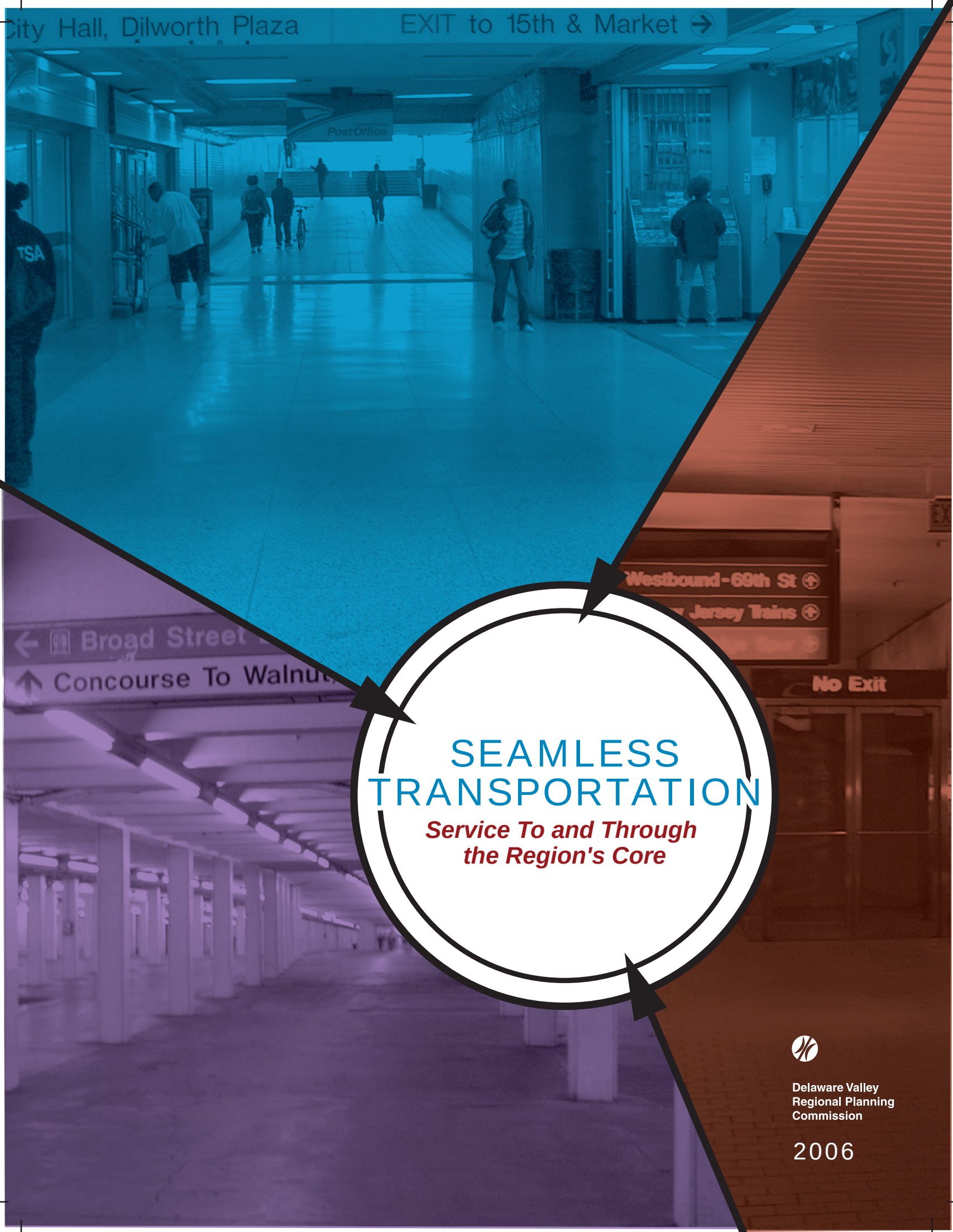

SEAMLESS TRANSPORTATION

Service To and Through the Region's Core

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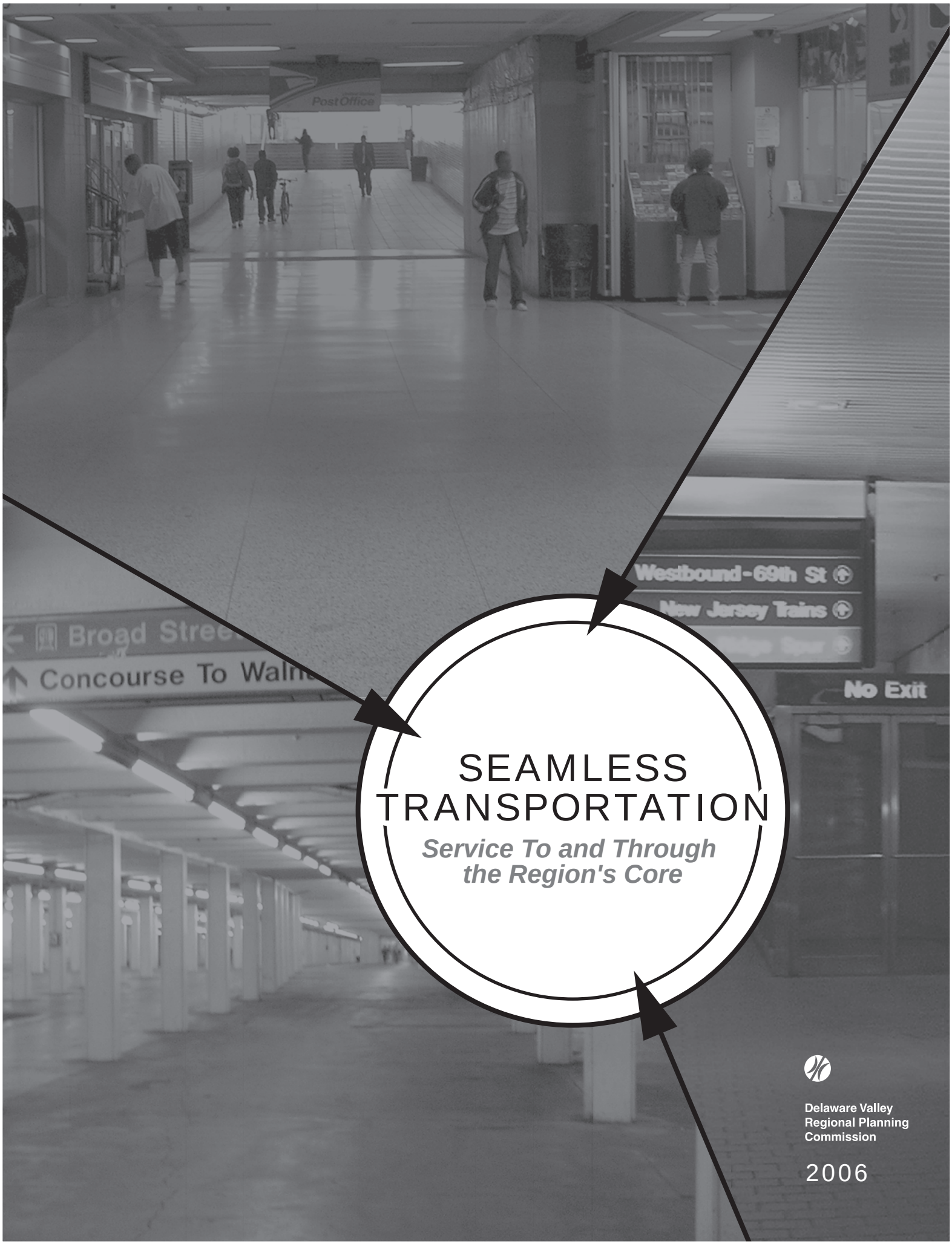

SEAMLESS TRANSPORTATION

Service To and Through the Region's Core

Delaware Valley
Regional Planning
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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.

Our logo is adapted from the official DVRPC seal, 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. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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 its findings and conclusions, which may not represent the official views or policies of the funding agencies.

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Note: Unless otherwise indicated, all photos in this report were taken in April 2006 by Gregory R. Krykewycz, PP, AICP.

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EXECUTIVE SUMMARY

This project principally involved two major components. The first was an analysis of key passenger movements between the three regional mass transit providers (New Jersey Transit, PATCO, and SEPTA), informed by Census journey to work data. As a result of this analysis, interagency transfer nodes which are key to significant numbers of transfers were identified. The second major component of this project involved a field survey of the passenger transfer experience at these key transfer nodes, resulting in recommendations for low capital improvements to enhance service coordination. In addition, existing interagency fare programs were examined in the context of the key identified transfer movements, and near and long-term improvements to these programs suggested.

Elements which were identified as being significant to interagency transfers, and a summary of recommendations for each, are as follows:

- **Signage** – The use of wayfinding (e.g. 'PATCO Trains to New Jersey This Way') and destination-based signage should be expanded. SEPTA's 'Getting Around' signs (see Figure 2) are an excellent example of the latter. In addition, where wayfinding signage is used, it is important that it be consistent.

- **Color coding** – New signage and station investments should continue to emphasize and reinforce the well-established color coding that is already strongly associated with the branding of PATCO and SEPTA city rail lines (e.g. PATCO / red, Market-Frankford Line / blue, Broad Street Line / orange, Subway-Surface Trolleys / green).

- **Facility branding** – Where key transfer facilities exist, they should be uniquely branded for easy passenger recognition. Specifically, this report suggests that such branding be applied to 8th and Market Station (Connecting the Market-Frankford Line, PATCO, and the Broad-Ridge Spur) as well as the unique bus transfer interfaces along east Market Street (Connecting New Jersey Transit and SEPTA bus routes). The recent effort to rename Amtrak 30th Street Station as Ben Franklin Station may be an effective model in this regard.

- **Distance and directness of the connection between lines** – For the most part, key interagency transfers in the core are proximate, with extensive use of color coding to direct passengers. The only specific recommendation for improvement in this regard involves the SEPTA and Amtrak 30th Street Station interface, where the pedestrian connection should be enhanced.

- **Fare instruments** – The most significant impediment to 'seamless' interagency travel is the lack of a unified, interoperable fare instrument. From the perspective of DVRPC, and this study specifically, fare interoperability within the region should be a key element of fare modernization efforts already planned by the three major regional transit providers.

INTRODUCTION

This project identifies key passenger movements between the three regional mass transit providers (New Jersey Transit, PATCO, and SEPTA). An analysis of these movements informs an assessment of the present degree of interagency coordination accommodating these transfers, resulting in recommendations for low capital improvements to enhance service coordination within the regional core (Center City Philadelphia). Center City is critical to interagency transit movements because it is the nexus of the regional mass transit network, and the only location where New Jersey Transit, PATCO, and SEPTA services converge.

SUMMARY OF METHODS

A comprehensive examination of key passenger transfer locations and movement patterns between transit modes and carriers required an assessment of regional work flows between individual geographies. The nature of transit service in the region is that inter-agency transit flows within the regional core are interstate flows by definition. This is because transfers between New Jersey Transit and SEPTA will nearly always involve an interstate movement, and the principal PATCO movements occur across the Delaware River.

The primary journey to work flows impacting inter-agency transit movements in the regional core are interstate transit work commutes. An analysis of these interstate commutes within the region in conjunction with existing transit routes and facilities permitted an identification of the transfer movements and nodes which are most important.

Once these key transfer facilities were identified, field surveys permitted an assessment of the present conditions through which transfer movements occur. The current arrangement of facilities, available amenities (including wayfinding signage, the availability of transfer fares, and others) were examined from the passenger's perspective so that potential impediments to a comfortable transfer could be observed. As a result of this field assessment, low capital strategies to address these impediments are suggested. In addition, existing interagency fare programs are examined in the context of the key identified transfer movements, and near and long-term improvements to these programs are suggested.

ANALYSIS OF WORK TRIP FLOWS

The 2000 US Census Transportation Planning Package (CTPP 2000) is the principal data source for journey to work analysis, and was employed for this project to comprehensively examine regional interstate transit work movements. The CTPP Journey to Work (JTW) data is derived from the 2000 US Census 'long form' sample data, which was administered to an average of one in six households in spring 2000, and specifically referenced trip patterns during the Census 'reference week': the first week of April, 2000.

Other regional employment data has been revised by DVRPC in conjunction with our member governments to better account for factors such as workers holding multiple jobs. However, due to the very large number of possible combinations, such adjustments were not made to regional journey-to-work origin and destination pairs. Accordingly, the journey-to-work data referenced in this report are as originally reported by the Census Bureau (i.e. they are not adjusted).

It is worth noting that CTPP journey-to-work counts reflect only the primary commute mode to the primary job, which may undercount modes other than single occupant automobiles. This is because most commutes involving transit, and particularly interstate commutes from suburban areas to or through the core, require an automobile for some portion of the trip. For example, if an individual commuter were to drive daily from Logan Township, Gloucester County, to the Ferry Avenue PATCO station and then ride PATCO into Center City, they might consider their primary transport mode for the trip to be their automobile. This would be recorded as such in their Census responses.

When regional interstate journey to work patterns were initially examined, it was clear that trip volumes from regional New Jersey municipalities to the City of Philadelphia dwarfed all other interstate commute patterns. Therefore, so as not to obscure other interstate transit movements ('through' rather than 'to' the regional core), interstate trips originating or terminating in Philadelphia are examined separately from other interstate movements.

Table 1 summarizes regional interstate transit commute volumes as a proportion of all commutes and illustrates the scale of trips involving Philadelphia in comparison to those which do not.

Table 1. Regional Interstate Journey-to-Work Patterns by Movement & Mode

Origin and Destination	Bus	Rail	Other	Transit Total	All Modes Total	Transit Share (%)
NJ to PA (non-PHL)	297	275	30,908	572	31,480	2 %
NJ to PHL	2,731	13,692	49,525	16,423	65,948	25 %
NJ to PA total				**16,995**	**97,428**	**17 %**
PA (non-PHL) to NJ	73	190	39,093	263	39,356	1 %
PHL to NJ	800	323	14,338	1,123	15,461	7 %
PA to NJ total				**1,386**	**54,817**	**3 %**

Source: United States CTPP 2000: Tables 308, 314. NOTE: These figures no not reflect any impact of the NJ Transit RiverLINE, as that line was not yet in service by Census 2000.

It is worth noting that the total number of daily interstate transit commutes not originating or terminating in Philadelphia (i.e. primarily interagency trips *through* the core) numbers less than 1,000 (572 trips from New Jersey and 263 from Pennsylvania). Maps 1 and 2 display the origins and destinations for these non-Philadelphia interstate transit trips at the municipal (Minor Civil Division/MCD) level.

Regional Municipal-Level Analysis (*Through* the Core)

An examination of these maps indicates that there are many more interstate bus origins in New Jersey than in Pennsylvania. This is also reflected in Table 1 (above). Interstate rail commutes are more evenly divided, but here also trips from New Jersey to Pennsylvania are greater than the reverse. These disparities may simply reflect a greater number of jobs in the four suburban Pennsylvania counties than in the four New Jersey counties.

According to DVRPC's 2000 Employment Centers report (Publication No. 05034; December 2005), none of the four suburban New Jersey counties had as many total jobs in 2000 as Delaware County (238,164), which had the least jobs among the four Pennsylvania counties. Cumulatively, employment in the four Pennsylvania counties was roughly 70% greater than the total employment in the four New Jersey counties (1,236,606 vs. 728,691). Given that 93% of total regional employment is located within the designated Employment Centers, which are in turn partly defined by access to major transportation connections (including transit), this general regional employment disparity likely has a significant impact on the disparity in suburban to suburban interstate transit commutes observed.

Tables 2 and 3 depict the regional municipalities with the highest numbers of interstate transit work attractions from within the region, along with the transit routes and core transfer facilities most likely to be serving these interstate riders (based on proximity).

MAP 1: Interstate Bus Commuting Patterns (Excluding Philadelphia)

MCD Interstate Bus Origins (NP)

- 0
- 1 - 6
- 7 - 8
- 9 - 13
- 14 - 97

MCD Interstate Bus Destinations (NP)

- 0
- 1 - 6
- 7 - 11
- 12 - 18
- 19 - 41

Where MCD has both Origins & Dest.:

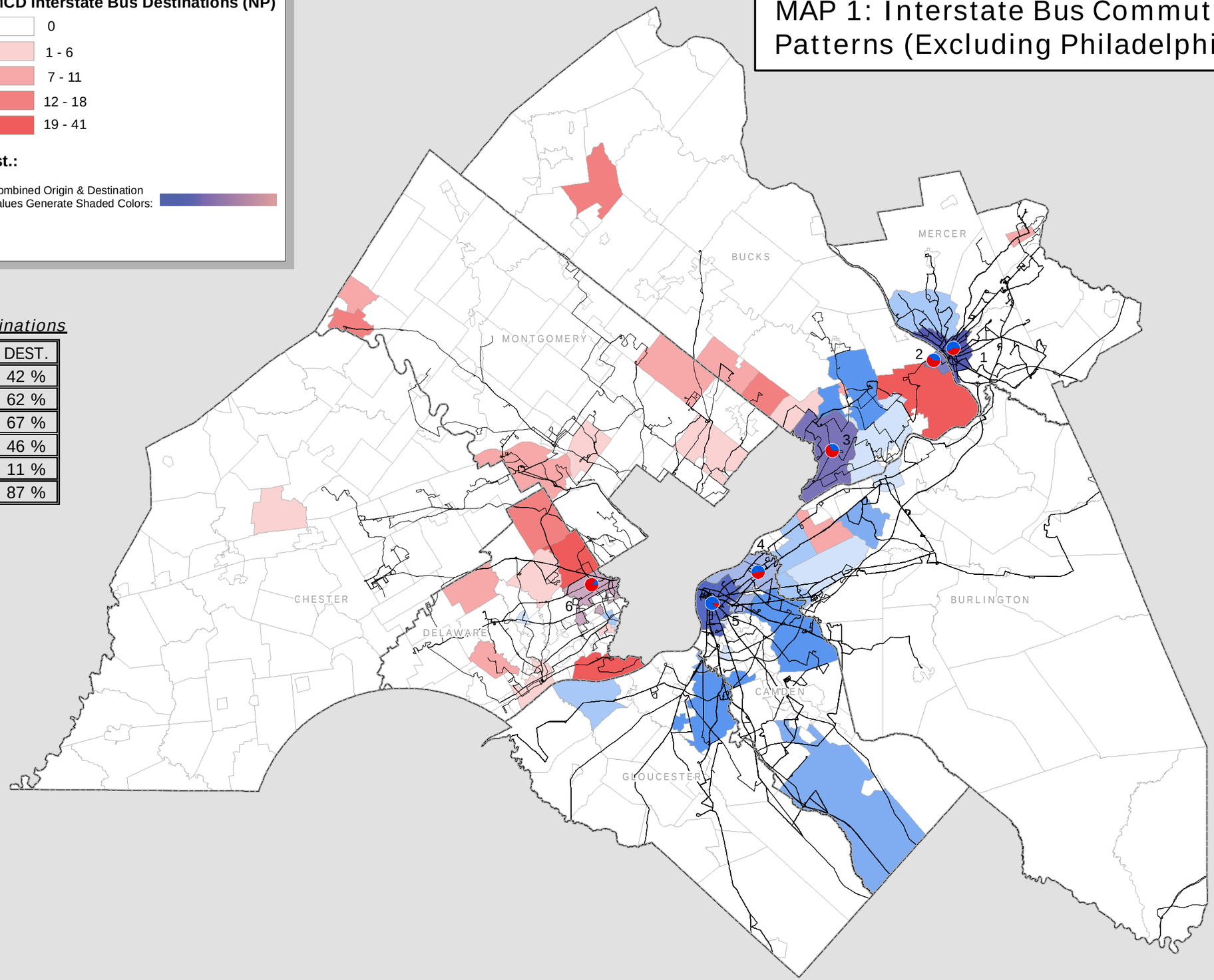
Ratio: Bus Origins (Ex. Phila) / Bus Dest. (Ex. Phila)

Combined Origin & Destination Values Generate Shaded Colors:

Bus Routes (Ex. Phila)

Municipalities with Origins & Destinations

	MCD	ORIGIN	DEST.
1	Trenton City	58 %	42 %
2	Morrisville Boro	38 %	62 %
3	Bensalem Twp	33 %	67 %
4	Pennsauken Twp	54 %	46 %
5	Camden City	89 %	11 %
6	Upper Darby Twp	13 %	87 %



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N

0 5 10 20 Miles

Source: Census Transportation Planning Package 2000 [CTPP 2000], Tables 308 & 314

MAP 2: Interstate Rail Commuting Patterns (Excluding Philadelphia)

MCD Interstate Rail Origins (NP)

- 0
- 1 - 7
- 8 - 9
- 10 - 16
- 17 - 44

MCD Interstate Rail Destinations (NP)

- 0
- 1 - 6
- 7 - 9
- 10 - 17
- 18 - 74

Where MCD has both Origins & Dest.:

Ratio: Rail Origins (Ex. Phila) / Rail Dest. (Ex. Phila)

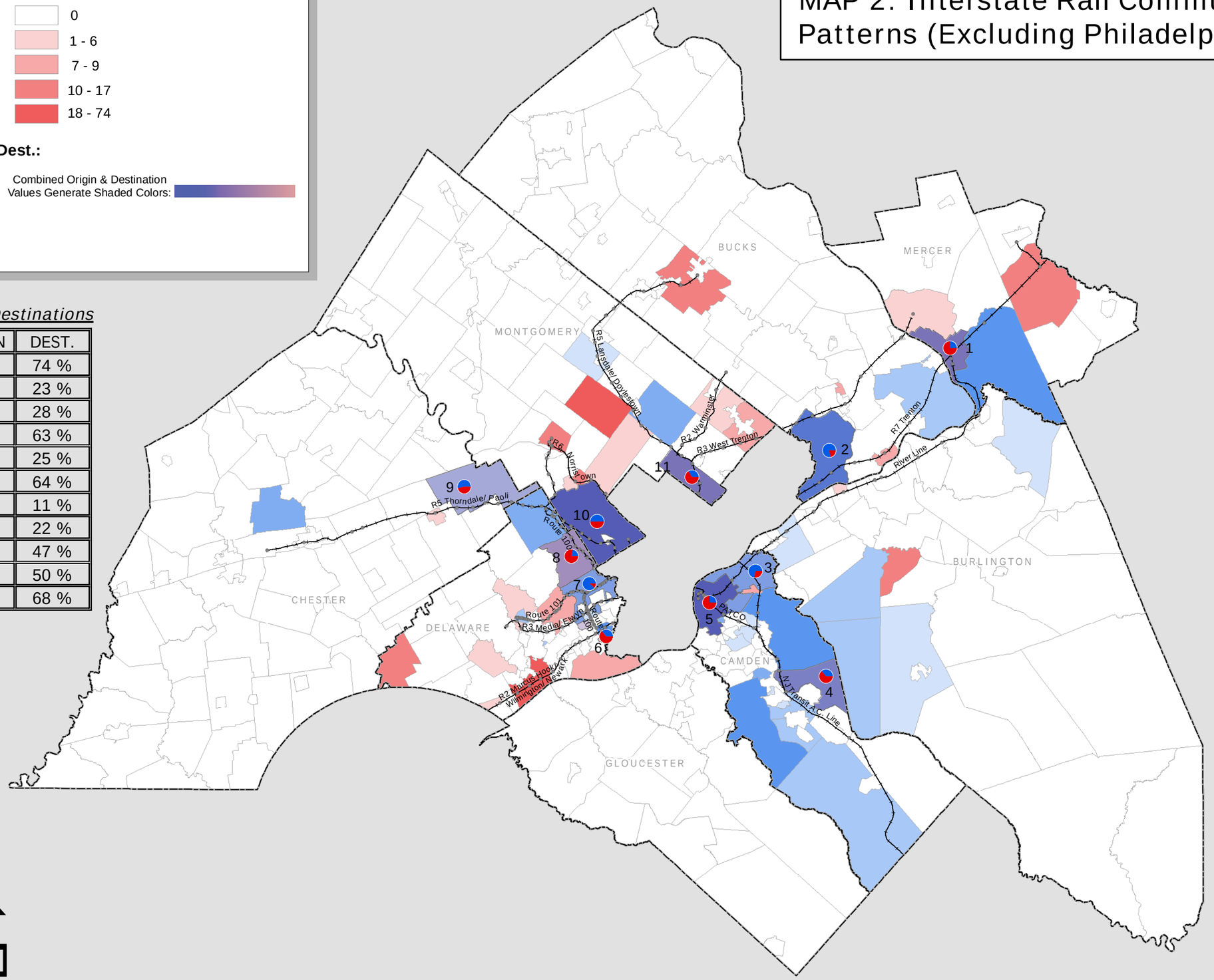
Combined Origin & Destination Values Generate Shaded Colors:

Commuter Rail Lines

Commuter Rail Stations

Municipalities with Origins & Destinations

	MCD	ORIGIN	DEST.
1	Trenton City	26 %	74 %
2	Bensalem Twp	77 %	23 %
3	Pennsauken Twp	72 %	28 %
4	Voorhees Twp	37 %	63 %
5	Camden City	75 %	25 %
6	Darby Twp	36 %	64 %
7	Upper Darby Twp	89 %	11 %
8	Haverford Twp	78 %	22 %
9	Tredyffrin Twp	53 %	47 %
10	Lower Merion Twp	50 %	50 %
11	Cheltenham Twp	32 %	68 %



Delaware Valley Regional Planning Commission
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N

0 5 10 20 Miles

Source: Census Transportation Planning Package 2000 [CTPP 2000], Tables 308 & 314

Table 2. Top Ten Regional Interstate Bus Attractors (Excluding Philadelphia)

Municipality	County	Daily Interstate Bus Attractions	Bus Route(s) Accomodating Interstate Access	Most likely Center City transfer facility(ies)
Upper Darby Borough	Delaware, PA	41	Multiple from 69th St. Terminal	8th St. or 11th St./Market East [*transfer from NJT bus (multiple) Blue Line subway 69th St.*]
Trenton City	Mercer, NJ	27	SEPTA Rt. 127	n/a
Falls Township	Bucks, PA	23	SEPTA Rt. 127	n/a
Bensalem Township	Bucks, PA	22*	Multiple from Northeast Phila.*	Surface transfers from NJT to SEPTA buses at numerous points (e.g. East Market St.)
Tinicum Township	Delaware, PA	21	SEPTA Rts. 37, 68 (connections with NJ Transit buses in S. Phila)	Surface transfers from NJT to SEPTA buses at numerous points
Haverford Township	Delaware, PA	19	Multiple from 69th St. Terminal	8th St. or 11th St./Market East [*transfer from NJT bus (multiple) Blue Line subway 69th St.*]
Morrisville Borough	Bucks, PA	18	SEPTA Rt. 127	n/a
Radnor Township	Delaware, PA	17	SEPTA Rts. 105, 123 (transfer at 69th St. Terminal)	8th St. or 11th St./Market East [*transfer from NJT bus (multiple) Blue Line subway 69th St.*]
East Rockhill Township	Bucks, PA	14	None	n/a
Pottstown Borough	Montgomery, PA	13	SEPTA Rt. 93 (transfer at Norristown)	8th St. or 11th St./Market East [*transfer from NJT bus (multiple) Blue Line subway 69th St. Rt. 100 to Norristown*]

Source: United States CTPP 2000: Tables 308, 314. *While SEPTA Rt. 127 provides access from Mercer County, New Jersey, these 22 workers all originate in the City of Camden.

Table 2 (above) reinforces the disparity between regional interstate bus commutes; all but one of the top regional interstate bus attractors is located in Pennsylvania. Additionally, this table highlights the significance of Market East (surface transfers along Market Street as well as the 8th/Market and Market East rail stations) for bus trips through the core.

Table 3. Top Ten Regional Interstate Rail Attractors (Excluding Philadelphia)

Municipality	County	Daily Interstate Rail Attractions	Rail Line(s) Accomodating Interstate Access	Most likely Center City transfer facility(ies)
Camden City	Camden, NJ	74	PATCO	a) 8th & Market Station [*transfer from Blue Line subway PATCO*]; b) Walnut/Locust Broad St. station & 12th/13th PATCO station [*transfer from Broad St. Line PATCO*]
Trenton City	Mercer, NJ	45	SEPTA R7	No inter-agency transfers necessary
Haverford Township	Delaware, PA	29	SEPTA Rt. 100 (7 Twp. Stops) (transfer at 69th St.)	8th & Market [*transfer from PATCO Blue Line subway 69th St.*]
Lower Merion Township	Montgomery, PA	28	SEPTA R5, R6	8th & Market Station [*a) PATCO Blue Line subway City Hall/Suburban Regional Rail Station; b) walk from 8th to Market East Regional Rail Station*]
Cheltenham Township	Montgomery, PA	25	SEPTA R1, R2, R3, R5	8th & Market Station [*a) PATCO Blue Line subway City Hall/Suburban Regional Rail Station; b) walk from 8th to Market East Regional Rail Station*]
Whitpain Township	Montgomery, PA	21	SEPTA R5	8th & Market Station [*a) PATCO Blue Line subway City Hall/Suburban Regional Rail Station; b) walk from 8th to Market East Regional Rail Station*]
Chester City	Delaware, PA	19	SEPTA R2	8th & Market Station [*a) PATCO Blue Line subway City Hall/Suburban Regional Rail Station; b) walk from 8th to Market East Regional Rail Station*]
West Windsor Township	Mercer, NJ	17	NJT Northeast Corridor (transfer at Trenton from SEPTA R7)	n/a
Voorhees Township	Camden, NJ	17	PATCO, NJT Atlantic City	a) 8th & Market Station [*Blue Line subway PATCO*]; b) 30th St. Station [*Blue Line Subway or Regional Rail NJT AC line*]
Doylestown Township	Bucks, PA	16	SEPTA R5	8th & Market Station [*a) PATCO Blue Line subway City Hall/Suburban Regional Rail Station; b) walk from 8th to Market East Regional Rail Station*]

Source: United States CTPP 2000: Tables 308, 314.

As referenced in Table 3, regional interstate rail attractors are more evenly distributed among Pennsylvania and New Jersey than bus attractors, with six of the top ten rail attractors located in Pennsylvania and four in New Jersey. Table 3 (like Table 2) also illustrates the significance of the Market East rail complex (and particularly 8th and Market Station) for observed interstate movements through the core, with the PATCO/Broad Street Line and SEPTA/New Jersey Transit Line movements also having roles.

It is worth noting that there are significant work movements between Bucks and Mercer counties, a limited portion of which are transit movements. For example, such commutes account for a large portion of the Falls Township interstate bus attractions and all of the Morrisville Borough attractions noted in Table 2. While these interstate transit work patterns are reflected in the tables and maps above, they occur independently of the regional core and are thus only peripherally related to this project.

Philadelphia TAZ-Level Analysis (*To/From* the Core)

Transit interstate origins and destinations within Philadelphia were examined at the level of the Traffic Analysis Zone (TAZ) so that specific trip and transfer patterns within the city could be discerned. Maps 3 and 4 display the results of this analysis.

As would be expected, TAZs in and around Center City Philadelphia exhibit the highest levels of bus and rail attractions within the city. In contrast, Center City TAZs are associated with very few interstate transit origins in comparison to neighborhoods outside Center City.

An examination of these maps permits additional general observations. First, interstate bus origins are more dispersed than interstate rail origins. In other words, interstate bus commutes originate from a much greater number of TAZs than do interstate rail commutes. This is naturally associated with the fact that many more TAZs are directly served by bus routes than by rail lines. Interestingly, a similar disparity is not present in the case of interstate transit attractions within the city – attractions are comparably dispersed for both modes, with both modes' heaviest attractors being located in Center City and University City.

The significance of the Market/Frankford and Broad Street Lines is apparent in the extension of interstate rail attractions along these routes, particularly north of City Hall along the Broad Street Line and west of the Schuylkill River to University City via the Market-Frankford Line. These attractions may to a significant extent reflect interstate commutes to the Temple University and University of Pennsylvania health systems and broader university campuses. For these movements, a transfer between PATCO and the Market/Frankford or Broad Street lines is likely.

MAP 3: Interstate Bus Commuting Patterns Within Philadelphia

TAZs with both Origins and Destinations

	TAZ	ORIGIN	DEST.		TAZ	ORIGIN	DEST.
1	359	44 %	56 %	8	137	73 %	27 %
2	251	76 %	24 %	9	155	22 %	78 %
3	1463	90 %	10 %	10	160	68 %	32 %
4	7	56 %	44 %	11	173	88 %	12 %
5	29	57 %	43 %	12	1461	67 %	33 %
6	77	45 %	55 %	13	261	85 %	15 %
7	1412	28 %	72 %	14	370	19 %	81 %

Interstate Bus Orig. by TAZ (2000)

- 1 - 6
- 7 - 8
- 9 - 15
- 16 - 46

Interstate Bus Dest. by TAZ (2000)

- 1 - 7
- 8 - 14
- 15 - 29
- 30 - 156

Where TAZ has both Origins & Dest.:

Ratio: Rail Origins / Rail Destinations

Combined Origin & Destination Values Generate Shaded Colors:

NJ Transit Bus Routes in Philadelphia

SEPTA Bus Routes in Philadelphia

Market Street

Broad Street

East Market Street Bus Transfer Locations

Delaware Valley Regional Planning Commission
April 2006

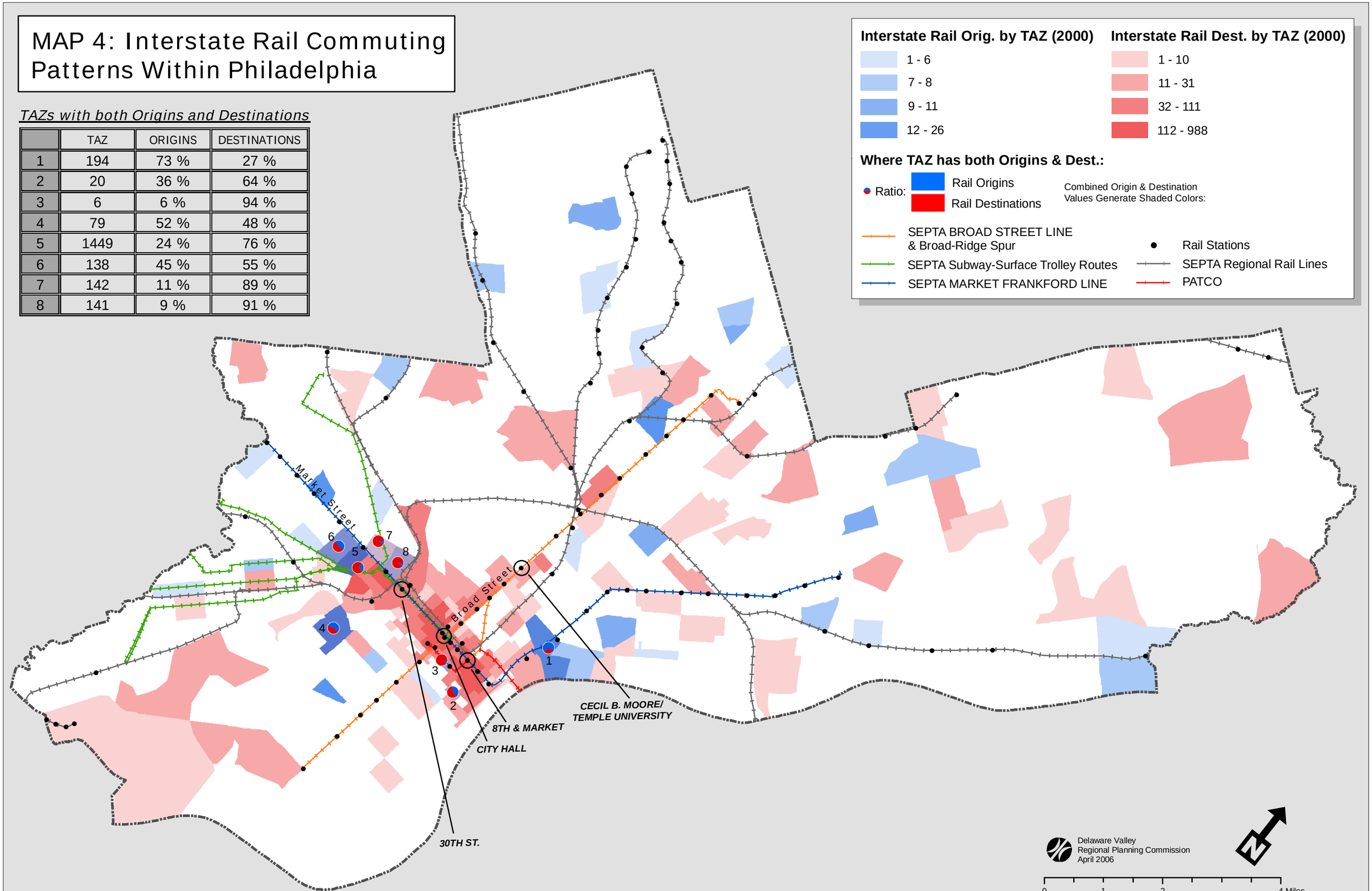
0 1 2 4 Miles

Source: Census Transportation Planning Package 2000 [CTPP 2000], Tables 308 & 314

MAP 4: Interstate Rail Commuting Patterns Within Philadelphia

TAZs with both Origins and Destinations

	TAZ	ORIGINS	DESTINATIONS
1	194	73 %	27 %
2	20	36 %	64 %
3	6	6 %	94 %
4	79	52 %	48 %
5	1449	24 %	76 %
6	138	45 %	55 %
7	142	11 %	89 %
8	141	9 %	91 %



Source: Census Transportation Planning Package 2000 [CTPP 2000], Tables 308 & 314

SURVEY OF KEY CENTER CITY TRANSFER NODES

As described above, an assessment of regional interstate transit work trip patterns resulted in an identification of key interagency transfer interfaces within Center City Philadelphia (see Tables 2 and 3). These are:

- 8th and Market Station [Market-Frankford Line, PATCO]
- 12th-13th Street / Walnut-Locust Stations [PATCO, Broad Street Line]
- 30th Street Station Complex [SEPTA, AMTRAK, New Jersey Transit]
- East Market Street (surface) [SEPTA, NJ Transit bus facilities]

The locations of interagency rail transfer facilities are highlighted in Figure 1, which illustrates the individual lines served by each facility. Figure 2 (with base mapping provided courtesy of the Center City District) reflects the extent of below-ground pedestrian concourses which connect these facilities and other points.

A field survey of each interface was conducted to identify potential impediments to efficient transfers and low capital strategies to improve the passenger transfer experience. Results of these field surveys are summarized below.

8th and Market Station [Market-Frankford Line, Broad-Ridge Spur, PATCO]

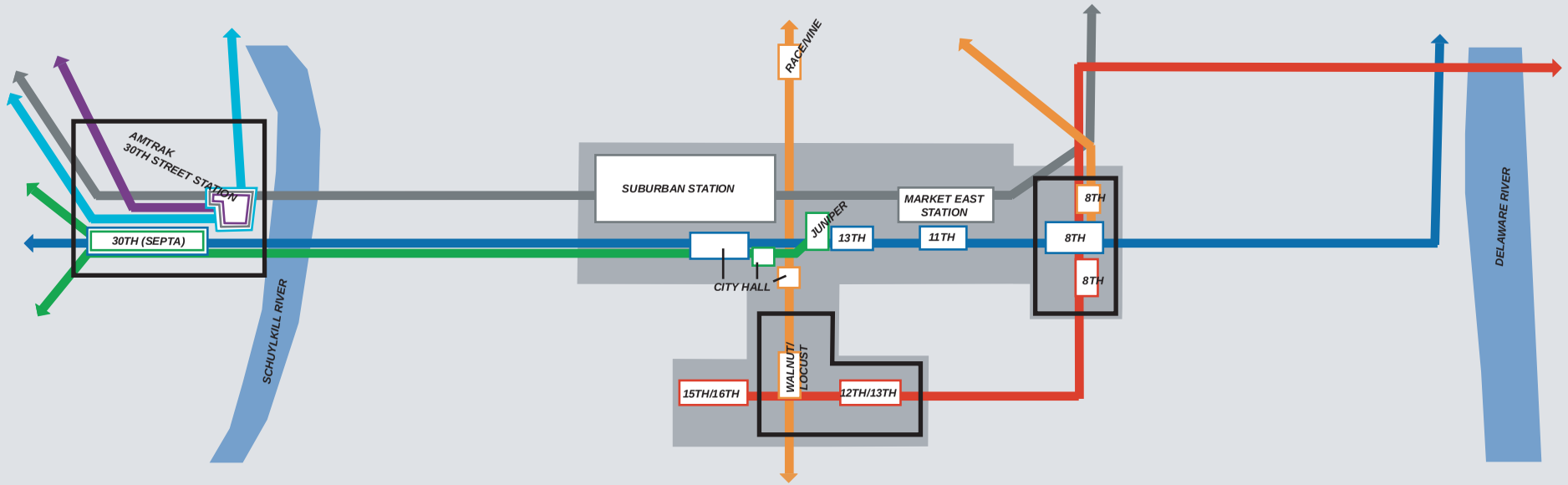
The underground station complex at 8th and Market Streets forms the eastern terminus of the Market East concourses. An interagency transfer is available between PATCO trains running to and from New Jersey and SEPTA's Market-Frankford Line and Broad-Ridge Spur.

The analysis of interstate rail trip patterns through the core (Table 3) indicates that the frequency of transfers between PATCO and the blue line subway at this facility is high. While most work trips involving this transfer terminate in Pennsylvania, the reverse transfer is also important for multiple key attractors (namely Camden City and Voorhees Township).

This facility also provides the most direct interagency connection along the key east-west Center City axis, permitting PATCO riders to access the blue line subway for trips terminating along Market Street in Center City as well as the University City area. Map 4 (depicting Philadelphia interstate rail trip patterns) shows the entire length of this east-west axis as being a significant interstate attractor.

The orange line Broad-Ridge Spur, which has its southern terminus at 8th and Market, provides frequent northbound and southbound peak period service (with headways of 7 minutes or less). However, northbound trains rejoin the normal Broad Street route at a point (Fairmount Station) north of the most significant interstate attractors along Broad Street and do not stop at the Cecil B. Moore (Temple University) station, further limiting the usefulness of this connection for inbound PATCO passengers. As Map 4 indicates, there are very few interstate rail origins along Broad Street, making this connection similarly limited in usefulness for outbound work trips to New Jersey.

Figure 1: Central Philadelphia Interagency Rail Connections



AMTRAK Lines
SEPTA Market-Frankford Line
SEPTA Broad Street Line and Broad-Ridge Spur
SEPTA Subway Surface Lines
SEPTA Regional Rail Lines
PATCO High-Speed Line
New Jersey Transit Atlantic City Line

Shaded areas: linked by off-street connections

Black Outline: major points of interagency connection

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(Not drawn to scale)

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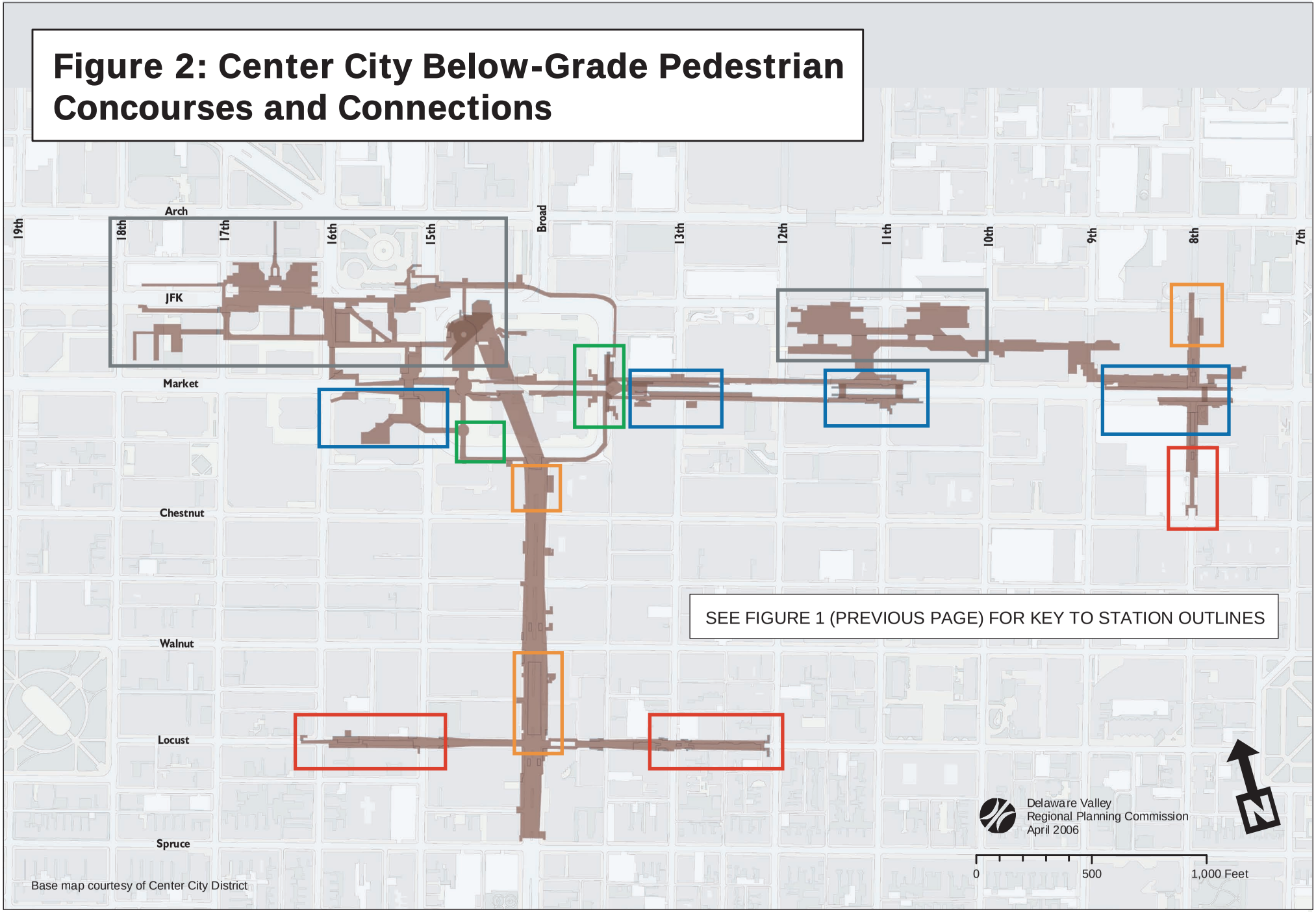
Figure 2: Center City Below-Grade Pedestrian Concourses and Connections



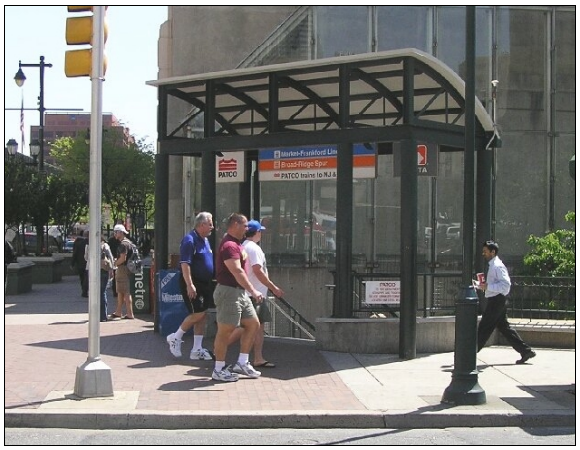
Transfer fare availability

Passengers originating in New Jersey for trips involving a transfer between PATCO and SEPTA city subway or certain bus routes may purchase a special round trip SEPTA transfer pair for $2.10 from vending machines located in New Jersey PATCO stations. This is a discount from the current $2.60 cost of two SEPTA tokens, and assuming 20 working days per month corresponds to a monthly cost of $42 (in addition to PATCO fares). PATCO riders making multiple daily SEPTA transfers (such as the majority traveling 'through' the core) will likely find a monthly SEPTA TransPass ($70) to be a more cost-effective option. The discounted PATCO/SEPTA transfer also lacks a key convenience benefit of the TransPass in that it can only be purchased in the form of individual transfers. This is due to SEPTA's requirement that the individual transfers be time stamped – one transfer must be used within 2 hours of purchase, and the other within 24 hours.

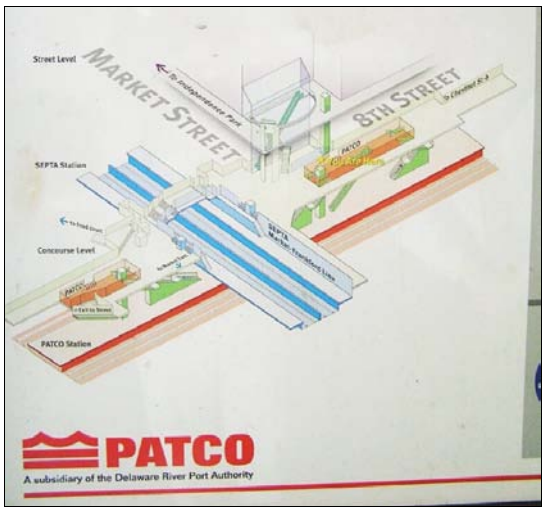
Both SEPTA and PATCO fares can be purchased from vending machines adjacent to each line's access from the 8th/Market concourse area.

Signage and the physical transfer interface

Color-coded turnstile areas and signage (PATCO / red; Market-Frankford Line / blue; Broad-Ridge Spur / orange) provide for a legible passenger understanding of the access points for each route. The PATCO platform access area also includes detailed diagrams illustrating the connections between lines as well as the route (through Market East) to the Pennsylvania Convention Center. These sorts of detailed signage – which can take some time to read – contribute to a comfortable passenger experience for the occasional (often event-based) rider who values confidence in the route to their destination over maximum speed.



Station access from the surface clearly indicates all three accessible rail lines.



Isometric concourse map in the vicinity of the PATCO turnstiles.

Map at the PATCO platform stairways which provides passenger direction to access the Pennsylvania Convention Center through off-street (below grade) pedestrian connections. The map illustrates key landmarks along the route.

Given the accessibility of the 8th/Market Station among surrounding Market East connections, and specifically (from the perspective of this study) the ability to reach the SEPTA Market East Regional Rail station, appropriate wayfinding signage throughout the Market East area is key. Signage within the Gallery Mall directs patrons to the Market-Frankford Line, PATCO, and Market East station, but the Broad-Ridge Spur accessibility is not referenced outside the immediate station vicinity. There, lighted color-coded signs direct passengers to all three lines. It is worth noting that the PATCO directional signage at this point is at its best in terms of clarity and simplicity (advertising simply “New Jersey Trains,” although “Lindenwold Line” is alternately indicated).

Gallery Mall signage directing patrons to the Market-Frankford and PATCO lines (but not the Broad-Ridge Spur).

Color-coded, lighted signage in the station vicinity.

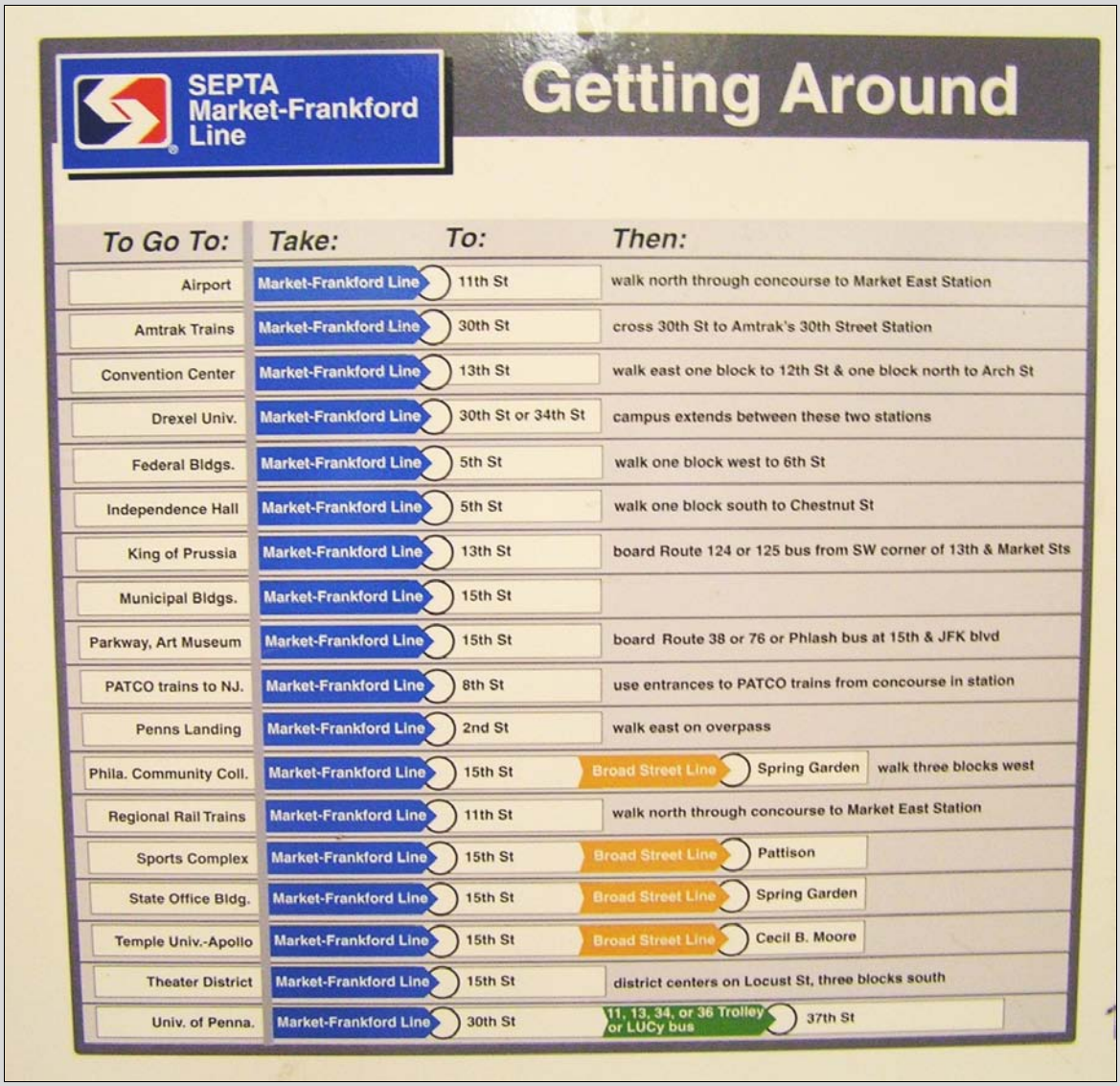
Summary and Recommendations

The interagency interface at 8th and Market (and more broadly Market East) is fairly intuitive from the Passenger perspective. Widespread signage directs riders to each of the involved rail lines in consistently color coded signs. This signage could be refined with more consistent, destination-based wording that would benefit the casual rider. For example, the photos immediately above depict three unique phrasings for PATCO signage: "PATCO," "Lindenwold Line," and "New Jersey Trains." An ideal, consistent wording might read "PATCO New Jersey Trains." Signage referencing the Broad-Ridge Spur should also appear in the Gallery Mall and Market East concourses.

This station also lacks one of the destination-based 'Getting Around' signs which appears to be a new fixture among major SEPTA Market-Frankford and Broad Street Line stations. These signs present the most direct SEPTA routes to specific destinations (i.e. "To Go To: Stadium Complex Take Market-Frankford Line City Hall/15th Street Then: Broad Street Line Pattison Station"). Such signs, an example of which (from SEPTA's 30th Street Station) is shown in Figure 2, are especially significant for casual, discretionary users at points of interagency and interline connection.

Ideally, such a sign should be added to the 8th/Market concourse area between the PATCO and Market-Frankford Line turnstiles.

Figure 3: SEPTA 'Getting Around' Signage



SEPTA's 'Getting Around' signs can be an excellent resource for discretionary, occasional riders. This example is from SEPTA 30th Street Station.

An ongoing station maintenance and rehabilitation project may provide an opportunity to make multiple improvements to signage.

The provision of a single fare instrument that would function for New Jersey Transit, PATCO, and SEPTA service would be the most significant improvement that could be made to facilitate seamless interagency transfers. This would be a high capital improvement, and each agency already has near to long term plans to modernize fare systems. PATCO has begun testing its new FREEDOM card fare instrument, a 'smart card' fare, and plans full implementation of this system before the end of 2006. It is

recommended that a priority of each agency's fare modernization initiatives should be fare interoperability among agencies.

In terms of a more near term solution, regular interagency riders would benefit from the ability to purchase the discounted ($2.10) SEPTA round-trip transfers in 'multipacks' of some kind. This would require some modification to SEPTA's current requirement of a strict time limit for these special transfers.

As noted above, the usefulness of the Broad-Ridge Spur for interstate/interagency commutes is limited by its lack of any Broad Street stops south of Fairmount and limited stops to the north. SEPTA should investigate the possibility of adding stops for at least some Broad-Ridge Spur trains at the Cecil B. Moore/Temple University Station, which Map 4 indicates to be in the vicinity of a concentration of interstate rail destinations.

Finally, given the significance of the 8th and Market Station complex to interagency transferability, it is appropriate to consider a new branding for this facility. A designated station 'name' (in the vein of recent efforts to rename Amtrak 30th Street Station as Benjamin Franklin Station) would aid in the identification of this facility as a key node in the region's transportation infrastructure.

12th-13th St. Station / Walnut-Locust Station [PATCO, Broad Street Line]

This transfer interface occurs at the southern end of the Central Philadelphia underground pedestrian concourse network, and includes the Walnut-Locust station on SEPTA's Broad Street (Orange) Line along with PATCO's 12th/13th and 15th/16th Street Stations. The primary transfer interface occurs between 12th/13th and Walnut-Locust Stations.

The analysis of interstate rail trip patterns through the core (Table 3) indicates that this transfer interface likely does not have a significant role for interstate trips not originating or terminating in Philadelphia. However, as Map 4 illustrates, there is a clustering of interstate rail destinations along Broad Street TAZs. This transfer interface accommodates inbound PATCO riders with destinations along Broad Street.

Transfer fare availability

Inbound PATCO riders transferring to the Broad Street Subway at this facility may purchase discounted round-trip SEPTA transfers (as detailed above for the 8th and Market Station).

Both SEPTA and PATCO fares can be purchased from vending machines adjacent to each line's access from the concourse area.

Signage and the physical transfer interface

The interface between the Walnut-Locust Broad Street Line station and the 12th/13th Street PATCO station is strong in its simplicity. The two lines' color coding is extensively used to 'brand' each entry area, and clearly marked fare vending machines are widely available in the turnstile vicinities. Effective signage is particularly important at this interface, as the transfer itself requires passengers to walk roughly one block underground (in contrast to the transfers at 8th and Market, where the lines are more proximate). At the pedestrian concourse level, the intersection of the east-west PATCO 'axis' and north-south Broad Street Line 'axis' is visually marked by red columns (which supplement signage directing passengers to turn left or right for PATCO service). Such boldly colored structural elements are not employed at the 'stations' themselves, however.

As noted above in the context of the 8th and Market Station, destination-based signage can contribute to a positive experience among discretionary, occasional riders by maximizing their understanding of their route. The sole use of destination-based signage in this transfer facility occurs for PATCO riders exiting at 12th/13th Street; the Broad Street Line signage along this path indicates "to stadiums." There are also limited examples of PATCO signage reading "Trains to New Jersey."

Simple, color-coded signage. The Broad Street Line sign on the left reads “to stadiums,” and the PATCO sign in the foreground reads “trains to New Jersey.”

Signage in the vicinity of the Walnut-Locust concourse which directs passengers to the two available PATCO station connections.

Token vending machines and extensive orange signage in the vicinity of the Walnut-Locust Broad Street Line station entryway.

Vending machines and red signage at the PATCO 12th/13th Street entry point.

Summary and Recommendations

The interagency interface of the PATCO and Broad Street subways in the vicinity of Broad and Locust Streets benefits from the extensive use of strongly branded and color-coded signage.

Although one of SEPTA’s destination-based ‘Getting Around’ signs (see Figure 2) is located at the northern end of the pedestrian concourse connecting Walnut-Locust Station with City Hall station, additional signs of this type should ideally be placed within the PATCO/Broad Street Line transfer interface so as to be obvious and convenient for passengers making the transfer. Ideally, such signage should also reference particular destinations in New Jersey accessible from specific PATCO stations (to accommodate ‘reverse’ discretionary riders).

30th St. Station(s) [SEPTA, NJ Transit Atlantic City Line, Amtrak]

The 30th Street rail 'complex' consists of: a) Amtrak 30th Street Station, which serves Amtrak service along the Northeast Corridor, New Jersey Transit Service to Atlantic City, and SEPTA's regional rail lines; and b) SEPTA 30th Street Station, which serves the Market-Frankford Line and Subway-Surface Trolleys. Despite proximity, these are two separate facilities with no off-grade direct connection.

The analysis of interstate rail trip patterns through the core (Table 3) indicates that a transfer to the Atlantic City line at Amtrak 30th Street Station may accommodate a certain number of daily work trips 'through the core' to Voorhees Township, Camden County.

In addition, the proximate connection between the two 30th Street Stations indirectly provides the opportunity for PATCO riders to connect to Amtrak Northeast Corridor Service via a transfer to the Market-Frankford Line at 8th and Market. The 30th Street 'complex' represents a crucial link within the regional rail network, connecting (via transfer) the entire city and commuter rail network with rail service outside the region.

Transfer fare availability

There is no direct accommodation for transfer fares at either 30th Street Station (they effectively operate as two independent facilities).

Signage and the physical transfer interface

The interface between SEPTA Blue Line and trolley service at SEPTA's 30th Street Station and other service at Amtrak 30th Street Station is not direct. Historically, an underground tunnel connected the two facilities, but this connection has been closed for some time (and is blocked on the SEPTA station end with security glass). Due to the lack of a direct connection, signage and other visual cues are critical to allow passenger transfers to occur smoothly.

Signage from within SEPTA's 30th Street Station directs passengers to the eastern end of the concourse for connection to Amtrak Service at "30th Street Station." However, LED signs along the concourse identify the SEPTA facility as "30th Street Station" as well. This may lead to some confusion among discretionary, occasional transfer riders concerning which station they are presently in.

As previously illustrated, SEPTA's 30th Street concourse includes one of the destination-based 'Getting Around' signs (Figure 2). This sign references the connection to Amtrak service at 30th Street, but does not reference New Jersey Transit's Atlantic City Line service (nor do the overhead signs along the concourse).

Signage within Amtrak 30th Street Station is more consistent, complete, and clear. Information kiosks throughout the Amtrak station direct passengers to "SEPTA buses & subways" (outside to SEPTA's 30th Street Station), which are differentiated from "SEPTA trains" (regional rail trains accessible from Amtrak 30th Street Station). These kiosks also reference New Jersey Transit trains. A passenger arriving via Amtrak, SEPTA, or New Jersey Transit rail service to the main atrium can follow a large overhead sign reading, "SEPTA Subways, Trolleys, Buses" to the southwest corner of the station. At that point, color coded (blue and green) "SEPTA transit" signs include arrows to the proper exit

doors through which the SEPTA 30th Street headhouse (also blue and green) is visible. The path between the two is in mixed parts sidewalks and faded yellow crosswalks.

The physical transfer interface between the two facilities is less than ideal, requiring at-grade crossing of 30th Street as well as two circulators/driveways. The diagram below illustrates the street-level pedestrian connections between the two stations, with the pathway on the right illustrating the continuation of the transfer route from Amtrak 30th Street Station to SEPTA 30th Street Station that is described above. Neither of the two connecting routes with crosswalks follows a direct 'line of sight' pathway, resulting in users making crossings at unmarked points.

Illustration of routes between AMTRAK 30th Street Station and SEPTA's 30th Street Station. (*Image source*: Microsoft/Pictometry; http://local.live.com).

Summary and Recommendations

The interagency interface at 30th Street between Amtrak 30th Street Station (which also houses the New Jersey Transit Atlantic City Line) and SEPTA's 30th Street Station is inherently impaired by the physical separation of the two facilities. As noted above, there are several improvements to station signage which could improve the simplicity of the transfer for passengers. First, platform signage in SEPTA's 30th Street Station, as well as the large identification signage on the station headhouse, should reflect the SEPTA portion of the station's name, and wayfinding signage directing passengers to the street level for Amtrak access should specifically reference the Amtrak 30th Street Station name. Second, platform signage at the SEPTA station should also reference the ability to transfer to New Jersey Transit service to Atlantic City.

In addition, the physical connection between the two stations should be enhanced for pedestrians. Wayfinding signage and a painted or striped path would clarify the intended surface connecting route between the two stations. Further, prospects for a dedicated, off-grade pedestrian connection should be explored. Ideally, the closed below-ground tunnel between the two facilities should be reopened. Alternatively, a pedestrian bridge would also provide least-distance, direct access between the two facilities, but would be much more capital intensive.

East Market Street [SEPTA, NJ Transit bus facilities]

As presented in Table 2, 'East Market Street' is the most significant specific location for bus transfers between SEPTA and New Jersey Transit within Center City, and also accommodates transfers between New Jersey Transit bus service and SEPTA Regional Rail and Blue Line Subway service. Market Street east of City Hall has been improved with a frequent spacing of large bus shelters which have a consistent design and color that is unique to this portion of Market Street.

From the perspective of this report, the area between 7th and 11th Streets is most significant, as each block in this area typically has at least one New Jersey Transit and one SEPTA shelter. New Jersey Transit shelters are located on the far side of each intersection (relative to westbound New Jersey Transit buses[1]), and SEPTA shelters are typically located on the near side (for both travel directions) and/or mid-block. Whereas similar shelters for SEPTA buses also occur east of 7th Street and west of 11th Street, New Jersey Transit shelters are only present for stops in that street range. Along this street frontage, the sidewalk and curb is bulbed out so that buses in the outside lanes meet the curb in close proximity to the shelters (which are located on the 'bulb outs').

New Jersey Transit and SEPTA shelters along the 7th Street block. Temporary construction activity prevents buses from stopping directly adjacent to the shelters.

Transfer fare availability

Fares are not available for purchase at any curbside bus shelter.

Signage and the physical transfer interface

Each shelter is appropriately branded with either the SEPTA or New Jersey Transit logos. In addition, route information is labeled at each shelter. In order to transfer between buses, passengers must know to walk from one agency's shelter to the other. As westbound SEPTA and New Jersey Transit buses make near side and far side stops, respectively, an ill-timed traffic signal (preventing east-west pedestrian crossings)

[1] Most New Jersey Transit bus routes to Center City arrive via the Benjamin Franklin Bridge, looping south along 6th Street, west along Market Street, north along Broad Street, and east along Vine and Race Streets to return to New Jersey via the bridge.

between the two stops might cause passengers to miss a quick transfer if their two buses arrive at close to the same time.

Summary and Recommendations

The shelters and streetscape design which accommodate interagency surface transfers along the eastern portion of Market Street are as extensive as can reasonably be expected short of a dedicated off-street transfer facility. More obvious carrier branding (which could take the form of larger logos, for example) might help to differentiate the shelters more clearly for occasional riders. In addition, a degree of traffic signal pre-emption, ensuring an east-west green signal for pedestrians where SEPTA and New Jersey Transit buses are stopped simultaneously on either side of a given street, for example, would give a greater priority to passenger transfers.

Viewed as a whole, the eastern portion of Market Street is a well-designed asset to the accommodation of interagency bus travel to or through Center City. In order to identify this asset for nonriders, a single designated name or branding for this complex of shelters and other bus infrastructure (which could be appropriately identified on major regional transit service mapping) may be appropriate.

CONCLUSIONS / SUMMARY OF RECOMMENDATIONS

The analysis and field surveys described in this report identified several factors pertaining to interagency transfers which are particularly significant to the passenger experience. These are:

- **Signage** – In particular, the integration of wayfinding and destination-based signage is an effective way to inform passengers of the specific transfers necessary to reach individual landmark facilities or destinations. There are excellent examples of this type of signage (SEPTA's 'Getting Around' signage – See Figure 2) already present in several key facilities. The use of these sorts of signage should be expanded.

- **Color coding** – Both PATCO and SEPTA city rail lines have well-established colors that are central to their branding, helping to make the transfer between lines more intuitive. New signage and station investments should continue to emphasize these well-established associations.

- **Facility branding** – Where key transfer facilities exist, they should be uniquely branded for easy passenger recognition. Specifically, this report suggests that such branding be applied to 8th and Market Station (Connecting the Market-Frankford Line, PATCO, and the Broad-Ridge Spur) as well as the unique bus transfer interfaces along east Market Street (Connecting New Jersey Transit and SEPTA bus routes). The recent effort to rename Amtrak 30th Street Station as Ben Franklin Station may be an effective model in this regard.

- **Distance and a direct connection between lines** – Minimal inter-line foot distance and a seamless, direct connection are critical to allowing interagency (and other) transfers to have the feel of an integrated trip. For the most part, key interagency transfers in the core are proximate, with extensive use of color coding to direct passengers clearly. The lone major exception to this rule is the SEPTA and Amtrak 30th Street Station interface; these two facilities are physically separated, and the pedestrian connection between them should be enhanced.

- **Fare instruments** – In general terms, the most significant impediment to 'seamless' interagency travel is the lack of a unified, interoperable fare instrument. As noted within this report, each of the three major regional transit carriers is presently engaged in some level of near or long term planning for a modernized fare instrument (most commonly conceived of as a 'smart card' type device). Among the three agencies, PATCO has made by far the most progress, with full implementation of its new FREEDOM Card fare system anticipated by the end of 2006. This is not surprising given that in the case of PATCO there is simply one mode and one line. From the perspective of DVRPC, and this study specifically, a key element of fare modernization among the three agencies should be fare interoperability within the region.

  The present availability for PATCO riders of discounted SEPTA round-trip transfers represents the only existing example of interagency fare cooperation to enhance Center City transfers. In the short term, it would be desirable for these

transfers to be available in sets larger than one in order to enhance the convenience of regular use.

Table 4. Summary of Recommendations by Transfer Facility

Transfer Interface	Facility Branding Improvement	Crosswalk/ Intersection Improvement(s)	Specific Signage Improvements	New Destination-Based Signage	Connecting Pathway Improvements	Service Modification(s) for Connecting Route(s)
8th and Market	X		X	X		X
12th/13th – Walnut/Locust Stations				X		
30th Street Station complex		X	X		X	
East Market Street bus shelter area	X		X			

Source: DVRPC, 2006

Table 4 summarizes the recommendations presented in this report for each key Center City transfer interface. For details concerning recommendations, see the appropriate section of this report for each respective facility.

TITLE: SEAMLESS TRANSPORTATION SERVICE TO AND THROUGH THE REGION'S CORE

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Geographic Area Covered: DVRPC Region (at the municipal level); City of Philadelphia (at the TAZ level); Philadelphia public transit facilities: 8th and Market Station, 12th/13th St. Station, Walnut-Locust Station, Amtrak 30th Street Station, SEPTA 30th Street Station, East Market Street bus shelters.

Key Words: Journey to Work, New Jersey Transit, PATCO, SEPTA, Center City, City Transit, Regional Transit, Interagency Transfer, Fare Modernization, Market-Frankford Line, Broad Street Line, Atlantic City Line.

ABSTRACT: An analysis of key passenger movements between the three regional mass transit providers (New Jersey Transit, PATCO, and SEPTA), informed by Census Journey to Work data, identified Philadelphia transfer facilities which are key to large numbers of transfers. A field survey of the passenger transfer experience at these key transfer nodes resulted in recommendations for low capital improvements to enhance service coordination. Elements which were identified as being significant to interagency transfers and consequently explored in the report were signage, color coding/branding, the distance and physical connection between the lines, and fare instruments & policies.

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