes transfers)	
		Boardings	Alightings	Boardings	Alightings	From Metro to Bi-County	From Bi-County to Metro	Boardings	Alightings
Option 1: No-Build	North	5,100	3,100	0	0	0	0	5,100	3,100
	South	0	0	0	0	0	0	0	0
	Total	5,100	3,100	0	0	0	0	5,100	3,100
Option 2: South Entrance without Bi-County	North	3,600	2,200	0	0	0	0	3,600	2,200
	South	1,600	1,000	0	0	0	0	1,600	1,000
	Total	5,200	3,200	0	0	0	0	5,200	3,200
Option 3: South Entrance with Bi-County	North	3,500	1,900	0	0	0	0	3,500	1,900
	South	1,500	900	300	1,400	400	800	1,900	2,200
	Total	5,000	2,800	300	1,400	400	800	5,300	4,200

PM Peak Period	Entrance	Metrorail Bethesda Station		Bi-County Transitway Bethesda Station		Transfers between Metrorail and Bi-County		Total Access Demand (excludes transfers)	
		Boardings	Alightings	Boardings	Alightings	From Metro to Bi-County	From Bi-County to Metro	Boardings	Alightings
Option 1: No-Build	North	3,100	5,000	0	0	0	0	3,100	5,000
	South	0	0	0	0	0	0	0	0
	Total	3,100	5,000	0	0	0	0	3,100	5,000
Option 2: South Entrance without Bi-County	North	2,200	3,500	0	0	0	0	2,200	3,500
	South	1,000	1,600	0	0	0	0	1,000	1,600
	Total	3,200	5,100	0	0	0	0	3,200	5,100
Option 3: South Entrance with Bi-County	North	2,000	3,300	0	0	0	0	2,000	3,300
	South	900	1,500	1,400	300	800	300	2,300	1,800
	Total	2,900	4,800	1,400	300	800	300	4,300	5,100

Daily	Entrance	Metrorail Bethesda Station		Bi-County Transitway Bethesda Station		Transfers between Metrorail and Bi-County		Total Access Demand (excludes transfers)	
		Boardings	Alightings	Boardings	Alightings	From Metro to Bi-County	From Bi-County to Metro	Boardings	Alightings
Option 1: No-Build	North	13,000	13,100	0	0	0	0	13,000	13,100
	South	0	0	0	0	0	0	0	0
	Total	13,000	13,100	0	0	0	0	13,000	13,100
Option 2: South Entrance without Bi-County	North	8,500	8,400	0	0	0	0	8,500	8,400
	South	4,700	5,100	0	0	0	0	4,700	5,100
	Total	13,300	13,500	0	0	0	0	13,300	13,500
Option 3: South Entrance with Bi-County	North	7,900	7,800	0	0	0	0	7,900	7,800
	South	4,400	4,800	2,400	3,200	2,000	2,000	6,700	8,000
	Total	12,200	12,600	2,400	3,200	2,000	2,000	14,600	15,800

Note: Figures are rounded to the nearest 100 riders, which may affect sums.

The ridership forecast shows the following notable trends:

- In Option 1, boardings and alightings would increase to about 13,000 per day by 2030, an increase of about 35 percent over existing conditions.
- The south entrance would induce a 3.2 percent increase in pedestrian-based Metrorail ridership from residential areas and a 7.5 percent increase in pedestrian-based ridership from commercial areas.
- The south entrance would capture about 37 percent of the station’s rail access trips in Option 2 and about 48 percent of rail access trips in Option 3.
- The addition of the Bi-County Transitway would increase total Bethesda-based rail ridership by about 13 percent, although Metrorail ridership would decrease slightly.

Capacity Constraints

An evaluation of the Bethesda Station’s infrastructure showed the following:

- In the No-build scenario, the Bethesda station’s only capacity shortfall would be the vertical passenger circulation between platform and mezzanine. If a south entrance were constructed, the existing north entrance would operate below capacity.
- The elevator-based south entrance would require three elevator cabs in Option 2 and five cabs in Option 3.

A summary of the station’s infrastructure requirements is presented in Table 2.

Table 2: Summary of Bethesda Station Infrastructure Requirements

Infrastructure Element			North Entrance				South Entrance	
			Existing	Option 1	Option 2	Option 3	Option 2	Option 3
Vertical Circulation	Street to mezzanine	Escalators	3	3	2	2	0	0
		Elevators*	1	2	2	2	3**	5**
		Stairs	0	0	0	0	1	1
	Mezzanine to platform	Escalators	2	2	2	2	1	1
		Elevators*	1	2	2	2	2	2
		Stairs	0	1	0	0	1	1
Farecard Vendors			7	7	5	5	2	3
Fare Gate Aisles		Standard	7	5	3	3	2	3
		ADA	1	2	2	2	2	2
		Spare	0	1	1	1	1	1
		Total	8	8	6	6	5	6

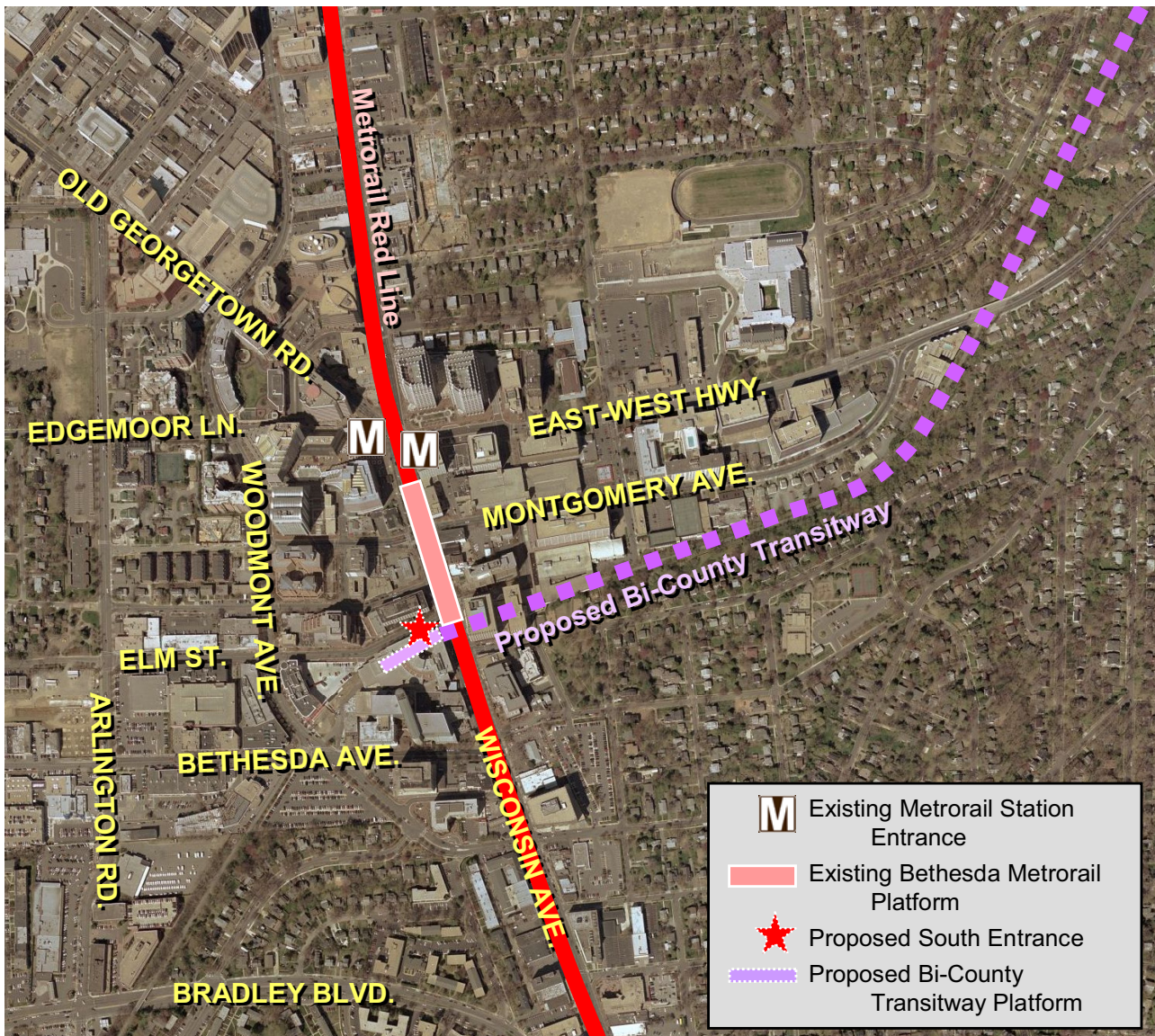
* A minimum of two elevators is recommended for redundancy.

** One additional elevator should be considered for redundancy.

INTRODUCTION

The Bethesda Metrorail Station is located in southern Montgomery County, Maryland, and serves the surrounding mix of office, retail, entertainment and residential development. The station is on Metrorail's Red Line, which operates between Shady Grove and Glenmont via downtown Washington, D.C. The Bethesda Station opened in 1984. An aerial photograph of the area is presented in Figure 1.

Figure 1: Bethesda Vicinity



In the Bethesda vicinity, the Red Line runs in a tunnel under Wisconsin Avenue, at a depth of roughly 130 feet below street level. The platform's depth poses a challenge to Metrorail passenger access.

Existing access is provided from the north of the platform, via an escalatorway connecting the station's underground mezzanine level with the bus level, about 20 feet below street level. A second, much shorter, set of escalators connects the bus level with street level, at the southwest corner of Wisconsin Avenue and Old Georgetown Road. An existing pedestrian tunnel also crosses under Wisconsin Avenue from the bus level to a second entrance point on the southeast corner of Wisconsin Avenue and East-West Highway.

A single elevator also provides access between the street and mezzanine levels. At street level, the elevator is located on the northwest corner of Wisconsin and Montgomery Avenues.

The station's bus level is mostly enclosed below a plaza and other development. It includes a bus terminal with seven bus bays serving 15 Metrobus and Ride-On bus routes, as well as the Bethesda 8 Trolley, which provides free shuttle service in the Bethesda central business district. The bus level also includes a kiss-and-ride lot with 26 parking spaces. Vehicular access to the bus bays and the kiss-and-ride lot is from the west, on Woodmont Avenue and Edgemoor Lane.

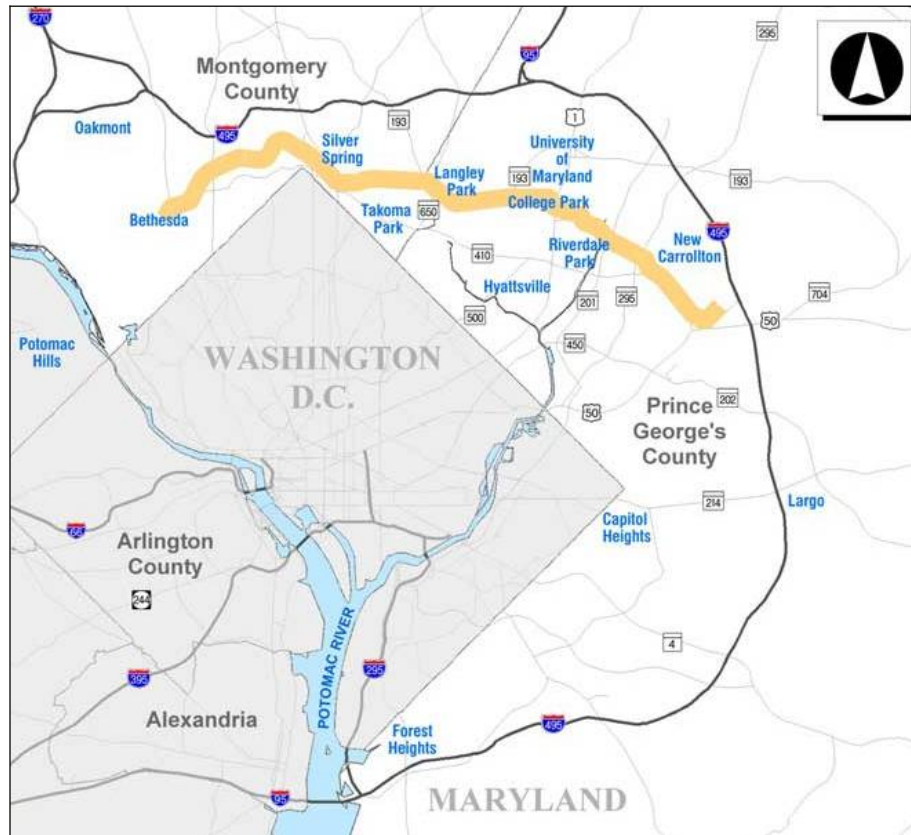
Vertical circulation between the mezzanine and center platform includes a single elevator and two escalators.

Bi-County Transitway

The proposed Bi-County Transitway would provide a high-capacity transit link between the Bethesda and New Carrollton Metrorail Stations, with stops at Silver Spring, College Park and intermediate points, as shown in Figure 2. The 14-mile route would provide direct connections between the Metrorail Red, Orange and Green Lines. Sometimes referred to as the Purple Line, the Bi-County Transitway evolved from the Capital Beltway Purple Line Study and the Georgetown Branch Transitway Study, which proposed to link Bethesda and Silver Spring on a shorter alignment.

Originally, the Georgetown Branch was established around 1900 to provide rail service between Silver Spring and Georgetown. After rail service ended, the corridor was identified as a potential transit corridor in the 1980s. Following feasibility studies, Montgomery County purchased the Georgetown Branch right-of-way in 1988. Portions of the alignment currently serve as the interim Capital Crescent Trail, a popular shared-use facility for pedestrians and bicyclists.

Figure 2: Bi-County Transitway Alignment



Source: Maryland Transit Administration

Several recent studies of the corridor have been undertaken:

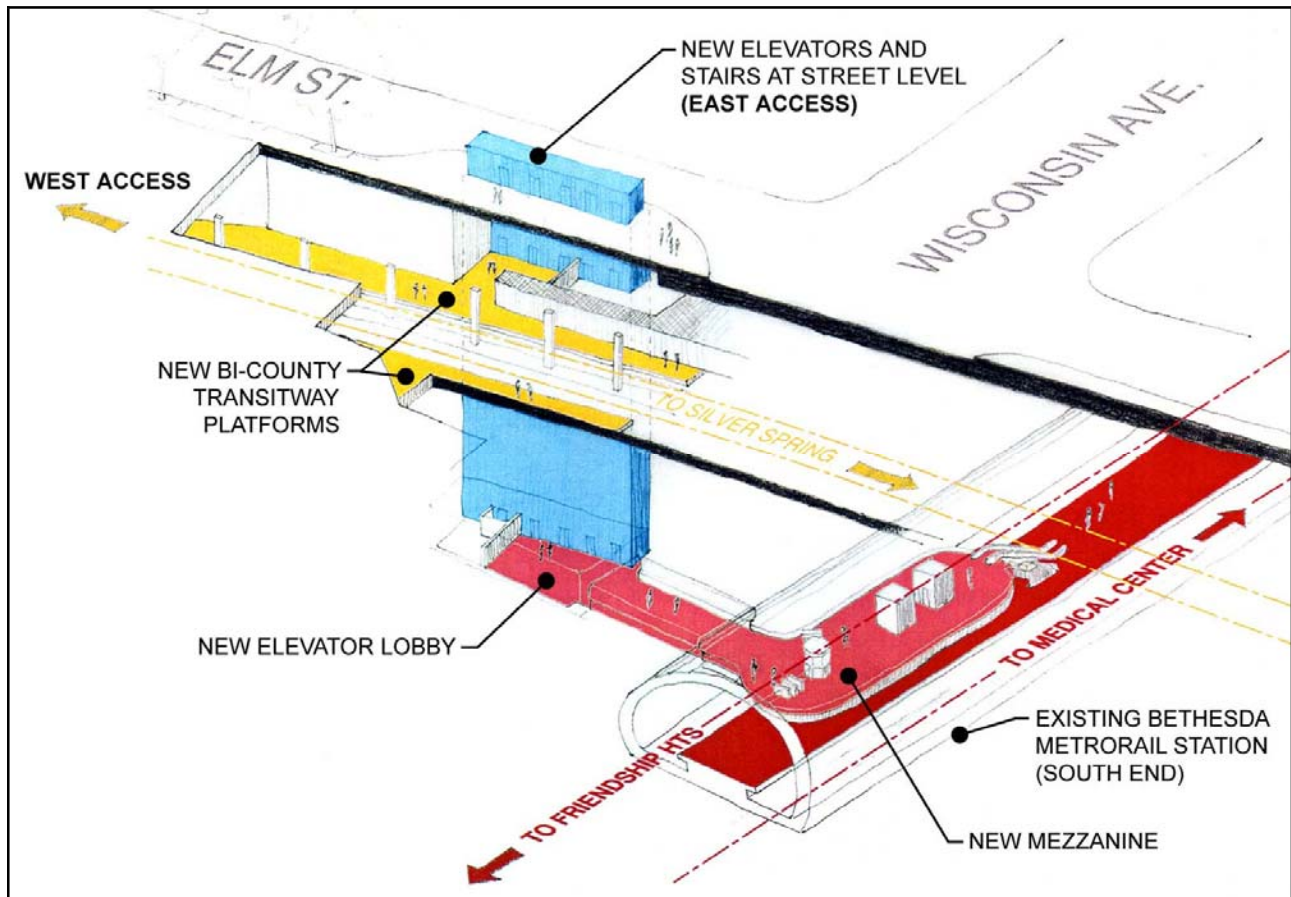
- The Georgetown Branch Transitway/Trail Major Investment Study (MIS)/Draft Environmental Impact Statement (EIS) was completed in 1996. This study considered light-rail and a busway on the 4.4-mile section of the Georgetown Branch between Bethesda and Silver Spring.
- The Georgetown Branch Transitway Terminal Stations Study was conducted by the Washington Metropolitan Area Transit Authority (WMATA) in 2001, to provide technical support to the Final EIS. The study proposed configurations for the Bethesda and Silver Spring Stations, which were considered the termini of the line at that time.
- The Maryland Transit Administration (MTA) is currently conducting the large-scale Bi-County Transitway Alternatives Analysis (AA)/EIS. MTA is looking at a variety of alternatives, including bus rapid transit (BRT) and light-rail transit (LRT); an alignment other than the Georgetown Branch right-of-way; and use of portions of existing roads for LRT.

The Bi-County Transitway's terminal station in Bethesda is proposed just west of Wisconsin Avenue and south of Elm Street. The platform would be one level below street level, as shown in

Figure 3. The Bi-County Transitway would be well above the existing Metrorail Red Line, and the platform would be near the south end of the existing Bethesda Metrorail platform.

For BRT alternatives, the transitway's Bethesda Station could also be located near the existing Metrorail Station's north entrance, in the same general vicinity as the existing bus bays.

Figure 3: Proposed Bethesda South Entrance Configuration



Source: Adapted from Georgetown Branch Transitway Terminal Stations Study Executive Summary

Figure 3 shows the Georgetown Branch Study's vertical circulation assumptions. Access to the Bi-County Transitway's Bethesda platform was proposed as a set of four elevators on the southwest corner of Wisconsin Avenue and Elm Street. The elevators would stop at the Bi-County Transitway level, 24.5 feet below street level, and would continue to the Metrorail Station, on a new mezzanine 122.5 feet below street level. This configuration would facilitate direct access to either transit route, as well as transfers between the two routes.

Because of the depth of the Metrorail platform, it was determined that escalator access to Metrorail at the south entrance would be prohibitive.

Access to the Bi-County Transitway Bethesda platform could also be provided via the existing Capital Crescent Trail to the west, which continues under the Apex Building to the intersection of Bethesda and Woodmont Avenues.

Study Purpose

The purpose of this study is to evaluate the Bethesda station facilities to determine their ability to accommodate the passenger traffic generated by the proposed south entrance and the proposed Bi-County Transitway. The following three future scenarios are considered:

- Option 1: No-build scenario, where existing transit service and infrastructure remain unchanged
- Option 2: South Entrance scenario, where no new transitway is assumed, but the south elevator access point is assumed to provide access to the Metrorail station
- Option 3: Bi-County Transitway scenario, where the transitway is assumed to be in place between Bethesda and New Carrollton, along with the new south elevator access point to serve both local and transfer access to Metrorail and the transitway

The study involved evaluation of existing and future land use, estimates of existing and future ridership levels on Metrorail and the Bi-County transitway, forecasts of new ridership generated by the south entrance, full evaluation of station features, such as elevators and fare gate aisles, and a review of the proposed station configurations for compliance with NFPA-130, the applicable transit station evacuation guideline published by the National Fire Protection Association.

Assumptions

General assumptions used throughout the study are as follows:

- Design year: 2030
- Future Red Line Metrorail service: 2.5-minute headways (24 trains per hour)
- Future Metrorail train consist: 8-car trains