



NEEDS *and*
OPPORTUNITIES STUDY
for the
R5 EXTENSION
West of Thorndale



Delaware Valley
Regional Planning
Commission

2006

NEEDS *and*
OPPORTUNITIES STUDY
for the
R5 EXTENSION
West of Thorndale

9006

R5 Thorndale
LOCAL

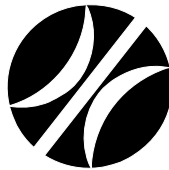
SEPTA



Delaware Valley
Regional Planning
Commission

2006

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty, and intercity agency that provides continuing, comprehensive, and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.



The DVRPC logo is adapted from the official seal of the Commission and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River flowing through it. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey. The logo combines these elements to depict the areas served by DVRPC.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) The Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for this report's findings and conclusions, which may not represent the official views of policies of the funding agencies.

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. DVRPC's website may be translated into Spanish, Russian, and Traditional Chinese online by visiting www.dvrpc.org. Publications and other public documents can be made available in alternative languages or formats, if requested. For more information, please call (215) 238-2871.

TABLE OF CONTENTS

	EXECUTIVE SUMMARY.....	1
1.0	INTRODUCTION.....	3
2.0	STUDY AREA ANALYSIS.....	7
2.1	General Service and Station Level Characteristics.....	7
2.2	Municipal Station Area Plans.....	11
2.3	License Plate Survey and Station Shed Profile.....	13
2.4	Year 2020 Ridership Forecast for New Riders at Atglen, Parkesburg, and Coatesville.....	16
2.5	Financial Estimates for SEPTA Regional Rail Service To Atglen.....	20
2.5.1	Capital and Infrastructure Costs.....	20
2.5.2	Annual Operation and Maintenance Costs.....	21
2.5.3	Farebox Recovery.....	23
3.0	IMPLEMENTATION OPTIONS.....	27
3.1	Policy Course 1: Maintenance and Preservation of the System.....	27
3.2	Policy Course 2: Pursue Capital Investments to Extend R5 Service..	28
3.3	Comments and Next Steps.....	29

LIST OF TABLES

Table 1	SEPTA Weekday Inbound Boards by Station.....	7
Table 2	Amtrak Weekday Inbound Boards by Station.....	7
Table 3	Weekday Parking Supply and Use by Station.....	8
Table 4	SEPTA and Amtrak Weekday Inbound Trips and Peak Fare by Station.....	9
Table 5	Summary of Address Matching by Station.....	14
Table 6	Summary Forecast Population Change by 2005 Shed Boundaries...	15
Table 7	Infrastructure Needs/Costs for Service Extension to Atglen.....	20
Table 8	Annual Operations Costs for Extended Service Scenarios to Atglen. Farebox Recovery with Forecast Ridership for Western Service Scenarios.....	23
Table 9	Required Ridership to Meet Farebox Recovery Benchmarks.....	25
Table 10	Required Ridership to Meet Farebox Recovery Benchmarks.....	25
Table 11	Parkesburg 80% Ride Shed Demographics by MCD	A-1
Table 12	Thorndale 80% Ride Shed Demographics by MCD	A-5
Table 13	Downingtown 80% Ride Shed Demographics by MCD	A-9
Table 14	Whitford 80% Ride Shed Demographics by MCD	A-13
Table 15	Exton 80% Ride Shed Demographics by MCD	A-17

LIST OF MAPS

Map 1	SEPTA and AMTRAK Service to Study Area Stations.....	5
Map 2	R5 Extension Delineation and Estimated Shed.....	17
Map 3	Significant Infrastructure Points.....	22
Map 4	Parkesburg 80% Station Sheds.....	A-3
Map 5	Thorndale 80% Station Sheds.....	A-7
Map 6	Downingtown 80% Station Sheds.....	A-11
Map 7	Whitford 80% Station Sheds.....	A-15

Map 8 Exton 80% Station Sheds..... A-19

APPENDIX: Summary Year 2020 Station Shed Forecasts by Minor Civil Divisions (Municipalities)

 Parkesburg Station Shed Summary..... A-1
 Thorndale Station Shed Summary..... A-5
 Downingtown Station Shed Summary..... A-9
 Whitford Station Shed Summary..... A-13
 Exton Station Shed Summary..... A-17

EXECUTIVE SUMMARY

SEPTA passenger service to Parkesburg and Coatesville was discontinued in 1995 due to low ridership (about 120 daily riders) and high operation costs. This study, advanced by the Chester County Planning Commission, examines extending SEPTA rail service west from Thorndale Station. The benefits and costs of extending the service, which include preservation and maintenance of the current system, new infrastructure, assessing potential ridership, as well as establishing financial responsibility, are all examined in this study.

General findings

In the short run, planners and policy makers should plan and promote transit service around the realities of the “Keystone Corridor”, working to build ridership at stations already served by a combination of Amtrak and SEPTA, rather than institute new services. Currently, Amtrak provides de facto express service from Parkesburg and Coatesville. The R5 rail corridor, officially Amtrak’s Keystone Corridor, was recently enhanced with \$150 million in upgrades, reducing travel times. The rail corridor already possesses a mix of SEPTA and Amtrak trains which provide competitive and complementary services between Parkesburg and Philadelphia.

Any service extension requires a capital investment (minimally an interlocking, rolling stock, stations, freight enhancements, and expanded station parking) and ongoing future operations costs (for Amtrak fees, additional crew, and hours of operation). Depending on the scenario, minimal investment in an interlocking, storage improvements, and freight bypass to facilitate Norfolk Southern movements is roughly \$9 million. An additional \$15 million in costs would be incurred if additional rolling stock needs to be acquired for planned service levels. Operating costs, again depending on service scenario, range from about \$1.7 million to \$5 million annually in 2005 dollars.

The demand for train service at the western stations is forecast to grow, but whether it would generate enough riders to justify capital investments or acceptably cover operating costs remains open to considerations such as the distribution of residential and employment land use. A short term Year 2020 forecast based on station-shed populations and journey to work factors finds about 456 new daily riders would use the extended R5 service. This represents a farebox recovery of 38 and 12 percent, for either the 10 or 36 train scenario to Atglen, respectively. Ridership of 604 and 1,804 daily riders would be required to meet the current R5 Thorndale operating ratio of 51% farebox return, depending on the service scenario.

This provides a framework for all stakeholders to understand the hurdles to overcome and commitments required for an extension: the coordination of service, demand, and facilities mixed with the timing of financial investments. All stakeholders should weigh the costs and benefits associated with addressing each level of need, and consider the ways in which they might partner to financially demonstrate their policy commitments.

Based on estimated ridership and costs, costs outweigh the benefits of extending SEPTA service west to Atglen in the short term. Service combinations of Amtrak and SEPTA, and recent infrastructure improvements all have the potential to provide the desired service at little additional cost to any partner. Planning, however, should continue to strategically preserve and enhance future opportunities. The recommendation is to boost ridership in advance of further expenditures, coupled with proactive land use planning over the long term to preserve services currently in place and support the desired future service extension.

This page intentionally left blank.

1.0 INTRODUCTION

This study was conceived by the Chester County Planning Commission in order to assess the needs and opportunities presented by extending the Southeastern Pennsylvania Transportation Authority (SEPTA) rail service beyond its current terminus at Thorndale to Coatesville, Parkesburg, and Atglen, at the Chester / Lancaster county line. The current service on this rail line is a mixture of SEPTA R5 regional rail service into Philadelphia from Thorndale; Amtrak Keystone service inbound to Philadelphia and New York City and outbound to Harrisburg; and Norfolk Southern freight service along portions of the line. This proposed project is listed as a High Priority in Chester County's list of "Transportation Needs for 2005," is consistent with their comprehensive plan "Landscapes," and is included in the DVRPC Long Range Plan as an 'aspiration.'

Extending service to the County line has been on the minds of public officials since SEPTA passenger service to Parkesburg and Coatesville was discontinued in 1995 due to low ridership and high operation costs. During the last two years of service (FY 94 and FY 95) both stations had about 60 daily inbound boardings, averaging about 120 daily riders. Operating costs were driven up due to the necessity of turn movements at the Paradise interlocking in Lancaster County. Following the station closures, the Downingtown station was the R5 terminus using the Downs interlocking nearby for efficient turn movements. In November 1999, the Thorndale station opened as the new terminus of the R5 line, and location of the new automated Thorn interlocking. This new facility had convenient road access, a large parking lot, new low maintenance station, proximity to recent residential and commercial development, and a new switching facility. The call is for restoring SEPTA's rail service an additional 10 miles to Coatesville, Parkesburg, and providing new service to Atglen.

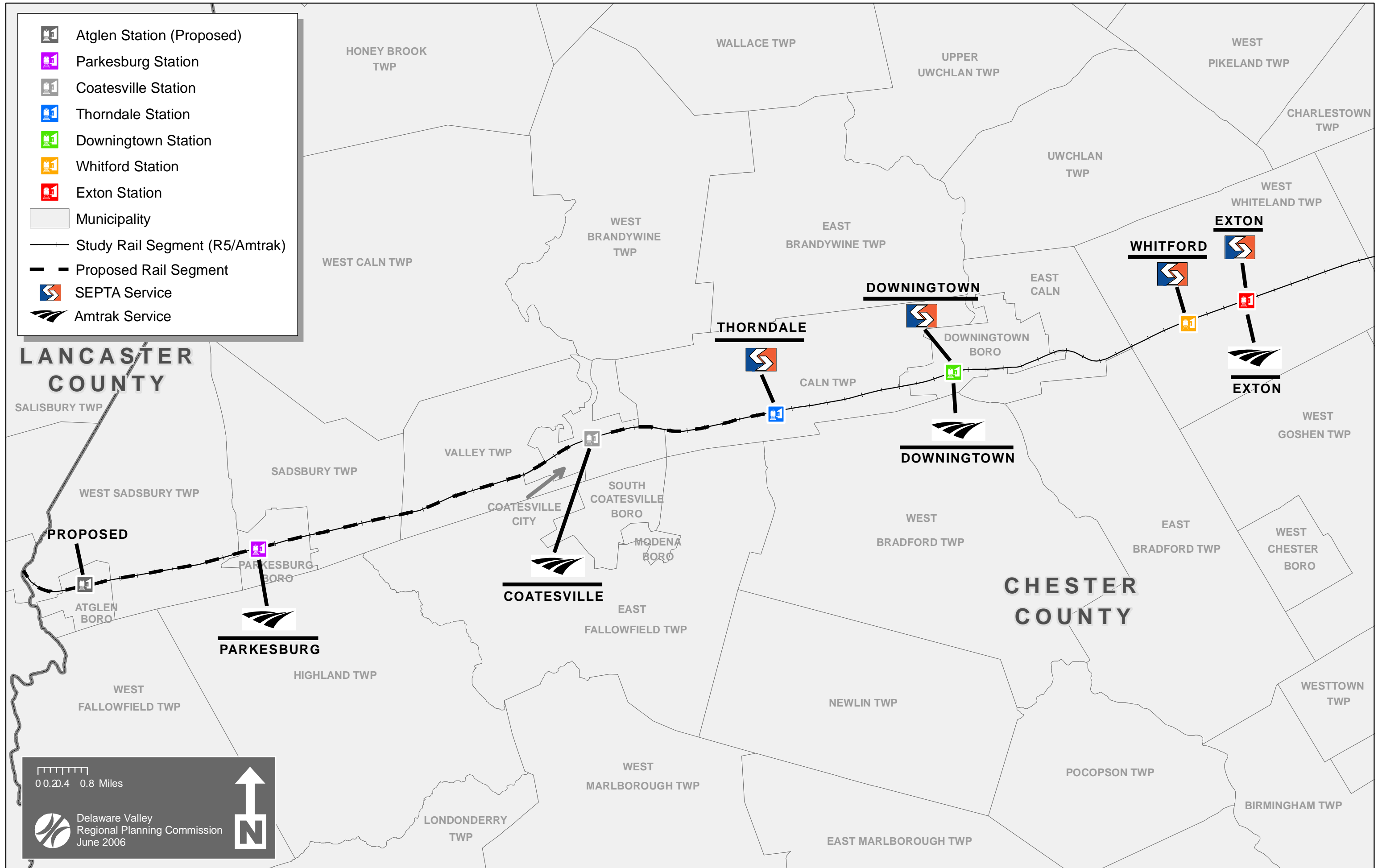
The switching facility improvement at Thorndale is critical to cost effective train turns on the line. Previously, the high operating costs were in part the result of a switching facility or interlocking located about ten miles into Lancaster County at Paradise. The dead heading movement required to turn the trains added considerably to costs, and coupled with low ridership necessitated trimming the service. Other infrastructure improvements such as the \$150 million dollar Keystone Corridor improvements from Harrisburg to Philadelphia have been completed in the study corridor.

This report provides an outline and evaluation of the needs and opportunities for Chester County and SEPTA to consider in extending R5 service westward. Preservation of the current system, providing new infrastructure, assessing potential ridership, as well as establishing financial responsibility are all part of this study.

The study area, as shown in Map 1, is comprised of seven stations, six with SEPTA and/or Amtrak rail service and one proposed station at Atglen. The rail corridor passes through the heart of Chester County and draws riders from Chester, Lancaster and Berks counties. The service extension is viewed by the County as significant to economic development plans, particularly for the old manufacturing city of Coatesville. It also depends on residential and employment development in the vicinity of the stations.

This page intentionally left blank.

MAP 1: SEPTA and Amtrak Service to Study Area Stations





2.0 STUDY AREA ANALYSIS

The western section of the R5 corridor was examined to determine the need for extending rail service by evaluating the current state of the line, making assumptions about the possible futures, and weighing opportunities that may exist.

The first step in the analysis was to describe the station level characteristics: boardings, parking limitations, service frequency, fares, as well as municipal plans incorporating the station areas. This includes examination of train station ride sheds and their demographic changes between years 1999 and 2005. Second, forecasts of future ridership based on the station shed geographies were generated, and from these forecast ridership figures, a basic financial analysis of capital and operations costs was performed. Finally, these results were synthesized into scenarios which take into account various technical, financial, and political realities. The scenarios provide structure to the multiple options available to Chester County, SEPTA, and the municipalities in assessing a service extension.

2.1 General Service and Station Level Characteristics

The first step was to review station characteristics: boardings, parking capacity and utilization, service frequency, fares, and municipal plans incorporating the station areas. Tables 1 and 2 provide weekday inbound boards to Philadelphia for SEPTA and Amtrak trains.

TABLE 1. SEPTA Weekday Inbound Boards by Station

Station	1999 * Boards	2001 Boards	2003 Boards	2005 Boards	Ab. Chg. 2001-2005	Percent Chg. 2001-2005
Thorndale	n/a	241	293	355	114	47%
Downingtown	386	273	299	256	-17	-6%
Whitford	195	253	229	305	52	21%
Exton	416	446	535	563	117	26%
Total	997	1,213	1,356	1,479	266	21%

Source: SEPTA Regional Rail Ridership Census 2005

* Thorndale Station opened 11/99, thus 1999 data not used in calculations for consistent station comparison

TABLE 2. Amtrak Weekday Inbound Boards by Station

Station	1999 * Boards	2001 Boards	2003 Boards	2005 Boards	Ab. Chg. 2001-2005	Percent Chg. 2001-2005
Parkeburg	34	26	34	41	15	58%
Coatesville	11	6	6	8	2	33%
Downingtown	59	45	39	44	-1	-2%
Exton	45	43	53	63	20	47%
Total	149	120	131	156	36	30%

Source: Chester County Planning Commission from Amtrak, 2005

* 1999 data not used in calculations for consistent station comparison

Table 1 shows inbound boards on SEPTA trains in the study area have grown 21 percent since 2001, an increase of 260 boards. This is less than overall SEPTA regional rail growth during the same period of about 25 percent, but it compares favorably with an overall R5 Thorndale line increase of about 9 percent.

The addition of the Thorndale station in 2001 affects the numbers in Table 1 in two ways: The first is that the addition of new capacity facilitates an increase in boards. Second, the decrease in ridership at Downingtown corresponds to a shift in riders to Thorndale station. The station shed maps suggest that Thorndale may provide a closer transit station for a number of the riders previously traveling to Downingtown. The decline in boards at Downingtown may be explained by riders shifting to Thorndale as a closer train station or one with more available parking.

Table 2 shows an Amtrak rate of change of 30 percent between 2001 and 2005 on an increase of 36 boards since 2001. The 41 inbound Amtrak boards at Parkesburg are greater than the 30 SEPTA boards in FY94 and FY95. The termination of service in 1995 may have shifted SEPTA riders onto Amtrak. The stability at Parkesburg suggests that people are willing to travel a greater distance for the premium inter-urban service which Amtrak provides. Amtrak boards at the Coatesville and Downingtown stations have shown little change over the years. The 48 inbound boards at Parkesburg and Coatesville are close enough to the previous 60 daily inbound SEPTA riders to note a decrease, but also acknowledge what appears to be a demand for service. Adding SEPTA and Amtrak together yields a total increase of 296 boards at these six stations since 2001.

Parking supply may limit or attract potential customers who drive to a station to ride the train. The number of automobiles parked at a station is sensitive to many factors. Time of day, time of the year, day of the week, availability of spaces, gas prices, proximate residential housing, the vagaries of weather, and highway factors (the effect of morning news reports) all contribute to counts changing daily. The below counts are from SEPTA's 2004 parking survey and supplemented with 2005 field views. Where the number of parked automobiles differed between the official parking survey and field views, the greater number was used in this table.

TABLE 3. Weekday Parking Supply and Use by Station

Station	2005 Parking Supply	Parked Automobiles	Spare Capacity	2005 Total Boards	Parked Autos per Board
Parkesburg	20	27	-7	41	66%
Coatesville	n/a	n/a	n/a	n/a	n/a
Thorndale	456	253	+203	355	71%
Downingtown	349	246	+103	300	82%
Whitford	282	244	+38	305	80%
Exton	<u>513</u>	<u>500</u>	+13	<u>626</u>	80%
Total	1,620	1,270	+350	1,627	78%

Source: SEPTA, May 2004 Parking Survey; DVRPC, November 2005 field views

Table 3 illustrates the parking supply and its use. There were 350 vacant parking slots during the SEPTA survey and field views, though these were not distributed evenly throughout the study corridor. Whitford and Exton are near capacity, while Downingtown and Thorndale have some capacity to spare. Parkesburg is over capacity with automobiles parking on shoulders

and in any places available. The supply of 2005 parking spaces is nearly the same as the number of 2005 boards with 1,620 and 1,627 respectively. Noting that demand is high, plans have been approved by SEPTA to add 180 additional parking spaces at Exton, where easy access and a full lot are signs of strong demand.

Table 3 includes 2005 boards from Tables 1 and 2 in order to describe the mode use by those accessing the station to ride the train. Overall, there were 357 more 2005 train boards than counted 2005 parked automobiles, meaning that about one-fourth of the riders (22%) did not park a car at the station. They either walked, bicycled, car pooled or were dropped off at the station. Stated alternately, about three-fourths of the riders (78%) drove their automobiles to the station and parked in the lot, a fact worth noting in relation to forecast boards and parking needs. By this logic Parkesburg and Whitford stations have good sized “Kiss and Ride” contingents with 34% and 44% of the boards not accounted for by a parked single occupancy vehicle. Logic dictates these “drop offs” reside close enough for a short car trip or to walk or bicycle to the station. Field views in 2005 identified large residential developments built close to a number of stations which might facilitate walk ups.

Service frequencies and the fares for inbound travel for both SEPTA and Amtrak trains are shown in Table 4.

TABLE 4. SEPTA and Amtrak Weekday Inbound Trips and Peak Fare by Station (peak trip subtotal in parentheses)

Station	SEPTA-In	SEPTA Fare	Amtrak-In	Amtrak Fare
Parkesburg	n/a	\$7.00 *	7 (3)	\$8.00
Coatesville	n/a	\$7.00 *	6 (2)	\$7.00
Thorndale	16 (6)	\$5.50	n/a	n/a
Downingtown	16 (6)	\$5.50	9 (3)	\$6.00
Whitford	16 (6)	\$5.50	n/a	n/a
Exton	16 (6)	\$5.50	11 (4)	\$6.00

Source: SEPTA and Amtrak 2005 Schedules

* Fare based on previous Zone 6 peak fare

Table 4 provides a consolidated view of weekday inbound SEPTA and Amtrak station frequencies as well as the one way ticket cost per passenger. Total inbound trips are shown, with the number of peak hour trips shown in parentheses. Downingtown and Exton are bolded to highlight the two stations which receive both SEPTA and Amtrak service. The SEPTA trains from these stations charge a Zone 5 peak fare of \$5.50 (Zone 5 off peak fares are \$4.25). Prior to closure, the Parkesburg Station was charged a Zone 6 peak fare, which was \$7.00.

The study stations with SEPTA service provide 16 inbound trips per day, of which 6 are in the morning peak. If one includes Amtrak service at Downingtown and Exton, then 25 total and 9 peak or 27 total and 10 peak trains, respectively, enhance the service frequency from these stations. The next inbound station at Malvern has a frequency of 36 total inbound trains and it charges a Zone 5 fare. The next inbound station, the Paoli station, has the same increased frequency as Malvern, but is a Zone 4 fare (\$5.00 peak and \$4.25 off-peak).

The SEPTA 2005 Regional Rail Census found 2,083 intra-suburban weekday trips or about 10 percent of all passenger trips on the line. Inbound Amtrak trips may pass through Philadelphia on the Keystone/Northeast Corridor to work destinations in Trenton and New York City.

One of the six peak period weekday trains is the “Great Valley Flyer,” (GVF) which provides express service from Paoli into Philadelphia, gathering riders from the study area stations (Thorndale, Downingtown, Whitford, Exton) plus Malvern and Paoli, and then traveling closed door from Paoli to 30th Street and Center City stations. SEPTA’s 2005 Regional Rail Census shows the GVF collecting 525 passengers from the study area stations. This number represents 41 percent of the 1,267 total weekday passenger boards for the study area stations served during the peak period.

Great Valley Flyer travel times to 30th Street Station from Downingtown and Exton (50 and 41 minutes respectively) are faster than local service inbound times (54 and 47 minutes). Leaving Exton, the GVF is 6 minutes faster than local service. This service has been successful, with station boards at Thorndale four times greater than for any of the other peak inbound runs. The intricacies of scheduling along the corridor, however, may limit replicating express services like the GVF. It appears that transit travel from the western areas of Chester County inbound are time sensitive, where faster closed service is important to daily commuters, attracting ridership.

Amtrak travel times are faster than SEPTA travel times (about 45 versus 55 minutes respectively) for comparable origin/destination pairs such as Downingtown to 30th Street Station. With the completion of new Keystone Corridor improvements there are scheduled to be even greater time savings. Taking Amtrak to Philadelphia, however, requires a physical transfer at 30th Street Station to center city via SEPTA regional rail, subway or trolley service. This transfer is free for Amtrak ticket holder.

Amtrak fares, travel times and rider comforts to Philadelphia from Parkesburg and Coatesville are competitive with SEPTA, even if service frequencies may not be optimal. Ridership is moderate at Parkesburg and minimal at Coatesville. This service is not to be taken lightly, as it provides mobility east to Philadelphia and west to Harrisburg, and through service (one seat ride) to northern New Jersey or New York City. Losing this service would sever connections to otherwise unserved stations, with little recourse locally or regionally. The concern, given low ridership and Amtrak budget problems, is the potential loss of Amtrak service at these stations.

Summary Points and Comments

- Ridership is time sensitive. About 41% of the inbound trips are on SEPTA’s “Great Valley Flyer” express train into Philadelphia. It appears that transit ridership from outlying areas is more sensitive to time savings than extended service or more frequent service.
- Amtrak already serves the outlying stations of Parkesburg and Coatesville (which have no SEPTA service) with competitive fares and faster travel times to 30th Street Station. Amtrak fares to Philadelphia 30th Street Station are comparable to SEPTA fares. Traveling from Downingtown and Exton Stations, there is only a 50 cent difference in the peak fares.
- Overall system characteristics, combining SEPTA and Amtrak service at Downingtown and Exton, provides enhanced service of 25 (9) and 27 (10) weekday trips inbound respectively (parentheses denote peak trips), with comparable fares and time savings as noted above.

- Amtrak serves 30th Street Station, but not center city Suburban Station. SEPTA will honor Amtrak receipt as a free transfer via Regional Rail to Suburban or Market East stations. Otherwise, one must walk across 30th Street to the subway-elevated and trolley station and pay an additional \$2.00 cash fare (or \$1.30 per token) for the trip into the Philadelphia CBD.

2.2 Municipal Station Area Plans

One consideration for the enhancement or addition of rail service is the degree to which such service would be complementary to local land use plans. Ideally, rail stations should be surrounded by relatively dense development that is ‘transit-oriented,’ where the transit service creates a market for relatively high-density, integrated, and walkable land uses, and where these uses in turn generate reliable ridership for the service. It would be important to know whether the station, service, and necessary station amenities would be viewed as desirable and planned for accordingly by the City or Borough.

Each of the three municipalities where new service is proposed – Atglen Borough, Parkesburg Borough, and the City of Coatesville – anticipates mixed-use station area development of the sort that may be expected to leverage rail service for local economic development. The local plans are summarized as follows.

Atglen Borough

The current Atglen Borough Comprehensive Plan (adopted in February 2000) specifically anticipates the possible provision of SEPTA commuter rail service, with Atglen proposed to house both the new terminus station for the R5 and a turnaround/interlocking facility. Either SEPTA or Amtrak could provide new service. The Keystone Corridor railroad tracks presently serve as the northern boundary for the principal developed portion of the borough. The Comprehensive Plan identifies a relatively large undeveloped area to the north of the rail line, the larger portion of which is located to the south and west of Zion Hill Road, as a development ‘Opportunity Site.’ Should rail service be provided, the plan proposes a mixed-use development of various housing types integrated with commercial uses and oriented toward a new train station to the west of Zion Hill Road.

Should rail service not be extended, the plan proposes an alternative development which would also be of a pedestrian scale, but which would be oriented away from the rail right-of-way. Each alternative, as characterized in the plan, would be of a traditional neighborhood type consistent with Chester County ‘smart growth’ planning efforts. The extension of rail service is viewed as potentially enhancing the marketability of this sort of relatively dense suburban development, and supports these local planning initiatives.

Parkesburg Borough

The present Parkesburg station is located within the borough’s historic, mixed-use, and walkable core. Several recent planning initiatives, including the borough’s most recent Comprehensive Plan (2002) and Revitalization Plan (2004), reflect a desire to capitalize on existing Amtrak service as an economic development asset through the provision of commuter-oriented service and retail uses in the immediate station vicinity. Specifically, the plans anticipate a greater proportion of nonresidential land uses in the station vicinity through residential conversions and the development of targeted parcels, resulting in a finer-grain mix of

land uses. Both of the above-referenced borough plans as well as the 2004 Octorara Regional Plan favorably reference SEPTA R5 service extension as a municipal priority. Further, these documents suggest the possibility of relocating the station to a more central portion of the borough's CBD in order to reinforce its status as a borough focal point (and to maximize economic benefits).

As an alternative to station relocation, the plans propose full improvement of the existing station parking lot in order to enhance capacity - again in order to enhance station activity and maximize economic benefits. It bears noting that additional commuter-oriented commercial uses might attract nonresidents and therefore have economic benefits for the borough, additionally an increase in residential density within the borough core would likely also have a positive effect on potential commuter rail ridership.

City of Coatesville

The existing Coatesville Station is located at the northern edge of the City's existing Central Business District, within walking distance of much of the City's mixed use core as well as its two historic districts. Further, the City of Coatesville has been actively engaged in revitalization planning initiatives since the late 1990s. These initiatives have resulted in a series of plans and redevelopment strategies for various sections of the city, several of which relate closely to the station site.

A 2002 Vision Plan prepared in association with the Chester County Countryside Exchange Program identified Coatesville Station as one of the City's five 'historic jewels' upon which revitalization would be anchored. Two additional 2002 Revitalization Plans define strategies to attract new shops, restaurants, residential and office development, and entertainment uses in order to establish Coatesville as the 'new commercial center of Chester County.' Specific to the train station, the Tier II Revitalization Plan identified the Central Business District to the south of the station as the first revitalization 'focus area,' and proposed a Third Avenue Promenade connecting the station with the proposed Intermodal Transportation Center at 3rd and Harmony Streets.

Additionally, the fifth 'focus area' – the 'North Side Redevelopment Area' – is located to the north of the station. This site is proposed to be developed as a Traditional Neighborhood Development (TND) of moderate density, oriented around a 'Main Street.' This redevelopment, which is to connect with Coatesville Station in some way, has been approved and is in the first phases of construction. Generally, the City's revitalization efforts in the vicinity of the station anticipate development of a mixed-use, transit-supportive character which would be mutually supportive of enhanced rail service.

Summary Points and Comments

- Atglen – Station supportive plans, mention of station location accounting for PA 41 highway access, plus land available for locating interlocking.
- Parkesburg – Station supportive plans, mention of station relocation accounting for PA 10 access and location of Park interlocking, strong Amtrak ridership but constrained parking.

- Coatesville – Multiple supportive revitalization plans proposed, considerable station work required, presently served by Amtrak with light ridership and with minimal station parking.

The station study by Stone Consulting & Design, Inc. (*Improving Transportation Options: Extending SEPTA Service to Meet the Needs of Coatesville and Western Chester County*, Stone Consulting and Design, Inc., September 19, 2005) recommended locating the station facilities at Atglen close to PA 41 and relocating Parkesburg Station closer to PA 10 in order to attract north-south traffic flows. These moves, however, relocate the stations away from the downtown areas. This strategy may provide a sensible way to orient transit access at the crossroads of automobile traffic to enlarge the shed area. At the same time, such a “park and ride” approach would be inconsistent with the “Smart Growth” emphasis of the County’s Landscapes plan.

The plan acknowledges the distribution of residential development along highways and the need for most riders to access the train with an automobile. It remains to be seen whether the residential development is an origin with ties towards transit accessible Philadelphia or other inter-municipal destinations. Alternatively, concentrating employment around stations to create a destination is not strongly attended to in the local plans. It remains to be seen if the planned employment generates local traffic or inspires a reverse commute from Philadelphia. Questions regarding origin, destination, and orientation to these stations remain a subject for future scrutiny.

2.3 License Plate Survey and Station Shed Profile

License plate surveys were performed in 2001 (1999 for Parkesburg Station) by Chester County Planning Commission staff and again in 2005 by a combination of CCPC and DVRPC staff. The survey sampled one day’s station parking by rail patrons to help determine from where SEPTA or Amtrak riders are originating. Using the collected license plate data, PennDOT provided addresses which were then matched in GIS and the points mapped. These address-matched points show the spatial distribution of those parking at the station and thereby define the station sheds. Station sheds for each station for different years were determined using license plate numbers collected from automobiles parked at the station parking lots.

The address-matched points derived from the license plates were measured by the linear distance from each respective station. Address locations were generally concentrated in the immediate station locality or MCD or clustered somewhat along a highway corridor. Some addresses were great distances away (such as Philadelphia or Bucks County) from the stations. Station patrons in these distant areas were not considered to be part of a station’s natural market area.

In order to address these outliers, the distances patrons traveled to the stations were examined. An area enclosing the inner 80% of patron distances was observed to reduce unexplained outliers and result in a more valid station shed. Accordingly, for robustness of analysis, this report considers the inner 80% of a station’s patron distribution to be its station shed or natural catchment area. Using GIS software, the points of this inner 80% were connected and these lines smoothed to define a shed boundary for each station. Municipalities within or intersecting these boundaries were considered to be part of the station sheds.

One limit of this method is that every train rider can not be taken into account. By relying on automobile license plates, this method does not capture the roughly 22 percent of riders who have been dropped off or arrived at the station by other means (car pool, bicycle, walk; see Table 3). These passengers would require an intercept survey to determine their geographic distribution, a step beyond the scope of this project, and one which may be worthwhile for follow up work. It seems likely, however, that many of these patrons would be local to the station, and would therefore be included in the larger station shed geography.

Simply put, the station shed measure is sensitive to the sample and inclusion of intersecting municipalities identified through the license plate survey. On any given day, boundaries derived from surveyed plates could include or exclude a municipality, boosting or reducing the aggregated population numbers within a specified station shed. Consequently, changes in the boundary of the shed and the resulting municipal intersections can alter the population numbers carried through in the analysis. Some description of these differing results are displayed graphically with accompanying text and municipal data in the appendix.

Table 5. Summary of Address Matching by Station

Station	1999/2001 Matches	2005 Matches	2005 Total Plates	Percent Matched
Parkesburg *	15	20	27	74%
Thorndale	149	211	253	83%
Downingtown	208	186	206	90%
Whitford	182	213	244	87%
Exton	317	404	500	81%

Source: DVRPC and Chester County Planning Commission Field views surveyed in 1999 and 2005

* Only Parkesburg Station surveyed in 1999

Table 5 above summarizes the single day sample matches, though no comparative data exist for the total number of plates counted in 2001 (1999 for Parkesburg). All of the matched proportions fit into an average acceptable minimum of 75-80 percent matched. Continued monitoring and license plate surveys at stations would be a step toward learning a more exact nature of the sheds.

TABLE 6. Summary Forecast Population Change by 2005 Shed Boundaries

	2000 Population	2020 Forecast	Absolute Difference	Percent Difference
Chester County	433,501	528,000	94,499	22%
Parkesburg shed	67,307	83,692	16,385	24%
Thorndale shed	179,619	217,600	37,981	21%
Downingtown shed	188,453	231,470	43,017	23%
Whitford shed	135,104	163,940	28,836	21%
Exton shed	286,122	340,300	54,178	19%

Source: DVRPC 2020 and Lancaster County 2020 Municipal level population forecasts

Table 6 provides a demographic profile of the 2005 station shed population using its year 2000 Census number, as well as its year 2020 forecast number, with columns showing the absolute and percent change between the two. Chester County as a whole is forecast to add 94,499 people from 2000 to 2020 for a 22 percent rate of growth. The percent change for each shed remains somewhat consistent with the Chester County forecasts, reflecting the smoothing of board adopted growth at the municipal level. There is much less volatility in these numbers, though the numbers are not immune from questions regarding sample size. For planning purposes, these numbers provide valid information at an order of magnitude for inferring ridership change.

There is evidence to suggest that population growth is outstripping the forecast rates of growth in some of the municipalities, which could change some of these conclusions. While the adopted 2020 population projections from the Chester County Planning Commission were used for technical analysis of this study, recent proposed development activity may generate greater than forecast growth through the projection horizon: over 17,000 proposed residential units were reviewed by the Planning Commission within the study area from 2003 to 2005.

This raises the question as to whether this expanded population is oriented towards employment in Philadelphia (implying potential R5/Amtrak use) or whether these new residents will be oriented towards suburban employment. Questions and assertions concerning rates of change not captured in the CCPC and DVRPC forecasts, and their orientation, add a layer of complexity to the assumptions used herein and for purposes of this report will be viewed as offsetting one another. In other word, as some municipalities appear to be “over-performing” in relation to forecasts and some “under-performing,” the adopted forecasts appear to reflect a middle of the road estimate.

2.4 Year 2020 Ridership Forecast for New Riders at Atglen, Parkesburg, and Coatesville

An estimate of the number of riders that would be attracted is a key consideration for the viability of any service extension. In order to arrive at an estimate of the number of combined daily riders that may be expected to use extended R5 service at Atglen, Parkesburg and Coatesville Stations at service maturity, we relied on an adjusted straightline estimate based on current ridership patterns in central and western Chester County. Straightline forecasting of future ridership involves calculating the ratio of current boards per capita in a known shed area and then applying this ratio to the forecast population in a designated service area.

The first step is to split the study corridor into two shed aggregations:

Central stations: These four stations (Thorndale, Downingtown, Whitford, and Exton) are currently the four westernmost stations on SEPTA's R5 Thorndale service, but reside in the central part of Chester County.

Western stations: These three stations (Atglen, Parkesburg, and Coatesville) reside in the western portion of the study area, are proposed for extension of SEPTA's R5 service, which is the subject of our study.

The municipalities for each station in the Central shed have already been established and described (see the Appendix). For the combined municipalities that form the sheds of the Central Stations, we calculated the ratio of 2005 daily rail boards at these four stations (combined Amtrak/SEPTA) to year 2000 population. This yields the numerical proportion of R5/Keystone transit used by the shed population, or per capita daily riders. This ratio was: 1,586 to 313,889, or 0.0050527. Transit data from 2005 is used for all boards for consistency with the shed distribution from that same year.

Based on the geographic scale and orientation of the calculated sheds of the Central Stations, we designated an estimated shed area for the 3 Western Stations (see Map 3). This area is bounded by the vicinity of Thorndale Station on the east, and extends roughly 6 miles north of the R5 corridor, roughly 5 miles south of the corridor, and roughly 8 miles southwest of Atglen Station (into Lancaster County).

The municipalities in Chester and Lancaster Counties which intersected with the estimated Western Station combined shed were identified. Knowing the projected 2020 populations for these Municipalities as well as the ratio of 2005 station boards to 2000 population for the Central Stations (0.005), we applied this same ratio to the 2020 MCD-level population projections for the estimated Western Shed. This yielded 850 estimated Western Station riders.

In one respect, however, using the Central Stations' boards/population proportion may not be appropriate and requires a modification. The 0.005 proportion was calculated from the Central Stations was used to forecast for western stations. The Central Stations are more proximate to Philadelphia than the Western Stations. Since Philadelphia anchors the R5 line, the attractiveness of Philadelphia as an employment center must weigh heavily in present day Central Station boards, and consequently in our 0.005 proportion. As the Western Stations are more distant from Philadelphia (with travel time and



travel cost thereby greater than the Central Stations), this factor must be considered in our 2020 ridership projection for the Western Stations.

In order to calculate a rough 'degree of attractiveness' for Philadelphia within the combined Central Station shed in comparison to the estimated Western Station shed, for each set of municipalities (in the two sheds), we added the total number of inter-municipal journey to work (JTW, data from CTPP 2000) origins as well as the total number of JTW trips ending in Philadelphia. The proportion of Philadelphia trips to all inter-municipal trips for the Central Station shed was 8,630 divided by 134,935 for a ratio of (0.064), and for the Western Station shed was 1,302 divided by 62,555 for a ratio of (0.021). In short, Philadelphia as a workplace destination is roughly three times more attractive (3.072821) for municipalities in the Central Shed as for municipalities in the Western Shed.

Again, since Philadelphia anchors the R5 line and dwarfs all other station areas in terms of employment concentration proximate (and walkable!) to rail transit, this relative reduction in attractiveness is factored into the 2020 board estimate for the Western Station Shed (i.e. our estimated boards at service maturity for the proposed R5 extension). Since the 850 estimated riders calculated above assumed an identical ratio of boards/population for the Western Shed as for the Central Shed, and as a result assumed identical macro-JTW characteristics for the two sheds, it makes sense to factor the comparative (east-west) Philadelphia-attraction ratio (3.07) into the raw estimate (850).

The 850 riders should be divided by 3.07 to reflect the calculated fact that residents of Western Shed municipalities are only ~27% as likely to be working in Philadelphia as Central Shed residents. 850 divided by 3.07 yields a revised ridership estimate of 277 riders at service maturity which would result from the proposed R5 extension. Subtracting the current Amtrak daily boards at Parkesburg and Coatesville stations (49) yields an estimate of 228 new riders who are forecast to be captured by the R5 extension.

This forecast of 228 new riders uses a number of assumptions and the resulting forecasts should be seen as order of magnitude estimates. The first assumption is that SEPTA and Amtrak service levels and fares at the western stations mimic current service at the Central stations. Obviously if extended service is different, the forecast ridership factors would be changed. Second, it is assumed that the mode split ratio of 2005 train boards to station shed population remains constant. Mode split may be affected positively or negatively by a wide range of occurrences, i.e.: the rise in gas prices, the expansion of suburban employment with abundant parking, new road capacity, and etcetera. Fourth, the forecast also assumes that parking is not a limiting factor. This "unconstrained" scenario does not cap boards based on physical limits to a station.

One effect of an increase of 228 riders would be the increase in demand for parking at the western stations. These stations in reality are quite constrained. Using the 78% ratio of parking to boards (see Table 3), an increase in boards would necessitate about 178 new parking spaces at the three western stations. Atglen and Coatesville have no parking currently and the Parkesburg station, with 20 slots, is constrained for boards in the forecast future. Parking is not figured directly into the infrastructure costs in the next section and presents a major expense for station construction in anticipation of extended service. Beyond the price of land and construction is the alternate cost of not providing sufficient parking, which would constrain boards at the stations, undermining the effect of extended service. Parking remains an issue requiring greater study in its forecast needs and appropriate lot sizing.

2.5 Financial Estimates for SEPTA Regional Rail Service To Atglen

If the forecast number of new daily riders represents the benefits of a service investment, then these ridership gains must be weighed against the costs of that investment. This section provides financial estimates for the provision of three additional stations beyond the present terminus at Thorndale Station. Two of the three proposed station locations, Coatesville and Parkesburg, were previously served by SEPTA rail service until 1995, and currently retain Amtrak service. A third station at Atglen has been proposed by Chester County to complete the SEPTA regional rail service to the edge of the region. All of these stations benefit from \$150 million in Keystone Corridor track and electrification improvements by Amtrak and PennDOT over the last few years. Critical to this assessment is the requirement of a rail interlocking in order for turning movements to be conducted cost efficiently.

2.5.1 Capital and Infrastructure Costs

The infrastructure costs shown below in Table 7 were identified by SEPTA and/or the Stone Consulting report on Coatesville as necessary capital investments, including station costs and other infrastructure costs. Table 7 details the estimated cost of infrastructure investments that would be required for a service extension to Atglen, though the costs are generally applicable for any service extension. These costs do not include any new track work, station or parking expansion which may be required at all three stations.

TABLE 7. Infrastructure Needs/Costs for Service Extension to Atglen

Improvement	Cost (\$ millions)
Interlocking	\$5.0 - \$5.5m
New station at Atglen/ station improvements	\$1.0 - \$5.0m
Freight bypass	\$3.0m
Storage	\$0.5m
SEPTA Train Cars (6 @\$2.5m each)	\$15.0m

Source: SEPTA Long Range Planning 2006; Stone Consulting & Design, Inc, 2005

As stated previously, an interlocking is the central capital item required to permit cost effective turning movements. It is a one time cost of about \$5 - \$5.5 million dollars, not including additional track work at a specific location. In order for Atglen to be effective, the interlocking needs to be built at the terminus of the line to avoid operating costs resulting from dead-heading ten miles to the Paradise interlocking in Lancaster County. Appropriate and available land for an interlocking is north and west of Route 41 and there is also track available to the south to facilitate train storage. Ownership of this land has been attributed to both Amtrak and SEPTA.

The interlocking is a 'deal breaking' improvement, for without its nearby construction, there is no way to cost-effectively turn the trains. If service to Atglen is foregone, an interlocking could also be constructed/upgraded at a closer location such as Parkesburg where an old device currently exists. Map 3 depicts the locations of interlocking facilities along the study area R5 segment, and details the potential site for a new station and interlocking facility at Atglen. Atglen does not have a station, so would require new construction, with costs estimated from \$1 to \$5 million depending on the type of station construction.

The combined cost of an interlocking, storage improvement, and freight bypass to facilitate Norfolk Southern movements is roughly \$9 million dollars. An additional \$15 million in costs

would be incurred for additional rolling stock to be acquired to maintain service frequencies due to the additional distances and time to Atglen. Scheduling plays a large role in this cost, which is almost entirely dependent on the level of service extended west.

The above estimates do not include costs for new station facilities, parking, or required ADA access improvements at Atglen, Parkesburg or Coatesville. A new Atglen station is integral to the Atgen municipal plan, but improvements and costs remain unscoped. Coatesville station faces expensive challenges getting to an acceptable state of repair, as it requires parking, platform repair, and considerable work on the station. While development in excess of forecast growth is called for in Coatesville, how this development alters station needs is important. The importance of new parking (there is none as it stands) in addition to some reliance on proximate walk up from new residences poses some challenges. The consultant report prepared by Stone and associates for Coatesville estimates a cost of \$25 million to make the required station, platform and ADA access improvements.

A prospective relocation of Parkesburg Station would add expense primarily in the form of expanded parking, ADA access requirements, and a new station facility. It also shortens the proposed service, but would capitalize on road access and open the possibility of modernizing the Park interlocking. Whether the station remains at its current location or moves, Parkesburg Station still requires additional, fully improved parking area to meet new demand.

2.5.2 Annual Operation and Maintenance Costs

Much like the station shed analysis or ridership forecast, any examination of operations and maintenance costs relies on service assumptions and cost parameters derived from the existing R5 Paoli-Thorndale Schedule and the SEPTA Fiscal Year 2006 Operating Budget. Tables and information below present the incremental costs of extending service based upon costs used to prepare the aforementioned operating costs.

Historically, Parkesburg and Coatesville had ridership in the last year of SEPTA service (1995) of 32 and 31 average weekday boards, while Atglen had no previous service. As stated previously, costs associated with this low level of ridership were too high to continue service. Central to these costs were declining ridership and the growing operating costs incurred conducting the trains to the Paradise interlocking in Lancaster County in order to turn around for the inbound trip.

Table 8 outlines the unit costs, number of units by labor car hours, payment to Amtrak for access to tracks, and SEPTA operations and maintenance for the equipment. For purposes of this estimation, only weekday service is considered and is divided into two levels of service scenarios which are defined with trains providing round trips:

- Scenario 1 - Limited weekday service (10 trains)
- Scenario 2 - Extend current weekday service from Thorndale (36 trains)

Both scenarios provide a baseline from which to consider service provision. Scenario 1 emphasizes a limited extension of peak services in the AM and PM. This recommends 10 additional daily train round trips from Thorndale to Atglen. The total operations and maintenance costs for this limited weekday service is about \$1.7 million dollars annually.

MAP 3: Significant Infrastructure Points



Scenario 2 extends current full service from the Thorndale terminus west to Atglen. This is an additional 36 daily train round trips. It would cost an estimated \$5 million dollars annually to run this service.

TABLE 8. Annual Operations Costs for Extended Service Scenarios to Atglen

Description	Unit Cost	Scenario 1		Scenario 2	
		Limited Service 10 Trains		Full Service 36 Trains	
		Total Units	Total Costs	Total Units	Total Cost
Labor Car Hours Amtrak	\$98.10	5,135	\$503,743	17,829	\$1,749,024
NEC Access SEPTA	\$7.14	59,670	\$426,044	165,750	\$1,183,455
Car Miles O/M	\$3.23	226,746	<u>\$226,746</u>	629,850	<u>\$2,034,416</u>
Annual Total			\$1,662,177		\$4,959,895

Source: SEPTA Long Range Planning, 2006

In FY 2006 SEPTA's total cost for railroad operations amounted to \$230 million dollars; of which about \$40 million dollars, or 17 percent of the budget, was spent for the R5 Paoli-Thorndale service. Chester County's transit contribution in FY06 came to \$1,282,000 of which \$740,000 went toward rail. Additional service means additional operating expenditure of about 4 percent for 10 additional trains and about 12 percent for 36 additional trains. These are additional costs which do not include additional weekend service operations costs.

2.5.3 Farebox Recovery

The farebox recovery ratio or operating ratio (O/R) was calculated using 2020 ridership estimates developed in Section 2.4 (228 new riders which are doubled to 456 total boardings) and operations costs from Table 8. The ratio of collected fares to operating costs incurred by the transit service is an important measure in service assessment. Weighing anticipated revenue against train operation costs, permits another evaluation of financial feasibility.

Table 9. Farebox Recovery with Forecast Ridership for Western Service Scenarios

Weekday (255) Train Service	Operating Cost	R5 Peak Fare	Forecast Ridership	Forecast Revenue	Farebox Recovery
		<i>Zone 5</i>			
10 Trains	\$1,662,177	\$5.50	456	\$639,540	38%
36 Trains	\$4,959,895	\$5.50	456	\$639,540	12%
		<i>Zone 6</i>			
10 Trains	\$1,662,177	\$7.00	456	\$813,960	49%
36 Trains	\$4,959,895	\$7.00	456	\$813,960	16%
		<i>Trailpass Avg. Fare</i>			
10 Trains	\$1,662,177	\$4	456	\$465,120	28%
36 Trains	\$4,959,895	\$4	456	\$465,120	9%

Source: Year 2020 DVRPC population forecasts and 2005 SEPTA operation estimates

Table 9 shows the different operating ratios generated using different operating costs and fares with the forecast number of new boards. Farebox recovery in this example is computed by multiplying the 456 forecast new riders for the western stations times the Zone 5 peak R5 railroad fare of \$5.50, and then multiplying that by total annual weekdays (255) for estimated revenue of \$639,540. Next, the forecast revenue of \$639,540 is divided by the operating costs of \$1,662,177 for the limited service 10 train scenario, which equals an operating ratio (O/R) of about 38 percent. The 38 percent farebox recovery is close to the regional rail system average O/R of about 41 percent, but is less than the R5 Thorndale average O/R of about 51 percent.

When the forecast revenue is divided by the greater operating costs of \$4,959,895 for the full service 36 train scenario, the O/R drops to about 12 percent. This ratio is less than SEPTA's lowest performing regional rail routes, the 24 percent O/R for both the R1 Airport and R6 Cynwyd lines. Both scenarios use the same ridership levels in their computations, though it is more likely that reduced service would mean reduced ridership.

One means of improving the operating ratio is to raise the average fare so incoming receipts are greater with the same number of riders. Everyone taking the extended R5 service pays a little more for the service, because the service is extended further west. Passengers on previous trains to Parkesburg were charged a Zone 6 fare of \$7.00. Charging a higher fare predictably raises the forecast revenue to \$813,960, and as seen in Table 10 also raises farebox recovery ratios to for 10/36 train services to 49 percent and 16 percent. The O/R for the 10 train scenario in particular is approaching a rate comparable to for both R1 Airport and R6 Cynwyd lines.

Table 9 brings into focus the sensitivity of farebox recovery to different operating scenarios and peak fare revenues. This is a means to weigh the ongoing operations costs of two different train scenarios against an estimate of forecast revenue if service was extended west. Charging a premium fare begins to offset operating costs particularly in the 10 train scenario, where if high ridership can be maintained it approaches viability. Viability, that is, if demand for a limited service is very high. One wrinkle is that discounted fares in the form of SEPTA's Trailpass, reduce the collected fare and thus reduce farebox recovery.

One example is the \$163.00 anywhere-zone monthly pass, used for trips beyond zone 4. Assuming use of 40 times a month for the western stations (twice a day, 5 days a week for 4 weeks in a month), results in an average of about \$4 per fare. This reduces the forecast farebox (\$456,120 for zones 5 and beyond) and mutes the recovery ratio to 28 and 9 percent respectively. The heavy use of discount fare instruments by center city commuters is likely to be the case. Certainly some mix of premium/discretionary fares and discounted fares would lower the probable cost recovery. Again these computations assume that ridership remains constant for both 10 or 36 train scenario, which is unlikely.

It may be constructive to calculate how many riders would be required to meet benchmarks such as the current R5 farebox recovery rate of about 51 percent for the three western stations. Table 10 below depicts how many people need to ride the trains from the three new stations to meet acceptable farebox returns. The required boards were computed using the Zone 5 peak fare. It was assumed that most riders would use a fare instrument appropriate for the zone rather than pay a Zone 6 peak cash fare. The Zone 5 fare is used as a proxy for an average fare at the three western stations since using a pass is less than the full fare of \$7.00, but assuming a mix of fare instruments it would cost more than a \$4 average fare used in Table 9.

Table 10 shows that in order to meet a 25 percent O/R similar to both the R1 Airport and R6 Cynwyd lines, about 296 daily riders would be required for the 10 train scenario and about 884 daily riders for the 36 train scenario (remembering that riders are the total number of inbound and the reciprocal outbound boardings.) In order to meet a 41 percent the regional rail system average O/R, about 486 daily riders would be required for the 10 train scenario and about 1,450 daily riders for the 36 train scenario. Determining ridership under the 10 train / 51 percent farebox recovery scenario results in a need for 604 weekday riders. These numbers are greater for the 36 train service. An additional 1,804 weekday riders would be required in order to reach a comparable 51 percent O/R for the full service 36 train scenario. These rider numbers create a goal for promoting ridership and a context for assessing the costs and benefits of extension.

Table 10. Required Ridership to Meet Farebox Recovery Benchmarks

Weekday (255) Train Service	Operating Cost	Zone 5 Fare	Farebox Recovery	Required Ridership
10 Trains	\$1,662,177	\$5.50	25%	296
36 Trains	\$4,959,895	\$5.50	25%	884
10 Trains	\$1,662,177	\$5.50	41%	486
36 Trains	\$4,959,895	\$5.50	41%	1,450
10 Trains	\$1,662,177	\$5.50	51%	604
36 Trains	\$4,959,895	\$5.50	51%	1,804

Source: Year 2020 DVRPC population forecasts and 2005 SEPTA operation estimates

Boarding totals of 296 daily weekday riders, much less than maximum 1,804 weekday riders, as a matter of comparison, frame the projected addition of 456 riders for year 2020 and present challenges for parking and station access at the western stations. Atglen, Parkesburg, and Coatesville, with about 20 combined spaces now, would require expanded parking capacities to handle the volume, driving up station cost estimates. This suggests that even if residential development is occurring in the study area at a greater rate than shown in the projections, there is still a long way to go to meet average revenue recovery (even if less than 51% O/R is okay). If some sort of farebox agreement was tendered between SEPTA and Chester County, it may not only be a question of the number of riders, but timing: How long is the county willing to subsidize the additional costs before enough riders get aboard?

Summary Points and Comments

- An estimated 228 new riders (456 new boards) are forecast for Year 2020 at Atglen, Parkesburg, and Coatesville stations. This presents challenges with creating and managing the parking supply for the majority of passengers who drive. This also adds considerable cost to the station to accommodate these boardings.
- Capital costs for SEPTA service extension requires the construction of an interlocking. Likely candidates are either Atglen or Parkesburg, with each station potentially incurring different capital and operational costs. Any extension scenario requiring this interlocking necessitates minimum \$5 million dollar expenditure.

- A farebox recovery of 38 and 12 percent are generated when operating costs for extending service with either a 10 or 36 train scenario, respectively. New boarding totals of 486 and 1,450 weekday riders are required to meet a SEPTA system average 41 percent operating ratio in the 10 or 36 train scenarios. Ridership totals of 604 and 1,804 weekday riders are required to meet a 51 percent operating ratio in the 10 or 36 train scenarios.
- The trade offs between rail service levels, parking costs and constraints, and rider demand could make for expensive trade offs in considering new service in the future.
- Typically negotiated agreements between SEPTA and the County are made to make up an agreed upon shortfall in the fares collected. The questions become what cost is the county willing to assume for extending service and how long is the county willing to subsidize service until acceptable ridership levels are obtained? To what extent is the County prepared to promote ridership to assure a steady growing ridership?
- Parking and station construction costs become critical with the forecast 228 new riders (456 new boards) for year 2020 at the western stations of Atglen, Parkesburg, and Coatesville. Ridership benchmarks requiring 604 and 1,804 weekday boards to reach 51 percent fare box recovery, put even greater pressure on the provision of parking and facilities along the extended service, assuming the passenger volumes are possible.

Issues for Future Consideration

- What is changing along the rail corridor? Regular data collection at facilities should be pursued to support future analysis, including parking counts, plate matching, and follow up at the expanded Exton train station.
- How is the distribution of new residential and employment development shaping the journey to work movements? Beyond the immediate station area, do land use and road facilities (“Complete the Streets?”) support access and investment in transit?
- What services would best match the forecast demand? One concept would involve altering existing service to account for the time sensitivity shown in train service by adding a second Great Valley Flyer express train in the morning and afternoon commutes. To what extent would this additional express service meet daily commuting needs? To what extent would a new express service be possible and would it reduce ridership due to lesser service levels on the Central end of the line?
- How much and for how long might the county be willing to financially support the costs required for infrastructure or operations changes? It is unlikely that any new services could be done without incurring some cost, consequently the timing of any investment would be important.

3.0 IMPLEMENTATION OPTIONS

What follow are two general policy options which address these and other factors.

3.1 Policy Course 1: Maintenance and Preservation of the System

As noted throughout this report, western Chester County presently has valuable public transit assets in the form of Amtrak service, Keystone Corridor track improvements, recent substantial investment in the Thorndale R5 terminus and upcoming parking expansion at Exton. Under this course, stakeholders would concentrate on maintaining, reinforcing, and institutionalizing existing Amtrak and SEPTA service in order to better take advantage of existing assets. Rather than extending service now, stakeholders would invest would-be service subsidies into low-capital strategies to reinforce the existing system.

Challenges:

- Substantial investment in Keystone Corridor improvements means all users of the line benefit: SEPTA, Amtrak, and Norfolk Southern. Amtrak provides the only current train service to Coatesville, though there are only 8 weekday boards, and Parkesburg's small ridership has been growing. While service may limit potential riders, lackluster ridership also limits the reasons to extend service. The challenge lies in maintaining a focus on low cost solutions to enhance ridership in the short run and monitor changes in parking, ridership, and supportive land use patterns in the long run.
- Current Amtrak and SEPTA service becomes less frequent as one travels west, with concurrently inadequate or non-existent parking. This both reflects existing low demand and in turn restricts ridership. When considering investment in capital and operations a pertinent question is how much can service be subsidized while waiting for ridership to catch up? To what extent is train ridership connected to burgeoning development either exceeding, meeting, or falling short of expectations?
- Despite Chester County's ambitious and progressive "Landscapes" plan, which envisions new growth occurring as 'smart growth' consistent with DVRPC's own Long Range Plan (reinforcing existing centers and transportation facilities, with more pedestrian, bicycle, and transit trips being possible), new residential growth continues to occur in a dispersed pattern with weak employment concentration surrounding R5 stations (which does not support transit viability).

Opportunities and Strategies (*Acting Stakeholder[s] in Parentheses*):

- Promote the "Keystone Corridor," Amtrak and SEPTA services to take advantage of their respective service characteristics. Amtrak already provides competitive fares and express trip times from Parkesburg and Coatesville while SEPTA service should remain focused on local service. It makes financial sense to encourage the public to view Amtrak "express service" and the existent SEPTA local service as a single system. (*Chester County, TMACC, municipalities, Amtrak, SEPTA*).

- Ridership was shown to be sensitive to time savings, as evidenced by the Great Valley Flyer, so another possibility is switching a local train into a second Great Valley Flyer express service. . (Chester County, *SEPTA*, *Amtrak*).
- Communities and municipalities should pursue parking expansion, parking enhancement, and supportive land use plans around stations. (*Chester County, municipalities*)
- Pursue new shuttle service to: a) establish the need and demand for more intensive services, and b) support existing rail service by bringing riders to stations from key origin points. Concentrate employment in patterns to make shuttle commutes from stations viable (*Chester County, TMAACC*).
- Promote Amtrak service, encouraging ridership by commuters who work in the Philadelphia CBD. SEPTA will accept an Amtrak receipt for a Center City transfer on the regional rail, though the connection at 30th Street Station is not seamless. Taking a regional view, it may be in Chester County's long term interest to encourage economic development in Center City in order to retain the viability of the employment destination from which rail service benefits. (*Chester County, Amtrak, SEPTA*).
- Raise the profile of the SEPTA Cross County Monthly Pass (\$85 per month), which might be worthwhile for inter-zone trips which do not extend into Philadelphia. Currently, this type of trip is low volume, though there are plans for the redevelopment of the Radnor Corporate Park. This idea, coupled with selected shuttle service, is a solid one, assuming employment concentrates at or near the rail stations. (*Chester County, SEPTA*).
- Alternatively, faster service might yield benefits. The new Keystone Corridor improvements will permit increased time savings on express Amtrak service (costs competitive with SEPTA). Rethinking the SEPTA service to carve out an additional express train in the scheduling would benefit SEPTA customers sensitive to time savings.
- Over the longer term, land use strategies consistent with the county's "Landscapes" plan should be more aggressively pursued at the county and municipal level in order to reinforce ridership along existing routes. This would generally involve: a) reinforcing origins by promoting residential density/development along access highways feeding into the stations, as well as within pedestrian and bicycle reach of the stations themselves; and b) reinforcing destinations by promoting transit-accessible employment concentrations at/around suburban stations (*Chester County, municipalities*).

3.2 Policy Course 2: Pursue Capital Investments to Extend R5 Service

As described in Section 2.5, any extension of R5 service would require substantial capital investments of at least \$5 to \$9 million dollars and incur long term operations costs estimated between \$1.6 million and \$5 million dollars annually, before any subsidy or farebox receipts. This does not include the necessary costs for new stations, ADA requirements, and expanded parking. Under this course, stakeholders would commit financially to bearing their appropriate share of these necessary costs in order to achieve their vision for service.

Challenges:

- The principal capital needs are for an interlocking facility (to enable train turnarounds) to be located just beyond the service terminus, along with storage areas for equipment and trains, and freight pass throughs. Parking expansion and station construction at the three western stations would add considerably to capital costs, but would draw riders from the surrounding area.
- An extension of service to Coatesville by itself might not be prudent, since the closest interlocking beyond Coatesville (see Map 3), located in Parkesburg, is not in service. Accordingly, extensions beyond Coatesville to Parkesburg (assuming a restoration of service) or Atglen (assuming a new interlocking facility) are possible alternatives.

Opportunities and Strategies (*Acting Stakeholder[s] in Parentheses*):

- Extending service to Atglen would require the construction of a new station facility and new interlocking just to its west. The mid-range cost estimate for new infrastructure at Atglen (Table 9) is \$9 million. It is also projected that six additional rail cars would be required in order to maintain frequencies with the additional miles, at an estimated combined cost of \$15 million. Operating costs, again depending on service scenario, range from about \$1.7 million to \$5 million annual dollars. The cost burden for necessary improvements could potentially be shared by stakeholders. This would require reprioritizing on Chester County's "Transportation Improvement Inventory," and careful financial consideration. (*Chester County, SEPTA, municipalities*).
- Extending service to Parkesburg would result in somewhat lower operating costs, as the increase in rail vehicle miles would not be as great as a full extension to Atglen. This may potentially reduce the number of new rail cars which would be required. A service extension to Parkesburg borough would require expanded parking and a new automatic interlocking, because the existing Park interlocking is manual. Relocating the station to a point east of the interlocking makes the station more accessible to auto traffic in the PA 10 corridor, but is more removed from the existing residential core in the borough. The new interlocking would be in the existing right of way where track work was just completed. Upgrading an interlocking in an active rail right-of-way can be expected to further increase costs.
- Land acquisition for a new station and potentially larger interlocking may also be an issue. The cost burden for necessary improvements could potentially be shared by stakeholders or added to a Chester County's "Transportation Improvement Inventory" (*Chester County, SEPTA, municipalities*).
- Communities and municipalities should pursue parking expansion, parking enhancement, and supportive land use plans around stations. (*Chester County, municipalities*)

3.3 Comments and Next Steps

Effective transit service in western Chester County is consistent with the county's "Landscapes" comprehensive plan and with DVRPC's Long Range Plan. Chester County already has transit assets in the form of rail stations, rail service, and bus operations (including shuttles). Recent SEPTA and Amtrak infrastructure investments like a new station at Thorndale, and PennDOT funded Keystone Corridor rail improvements have all recently been made. The present study continues a demonstrated county commitment to exploring the ways in which transit service might improve resident quality of life.

The results of the study suggest three points: 1) the current mix of SEPTA and Amtrak service (including recent Amtrak rail upgrades) already provide a defacto western extension and should be promoted as a single Keystone Corridor service; 2) expensive capital improvements for rail, station and parking improvements would be required for new service, though no funding sources were identified; 3) Year 2020 forecast ridership might support a service extension but would require strong transit orientation of residential and employment growth and need to consider a County subsidy in the short run.

The R5 service extension would be consistent with county and municipal plans, however, as noted herein, Amtrak already provides defacto express service at a competitive price. An extension would require financial commitments for infrastructure improvements and to meet operating costs, especially in the early operational stages of any service.

Ridership forecasts, train infrastructure, service levels, and farebox recovery all present a multitude of financial trade offs, even if major ridership demand can be cultivated and demonstrated. A high demonstrated demand would be helpful in both justifying levels of service and help in ameliorating operating costs. Ridership must be given the chance to grow from a base of zero, and permanence of service must be apparent to all parties in order for the investment to impact local development patterns and contribute to beneficial economic development in the ways envisioned by project backers.

The needs and opportunities described above provide a framework for all stakeholders to better understand the hurdles to be overcome and commitments required to extend service. All stakeholders should weigh the costs and benefits associated with addressing each level of need, and consider the ways in which they might partner to financially demonstrate their policy commitments.

Planning should be continued to strategically preserve and enhance future opportunities. The minimal recommendation is to boost ridership in advance of new expenditures required to extend the line, coupled with long term land use planning to preserve and enhance ride sheds in order to retain the services which are currently in place.

APPENDIX

**Summary Year 2020 Station Shed Forecasts by Minor
Civil Divisions (Municipalities) A-1**

APPENDIX

Parkesburg Station Shed Summary

The change in the 2005 Parkesburg Station Shed (shown in Table 11) between the 2000 and 2020 resulted in a shed increase of 24 percent or about 16,000 people. This is within a few percentage points of the board approved forecasts for Chester and Lancaster Counties .

Map 4 provides a graphic comparison of the change in 1999 and 2005 station sheds. The municipalities of origin in Table 11 are tallied for their population, but the ride sheds depicted in Map 4 reflect the expanded number of Municipalities derived from the 2005 license plate survey (in comparison to the 1999 survey) and the distances traveled to park at the station. The 2005 survey results depict longer distances being traveled to ride Amtrak inbound to Philadelphia. Both sheds follow PA 10 along a north/south axis and PA 372 from the west. Regardless of the parking or boarding numbers, those who travel to the station are clearly accessing it via main roads, which likely correspond to the distribution of development.

Table 11. Parkesburg 80% Station Ride Shed Demographics by MCD

	2000 Pop	2020	Total Change 00-20	Percent Change 00-20
Chester County	433,501	528,000	94,499	22%
Lancaster County	470,660	548,979	78,319	17%
Atglen Boro.	1,217	1,620	403	33%
East Fallowfield Twp.	5,157	6,440	1,283	25%
Highland Twp.	1,125	1,260	135	12%
Honey Brook Twp.	6,278	7,750	1,472	23%
Londonderry Twp.	1,632	2,280	648	40%
London Grove Twp.	5,265	8,090	2,825	54%
Parkesburg Boro.	3,373	4,070	697	21%
Penn Twp.	2,812	4,310	1,498	53%
Sadsbury Twp.	2,582	2,820	238	9%
West Caln Twp.	7,054	2,620	135	5%
West Fallowfield Twp.	2,485	2,970	526	22%
West Sadsbury Twp.	2,444	3,569	566	19%
Bart Twp	3,003	3,569	566	19%
Christiana Boro.	1,124	1,107	-17	-2%
Paradise Twp.	4,698	5,102	404	9%
Sadsbury Twp.	3,025	3,835	810	27%
Salisbury Twp.	10,012	12,419	2,407	24%
Strasburg Twp.	<u>4,021</u>	<u>4,700</u>	679	17%
Total	67,307	83,692	16,385	24%

This page intentionally left blank.



Thorndale Station Shed Summary

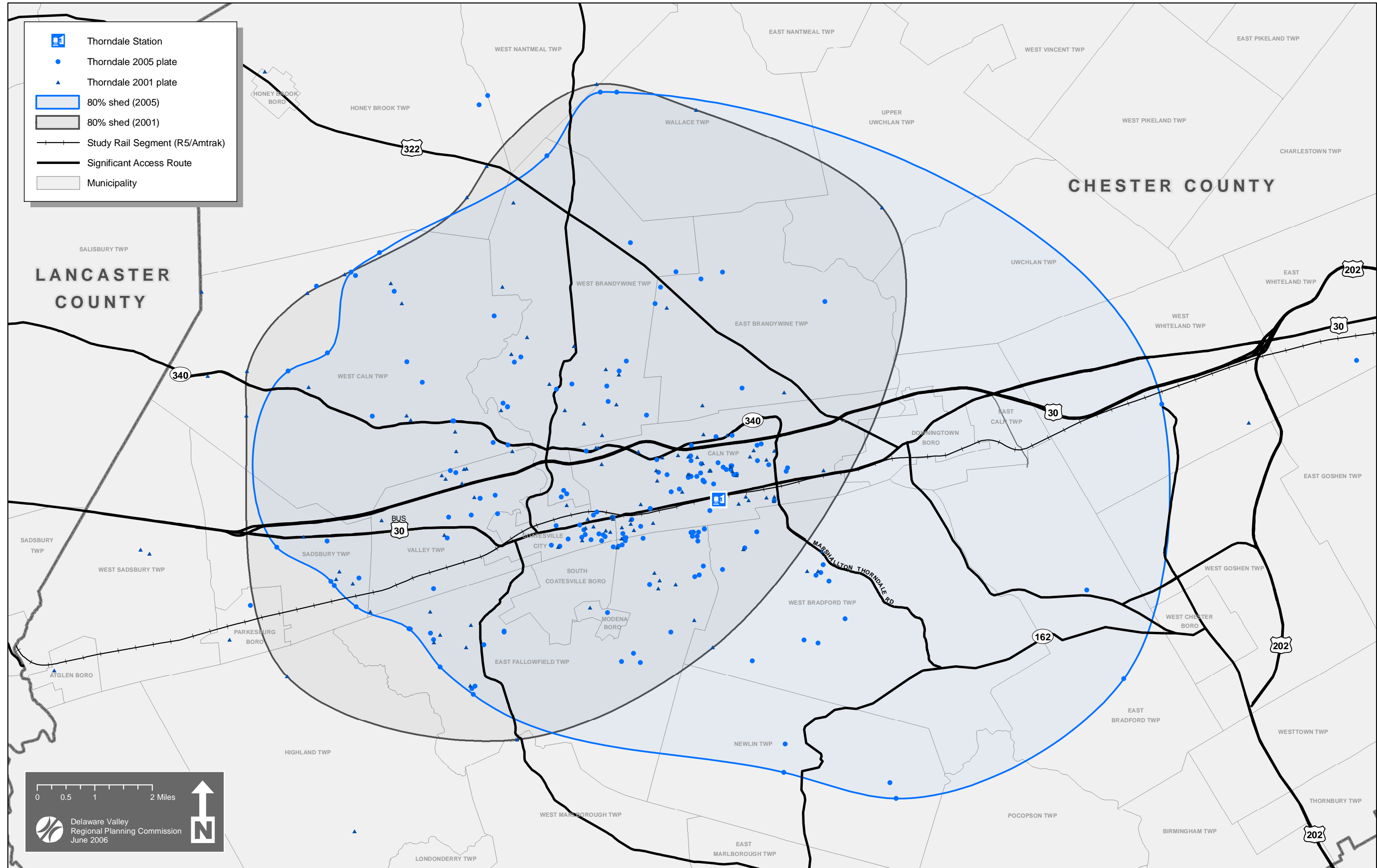
The Thorndale train station is the current terminus for the R5 line. Opened in late 1999, it has a new station and large parking facility, consistent with SEPTA suburban plans. Map 4 on the next page provides a graphic description of the change in 2001 and 2005 station sheds. This is caused by an expanded number of municipalities derived from the 2005 license plate survey (in comparison to the 2001 survey). While the Municipalities are tallied for their population in Table 12, the ride sheds depicted in Map 5 reflect the spread of the distance traveled to park at the station. The 2005 survey results depict an eastward extension of the shed. It has been suggested that access to the station has been greatly facilitated by Marshalton/Thorndale Road, which generally bisects the direction of shed growth. The majority of riders originate relatively close to the station but are likely forced to drive by the lack of bicycle and pedestrian amenities.

Table 12. Thorndale 80% Station Ride Shed Demographics by MCD

	2000 Pop	2020 Pop	Total Change 00-20	Percent Change 00-20
Chester County	433,501	528,000	94,499	22%
Caln Twp.	11,916	14,750	2,834	24%
Coatesville City	10,838	11,490	652	6%
Downingtown Boro.	7,589	8,030	441	6%
East Bradford Twp.	9,405	12,740	3,335	35%
East Brandywine Twp.	5,822	6,960	1,138	20%
East Caln Twp.	2,857	3,270	413	14%
East Fallowfield Twp.	5,157	6,440	1,283	25%
Honey Brook Twp.	6,278	7,750	1,472	23%
Modena Boro.	610	580	-30	-5%
Newlin Twp.	1,150	1,350	200	17%
Pocopson Twp.	3,350	4,330	980	29%
South Coatesville Boro.	997	1,100	103	10%
Upper Uwchlan Twp.	6,850	12,200	5,350	78%
Uwchlan Twp.	16,576	20,000	3,424	21%
Valley Twp.	5,116	6,430	1,314	26%
Wallace Twp.	3,240	4,370	1,130	35%
West Bradford Twp.	10,775	12,880	2,105	20%
West Brandywine Twp.	7,153	9,510	2,357	33%
West Caln Twp.	7,054	8,730	1,676	24%
West Chester Boro.	17,861	17,890	29	0%
West Goshen Twp.	20,495	24,060	3,565	17%
West Nantmeal Twp.	2,031	2,280	249	12%
West Whiteland Twp.	<u>16,499</u>	<u>20,460</u>	3,961	24%
Total	179,619	217,600	37,981	21%

This page intentionally left blank.

MAP 5: Thorndale 80% Station Sheds





Downingtown Station Shed Summary

The Downingtown station shed is relatively large with Map 1 showing that it surrounds the Thorndale and Whitford station sheds. As a long time, established SEPTA and Amtrak station, its ridership may be more historic or habitual than proximate. The change in the Downingtown Station Shed (shown in Table 13) between the 2000 and 2020 results in a shed increase (in constant 2000 Census figures) of 23 percent or about 43,000 people.

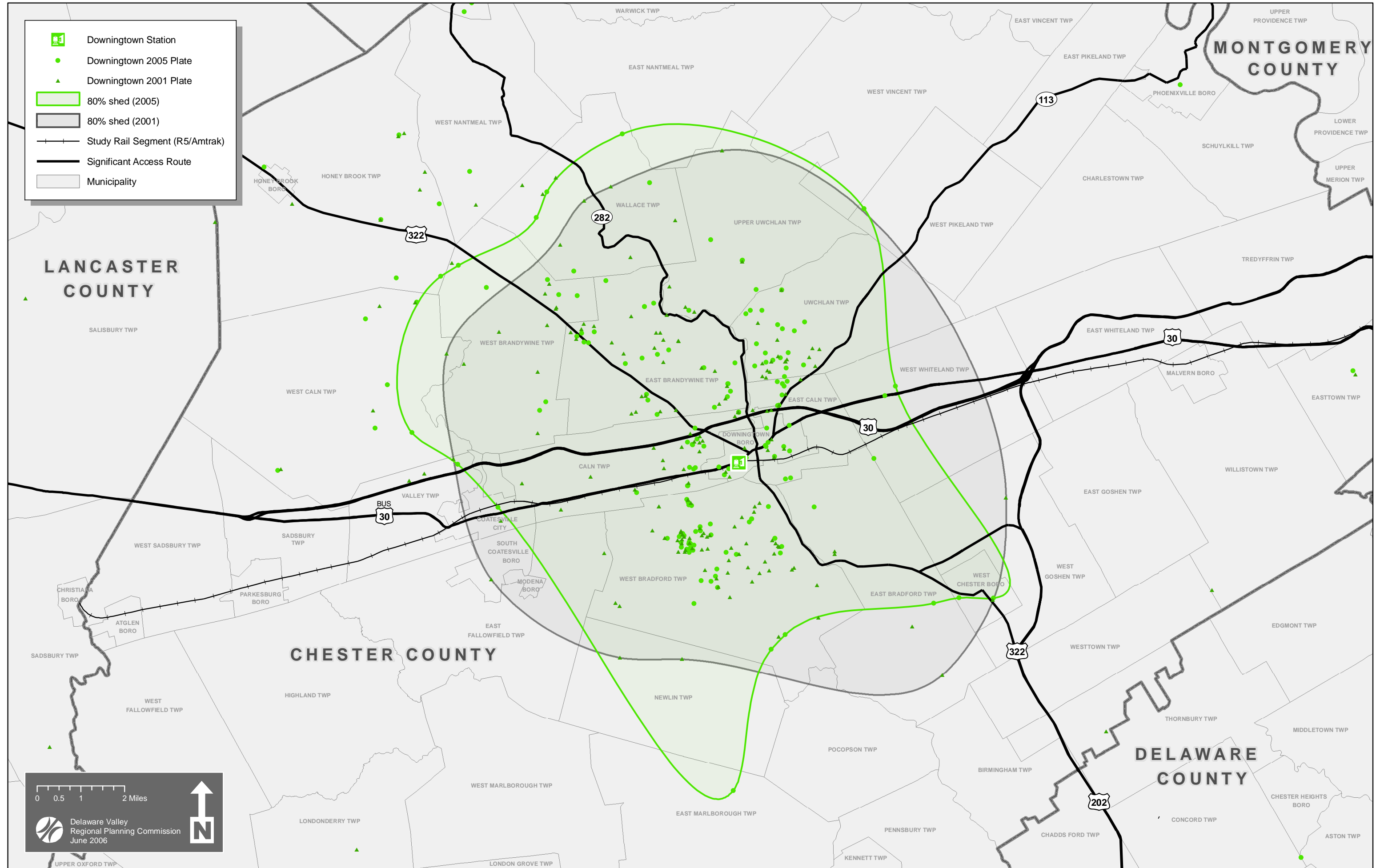
Map 6 provides a graphic description of the change in 2001 and 2005 station sheds. This is caused by an expanded number of Municipalities from the 2005 license plate survey (in comparison to the 2001 survey). While the Municipalities of origin are tallied for their population in Table 13, the ride sheds depicted in Map 6 reflect the spread of the distance traveled to park at the station. The mapped sheds associated with the 2001 and 2005 survey results are similar. There does appear to be clustering just north and west of the station outside the 80% shed along Route 322, suggesting that access to the station is well accommodated along that corridor.









Table 13. Downingtown 80% Station Ride Shed Demographics by MCD

	2000 Pop	2020 Pop	Total Change 00-20	Percent Change 00-20
Chester County	433,501	528,000	94,499	22%
Caln Twp.	11,916	14,750	2,834	24%
Coatesville City	10,838	11,490	652	6%
Downingtown Boro.	7,589	8,030	441	6%
East Bradford Twp.	9,405	12,740	3,335	35%
East Brandywine Twp.	5,822	6,960	1,138	20%
East Caln Twp.	2,857	3,270	413	14%
East Fallowfield Twp.	5,157	6,440	1,283	25%
East Marlborough Twp.	6,317	8,980	2,663	42%
East Nantmeal Twp.	1,787	2,060	273	15%
Honey Brook Twp.	6,278	7,750	1,472	23%
Newlin Twp.	1,150	1,350	200	17%
South Coatesville Boro.	997	1,100	103	10%
Upper Uwchlan Twp.	6,850	12,200	5,350	78%
Uwchlan Twp.	16,576	20,000	3,424	21%
Valley Twp.	5,116	6,430	1,314	26%
Wallace Twp.	3,240	4,370	1,130	35%
West Bradford Twp.	10,775	12,880	2,105	20%
West Brandywine Twp.	7,153	9,510	2,357	33%
West Caln Twp.	7,054	8,730	1,676	24%
West Chester Boro.	17,861	17,890	29	0%
West Goshen Twp.	20,495	24,060	3,565	17%
West Pikeland Twp.	3,551	5,670	2,119	60%
West Vincent Twp.	3,170	4,350	1,180	37%
West Whiteland Twp.	<u>16,499</u>	<u>20,460</u>	3,961	24%
Total	188,453	231,470	43,017	23%


This page intentionally left blank.

MAP 6: Downingtown 80% Station Sheds



-  Downingtown Station
-  Downingtown 2005 Plate
-  Downingtown 2001 Plate
-  80% shed (2005)
-  80% shed (2001)
-  Study Rail Segment (R5/Amtrak)
-  Significant Access Route
-  Municipality

0 0.5 1 2 Miles



Delaware Valley
Regional Planning Commission
June 2006



Whitford Station Shed Summary

The Whitford station shed is interesting in that it exists within the Exton shed and is nearly engulfed by the Thorndale and Downingtown sheds. The shed is notably smaller than surrounding station travel and functions as a "spillover" station (with available parking capacity) for riders from Exton station. The change in the Whitford Station Shed (shown in Table 14) between the 2000 and 2020 resulted in a shed increase (in constant 2000 Census figures) of 21 percent or about 29,000 people.

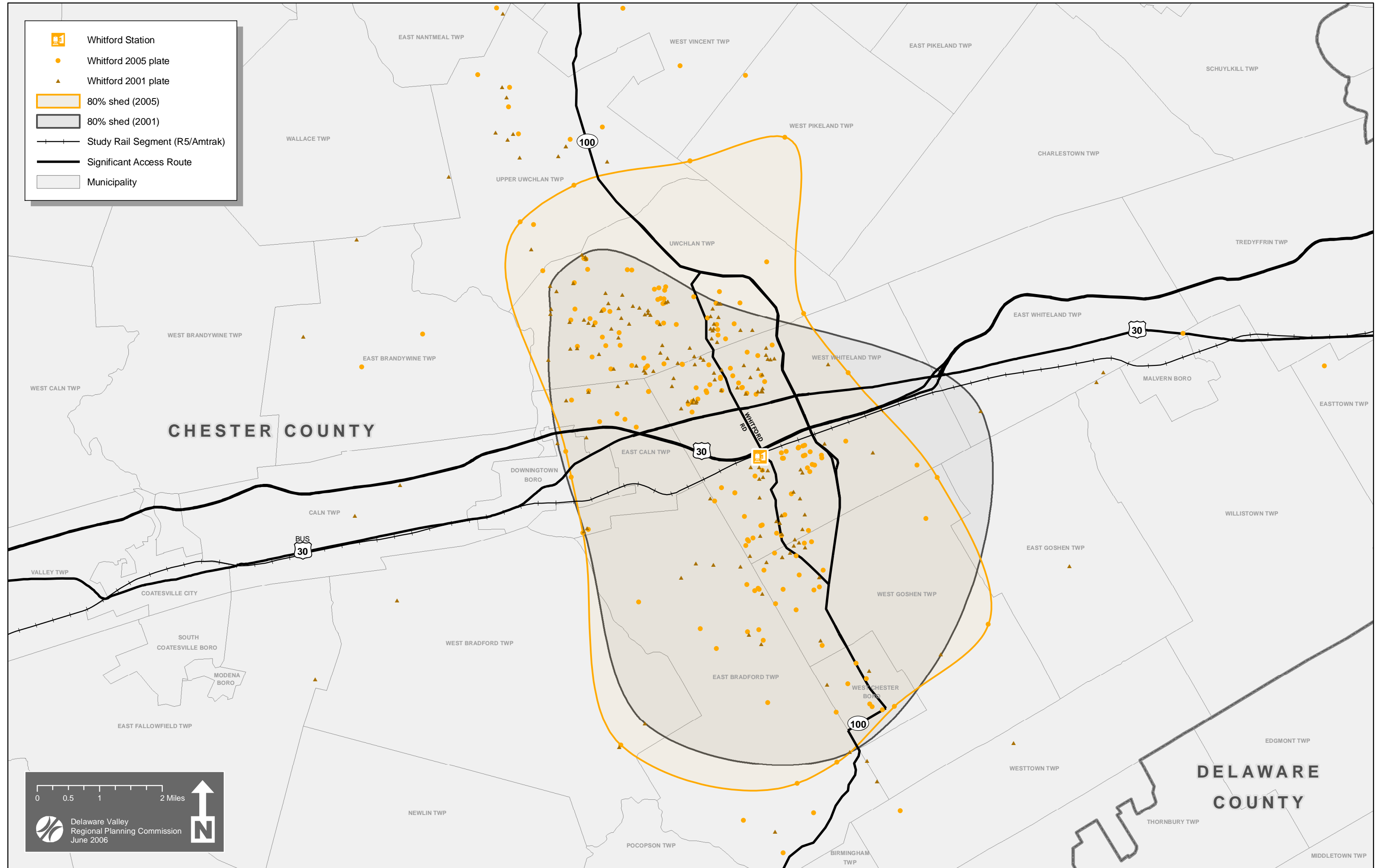
Map 7 provides a graphic description of the 2001 and 2005 station sheds. This is caused by an expanded number of Municipalities derived from the 2005 license plate survey (in comparison to the 2001 survey). While the Municipalities of origin are tallied for their population in Table 14, the ride sheds depicted in Map 6 reflect the distance traveled to park at the station. Relative to the 2001 shed, the 2005 shed is following the Route 100 corridor. Whitford, with its extra parking capacity (see Table 3), may serve as a local alternative to the Exton. There appears to be clustering north and west of the station (outside the 80% shed) along Route 100 and Whitford Road where roughly 2,000 new housing units are either already constructed or planned (these may not have been figured into the 2020 forecast numbers).

Table 14. Whitford 80% Station Ride Shed Demographics by MCD

	2000 Pop	2020 Pop	Absolute Change 00-20	Percent Change 00-20
Chester County	433,501	528,000	94,499	22%
Downingtown Boro.	7,589	8,030	441	6%
East Bradford Twp.	9,405	12,740	3,335	35%
East Brandywine Twp.	5,822	6,960	1,138	20%
East Caln Twp.	2,857	3,270	413	14%
East Goshen Twp.	16,824	19,780	2,956	18%
Upper Uwchlan Twp.	6,850	12,200	5,350	78%
Uwchlan Twp.	16,576	20,000	3,424	21%
West Bradford Twp.	10,775	12,880	2,105	20%
West Chester Boro.	17,861	17,890	29	0%
West Goshen Twp.	20,495	24,060	3,565	17%
West Pikeland Twp.	3,551	5,670	2,119	60%
West Whiteland Twp.	<u>16,499</u>	<u>20,460</u>	3,961	24%
Total	135,104	163,940	28,836	21%

This page intentionally left blank.

MAP 7: Whitford 80% Station Sheds



0 0.5 1 2 Miles

Delaware Valley
Regional Planning Commission
June 2006

N



Exton Station Shed Summary

The Exton station shed has the largest geographic shed, enclosing or overlapping the western sheds: Whitford, Downingtown, and Thorndale. The magnitude of the station shed can be attributed to the station's access via Rt. 100 (to the north and south) and Rt. 30 (to the east and west). Therefore, Exton station provides the most convenient service location for residential concentrations in the West Chester and Lionville areas. This is evidenced by the 2005 travel shed's population, encompassing two-thirds of Chester County's population. The change in the Exton Station Shed (shown in Table 15) between the 2000 and 2020 equals a shed increase of 19 percent or about 54,000 people.

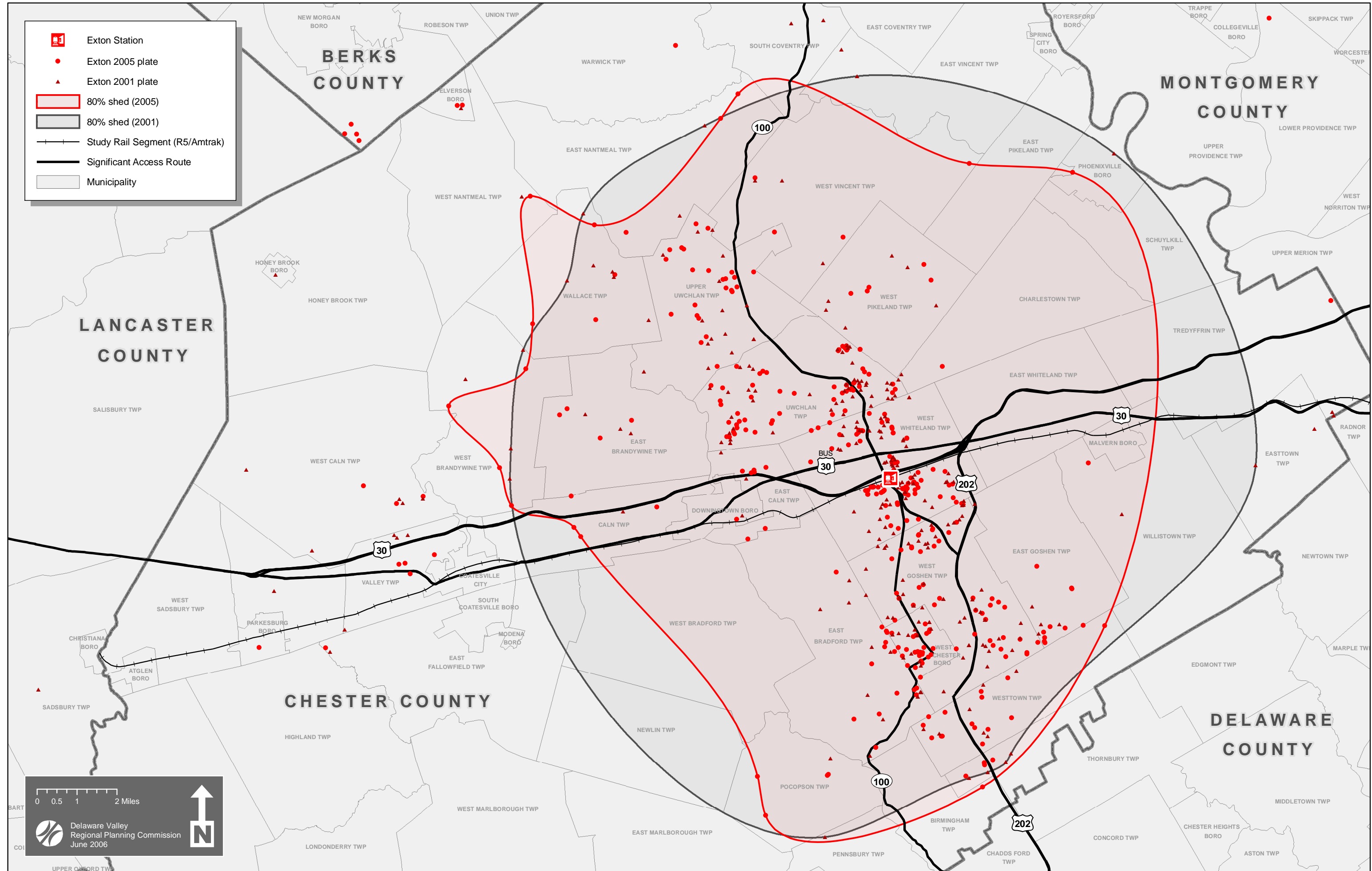
Map 8 provides a graphic description of the 2001 and 2005 station sheds. While the Municipalities of origin are tallied for their population in Table 15, the ride sheds depicted in Map 7 reflect the spread of the distance traveled to park at the station. Relative to the 2001 shed, the 2005 shed indicates a general reduction in distances traveled by passengers to the station. Consequently, the 'inner-80%' of distances upon which the shed is determined resulted in fewer Municipalities being included. There appears to be clustering just north and west of the station (outside the 80% shed) in Morgantown where new housing units continue to be constructed in Berks County and just west of Coatesville. Origins clearly have clustered along Route 100, reflecting again the significance of station highway access in the residential and travel choice made by station patrons.

Table 15. Exton 80% Station Ride Shed Demographics by MCD

	2000 Pop	2020 Pop	Total Change 00-20	Percent Change 00-20
Chester County	433,501	528,000	94,499	22%
Birmingham Twp.	4,221	6,300	2,079	49%
Caln Twp.	11,916	14,750	2,834	24%
Charlestown Twp.	4,051	5,450	1,399	35%
Downingtown Borough	7,589	8,030	441	6%
East Bradford Twp.	9,405	12,740	3,335	35%
East Brandywine Twp.	5,822	6,960	1,138	20%
East Caln Twp.	2,857	3,270	413	14%
East Goshen Twp.	16,824	19,780	2,956	18%
East Pikeland Twp.	6,551	7,730	1,179	18%
East Vincent Twp.	5,493	6,660	1,167	21%
East Whiteland Twp.	9,333	10,560	1,227	13%
Malvern Boro.	3,059	3,210	151	5%
Newlin Twp.	1,150	1,350	200	17%
Pennsbury Twp.	3,500	4,240	740	21%
Phoenixville Boro.	14,788	15,680	892	6%
Pocopson Twp.	3,350	4,330	980	29%
Schuylkill Twp.	6,960	8,680	1,720	25%
South Coventry Twp.	1,895	2,310	415	22%
Thornbury Twp.	2,678	3,820	1,142	43%
Tredyffrin Twp.	29,062	30,920	1,858	6%
Upper Uwchlan Twp.	6,850	12,200	5,350	78%

Uwchlan Twp.	16,576	20,000	3,424	21%
Wallace Twp.	3,240	4,370	1,130	35%
West Bradford Twp.	10,775	12,880	2,105	20%
West Brandywine Twp.	7,153	9,510	2,357	33%
West Caln Twp.	7,054	8,730	1,676	24%
West Chester Boro.	17,861	17,890	29	0%
West Goshen Twp.	20,495	24,060	3,565	17%
West Nantmeal Twp.	2,031	2,280	249	12%
West Pikeland Twp.	3,551	5,670	2,119	60%
Westtown Twp.	10,352	10,760	408	4%
West Vincent Twp.	3,170	4,350	1,180	37%
West Whiteland Twp.	16,499	20,460	3,961	24%
Willistown Twp.	<u>10,011</u>	<u>10,370</u>	359	4%
Total	286,122	340,300	54,178	19%

MAP 8: Exton 80% Station Sheds





Needs and Opportunities Study for the R5 Extension West of Thorndale**Publication No.:** # 07021**Date Published:** June 2007**Geographic Area Covered:** Eastern Lancaster County, Western Chester County, Train stations at Atglen, Parkesburg, Coatesville, Downingtown, Whitford, and Exton.**Key Words:** SEPTA, Amtrak, Keystone Corridor, R5 Thorndale, Atglen, Parkesburg, Coatesville, Downingtown, Whitford, Exton, Lancaster County, Chester County, Great Valley Flyer, Service extension, Norfolk Southern

Abstract: This study examines the costs and benefits of extending previously discontinued service from Thorndale Station west to three stations in Chester County: Atglen, Parkesburg, and Coatesville. The methods of analysis include evaluation of current service and parking levels, Year 2020 straight line ridership forecasts based on station sheds, an inventory of capital and operating costs, and an assessment of cost recovery for varying ridership. The results of the analysis suggest three points: 1) the current mix of SEPTA and Amtrak service (including recent Amtrak rail upgrades) already provide a de facto western extension and should be promoted as Keystone Corridor service; 2) expensive capital improvements for rail, station and parking improvements would be required for new service, though no funding sources were identified; 3) Year 2020 forecast ridership could support a service extension but would require strong transit orientation of residential and employment growth.

Delaware Valley Regional Planning Commission
190 North Independence Mall West, 8th Floor
Philadelphia, PA 19106-1520

Phone: 215-592-1800
Fax: 215-592-9125
Internet: www.dvrpc.org

Staff Contact: Joseph F. Hacker, Ph.D., AICP
Direct Phone: 215-238-2935
Email: jhacker@dvrpc.org



Delaware Valley
Regional Planning
Commission

*190 N. Independence Mall West
8th Floor
Philadelphia, PA 19106-1520
215.592.1800
www.dvrpc.org*