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memorandum

DATE: December 2022

TO: Brian Styche & Alex Sankaran, Chester County Planning Commission

FROM: DVRPC

SUBJECT: Chester County Public Transportation Plan Update

The Delaware Valley Regional Planning Commission was asked to update transit service metrics outlined in the *Chester County Public Transportation Plan*. This report documents the project team's efforts in replicating or enhancing methodology previously undertaken by Chester County Planning Commission staff in 2014.



The Delaware Valley Regional Planning Commission

is the federally designated Metropolitan Planning Organization for the Greater Philadelphia region, established by an Interstate Compact between the Commonwealth of Pennsylvania and the State of New Jersey. Members include Bucks, Chester, Delaware, Montgomery, and Philadelphia counties, plus the City of Chester, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties, plus the cities of Camden and Trenton, in New Jersey.

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Executive Summary

For over two decades, Chester County's Landscapes Comprehensive plans have remained dedicated to "balancing growth and preservation." In an effort to meet the transportation needs of new and current residents and employees, the county has committed to monitoring their efforts in expanding their transportation network and services. As of 2019, Chester County's service providers are served by Southeastern Pennsylvania Transportation Authority (SEPTA) rail and bus services, Amtrak passenger rail service, Pottstown Area Rapid Transit (PART) bus service, and the Transportation Management Association of Chester County (TMACC) bus service (Coatesville Link and SCCOOT).

The purpose of this study is to assist Chester County in updating their *Chester County Public Transportation Plan*, specifically, the bus and rail route map (on page 14 of the *Chester County Public Transportation Plan*) and *Measuring Success Metrics* (page 23). The revised map offers a comprehensive illustration of Chester County's current transportation system. Chester County relies on a set of criteria outlined in *Measuring Success Metrics* to evaluate improvements to their transportation service and network: Parking Availability, Bus Routes & Stops, Land Use, Transit Amenities/Reliability, Subsidy, Ridership and Mode Share. This memo provides details of the DVRPC project team's efforts in replicating the methodology in generating the previously listed criteria. Sources are cited throughout the report to assist the county in replicating these calculations for future *Chester County Public Transportation Plan* updates. A primary part of the project is data collection, therefore DVRPC shared with Chester County a zipped folder containing the data outlined in the methodology analysis by transit agency. All the data necessary to replicate the methodology is in this folder.

¹ <u>Landscapes3 Chester County Comprehensive Plan</u> pg 10

² The *Measuring Success* metrics specified on page 26 of the *Chester County Public Transportation Plan* have been updated to meet 2019 pre-pandemic numbers. In some instances, where 2019 data is unavailable due to the pandemic or service transfers, data from the nearest year is supplemented. The RideGuide map on page 16 is updated to 2021 service.

³ Chester County Public Transportation Plan

Chapter 1: Background

As an element of Chester County's *Landscapes2*,⁴ Chester County Planning Commission and the Delaware Valley Regional Planning Commission (DVRPC) prepared a *Chester County Public Transportation Plan* in 2014.⁵ The intention of this memorandum is to offer an update of current public transit service conditions and guidance for transit agencies and local governments in Chester County. In Chester County's following comprehensive plan, *Landscapes3 Connect*⁶ identifies several recommendations to advance mobility throughout the county. DVRPC's memorandum helps to address recommendation 5 to promote buses within the growth areas and recommendation 6 to expand regional rail service by conducting an overview of existing service.

Chester County Planning Commission proposed that DVRPC assist in updating tables in the *Chester County Public Transportation Plan* to reflect operating changes since 2014. This report updates the data and data sources relative to the performance measures for current conditions and the future plans of Chester County's transit service providers, which have changed significantly in the past 8 years. This revision is also intended to support Chester County in assessing if the county reached their performance benchmarks. The project team worked closely with Chester County planning staff to ensure that the work is comprehensive and meets their goals for this project. The content of this memo focuses on documenting the methodology and results of these updates⁷ so that the process can be replicated in future updates. The methodology used in this update builds on the procedure depicted in the *Chester County Public Transportation Plan*.

⁴ <u>Landscapes2 Chester County Comprehensive Policy Plan</u>

⁵ Chester County Public Transportation Plan

⁶ <u>Landscapes3 Connect</u>

⁷ Chester County Transportation Plan, page 23 of Chester County's Transportation Plan along with the Chester County Ride Guide map on page 14

Chapter 2: Data Gathering & Methodology

The methodology outlined in this report is used by Chester County to gauge how the transportation system has improved since the last comprehensive plan, *Landscapes2*. The *Chester County Public Transportation Plan⁸* offers a comprehensive map of Chester County bus and rail transit services as well as a chart highlighting transit system services, commodities, ridership, subsidies, and on-time performance. For the purpose of this memo, the project team split the map into two (see Appendix A), one reflecting rail services and the other bus services. Due to the ongoing pandemic, which has skewed current public transportation ridership, Chester County requested the use of 2019 data when available⁹ for this analysis. If there was no recent data available the project team supplemented data from Chester County's 2018 vehicle miles analysis. At the start of DVRPC's work in FY2022, Chester County shared this analysis as a guide and reference. When there was a significant change and a dataset was unavailable DVRPC staff manually added data. In the case that 2019 data is not used it will be explicitly stated.

Chester County's passenger transportation system is composed of Southeastern Pennsylvania Transportation Authority (SEPTA) rail and bus services, Amtrak passenger rail service, Pottstown Area Rapid Transit (PART) bus service, and the Transportation Management Association of Chester County (TMACC) bus service (Coatesville Link, and SCCOOT). The Delaware Authority for Regional Transit (DART) and Upper Merion Rambler expands the region's transportation system and is connected to Chester County's system. The Greater Valley Forge Transportation Management Association (GVFTMA) provides services just north of Chester County in Montgomery County. The project team utilized publicly available information and files to acquire data, such as ridership reports, survey results and census data. In addition, each of the above organizations were asked by email and phone for relevant 2019 shapefiles, ridership data and subsidy data by route for transit services located in Chester County. Chester County provided a sample spreadsheet from their 2013 data collection for the DVRPC project team to base our methodology on, as well as a spreadsheet example for the vehicle miles calculations. ¹¹ In addition, DVRPC was encouraged to use higher quality data or methodology where feasible.

Table 1 is a table of the information that Chester County requested to be updated for this project. It is a summary of all the data, and subsequent sections will explain the methodology and data sources for each of the inputs listed in Table 1.

⁸ Chester County Public Transportation Plan

⁹ Because the former Krapf A, now SEPTA Route 135, service was transferring between ownership at this time, limited data is available.

¹⁰ Transit Vehicle Miles from Chester County (2018)

¹¹ The Chester County Public Transportation Plan Methodology spreadsheet from 2018 reflects calculations from 2013 and 2018 updates. The second document is referred to as the 2018 Vehicle Miles spreadsheet through the memo.

Table 1: Chester County Transportation Service Summary

	Category	2014	2019
	Rail stations	12	12
	Rail stations with more than 90% utilization	7	9
Station Parking availability	Total spaces—all stations	3305	3491
	Parking utilization to rail boardings ratio	55%	49%
	Total bicycle parking spaces at rail stations	48	75
	Bus stops	847	867
	Bus Routes	16	15
Bus Routes and Stops	Percent of bus stops with more than 5 boardings, with shelters	23% (27/116)	25% (29/118)
	Percent of bus stops with shelters	6% (50/847)	9% (79/867)
	Percent of bus stops with pedestrian connections	46% (390/847)	46% (397/867)
	Percent of growth area municipalities (54) served by transit	76% (41)	76% (40)
Land use	Percent of growth area municipalities (54) served by transit, with transit related ordinances	56% (23)	78% (32)
	Service providers	5	4
Transit amenities &	Service providers with real time info	2	2
Reliability	Service providers with cashless payment	2	3
	Average on-time performance	78%	83%
Ridership	Annual ridership—bus	1,440,950	1,260,427
Mucromp	Annual ridership—rail	3,310,965	3,024,150
Mode share	Percent of workers using public transit	2.90%	2.61%
modo Silai 6	Private shuttle ridership	N/A	N/A

SEPTA(2019-20); Amtrak (2018-19); TMACC(2018-19); PART(2019, 2021); DVRPC (2022)

Transit Amenities & Reliability

As of 2019, Chester County is served by four transit providers, SEPTA, TMACC, PART, and Amtrak, that provide a combination of bus and rail services. The former Krapf A line is now operated by SEPTA as Route 135. Table 2 shows the data collected for transit service amenities and on-time performance. Three of the agencies (Amtrak and SEPTA, TMACC) provide an option for cashless payment. According to the data collected, since 2014, overall on-time performance has improved by 4% across transit service.

Table 2: Transit Amenities & Reliability

Data	2014	2019	Agency
Service providers	5	4 ¹²	SEPTA, TMACC, PART, Amtrak
Service providers with real time info	2	2	SEPTA
Service providers with cashless payment	2	3	SEPTA, TMACC, Amtrak
Average on-time performance	78%	83%	SEPTA, TMACC, Amtrak, PART

Source: SEPTA Route Statistics; Pottstown¹³⁻¹⁴; Via Amtrak and TMACC email

 $^{^{12}}$ Due to the transfer of Krapf A Line, now Route 135, Krapf no longer directly services the county.

¹³ PART services are monitored through spot checks rather than an intelligent transportation system.

¹⁴ On-time performance for PART, Amtrak and TMACC services were provided via email.

Rail Parking Availability

One method of accessing rail stations in Chester County is to drive and park a vehicle at a facility and board the train. Depending on the station there is daily parking, permit or monthly parking, and structured parking. All vary in cost.

Table 3 summarizes the parking availability and utilization in Chester County using information and data from Amtrak, DVRPC and SEPTA. SEPTA provided parking utilization rates from 2018 and 2021. DVRPC used this combined with Amtrak's website and DVRPC's Park and Ride Origins online map to compile the data below.

Table 3: Rail Parking Availability and Utilization

Data	2014	2019 ¹⁵	Agency
Rail stations	12	12	SEPTA, Amtrak
Total spaces—all stations	3305	3491	SEPTA, Amtrak
Rail stations with more than 90% utilization	7	10	SEPTA, Amtrak
Parking utilization to rail boardings ratio	55%	49%	SEPTA, Amtrak
Total bicycle parking spaces at rail stations	48	75	SEPTA, Amtrak

Sources: SEPTA Parking Utilization (2018), DVRPC Park and Ride Passenger Origins Online (2022), Amtrak website (2022), via Chester County

Bus Routes and Stops

A central part of Chester County's transportation network are the bus routes that carry passengers to reach major employment centers and destinations within and outside of the county (See Table 4). In addition, understanding the amenities that exist to make safe connections and comfortable waiting times are relevant to be able to make recommendations for enhancements along the routes and at stops. This data was compiled using information collected by Chester County and SEPTA's bus stops and routes shapefile.

Table 4: Bus Routes and Stops

Data	2014	2019 ¹⁶	Agency
Bus stops	847	867	SEPTA, TMACC, PART
Bus Routes	16	15	SEPTA, TMACC, PART
Percent of bus stops with more than 5 boardings, with shelters	23% (27/116)	25% (29/118)	SEPTA, TMACC
Percent of bus stops with shelters	6% (50)	9% (79/867)	SEPTA, TMACC
Percent of bus stops with pedestrian connections	46% (390)	46% (397/867)	SEPTA, TMACC

Sources: Chester County Bus Stops Shapefile (provided to DVRPC 2022), SEPTA Spring 2020 Stops by Route (2020)

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¹⁵ Data is primarily from 2019, but when this was not available 2018 or 2021 data sets were used.

¹⁶ Features data from multiple years.

Land Use

In the *Chester County Public Transportation Plan*¹⁷ and later *Landscapes3*, Chester County identifies 54 growth area municipalities, defined as municipalities located in areas designated by the county as urban, suburban, and rural centers. Table 5 reflects that the number of growth area municipalities served by transit remained the same between 2014 and 2019.

Not all of these municipalities have specific information about transit in their local ordinances. However, DVRPC staff reviewed current zoning ordinances and found between 2014 and 2022, there has been a substantial increase in the number of municipalities enacting transit-related ordinances. Detailed information about this can be found in Appendix A.

Table 5: Land Use

Data	2014	2022	Agency
Percent of growth area municipalities (54) served by transit	76% (41)	76%(40)	SEPTA, TMACC, PART, Amtrak
Percent of growth area municipalities (54) served by transit, with transit related ordinances	56% (23)	78%(32)	SEPTA, TMACC, PART, Amtrak

Source: Chester County Public Transportation Plan; Landscapes3 Chester County Comprehensive Plan (2018)

Ridership

The goal for this section is to identify bus and rail ridership within Chester County, shown in Table 6. Available stop-level ridership data for Amtrak rail services and SEPTA bus/ rail services is collected and shared with DVRPC. However, the other services only provided a static ridership number for the entire route, making it difficult to accurately factor within the county only. A formula was created where the percentage of the route within the county is equivalent to the percentage of total ridership within the county. For example, if 30% of the route is within Chester County, and the ridership for the total service is 100, ridership within the county is assumed to be 30. The method assumes the same ratio of route miles and ridership throughout a route. Table 6 summarizes annual ridership by bus and rail service.

Table 6: Ridership within Chester County

Data	2014	2019	Agency
Annual ridership—bus	1,440,950	1,260,427 ²⁰	SEPTA, TMACC, PART
Annual ridership—rail	3,310,965	3,024,150	SEPTA, Amtrak

Sources: See Table 11; SEPTA, Amtrak, TMAAC, PART (2018 and 2019, 2021)

¹⁷ Chester County Public Transportation Plan

¹⁸ Landscapes 3 Chester County Comprehensive Plan pg30

¹⁹ Growth Area Municipalities were calculated by the county in *Landscapes3*

²⁰ 2019 Bus Ridership declines due to differences in data sourcing from the original 2014 data. Ridership reported for Line 135, formally Krapf A, significantly decreased after transferring to SEPTA. Additionally, PART only collects boardings rather than ons and offs, or ridership.

The following bulleted section provides brief notes on how ridership was given to DVRPC for the purposes of this project, further detailed in Table 6.

- SEPTA SEPTA ridership sent directly from SEPTA via email.
- TMACC TMACC ridership (Coatesville Link and SCCOOT) was shared with the county by email.
- PART PART does not collect total ridership; the numbers shown in each table in this section reflects boardings only. Only a small percentage of the Green and Orange Lines are located within Chester County. For this reason, the project team feels comfortable assuming that 17.8% is within the county.
- Amtrak Publicly available Amtrak stop level-ridership data is used for the Keystone service.

Table 7: Ridership Data Source

Org.	Туре	Year	Source
SEPTA	Bus; Rail	2019	Daily Average Weekday Ridership by Bus Stop; SEPTA's 2019 Route Statistics - Daily Average Weekday Ridership by Service
TMACC	Bus	2019	Received directly from TMACC via email
PART	Bus	FY 2018-19	FY 18-19 Boardings Statistics ²¹ - Received via email
Amtrak	Rail	2019	Amtrak fact sheet: Keystone service by Stop

Sources: SEPTA, Amtrak, TMAAC, PART (2018 and 2019)

Mode Share

According to the Census Transportation Planning Products Program, the percent of workers using transit decreased in Chester County (See Table 8).

Table 8: Mode Share

Data	2014	2019	Agency
Percent of workers using public transit	2.90%	2.61%	All
Private shuttle ridership	N/A	N/A	All

Source: 2019 ACS 1-Year Estimates (Table S0802)

 $^{^{\}rm 21}$ PART stores boardings rather than ridership

Chapter 3: Supplementary Data

This section outlines data collected by the project team to replicate the subsidy data analysis process conducted in the *Chester County Public Transportation Plan*.²² Although subsidy is not calculated here, the project team collected the relevant data to do so, and it is included in this report in case it can be useful for future efforts or to understand the methodology behind the 2014 process.

Vehicle Miles & Trips

Vehicle miles is the total distance traveled by each rail or bus service within the county. Chester County's 2018 Vehicle Miles Spreadsheet determines daily vehicle weekday miles by multiplying the distance traveled in one trip by the number of trips taken by each unique route variation, trip, or subroute. In this case, trips (also called subroutes for the purposes of this memo) are the variations in each transit service schedule within the same service line.²³

Amtrak, PART and TMACC daily vehicle miles are calculated by multiplying 2018 one-trip distance (miles) by 2019 service schedule's subroutes. ²⁴ The trips are calculated by tabulating all scheduled services, including subroutes. When comparing 2018 and 2019 schedules the subroutes route distances are similar.

Similar to the three other service providers in Chester County, the team determined there were negligible differences between most of the route patterns between 2018 and 2019. However, for subroutes that did change drastically (Routes 92, 104, 120, & 124), SEPTA's Bus schedules shapefile was used to approximate the distance. Table 9 lists a source, year and transit type necessary to calculate vehicle miles for each transportation organization in Chester County.

Table 9: Transit Vehicle Miles Data

Daily Vehicle Miles in Chester County	Summary	Org.	Туре	Year	Source
5,198	SEPTA	SEPTA	Bus & Rail	2018; 2019	Chester County Vehicle Miles; SEPTA Schedule Wayback Machine Archives; Septa Route Patterns shapefile
878	TMACC	TMACC	Bus	2018	Chester County Vehicle Miles via email; TMACC Schedule
85	PART	PART	Bus	2018; 2021	Chester County Vehicle Miles via email; PART Schedule
994	Amtrak	Amtrak	Rail	2018; 2019	Chester County Vehicle Miles via email; KeyStone Service Timetable

Source: Chester County (2018); SEPTA, Amtrak, TMAAC, PART(2019-2021)

²² Chester County Public Transportation Plan

²³ To calculate trips the Chester County's original *2018 Transportation Plan Methodology* spreadsheet employs several methods for calculating trips. This was simplified with Chester County. In this memo, trips refers to the number of route variations.

²⁴ 2019 subroute must align with subroute/distance columns in the *2018 Vehicle Miles* spreadsheet to calculate vehicle miles. These transit services do not house route pattern/variation shapefiles.

Outlying Factor

The methodology detailed above was selected by the project team as the best method. Before coming to that conclusion, alternative methods were tested to determine SEPTA's vehicle miles for bus and rail services. SEPTA's annual Route Statistics report includes annual vehicle miles driven, in contrast to daily vehicle miles as specified in the previous report and spreadsheets. Rather than calculating daily vehicle miles from this static number, the project team chose to maintain the county's original methodology.

Full Cost

For the purpose of this memo, full cost is assumed to refer to fully allocated costs by operator. This data was intially collected through email and service websites to help calculate subsidy by service. The sources for each shown in Table 10 organized by year, transit type and transit organization.

Table 10: Full Cost Data

Full Cost of Full Route	Org.	Туре	Year	Source
\$87,749,888	SEPTA	Bus & Rail	2019	Annual Route Statistics
\$1,232,468	TMACC	Bus	2019	Received directly from TMACC via email
\$2,281,411	PART	Bus	2018	2018 FS Urban Operating Assistance 0619.pdf (pg9)
\$52,977,735	Amtrak	Rail	FY2020	FY 2020 Annual Operations Report

Source: SEPTA, Amtrak, TMAAC, PART(2018-2021)

Passenger Revenue

The purpose of this section is to describe how the project team compiled transit passenger revenue from the sources listed in Table 11. SEPTA summarizes their data by calendar year. PART and Amtrak collect their data by fiscal year rather than by calendar year. 2019 passenger revenue is calculated by summing total revenue from the third and fourth quarter of PART's FY 2018-19 and the first and second quarter of FY 2019-20.

Table 11: Passenger Revenue Data

Passenger Revenue of Full Route	Org.	Туре	Year	Source
\$32,771,132	SEPTA	Bus & Rail	2019	Annual Route Statistics
\$145,820	TMACC	Bus	2019	Received directly from TMACC via email
\$279,470	PART	Bus	FY 2018- 19	FY 18-19 Statistics - Received via email
\$40,868,700	Amtrak	Rail	FY 2018-19	Pennsylvania Public Transportation Performance Report (pg 2020)

Source: SEPTA, Amtrak, TMAAC, PART(2018-2019)

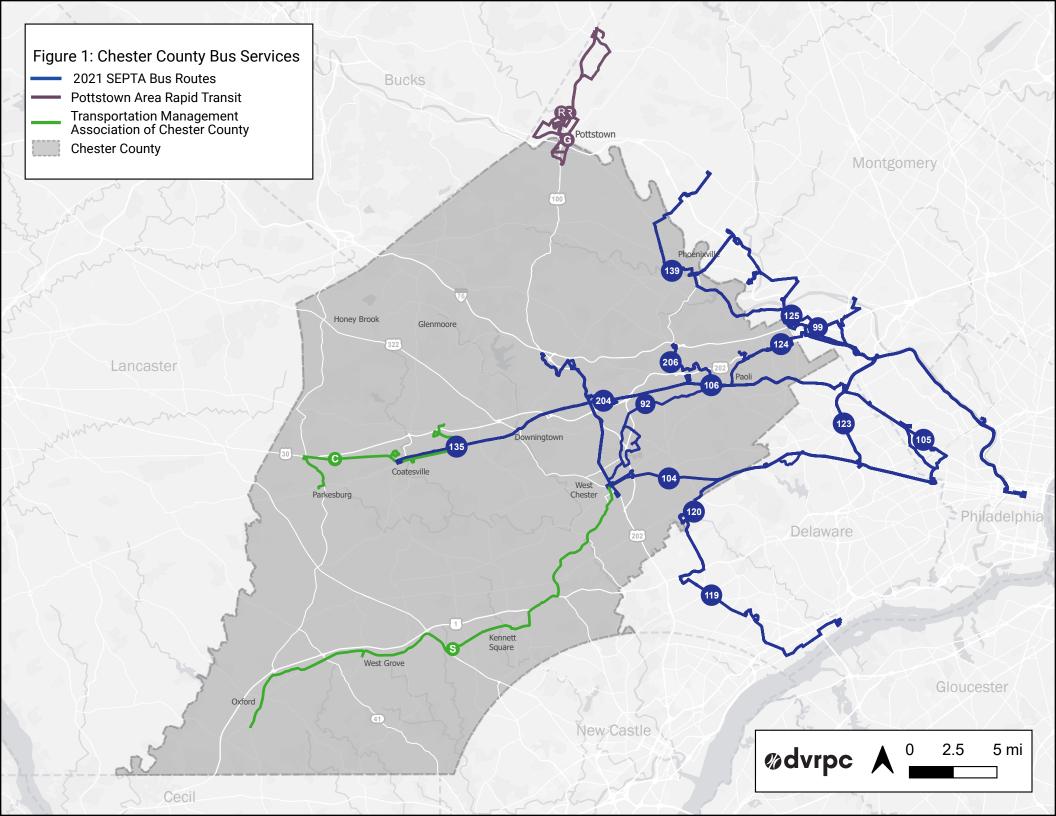
Next Steps

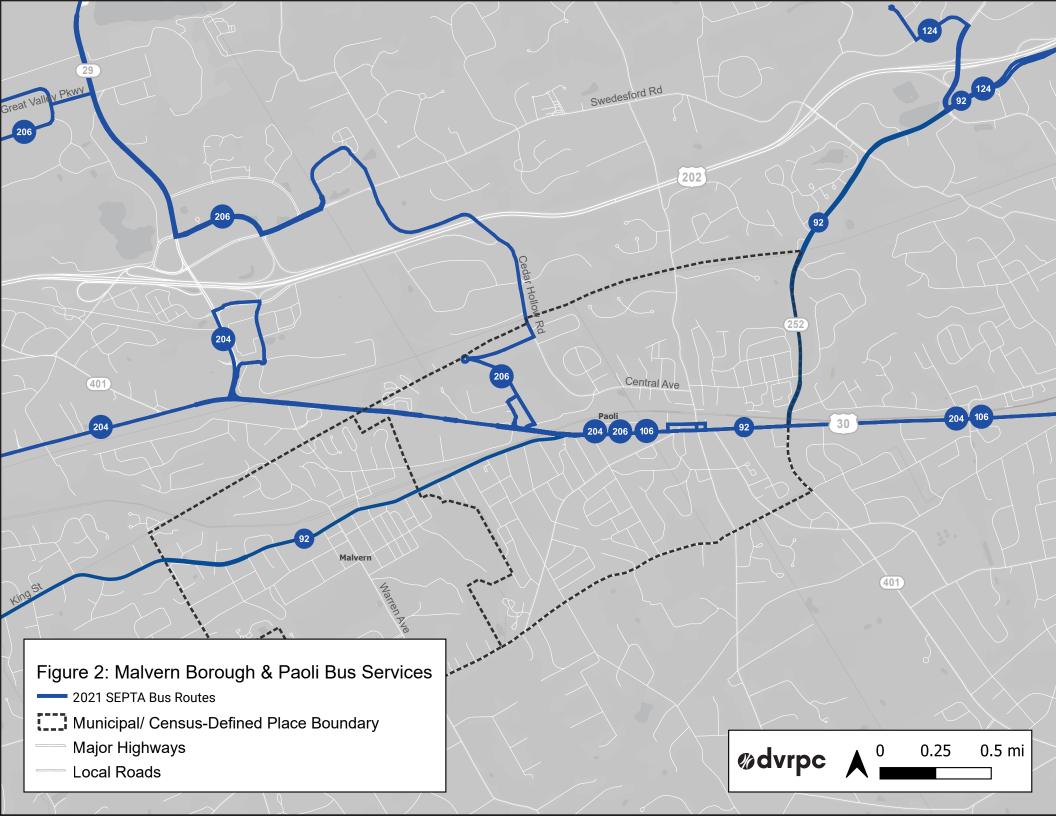
Chester County will be continuing to update their *Chester County Public Transportation Plan* in 2022-23 based on the results of this memo in Phase 2. DVRPC will participate as a stakeholder in this future endeavor as needed.

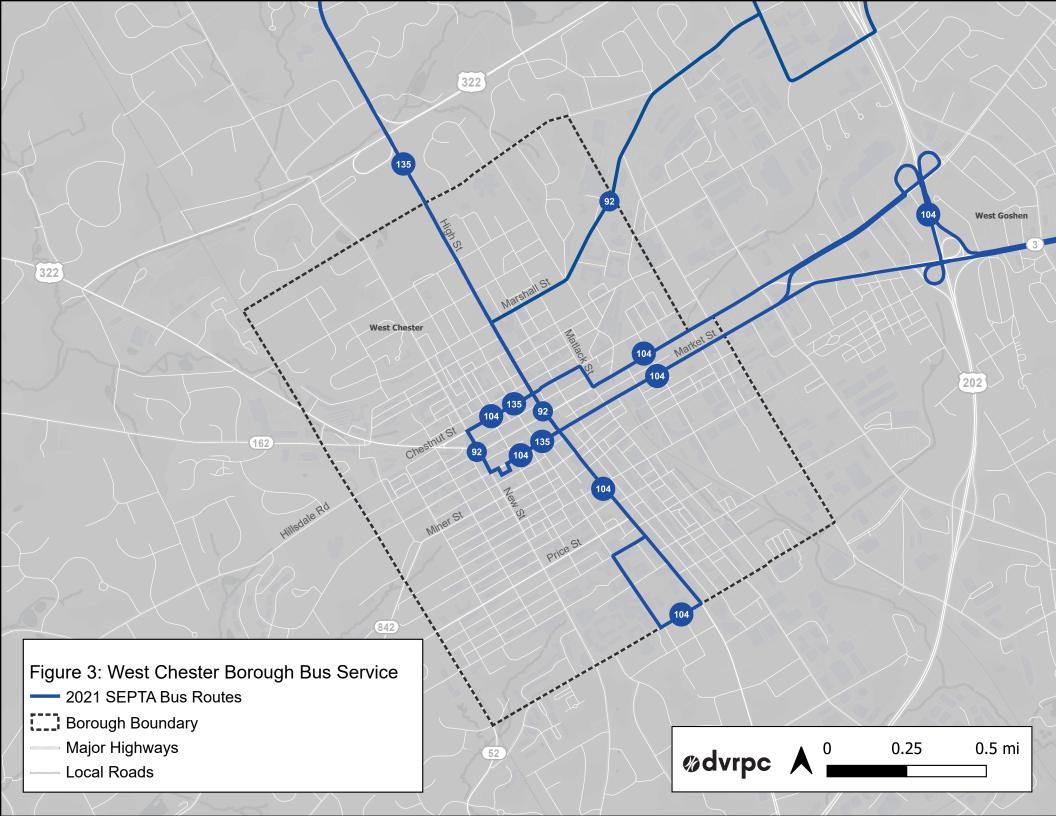
Appendix

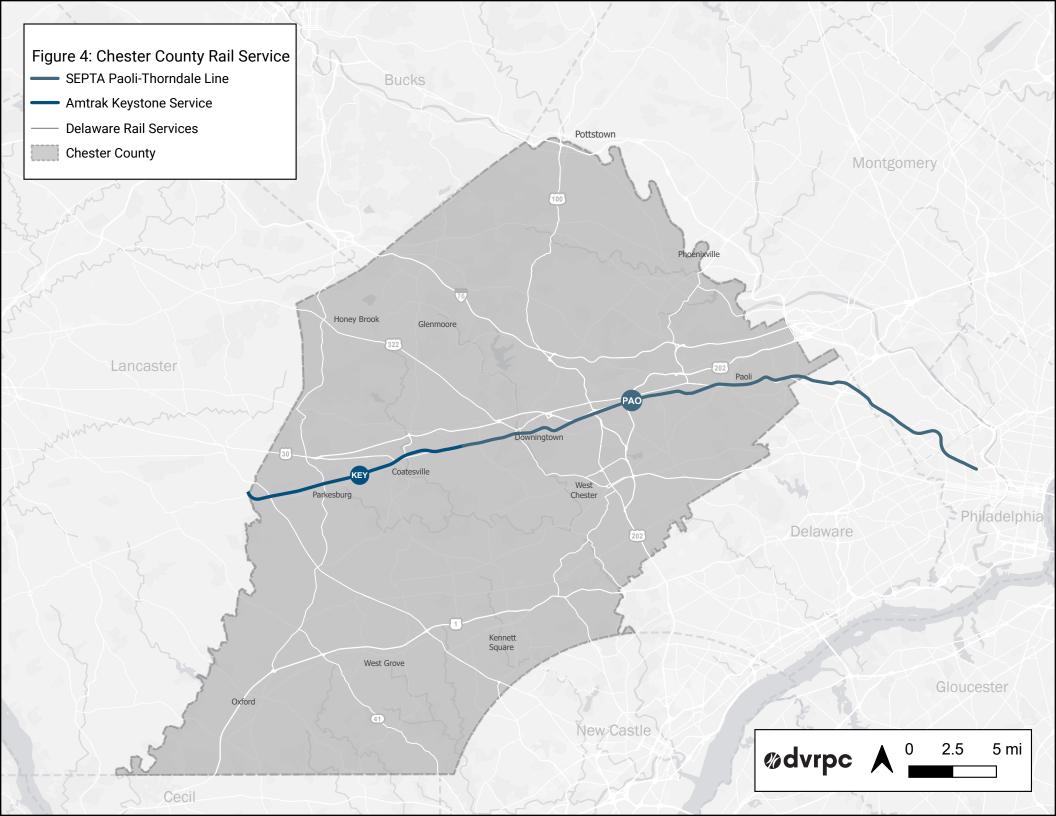
The *Chester County Public Transportation Plan*²⁵ offers a comprehensive map, called the RideGuide, of Chester County bus and rail transit services. For the purpose of this memo, the project team split the map into two, one reflecting rail services and the other bus services. This map refers to transit services available as of 2021.

²⁵ Chester County Public Transportation Plan









Chester County Public Transportation Plan Update

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Chester County; Landscapes2; Transit; Bus Services; Rail Services; SEPTA; Pottstown PART; Transportation Management Association of Chester County; TMACC; SCCOOT; Coatesville Link; Amtrak; Ridership; Land use; Mode Share; Rail Parking; Transit Amenities; Transit Reliability

Abstract:

The Delaware Valley Regional Planning Commission was asked to update transit service metrics outlined in the *Chester County Public Transportation Plan*. Updating the metrics to reflect 2019 pre-pandemic service levels allows the county to monitor progress in achieving goals also outlined in the comprehensive plan. This report documents the project team efforts in replicating or enhancing methodology previously undertaken by the county.

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