

# ROUTE 40

## 2<sup>nd</sup>-Lombard to Conshohocken-Monument

### KEY SERVICE CHARACTERISTICS, ISSUES, AND OPPORTUNITIES

- *In many respects, Route 40 is two routes combined into one, with predominant ridership patterns from Wynnefield Heights to University City (including connections to the Market-Frankford Line) and between University City and Society Hill/Queen Village.*
- *Ridership is relatively high and peak period and midday service is frequent.*
- *Weaknesses include circuitous north end service, slow speeds, too many stops, missed trips, and overlap with other services.*

### ROUTE OVERVIEW

Route 40 operates between West Park and 2<sup>nd</sup> Street and Lombard Street in Center City via Wynnefield Heights, Wynnefield, Parkside, Belmont, Mantua, and University City (see Figure 1).

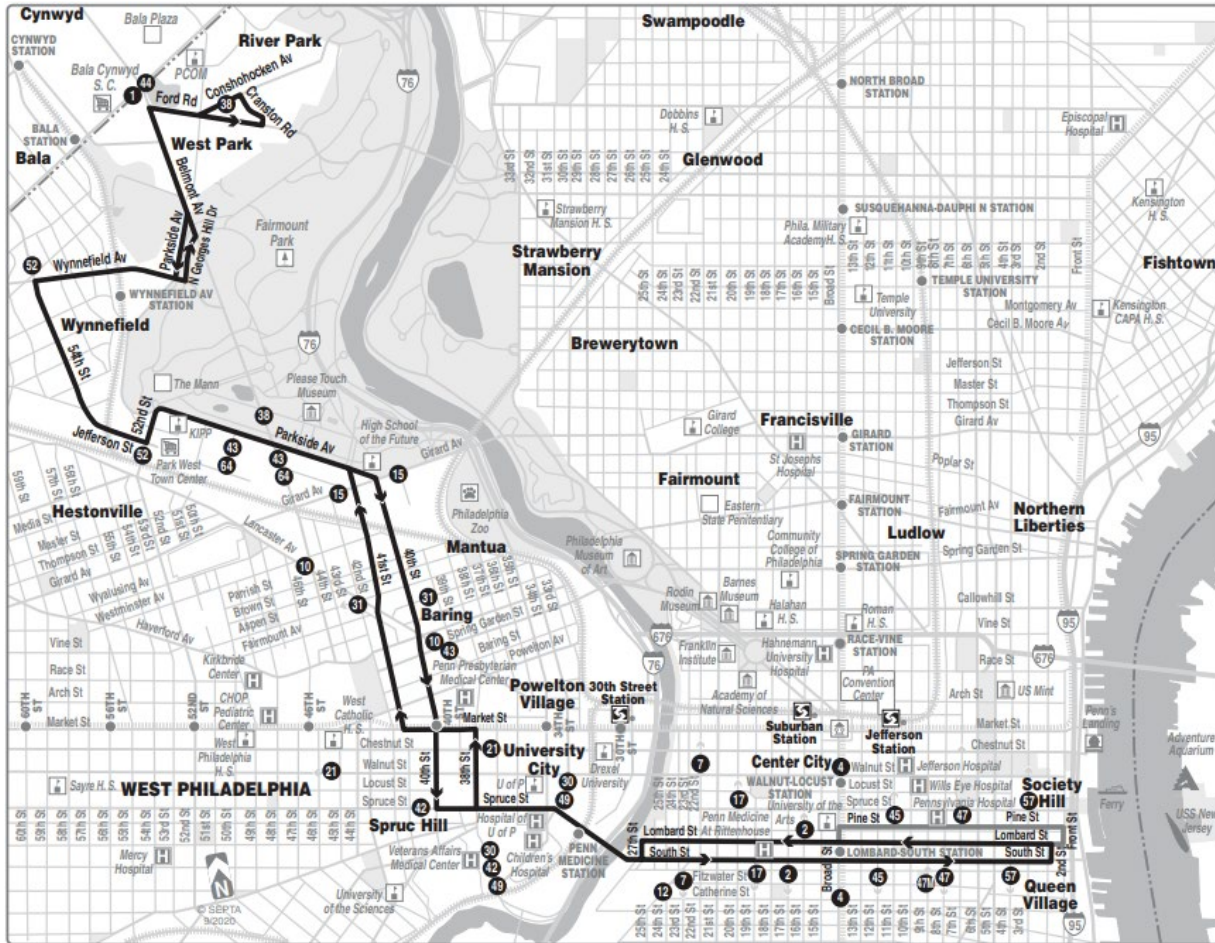
Several other routes have overlapping segments or similar service as Route 40:

- Route 38 (5th-Market to Wissahickon Transportation Center) overlaps with Route 40 in the Wynnefield Heights neighborhood and again in Mantua. Route 38 also provides service to Center City but not to University City.
- Route 52 (49th-Woodland to 54th-City or 50th-Parkside) overlaps with Route 40 in Wynnefield along 54<sup>th</sup> Street and West Jefferson Street.
- Multiple routes connect the neighborhoods of East Parkside, Belmont, and Mantua with Center City.
- Multiple routes connect University City and the Market-Frankford Line.

Other than its alignment in Wynnefield, the routing of Route 40 is direct. However, there are two areas where service is split between parallel roads. In most cases this type of operation is necessitated by one-way street patterns, but this is not the case with Route 40's split operations:

- Between Parkside Avenue and Market Street, northbound service operates on 41<sup>st</sup> Street and southbound service operates on 40<sup>th</sup> Street even though 40<sup>th</sup> Street is two-way.
- Between Market Street and Spruce Street, northbound service operates on 38<sup>th</sup> Street and southbound service operates on 40<sup>th</sup> Street even though 38<sup>th</sup> Street is two-way.

In addition, the route's alignment east of Broad Street is complicated by a weekend service pattern that puts eastbound service on Pine Street instead of South Street.

**Figure 1 | Route Map**


## SERVICE OVERVIEW

### Schedule

Route 40 operates for 21 hours a day on weekdays from 5:24 AM until 2:06 AM. On Saturdays and Sundays, it operates from 5:23 AM until 2:06 AM. On weekdays, average frequencies range from 11 to 15 minutes between 6:00 AM and 6:00 PM, and from 20 to 39 minutes at other times.

On Saturdays, service frequencies average 28 minutes during the day and 34 minutes at night. On Sundays, frequencies average 30 minutes during the day and 35 minutes at night.

**Table 1 | Schedule Statistics**

Service Day	Span Of Service	Frequency (Range)	Frequency (Average)
<b>Weekdays</b>	5:24 AM to 2:06 AM		
Early AM	5:24 AM to 5:59 AM	27	27
AM Peak	6:00 AM to 8:59 AM	6 - 25	11
Midday	9:00 AM to 2:59 PM	6 - 16	15
PM Peak	3:00 PM to 5:59 PM	8 - 14	11
Evening	6:00 PM to 9:59 PM	9 - 30	20
Late Night	10:00 PM to 11:59 PM	19 - 32	29
Owl	Midnight to 2:06 AM	33 - 45	39
<b>Saturdays</b>	5:23 AM to 2:06 AM		
Day	8:00 AM to 5:59 PM	24 - 40	28
Night	Before 8:00 AM & After 5:59 PM	29 - 45	34
<b>Sundays</b>	5:23 AM to 2:06 AM		
Day	8:00 AM to 5:59 PM	20 - 40	30
Night	Before 8:00 AM & After 5:59 PM	29 - 45	35

Note: Span of service reflects the time the first bus begins service until the time the last bus finishes service.

## Service Patterns

Route 40 operates with four service patterns (see Table 2):

- On weekdays, the first two inbound trips are short-turns that begin service at 52<sup>nd</sup> Street at Heston Street. All other inbound service operates the full length of the route along the primary alignment (shown in black in Figure 1). All outbound service operates along the primary alignment.

**Table 2 | Service Patterns**

Pattern	Origin	Destination	Unique Feature	Unique Stops	Trips Per Day		
					Wkd	Sat	Sun
<b>Eastbound</b>							
229312	Conshohocken Ave & Monument	Lombard St & 2nd St	Primary Pattern	0	72	13	13
229307	Conshohocken Ave & Monument	Lombard St & 2nd St	Weekend afternoon detour via Pine Street on Friday evenings and weekends	11	0	26	25
229310	52 <sup>nd</sup> St & Heston St	Lombard St & 2nd St	Early AM short-turns	0	2	1	1
<b>Westbound</b>							
229331	Lombard St & 2nd St	Conshohocken Ave & Monument	Primary Pattern	0	79	40	39

Note: Unique stops are those not served by the primary pattern

- On Saturdays and Sundays, the first inbound trip is the short-turn that begins service at 52<sup>nd</sup> Street at Heston Street. Subsequent inbound service through 11:30 AM operates along the primary alignment. Inbound service after 11:30 AM east of Broad Street in

Center City uses Pine Street instead of South Street to avoid weekend congestion on South Street which is narrow road lined with restaurants, bars, and retail. All outbound service operates along the primary alignment.

## RIDERSHIP

In Fall 2019, Route 40 carried approximately 7,600 passengers on weekdays, 2,900 on Saturdays, and 2,400 on Sundays (see Table 3). Based on weekday ridership, it was SEPTA's 21st highest ridership route.

**Table 3 | Fall 2019 Ridership and Productivity**

	Weekdays	Saturdays	Sundays
<b>Daily Ridership</b>	<b>7,819</b>	<b>3,010</b>	<b>2,516</b>
Rank	21	32	29
<b>Passengers per Revenue Vehicle Hour</b>	<b>51.2</b>	<b>41.4</b>	<b>37.3</b>
Rank	36	46	41

## Transfer Patterns

The largest transfer rates on Route 40 are to and from:

- The Market-Frankford Line (14.7% of all trips)
- The Broad Street Line (4.9%)
- Route 52 49th-Woodland to 54th-City or 50th-Parkside (3.2%)
- Route 10 13th-Market to 63rd-Malvern (1.7%)
- Route 15 63rd-Girard to Richmond-Westmoreland (1.6%)

Weekend transfer patterns are very similar.

## Ridership by Stop

In many respects, Route 40 is two routes combined into one, with predominant ridership patterns from Wynnefield Heights to University City (including connections to the Market-Frankford Line) and between University City and Society Hill/Queen Village. However, a large proportion of riders also ride through University City. In more detail, on eastbound trips in Fall 2019 (see Figure 2):

- The largest number of passengers – 251 – boarded at Route 40's western terminus at Conshohocken Avenue at Monument Road. This stop serves several very large residential complexes.
- Most other stops through to Market Street served 10 to 50 boardings and 50 or fewer alightings. Exceptions included:
  - 78 passengers boarded and 14 alighted at Wynnefield Avenue at Bryn Mawr Avenue. This stop is adjacent to several large residential complexes and towers.
  - 106 passengers boarded and 82 alighted at 52<sup>nd</sup> Street at Heston Street. This is a transfer point with Route 52 (49th-Woodland to 54th-City or 50th-Parkside).

**Figure 2 | Weekday Eastbound Ridership by Stop**


- 350 passengers boarded and 55 alighted at the two stops on Parkside Avenue at 51<sup>st</sup> Street and 50<sup>th</sup> Street. These stops are the closest to the Park West Town Center shopping area and a short walk to the 50<sup>th</sup> & Parkside Loop, which is served by multiple SEPTA routes.
- 130 passengers boarded and 100 alighted at Parkside Avenue at 40<sup>th</sup> Street and the next stop 40<sup>th</sup> Street at Poplar Street. This is a transfer point with Trolley Route 15 63<sup>rd</sup>-Girard to Richmond-Westmoreland.
- 122 passengers boarded and 58 alighted at 40<sup>th</sup> Street at Lancaster Avenue. This is a transfer point with Trolley Route 10 (13<sup>th</sup>-Market to 63<sup>rd</sup>-Malvern).
- The stop with the most activity was 40<sup>th</sup> Street at Market Street, which is served by the Market-Frankford Line. 137 passengers boarded and 750 alighted at this stop. An additional 245 passengers alighted at the next two stops. Seventy percent of all riders from the north alight in the vicinity of Market Street.
- Most stops between 40<sup>th</sup> & Market and the Broad Street Line served 10 to 50 boardings and between 40 and 75 alightings. Exceptions included:
  - 245 passengers alighted at the two stops on 40<sup>th</sup> Street at Chestnut Street and Walnut Street. This is a transfer point with Route 21 Penn's Landing to 69<sup>th</sup> Street Transportation Center.
  - 500 passengers boarded and 180 alighted at the three stops on Spruce Street between 37<sup>th</sup> Street and 34<sup>th</sup> Street. These are the primary stops serving the University of Pennsylvania and the adjacent hospital district.

- Once the route crosses the Schuylkill River, boardings and alightings were low until Broad Street.
- 91 passengers boarded and 243 alighted at South Street at Broad Street. This stop is served by the Broad Street Line.
- Through to the eastern terminus of Route 40, boardings rapidly declined from 24 at 13<sup>th</sup> Street to less than five east of 7<sup>th</sup> Street. Alighting activity was higher, with between 40 and 90 alightings at most stops. Exceptions include:
  - There were 103 alightings at South Street at 4<sup>th</sup> Street. This is a transfer point with Route 57 Whitman Plaza to Rising Sun-Olney or Fern Rock Transportation Center.
  - There were 170 alightings at Lombard Street at 2<sup>nd</sup> Street, Route 40's terminus.

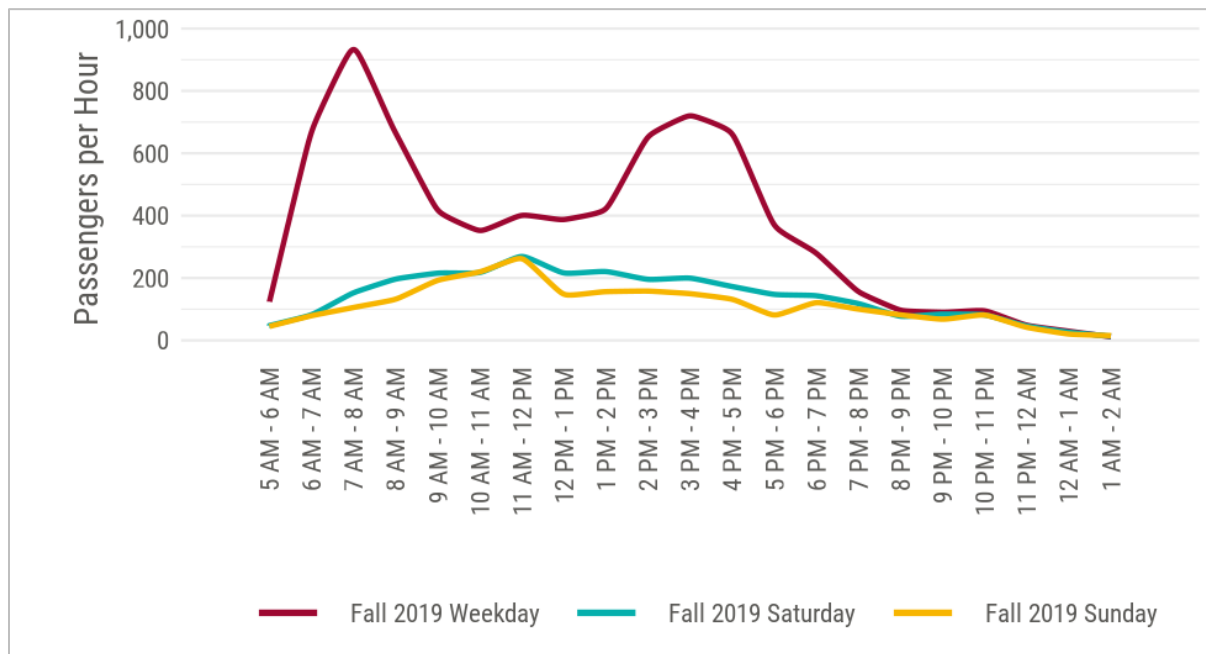
Westbound patterns generally mirror eastbound patterns. Weekend patterns are also similar but with lower volumes, especially east of Broad Street where morning eastbound trips operate on South Street and trips after 11:30 AM operate on Pine Street.

## Ridership by Time of Day

### Ridership by Hour

In Fall 2019, weekday ridership had strong peak demand (see Figure 3). Midday ridership, on a per hour basis, was generally about half as much as peak period ridership. Evening ridership was much lower fell quickly after 5:00 PM. Saturday and Sunday ridership did not exhibit peaks and gradually increased through mid-afternoon and then gradually decreased.

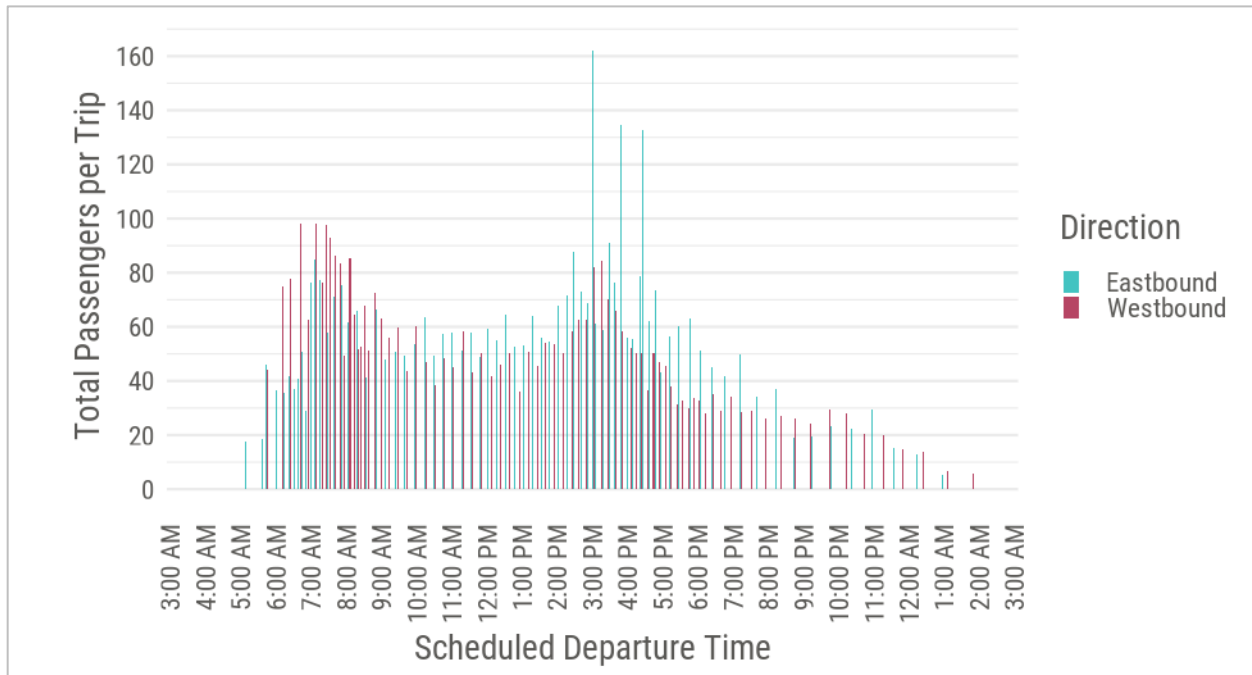
**Figure 3 | Ridership by Hour: Fall 2019**



### Ridership and Maximum Loads by Trip

In Fall 2019, weekday ridership per trip was high throughout most of the day, reflecting both strong demand and the length of the route (see Figure 4):

- Westbound trips during the AM peak and eastbound trips during the PM peak often had more than 80 passengers with some over 120. Due to turnover along the route, nearly all trips operated below standing capacity. Midday trips generally carried about 40 to 60 passengers with maximum loads of 25 to 35. Ridership increased to PM peak levels at approximately 2:00 PM, when maximum loads increased to about 35 passengers.
- In the evening, ridership decreased to around 40 riders per trip at 8:00 PM, and to 20 or less after midnight.

**Figure 4 | Weekday Ridership by Trip**


On Saturdays, ridership ramped up from less than 20 passengers on the first few trips to approximately 40 riders per trip at 8:00 AM. It increased to around 80 to 120 passengers per trip until about 5:00 PM and then declined to about 40 passengers per trip at 10:00 PM. There were fewer than 20 passengers per trip after midnight.

Sunday ridership by trip patterns were very similar to those on Saturday but with most individual trips carrying slightly lower ridership.

On all days, there is somewhat higher eastbound ridership compared to westbound, suggesting that some people use multiple routes where services overlap.

## ON-TIME PERFORMANCE AND RUNNING TIMES

### On-Time Performance

In Fall 2019, Route 40's on-time performance (OTP) was 70% on weekdays, 74% on Saturdays, and 78% on Sundays (see Table 4). Most OTP issues were due to late trips, but there were also a significant number of early trips, and the combination of early and late trips produced significant bunching problems.

**Table 4 | On-Time Performance**

	Early (>2 Mins Early)	On Time (<2 Mins Early to 6 Mins Late)	Late (>6 Mins Late )	Missed Trips
<b>Goal</b>		<b>80%</b>		
<b>Fall 2019 Actual</b>				
Weekday	11%	70%	22%	3.4%
Saturday	9%	74%	17%	1.7%
Sunday	9%	78%	13%	1.8%

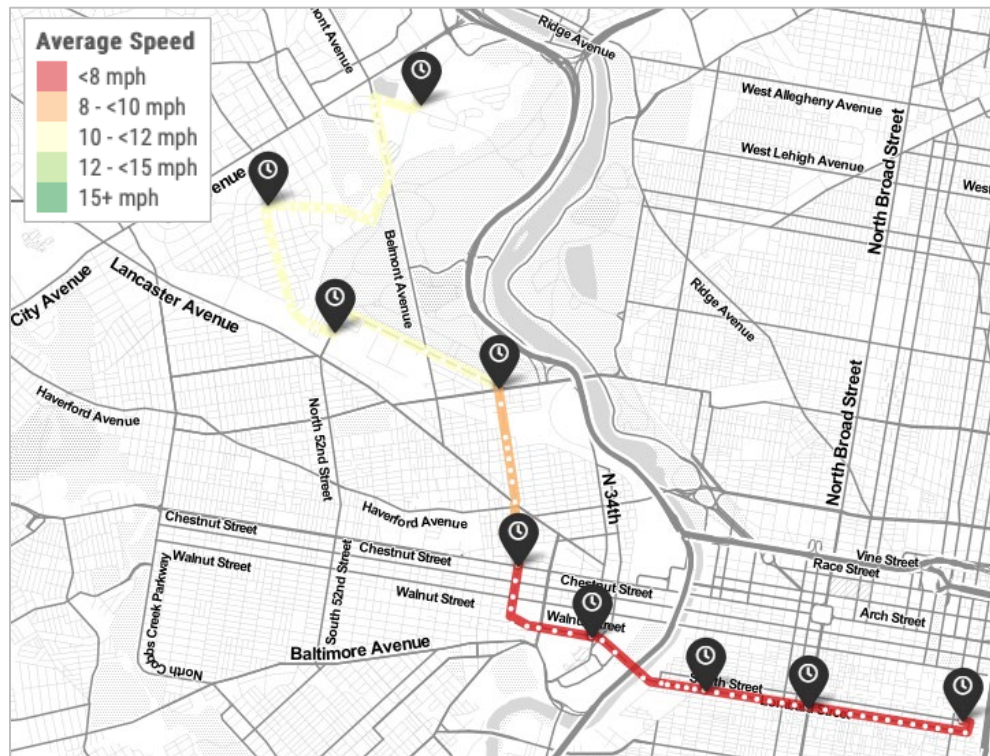
Note: On-time percentages are for trips that are run (do not include dropped trips)

Dropped trips were a significant issue for Route 40, particularly on weekdays, with 3.4% of trips not operated on weekdays, 1.7% of trips not operated on Saturdays, and 1.8% of trips not operated on Sundays.

## AVERAGE SPEEDS AND STOP SPACING

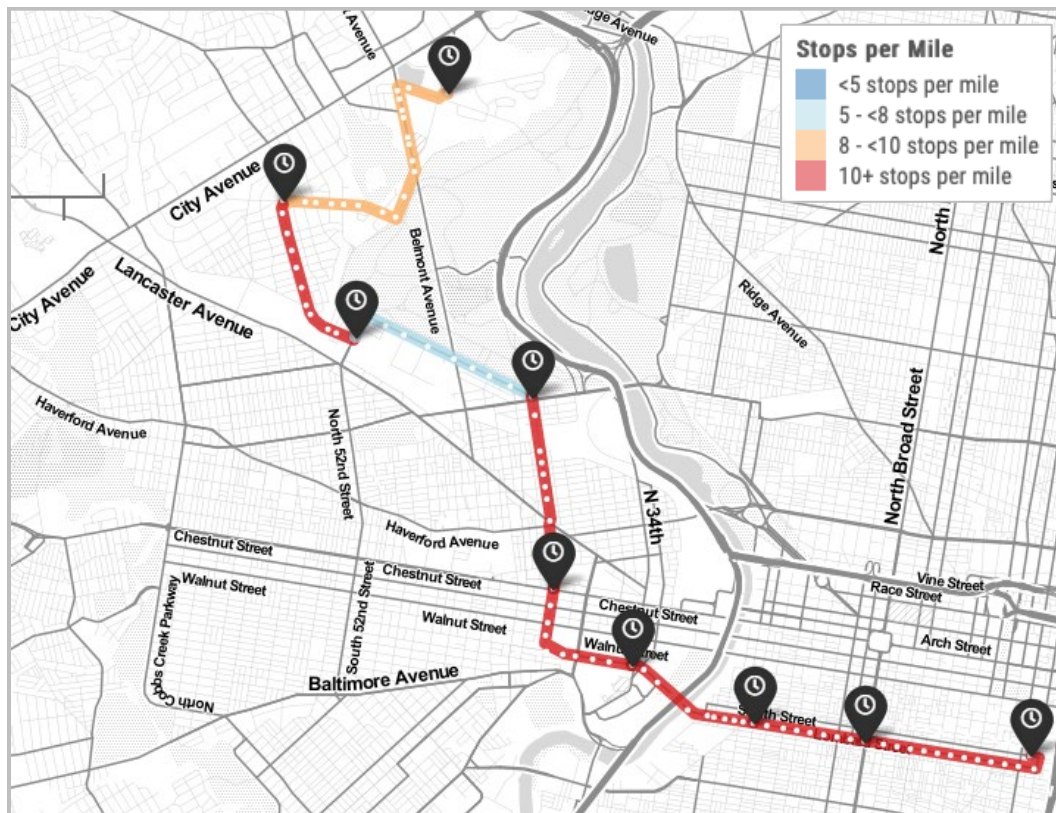
Through Center City and University City, Route 40 is a slow due to a congested operating environment and too many stops along most of its alignment. North of Girard Avenue speeds improve due to lower congestion levels.

In the fall of 2019, Route 40's overall average speed on weekdays was only 9.4 mph. This represented an average of relatively good speeds along its northern half and very slow speeds along its southern/eastern half (see Figure 5).

**Figure 5 | Average Speeds: PM Peak Eastbound**


Route 40 has an average of 11 stops per mile but even more stops per mile in some areas (see Figure 6). The segments with more than ten stops per mile mean that stops are less than 600 feet, or a two-minute walk, apart on average.



**Figure 6 | Stop Spacing by Route Segment**


## RIDER CHARACTERISTICS

Compared to the system as a whole, Route 40's riders have higher incomes, are more likely to be white, and are more likely not have a vehicle (see Table 5).

**Table 5 | Rider Characteristics**

	Route 40 Riders	Systemwide Average
Median Household Income	\$37,460	\$32,713
Share in Poverty	29%	30%
Ethnicity		
White	45%	38%
Black	43%	46%
Hispanic	6%	10%
Other	6%	7%
Without a Vehicle	49%	37%
Seniors	18%	15%
With a Disability	2%	2%

## SERVICE IMPROVEMENT OPPORTUNITIES

Opportunities to strengthen Route 40 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Split Route in University City:** Longer routes are more difficult to operate reliably because delays carry through to the end of the route and often magnify. Splitting the route in two, with the split made in University City could produce two shorter routes that would be easier to operate reliably.
- **Operate Weekday and Weekend Service Using the Same Alignment via Pine Street:** Although the eastbound change on weekends to Pine Street is on a segment where most passengers are alighting, the complexity of different patterns can still discourage ridership. Since South Street remains congested, Pine Street should be used on all days.
- **Extend Route to Wissahickon Transportation Center:** A short northward extension of Route 40 would maximize transfer opportunities for riders.
- **Adjust Service Frequencies/Upgrade to Frequent Service:** Route 40 provides frequent service (an average of every 15 minutes or better) from the beginning of the AM peak to the end of the PM peak, but with service that averages every 20 minutes the evening. In the peaks, there is excess capacity, and some peak service could be shifted to the evening to upgrade service to a 15 Max route.
- **Extend Route to Stronger Northern Terminal:** Route 40 could be extended to either City Avenue or Wissahickon Transportation Center in order to facilitate transfers to nearby crosstown services.