CAT Service Study

January, 2010

Harrisburg Area
Transportation Study and
Capital Area Transit

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Chapter I: Purpose and Need

A) Introduction and Background on the CAT service study

Employment, residential, and commuting patterns have steadily changed due to suburban growth since the 1950s, with profound impacts to fixed-route transit service in the Harrisburg area and surrounding counties. The first wave of suburban growth began soon after World War II and was mainly a migration of population. Residences moved, but employment, retail, services, and entertainment remained in the city. Mass transit routes were created to run in a radial pattern from outside the city to a point within the city where economic activities were concentrated. Over the past 50 years economic activity has followed the population shift to the suburbs in the form of malls, strip shopping centers, and office parks. This geographic shift in employment and residence has led to a prevalence of non-traditional commuting, both from the central city to the suburbs and from one suburb to another. The radial transit system, designed for a different time, is ill suited to address a decentralized metropolitan area.

According to the 2030 Regional Transportation Plan 2007 Update (RTP), in 1950 Harrisburg and the surrounding boroughs were home to 63% of the region's population, and the city's population hit a historical high of 90,000 people. Between 1950 and 1970 the population of the region grew by 30%. In the same time period, the population of the city and boroughs decreased by 6%, and represented only 45% of the total region. From 1970 to 2000 the trend continued as the region grew by 24% and the population of Harrisburg declined. Between 1950 and 2000 Harrisburg lost 45% of its population, while Lower Paxton Township, one of the fastest growing suburbs, gained nearly 700% (II-1 to II-2). The 2030 RTP projects population growth to continue in the townships at the edge of the metropolitan area.

As the state capital, the Harrisburg region has a high percentage of government employees. State government employment is concentrated in downtown Harrisburg, made up of the central business district and the nearby Capitol Complex. 30% of the 56,000 people working in Harrisburg are employed by the Commonwealth (2000 CTPP). This concentration of state workers has led to high retention of downtown employment in the face of suburbanization. The CAT system has evolved to focus on serving downtown employment. Although state workers make up 10% of Tri-County residents, they make up 29% of Tri-County residents who commute using public transit (2000 CTPP). State employees, along with other center city employees, have provided a steady and reliable base of transit ridership. It has allowed CAT to maintain ridership without making serious adjustments to the radial hub transit network first developed years ago.

Outside of government employment, the regional trend has been a shift from an industrial base to a service base (RTP 2007 II-1). Old industrial facilities within the city and the boroughs have shut down and new employment centers have been built in the suburbs. New employment centers are most often cited and designed in a way that facilitates single occupancy automobile commuting and discourages transit. However the number of

commuting trips ending at suburban jobs and its share of total commutes in the region warrants an examination of transit opportunities.

Why was the study initiated?
The last study to examine the CAT route structure was in the early 1990's. The Capital Area Transit fixed route system has undergone tremendous passenger growth in the past few years. Largely fueled by higher gasoline prices, but encouraged by other factors also, the system achieved ridership increases in 52 of the last 55 months. Various stakeholders were concerned that the current route structure was not adequately serving some of the more recent growth areas throughout the region. The Harrisburg Area Transportation Study (HATS — the Harrisburg area metropolitan planning organization) coordinating committee and affected stakeholders decided that a comprehensive, regional look at the system was needed. The study is in the fiscal year 2007-2008 HATS Unified Planning Work Program and the 2008-2009 work program.

Who are the stakeholders?
The stakeholders in the study are ultimately the users of the CAT system. Any changes recommended to the system would be done to address ridership concerns. The comprehensive review provides benefits to people relying on the CAT ridership for some of their livelihood. Those beneficiaries include employers, retail vendors, municipalities, and funding jurisdictions. Employers would benefit from access to employees who might not otherwise be available to the work force. Current employees would benefit from a much more relaxing and cost effective decision for commuting. Vendors would benefit from potential ridership being able to avail themselves to the retail opportunities. Municipalities would benefit from the reduction in congestions and increase in air quality due to an increase in the transit riding public. The increase in ridership, as well as any operation improvements, would provide efficiencies for the tax dollars being spent on the transit services. Ultimately everyone in the region has a stake in how well CAT does and how well its system performs.

A study advisory committee represents various stakeholders for the study. The committee has representatives from: Perry, Dauphin, and Cumberland Counties; CAT; HATS; PennDOT; the Federal Transit Administration (FTA); Hummelstown Borough; and Marysville Borough.

B) Purpose And Needs

The purpose of this study is to implement changes that improve the usability, competitiveness, and attractiveness of fixed route transit service throughout the CAT service area and adjacent counties.

1. *Traditional direct radial transit service has difficulty serving an area with dispersed development*

HATS staff performed an analysis of the 2000 CTPP journey to work to discover where area residents are living and where they are working. The analysis began by listing the top four destinations of residents from each municipality. In almost every case, Harrisburg appeared as one of the top four commuter destinations for residents of Dauphin County.

However, it was not always the top destination, and in some cases it was third or fourth. As many or more people were living and working in the same suburban municipality, or commuting from one suburban municipality to another.

Mapping the journey to work data showed that population and jobs in Dauphin County are concentrated in Harrisburg and the suburban townships of Lower Paxton, Susquehanna, Swatara. The worker flow within the area of these municipalities accounts for a high percentage of all worker trips in Dauphin County. In Cumberland County, population and worker flows are concentrated around the West Shore (made up of Camp Hill, Lemoyne, Wormleysburg, and New Cumberland Boroughs). This area is an older, more densely built suburban area. There are many West Shore residents that commute into the city, but there are also many who work in the West Shore or commute to one of the surrounding townships. The greatest concentration of worker trips in Cumberland County is between the West Shore, Hampden, Lower Allen, and East Pennsboro. There are also cross-river commuter trips that end in a suburb, especially from Lower Paxton to the three Cumberland suburban centers, and from Hampden to Susquehanna.
See Harrisburg – Journey to Work, Map 1-1

Both Dauphin and Cumberland counties have second centers of population and employment that became apparent through analysis of journey to work data. In eastern Dauphin County, Derry Township is the top draw for commuters from adjoining municipalities and draws a high number of commuters from Palmyra, North Londonderry, and South Londonderry in Lebanon County. In Cumberland County, Carlisle is the second center of population and employment. It also draws a higher number of people from the immediate municipalities than the West Shore or Harrisburg does.
See Cumberland County – Journey to Work, Map 1-2 and Dauphin County – Journey to Work, Map 1-3

CAT's direct radial system was formulated based on first generation streetcar suburbs. Many of the routes still follow the old street car lines. As public funding and support moved to accommodating single occupancy vehicles at the expense of mass transit, it became more and more difficult for transit to compete with the automobile. CAT planners found that the most reliable ridership came from people commuting into downtown Harrisburg with its high density mix of land uses, limited parking, and congested corridors. Over time the suburban areas of the region have grown rapidly. Today there are a greater number of people making non-traditional city to suburb and suburb to suburb than there are people commuting into the center city. These commutes are not served well by the CAT network.

2. Transit time is not always competitive with automobile travel.
For many origins and destinations in the region, especially going from suburb to suburb, trips takes substantially longer by bus than by car because CAT's radial network is designed primarily to transport people within Harrisburg and to and from the suburbs and Harrisburg. HATS staff conducted a commute time study to compare drive times to bus times. Common commutes between municipalities were selected from the CTPP journey to work data. Using the population density GIS layer, population clusters within the origin municipality was identified. Then one cluster was chosen and a street intersection near the

center was identified. Transit routes were not taken into consideration in choosing trip origins. Locations not on a transit route were timed adding the peak hour drive to a park and ride. Destinations were chosen by using CTPP data to find high employment TAZ's, and then identifying employment clusters with the TAZ using InfoUSA employer data. Only destinations on an existing transit line were chosen. The travel time by automobile was measured by HATS staff driving between the origin and destination pairs during morning peak time. Travel time by bus was found using the CAT scheduled stop times. These times were chosen to arrive at the final destination as close to 8:00 AM as possible.

The result was an average of 30 minutes longer for the trips by bus over the same trips by automobile. Two of the trips took over 60 minutes longer by bus than by car. The biggest differences in time where seen on origin and destination pairs farther out on the system "spokes" that had no direct connection and required a long trip for a transfer. For example, a trip from the Chambers Hill and Mushroom Hill Road area of Swatara Township to the Hershey Medical Center took only 10 minutes by automobile, but would take 75 minutes by bus. On the other side, trips that ended in downtown Harrisburg took an average of 13 minutes longer by bus than they did by automobile. The difference in time between the two modes on trips to downtown Harrisburg increased as the length of the trips increased. This shows that transit can be competitive in travel time, if origins and destinations are connected more directly. It also shows that there is room for some time savings on longer distance trips if buses can move more quickly through congested traffic.

3. Better understanding of transit costs and benefits is needed.

There are many reasons why people choose to drive to work rather than take a bus — even when bus service is available. The surge in gas prices since 2004 has been accompanied by a surge in CAT ridership starting in February 2004, indicating that more people are realizing an economic benefit to using mass transit rather than driving. However, the correlation between gas prices and CAT ridership has historically not been very close and many other factors influence mode choice for commuting. People typically underestimate the total costs of using personal vehicles versus mass transit. In our area, bus riders accounted for only 1.15% of all commuters according to Census data. Approximately 80% of commuters drive to work alone.

A recent poll by the Susquehanna Regional Transportation Partnership indicates that consideration of the costs and benefits other than direct monetary costs play a large role in why people choose personal vehicles over public transit. Commuters need a better understanding of the true costs of using personal vehicles to commute so they can make more informed mode choices. Meanwhile, CAT needs to better understand why people choose to not use buses so it can implement changes in its service to improve the usability, competitiveness, and attractiveness of fixed route transit service.

There is no doubt that using public transit saves money. A national report from the American Public Transportation Association from May 2007 states that,

"For every dollar earned, the average household spends 18 cents of every dollar on transportation, 94 percent of which is for buying, maintaining and operating cars, the

largest source of household debt after mortgages. Americans living in transit-intensive metropolitan areas save $18 billion annually in congestion costs. Every $10 million invested in public transportation saves more than $15 million, for both highway and transit users. This includes savings of about $200 to $4,500 worth of gas per year for a transit user" (Public Transportation Fact Book, xi).

In our area the savings are also dramatic. The table below compares costs for driving and using the bus for different distances and gas prices. The costs are calculated using the commuting cost calculator at the web site for Commuter Services of South Central PA (www.pacommuterservices.com/commute_calculator.html).

Costs and Variables	**Short commute (Susquehanna Twp. to Harrisburg) in zone 1 with lower gas prices**	**Longer commute (Middletown to Harrisburg) in zone 2 with lower gas prices**	**Short commute (Susquehanna Twp. to Harrisburg) with higher gas prices**	***Longer commute* (Middletown to Harrisburg) zone 2 with higher gas prices**
Daily commute round trip	5 miles	20 miles	5 miles	20 miles
Days per month of work	22	22	22	22
Average gas mileage	25	25	25	25
Cost of gasoline per gallon	$2.00	$2.00	$3.25	$3.25
Cost of parking per month	$50 (City Island)	$50 (City Island)	$50 (City Island)	$50 (City Island)
Monthly Commuting Cost	$58.80	$85.20	$64.30	$107.20
Yearly car commuting cost	$705.60	$1,022.40	$771.60	$1,286.40
Bus Fare twice a day at full fare for a month	$72.60 (1.65 per trip)	$90.20 (2.05 per trip)	$72.60 (1.65 per trip)	$90.20 (2.05 per trip)
Yearly cost at full bus fare.	$871.20	$1082.40	$871.20	$1082.40
Monthly pass	$45.00	$58.00	$45.00	$58.00
Yearly cost with monthly passes	$540.00	$696.00	$540.00	$696.00
Yearly savings with monthly pass vs. car	**$165.00**	**$326.40**	**$231.60**	**$590.40**

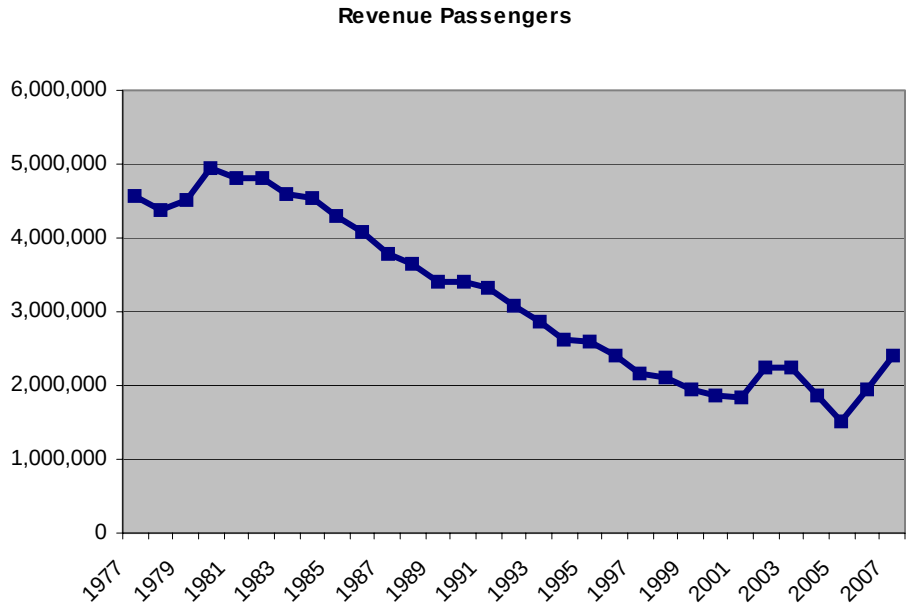
Note that the above comparison does not include the costs of car insurance and maintenance because many bus riders have cars and also pay those costs. If those costs are included in the car commute total costs — as when comparing people who drive their own vehicles with people who do not own vehicles but ride the bus — the savings for bus riders are even more dramatic.

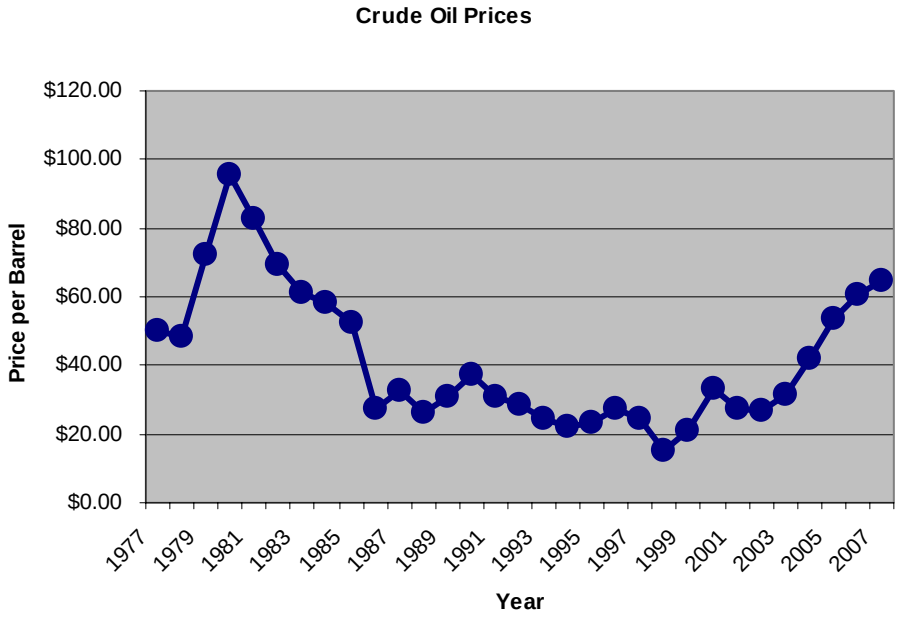
For example, adding in the cost of insurance, financing and depreciation at $15.28 per day and the cost of maintenance at 5.3¢ a mile, the yearly commuting cost for the 5 mile round trip at $3.25 a gallon of gasoline is $4875.48.

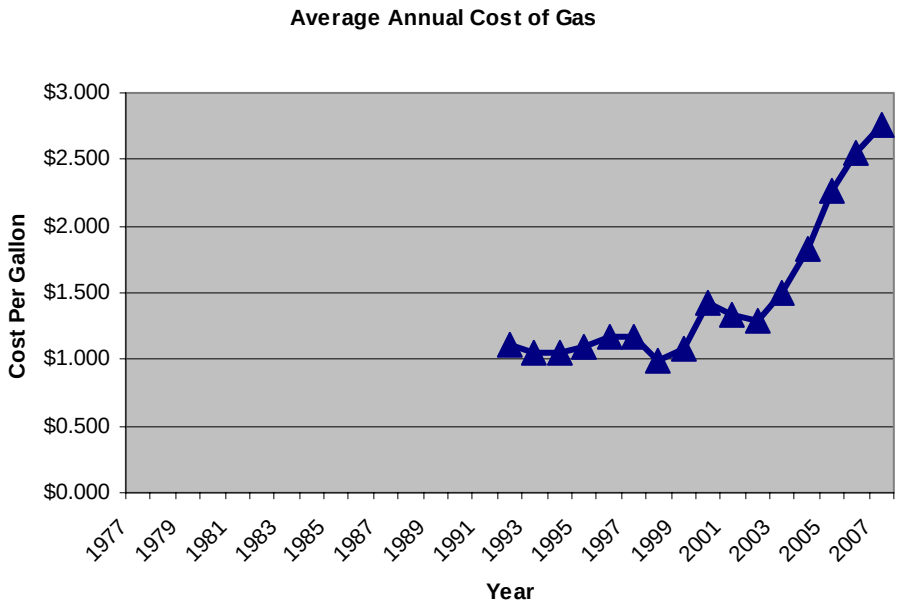
There is a strong correlation between gas prices and ridership, but a more detailed analysis is needed to answer just how strong that correlation is, and what other factors influence a person's decision to use transit.

The study team compared yearly CAT ridership to average annual crude oil prices per barrel and gas prices per gallon, adjusted for inflation. The study team then did a regression analysis to discover the correlation between ridership and gas/crude prices. A correlation (R squared) value of 1 is a perfect correlation, meaning that changes in ridership can be wholly attributed to changes in crude and/or gas prices. Any fraction below 1 indicates to degree to which crude/gas prices account for changes in ridership.

Ridership, crude prices, and gas prices have changed significantly since 1977.







Note: data is only available for the annual average cost of gas per gallon from 1992.

From 2004 to 2007, the correlation between crude prices, gas prices, and ridership is nearly 96%. However, when comparing ridership with crude prices and gas prices per gallon going back to 1992, the correlation drops to just fewer than 40%. This means that other factors combine to account for 60% of the changes in ridership during that period. Comparing just crude prices and ridership from 1977 to 2007 gives a correlation of 35%.

The analysis indicates that:

- Gas prices seemingly account for the most recent increases in ridership. When 2008 ridership and gas price numbers come out, they will almost certainly continue show the strong correlation.
- Looking back in time, however, the correlation between gas prices and ridership is much weaker. Other factors have contributed to changes (mostly declines) in ridership. Some of those factors may be: greater affordability of automobiles; greater accommodation of vehicle travel with new/upgraded roads and expanded, low-cost parking facilities; and more dispersed development with many residential and employment centers developing away from the metropolitan center.
- The implication is that while high gas prices may be driving recently increased ridership, other service factors will probably have a more lasting effect on long-term ridership.

The Susquehanna Regional Transportation Partnership (SRTP) conducted a poll in 2007 of the general population in Adams, Cumberland, Dauphin, Lancaster, Lebanon, Perry, and York Counties. Among other findings, the poll indicated the top three reasons that people chose not to use any form of commuter option (e.g., transit or carpooling) were:

- Lack of people to share carpools/vanpools (29% of respondents in Cumberland, 34% in Dauphin, and 32% in Perry);
- Lack of transit/bus/train service (25% of respondents in Cumberland, 22% in Dauphin, and 46% in Perry);
- Problems with shifts or unpredictable schedules (20% of respondents in Cumberland, 19% in Dauphin, and 33% in Perry).

SRTP conducted the poll to help enhance its Commuter Services of South Central Pennsylvania program, but the results have a bearing on this study. Those answers citing a lack of transit service suggest a connection to the first study need, and the problems with shifts or unpredictable schedules suggest a relationship to commute times (especially for trips with a great disparity in travel time for buses compared to cars).

4. Inadequate resources impact transit expansion

The capital improvement needs of CAT currently outweigh the available funding. The necessary capital improvements are bus replacements, replacement of fare collection boxes; renovations/new construction needed on the CAT facility; installation of onboard security cameras, and installation of automatic vehicle location systems. Additionally, the existing fare structure is complicated and causes confusion for drivers and passengers. With the increase in ridership as indicated above the need for capital improvements is more immediate. Projects needed for the enhancement of the network include,

32 buses are eligible for replacement during the four year period of 2009 to 2012, estimated at a cost of $12,960,000. In addition, the purchase of 10 clean-fuel buses needs to be made to reduce the environmental impact of the bus network. No section 5309 Bus Funding is available for this procurement, but the estimated cost is $3,700,000.

- A fleet-wide replacement of the fare boxes and fare collection systems, originally installed in 1995, estimated at a cost of $1,000,000
- The renovations and new construction needed for the renovation of the CAT operations, maintenance and administrative facility on the corner of North Cameron and Forster Streets in Harrisburg needed. The building, built in 1904, and previously renovated starting in 1975, cannot accommodate the upgraded busses currently in use by the CAT system. Historically, the 35-foot long buses used in the CAT system could be maintained in this building, but the newer 40-floot low-floor buses do not fit in the existing maintenance bays. The new buses are needed to help accommodate disabled and elderly riders. In addition, the 40-foot low-floor buses can increase ridership with their higher capacity. Future additions of bicycle racks on the fronts of these buses with further reduce the ability for CAT to complete general maintenance in the current facility. The renovations and new construction will accommodate the newer longer buses to ensure smooth running of the system. These improvements are estimated at a cost of $3,500,000.
- The need to equip the fleet with onboard security cameras and the supporting system equipment, at an estimated cost of $800,000.
- The need to include automatic vehicle location systems for the fleet at an estimated cost of $500,000.

The capital improvements listed are estimated at a cost of $22,460,000. The goal is to complete these improvements as soon as the money is available. Funding is not available for many of the capital improvements needed by CAT.

The addition of these improvements will encourage increased ridership and the ability for CAT to monitor and maintain their fleet. The drawbacks in funding leave many of these improvements unable to be completed. The funding gap in the last three years is shown in the table below. The money allocated from Section 5307 Capital Formula Funding that was given to CAT, 54% was programmed for the maintenance of capital assets. This funding is apportioned on the basis of legislative formulas based on a combination of revenue vehicle miles and passenger miles for bus and fixed guideway, as well as population and population density. Most applications of 5307 funds require a 20% match. Capital money, which could be used for vehicle procurement and other capital asset acquisitions must be reallocated and used for the costs of maintaining the current bus fleet.

Fiscal Year	***Section 5307 Capital Formula Funding***	***Section 5307 Money for Maintenance***	***Gap***
2006	$3,362,220	$1,700,000	$1,662,220
2007	$3,592,364	$2,018,568	$1,573,796
2008	$3,811,952	$2,074,124	$1,737,828

Additionally, the current fare structure is complicated and causes confusion for drivers and passengers. The CAT network includes multiple zones and fare levels leading to confusion

for riders and drivers. The multiple fare media hinders quick recognition of prices. Confusion over fares causes delay by adding time to fare transactions.

5. Legislative decisions unnecessarily restrict transit options

The work of the Commonwealth of Pennsylvania's Transportation Funding and Reform Commission during 2006 identified the significant additional investment needed for the state's highway, bridge and public transit programs. While the new Act 44 legislation has been most helpful in stabilizing the CAT system and prevented both a significant service reduction and a fare increase, Act 44 funded approximately 40 percent of the identified additional mass transit finances need statewide. The uncertainty surrounding the tolling of Interstate 80 leads to additional uncertainty with the future of Act 44.

In 1981, federal operating assistance received by the Harrisburg urbanized area from the U.S. Department of Transportation for support of CAT's operating budget totaled $1,629,704. Through federal regulatory changes and the population growth of the Harrisburg urbanized area, the federal operating assistance annually reduced in amount and by the mid 1990's, totaled zero (urbanized areas exceeding 200,000 as identified by the U.S. census are not eligible for federal operating assistance).

Additional restrictions and set asides implemented by the federal government, results in less flexibility to address local priorities. For example, the requirements of the Americans with Disabilities Act (ADA) restrict that no more than ten percent of an urbanized area's section 5307 formula funds may be used to fund the federal government mandates. Yet, CAT's ADA expenses to comply with the federal regulations annually exceed the restricted funding limit. This in turn requires the use of operating funds provided by the state and local governments to satisfy a federal mandate. Other examples include the SAFETEA-LU requirement that a transit authority use one percent of section 5307 formula funds to fund "safety and security expenses." Another set aside requirement is to spend one percent of section 5307 formula funds on "transit enhancements."

Two limited federal programs in terms of dollars but with significant administrative requirements in order to receive the funds are the Jobs Access Reverse Commute (JARC) program and the New Freedoms Program. CAT has already submitted concerns about being able to use these federal dollars to the FTA. The whole process could be streamlined and better utilized simply by adding these dollars to an urbanized area section 5307 program.

On the state level, having the ability to further utilize vehicles on an as available, as needed basis which were purchased with capital dollars from shared ride programs in fixed route service would at times be helpful. Generally, peak service hours for the two modes of transportation (paratransit and fixed route) are different. In a limited manner, it may be possible to use paratransit equipment of specific hours to operate community circulator type of service.

C) Who will decide what action to take, and how will this document be used?

The CAT board of directors makes the ultimate decisions on CAT service and the use of its resources. However, the material in this study will provide not only the CAT board, but all HATS area transportation decision makers with appropriate information to make the most prudent determinations. The document will be used to verify the purpose and needs selected by the committee and screen acceptable solutions to address those identified needs. Data presented as part of this effort can be used by municipal, county and state officials to direct resources towards meaningful solutions to the needs identified through the process. The analyses done as part of this effort will reflect information which may cause decision makers to rethink the status quo approach (highway vs. transit) to transportation priorities.

D) What is the scope of this study?

The scope of this study is the operations, facilities, and equipment of the Cumberland-Dauphin-Harrisburg Transit Authority, also known as Capital Area Transit or CAT. CAT is a public transit agency formed by the Cumberland County and Dauphin County Commissioners and the City of Harrisburg, and is designated as the public transportation provider in the greater Harrisburg area. Other public transit authorities, private transportation services, and intercity bus and rail are not considered within the scope of this study. Currently CAT service is concentrated in Harrisburg and its immediate suburbs in Cumberland and Dauphin County. The geographic area within scope of this study includes all of Dauphin, Cumberland, and Perry Counties along with parts of Lebanon and York Counties.

CAT operates a fixed-route division and a shared ride/paratransit division. The scope of this study only includes the fixed route division; the shared ride/paratransit division will not be considered. The fixed route division operates on a set schedule and route system and includes the finances, facilities, equipment, and employees that provide fixed route service. Any mode or type of fixed route mass transit may be considered within the scope of this study, including but not limited to commuter rail, light rail, and bus rapid transit. This study is considered an evaluation of the opportunities and challenges in providing efficient mass transit. Routing and scheduling evaluation of existing routes with existing equipment is ongoing by CAT staff and is not within the scope of this study. The CAT service study will take a broader, system-wide view and seek to encourage new ridership.

E) How to read the rest of this document.

Chapter 2 describes the existing conditions of the area to be affected by the alternatives retained for further consideration.

Chapter 3 presents the alternatives analysis. It introduces the range of reasonable alternatives developed to meet the project purpose and needs. It identifies those alternatives retained or dismissed from more detailed study and the reasons for their retention or dismissal.

Harrisburg - Journey to Work

1-1

Dauphin Borough
Middle Paxton Township
West Hanover Township
East Hanover Township
Penn Township
Marysville Borough
From Upper Dauphin 2,400
From Perry 2,900
Carroll Township
Rye Township
Susquehanna Township
Lower Paxton Township
East Pennsboro
1,700
700
1,000
600
500
600
600
2,400
Penbrook
3,400
1,000
2,300
900
1,700
800
1,400
1,600
2,000
Wormleysburg
Harrisburg City
Paxtang
Swatara Township
300
Hummelstown
Derry Township
Middlesex Township
Silver Spring Township
Hampden Township
CampHill
Lemoyne
700
5,800
1,200
2,400
700
1000
800
800
800
700
800
700
New Cumberland
Steelton
Lower Swatara Township
Conewago Township
Londonderry Township
Shiremanstown
2,200
Middletown
700
Mechanicsburg
Lower Allen Township
200
Highspire
Carlisle
South Middleton Township
Upper Allen Township
Monroe Township

Legend

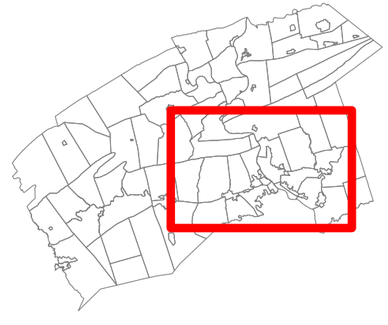
- To Harrisburg
- To Suburbs
- Municipal Boundaries
- Urban Core
- Urbanized Area
- Susquehanna River

N

0 1.25 2.5 5

Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION



Cumberland County - Journey to Work
Carlisle - Harrisburg Commuter Split

1-2

Hampden Township

Silver Spring Township

North Middleton Township

Lower Frankford Township

Middlesex Township

Mechanicsburg Borough

Carlisle Borough

West Pennsboro Township

Upper Allen Township

Monroe Township

Dickinson Township

South Middleton Township

1,700
300
300
400
300
700
1,700
300
300
700

To Harrisburg

Legend

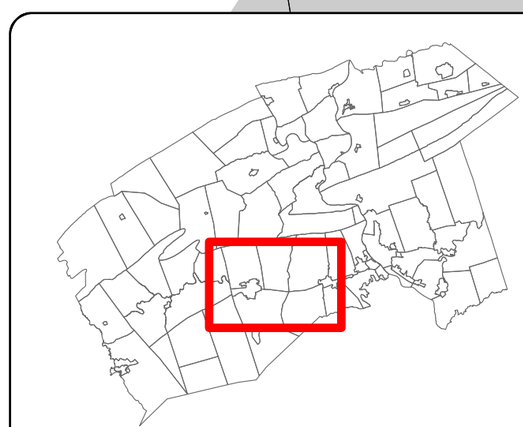
- To Harrisburg
- To Carlisle
- Municipal Boundaries
- Urbanized Area

N

0 0.5 1 2

Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION



Dauphin County - Journey to Work
Derry - Harrisburg Commuter Split

1-3

Susquehanna Township
Lower Paxton Township
West Hanover Township
East Hanover Township
North Londonderry Township
Palmyra
Penbrook
Harrisburg City
Paxtang
Hummelstown
Swatara Township
Derry Township
South Londonderry Township
Wormleysburg
Lemoyne Borough
New Cumberland Borough
Steelton Borough
Lower Allen Township
Lower Swatara Township
Highspire
Middletown Borough
Londonderry Township
Conewago Township

400
2,400
700
300
500
700
300
500
1,200
1,100
700
400
400

Legend
- To Harrisburg
- To Derry
- Municipal Boundaries
- Urbanized Area
- Susquehanna River

N

0 1.25 2.5 5
Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION

Chapter II: Existing Conditions

A) Regional Demographics and Trends

Residential density in the region mostly occurs on an east-west axis from Mechanicsburg to Hershey. Within that area the highest density is within Harrisburg and the immediately adjoining boroughs and suburban area. Along the river there is a north-south corridor of higher density development, on the east shore from Susquehanna Township south to Middletown, and on the west shore from Enola south to New Cumberland.

Employment and its distribution is an important indicator of travel demand. Since 1980 the HATS region has continued to experience a shift from industrial to service industry sector dominance as well as an increase in total employment. The HATS region benefits from a relatively stable employment source (government). However, the business or non-government component of our economic base requires our municipalities and region to work together to create a favorable and globally competitive climate for job creation and retention.
See: Major Employers, Map 2-1

There has been a steadily growing proportion of the population 65 years and older. This age group has increased over 40% since 1980 in our region. These trends have important policy implications for transportation planning, as we continue to experience increasing numbers and proportions of elderly population, the "graying" of the suburbs, and the ensuing changes in transportation needs and mobility issues

The spatial separation between jobs and housing, and a lack of reliable alternative transportation choices, particularly impacts residents who may not have a vehicle available to access these jobs. During the last decade the number of households without a vehicle remained fairly constant, but still reflects about 8.5% of our region's households (about 45,000 people).

The total number of persons and their spatial distribution are important factors to be considered in transportation planning. The HATS Region, like other parts of Pennsylvania and the United States, is becoming increasingly more urbanized. Population data over the past 50 years reflects significant population increases in suburban townships and rural areas and decreasing in central places such as the City of Harrisburg.

In 1950, the regional population was focused in the City of Harrisburg and other more centralized urban areas of the region. In fact, the City of Harrisburg reached its all-time high Census population of 89,544. Other small towns in the region experienced similar peaks in their population during this decade. Approximately 62.7 percent of the region's population (198,618 persons) resided in the city and other boroughs throughout Cumberland, Dauphin and Perry Counties. The remaining population was distributed in the adjacent suburban and rural townships.

By 1970, a dramatic shift in local development and population distribution occurred. The region's growing population was moving to more suburban settings. Recently improved interstate and other road systems in the region, as well as new housing development, influenced the shift from centralized community populations to wider suburban and rural growth.

Over the period from 1950 to 1970, the region experienced its largest population growth surges with a total population increase of 29.5 percent (93,603 persons) in 20 years. During the same period, non-township populations and the City of Harrisburg experienced a decrease of approximately 12,263 (6.2 percent) persons and hosted only 45.4 percent of the region's residents.

Over the past thirty years (1970 to 2000), city and borough population declines have continued. While the regional population continued to grow another 24.4 percent, boroughs and the City of Harrisburg continued to experience downward population trends, while suburban communities experienced significant population increases which often doubled from 1970.

Central places such as the City of Harrisburg and other small boroughs continued to experience declines in numbers. By 2000, the City of Harrisburg had declined in population by 43.3 percent to 48,950. Boroughs have also experienced stable to declining population totals over the same period. Population in the region is projected to grow at a diminishing rate over the next thirty years (2000 to 2030).

County	***2000***	***2010***	***2020***	***2030***	***Percent Change***
Cumberland	213,674	249,813	269,375	285,089	33
Dauphin	251,798	264,378	273,483	282,830	12
Perry	43,602	52,785	55,784	57,482	32

Projections to the Year 2020 were based on PA State Data Center county totals as "controls". The control totals then were allocated among the municipalities based on a model developed by Tri-County Regional Planning Commission, which includes weighted factors regarding current population distribution as well as thirty-year population and housing rends. From 2020 to 2030, county control totals were estimated based on the incremental change of PA State Date Center projections from 2005 to 2020. The TCRPC allocation methodology was then applied to those estimated county control totals.

The relative difference in age structure between the counties in our region is evident in the change in median age. From 1960 to 1970, median age stabilized or declined slightly, then increased over the past three decades. By 2000, Perry County had the lowest median age with 37.5, while the HATS Lebanon County municipalities had the highest at 40.1 years of age.

As with population, the total number of households and their spatial distribution are also important indicators in forecasting future trip generation. Households correspond to the number of occupied dwelling units – those that work, shop, and travel (generate trips).

A decline in household size has been commonly experienced throughout the United States, Pennsylvania, and the HATS region. From 1980 to 2000 the region's household size decreased approximately 8.6 percent and on average were less than 3 persons per household. Several factors account for this change, including more single parent households, families having fewer children, fewer children continuing to reside in their parent's home, a growing elderly population, and rising personal income which allows more single persons to maintain a household.

With continued advances in technology, employment growth in the HATS region is expected to sustain the trend from the production of goods to the delivery of services to the Year 2030.

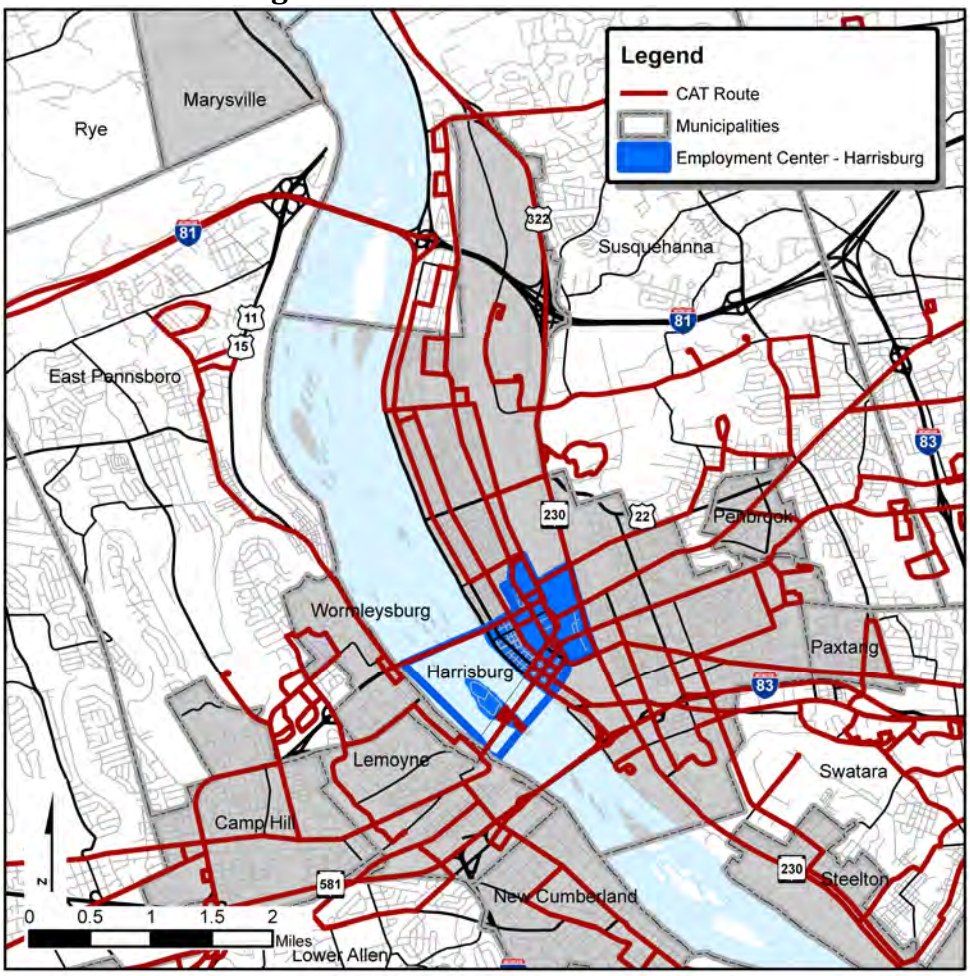
County	***2000***	***2010***	***2020***	***2030***	***Percent Change***
Cumberland	127,201	145,184	165,740	189,227	48
Dauphin	151,559	172,869	197,212	224,995	48
Perry	21,740	24,565	27,826	31,594	45

The employment projections were developed based on expected industry growth rates established by PA Department of Labor for the Harrisburg MSA, and categorized as either retail or non-retail for travel demand model input. These rates were applied to Year 2000 base employment numbers developed with Census and InfoUSA data to generate county-level employment totals. These totals were allocated to the traffic analysis zones (TAZ) level using a distribution model factoring in density, availability of vacant buildable land and utilities (water and sewer) conditions.

Most jobs are projected to locate along the east-west corridor from Carlisle Borough to Palmyra Borough and be more heavily concentrated around the region's urban core. No municipalities are projected to lose jobs and it is anticipated that increases in employment will generate increases in travel and congestion levels.

B) Major Employment Centers

1) Downtown Harrisburg



Traffic analysis zones covering the Downtown Harrisburg employment center.

Overview

Downtown Harrisburg is the historical center of employment in the region and is the main focus of the existing CAT system. Conditions within the center of Harrisburg are very good for transit ridership. Parking is scarce and public lots charge a fee for use. The downtown streets are pedestrian friendly. It features short blocks, a traditional street grid, wide sidewalks, and a pleasant streetscape. There is a wide variety of restaurants and personal services within easy walking distance of most employers.

According to Tri-County Regional Planning Commission (TCRPC) estimates, in 2005 there were 20,799 total workers in downtown Harrisburg. 19,860 of those workers were non-retail, and 939 worked in retail. Harrisburg draws workers from all over the region, and from counties outside of the CAT service area. Even though downtown Harrisburg is the destination of the vast majority of CAT riders and is very well served, there is always opportunity to capture more riders.

Residential Density
The current CAT system matches up very well with residential density in the region. The city and the boroughs are the centers of population. Though they have been losing population over the last few decades, recent estimates show that this trend is slowing and that there is a possibility it will reverse. There are ambitious revitalization programs in place or proposed in Harrisburg and in many of the boroughs. There is a new interest in preserving or in some cases recreating the traditional residential and business development patterns of the city and boroughs. A trend away from auto-centric development in the region's traditional population centers will create an opportunity for transit to aid in community revitalization and to expand ridership into downtown Harrisburg.

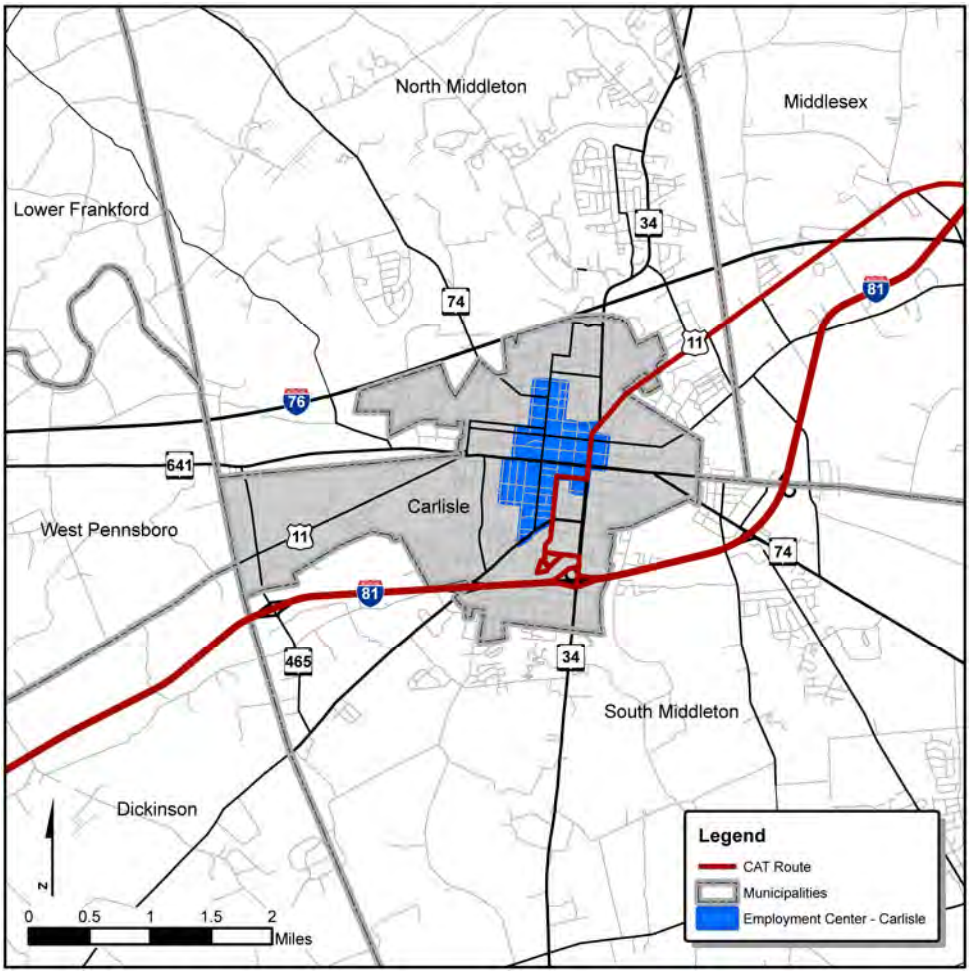
Some of the townships in the CAT service area are also reforming the way they develop. Updated comprehensive plans and zoning ordinances often include areas targeted for more dense development, as well as requirements for pedestrian facilities and pedestrian accessible commercial development. Currently the first traditional neighborhood development is being planned in Londonderry Township. With the projected growth in the region and the scarcity of developable land, there will be more areas of residential development dense enough for transit service in many parts of the region.

Congestion
The HATS Congestion Management Process (CMP) identifies the following corridors into downtown Harrisburg:

CMP Corridor	***Streets***	***Lowest Peak LOS***	***CMP Priority***
9	I-81	E	Y
14	I-83	E	Y
63	PA 230	D	Y
64	PA 230	C	Y
79	7th	C	N
89	Paxton	F	Y

Current Transit Service
Almost all of the routes on the CAT system provide service to downtown Harrisburg.

2) Carlisle



Traffic *analysis zones coving the Downtown Carlisle employment center.*

Overview

Carlisle is an historic borough with a traditional downtown and neighborhood design. Tri-County Regional Planning Commission employment estimates show 5,450 total employees in downtown Carlisle, 3,716 non-retail employees and 547 retail employees. Non-retail employees include large employers such as Cumberland County and Dickinson University. Journey to work data from the 2000 U.S. Census shows that Carlisle Borough is the top destination for workers living in most central and western Cumberland County communities. Downtown Carlisle has easily available, free parking for most commuters. It also has pedestrian friendly streets and convenient restaurants and services for daytime workers. The parking can be a disincentive for transit ridership, while the traditional design of the downtown and the mix of uses is an incentive.

Comprehensive Traffic Study of Downtown Carlisle

A study of traffic in downtown Carlisle was published in September of 2008. The study focuses on the following goals;

- Calm traffic and enhance Carlisle's small town feeling
- Reduce accidents and enhance safety

- Promote walking and bicycling
- Reduce air and noise pollution
- Maximize downtown business success
- Improve parking access and safety
- Reduce truck traffic in Downtown Carlisle

The recommendation of the study is a road diet in downtown Carlisle, reducing the travel lanes on High and Hanover streets from four lanes to two. Along with the road diet are recommendations for pedestrian and bicycle enhancements. Transit should be considered as another part of this plan. CAT service in the borough will further enhance the goals stated in the report.

Comparison to small transit systems in Pennsylvania
The service population of Carlisle Borough, including traffic analysis zones in North Middleton and South Middleton Townships, is 34,600 (2000 US Census). Out of the other systems in Pennsylvania with less than 10 total buses in their fleets, Carlisle's service area is most similar to Butler, Mt. Carmel, and Venango. The ridership per revenue vehicle hour for each of these systems is slightly below the CAT system number. In 2007 CAT had 16 riders per revenue vehicle hour, while Butler had 13 and Mt. Carmel had 12. Venango came in much lower, with 7. Dubois and Kittanning, with much lower service populations, came in at 6 and 5 riders respectively.

The number of senior passengers as a percentage of total ridership is much higher in these other systems than the CAT system wide percentage. CAT fixed route ridership was about 8% senior passengers. Out of the 3 small systems with comparable population, Venango carried 24% senior passengers, Butler 40%, and Mt. Carmel 89%. The total percentage of residents over 65 in each county does not seem to vary enough to explain the differences in these percentages. Cumberland County falls into the middle range of these counties.

County	***Percent over 65***
Butler	14
Cumberland	15
Northumberland	19
Venango	16

Comparative Statistics for Pennsylvania Transit Systems under 10 Vehicles in Total Fleet

Transit System	*Service Area Population*	*Total Fleet*	*Fixed Routes*	*Total Passengers*	*Senior Passengers*	*Total Ridership per Revenue Vehicle Hour*
Butler Transit Authority	33,339	6	6	152,124	59,638	13
Lower Anthracite Transit, (Mt. Carmel)	33,000	3	2	56,710	50,311	12
Venango Bus	36,354	4	3	55,920	13,260	7
DuFAST, (Dubois)	18,378	5	4	57,874	25,369	6
Town and Country Transit (Kittanning)	11,837	6	3	53,645	31,522	5

Residential Density

Much of Carlisle Borough has a residential density over 3,000 people per square mile. Neighborhoods to the north of downtown are over 6,000 and to the south of downtown over 12,000 people per square mile. Residential density within the borough should be sufficient to support transit. The top two origins for workers commuting into Carlisle are North Middleton and South Middleton Townships. In North Middleton Township there is relatively dense residential development along PA-34 in Schlusser. The rest of the township is low density residential development. South Middleton Township has dense residential development along Forge Road leading out of Carlisle south to Boiling Springs. South on PA 34 from Carlisle is the small borough of Mount Holly Springs, an older community with a tradition street design and density.

Congestion

The HATS Congestion Management Process (CMP) identifies the following corridors into Carlisle:

CMP Corridor	*Streets*	*Lowest Peak LOS*	*CMP Priority*
50	PA 34	D	N
29	US 11	C	Y
48	PA 641	C	N
49	PA 641	C	N

Current Transit Service

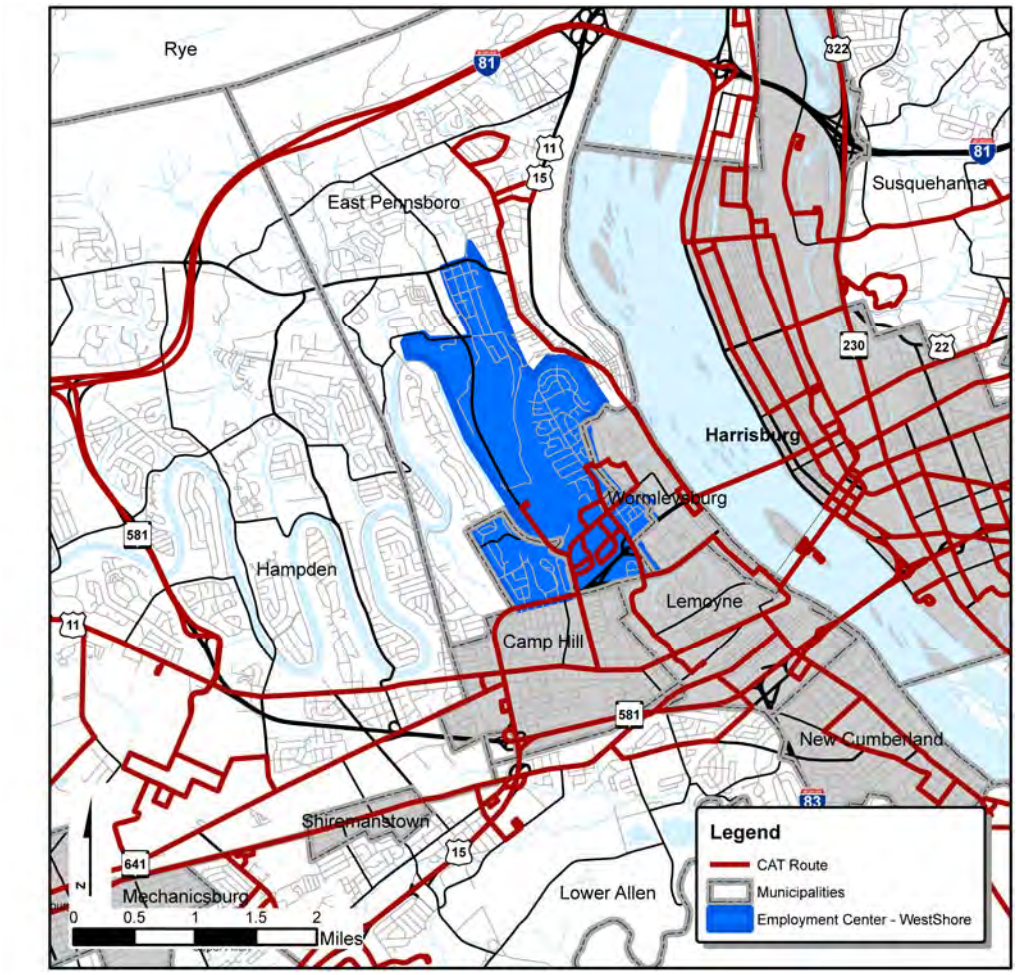
- C and CX – Carlisle Local and Commuter Express

The Carlisle Local connects Carlisle with Harrisburg via the Carlisle Pike. The route originates at the Carlisle Commons shopping center, where a park and ride is located, and then travels through the borough and provides access to the retail establishments on the Carlisle Pike as well as the Lemoyne Transfer Center and downtown Harrisburg. The Carlisle Commuter Express also originates at the Carlisle Commons park and ride and makes stops in the borough, but uses I-81 to Harrisburg instead of the more congested Carlisle Pike. The express route saves about one quarter of the time it takes the local route to reach the Market Street Transfer Center from the origin at the Carlisle Commons. Both routes have been very successful.

- 81-Shippensburg/Newville

Route 81 originates in Shippensburg and stops at the Newville park and ride before it arrives at the Carlisle Commons park and ride. From the Carlisle Commons, there are two versions of the route. One version provides express service to Harrisburg; the other provides service to the Mechanicsburg Navy Depot. This route is not timed to allow easy transfer to route C for riders wishing to travel from Shippensburg and Newville into Carlisle.

3) West Shore Office



Traffic *analysis zones covering the West Shore Office employment center.*

Employment
The West Shore Office Complex, as defined in this study, is the large employment center off of the Camp Hill Bypass in East Pennsboro Township. This is one of the most dense employment areas in the CAT service area. According to Tri-County Regional Planning Commission employment estimates, 2005 employment in the office complex was 13,782, with 13,470 non-retail workers and 312 retail workers. Analysis of 2000 journey to work data shows that East Pennsboro Township draws employees from each of the surrounding municipalities in Cumberland County, and many employees from Dauphin County. Commuters into East Pennsboro Township come from such a wide variety of locations that it isn't possible to pinpoint a concentrated area of commuter origins.

The very high number of non-retail workers makes this area a natural target for future transit service. The low amounts of retail workers, however, show that there is little in the way of services available to workers within walking distance. Past attempts to serve this office complex with transit have shown that the inability of employees to access such services within easy and safe walking distance is a barrier to ridership. Until the auto-centric character of development in and around the office complex changes, transit ridership into the complex will be limited.

Residential Density
The West Shore Office Complex is in close proximity to the boroughs of Camp Hill, Lemoyne, Wormleysburg, and New Cumberland. Immediately across the river from the complex is the City of Harrisburg. These municipalities are all older residential development and have the density to support transit. There is also dense residential development along Enola Drive in East Pennsboro Township and Front Street in Susquehanna Township.

Congestion
The HATS Congestion Management Process (CMP) identifies the following corridors near the West Shore Office Complex:

CMP Corridor	***Streets***	***Lowest Peak LOS***	***CMP Priority***
23	US 11/15	C	Y
84	Poplar/Erford/21st	D	Y
85	Center/East Penn	D	N

Current Transit Service

- K-Erford Road

The Erford Road route takes riders from downtown Harrisburg and Wormleysburg to the office complex. There are two trips during the AM rush one hour apart and one trip out of the office complex during the PM rush. Route K also carries AM and PM peak riders from Erford and Wormleysburg into downtown Harrisburg. Route K has a relatively low passenger load.

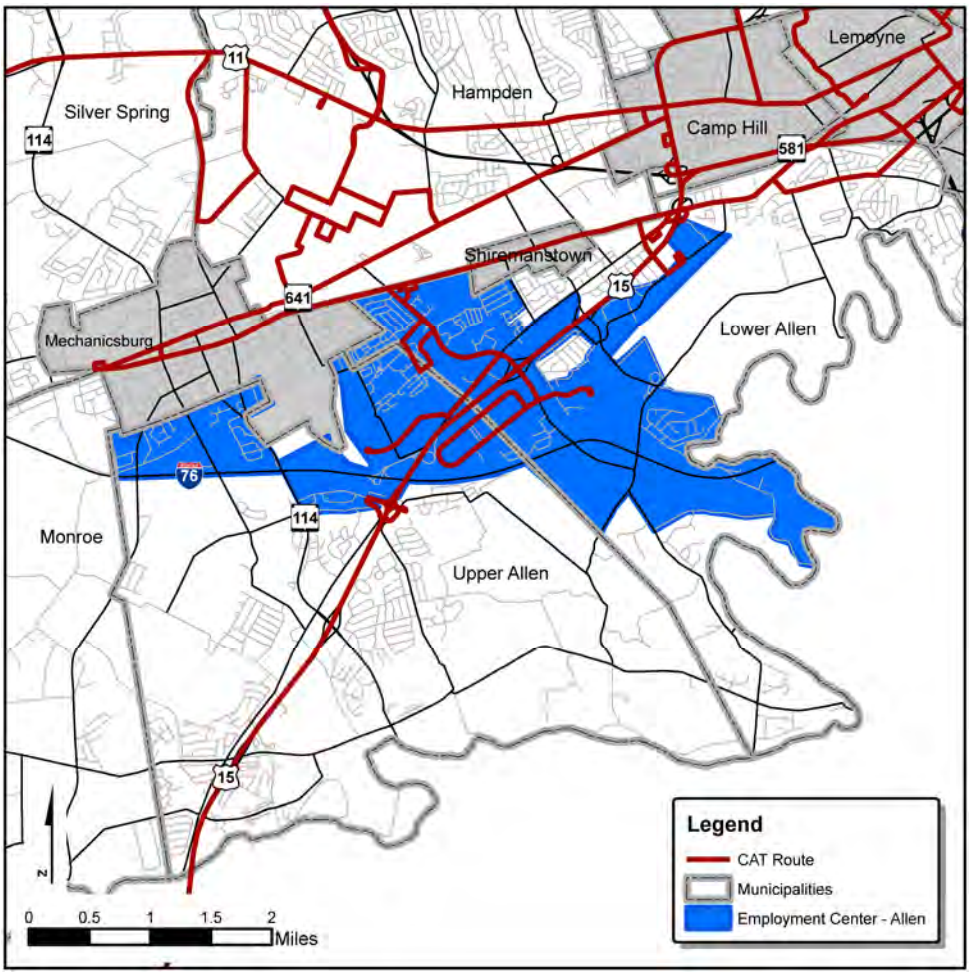
- L-Lemoyne Shuttle

Route L was created to shuttle riders from the Lemoyne Station to the West Shore Office Complex. For a number of reasons, this route was one of the poorest performing routes in the CAT system. A recent change to the routing of the Lemoyne Shuttle brings the route through the residential area of Lemoyne Borough before stopping at the station and continuing on to the office complex. This is currently the only route that is meant to serve the office complex exclusively. Since the route was very different in past years, past ridership numbers are not applicable. Future ridership on this route could indicate if an opportunity to serve the office complex exists or not.

- D-Shoppers Special

Route D serves Holy Spirit Hospital in the office complex. It does not run at peak commuting times.

4) Allen Office Park



Traffic analysis zones covering the Allen Offic Park employment center.

Overview
The Allen Office Park straddles the line between Lower Allen and Upper Allen Townships. According to Tri-County Regional Planning Commission estimates, in 2005 the Lower Allen Office Park and the surrounding area employed 13,739 people. There were an estimated 1,784 retail employees, and 11,955 non-retail employees. There are a high percentage of retail employees compared to other employment areas this study examines. The high number of retail employees does not necessarily point to availability of services in this area. Development in this area has been along the traditional suburban office park model with large parking lots and complete separation of uses. Parking availability, lack of convenient restaurants and services, and a pedestrian unfriendly design in the area may be a deterrent to successful bus ridership.

Residential Density
Journey to work data suggests that some of the Lower Allen and Upper Allen Townships employees come from within the townships and from the nearby boroughs. But, like other suburban office development, this employment area is very easily accessible by personal automobile and so the origins of its employees are scattered across the region. Very little of the townships themselves are over the 3,000 person per square mile threshold. Heading south on US 15 there are some pockets of higher density development. In areas of the townships that do have denser residential development the predominant design is the circuitous suburban street design. This type of residential development is difficult to serve with buses. To the north of the office park is the borough of Mechanicsburg which has a traditional street pattern and can potentially be served by buses. To the east are Shiremanstown and the west shore boroughs. The density and development patterns of these towns make them the best target for transit service to this office park.

Congestion
The HATS Congestion Management Process (CMP) identifies the following corridors into the Allen Office Park:

CMP Corridor	***Streets***	***Lowest Peak LOS***	***CMP Priority***
22	US 15	C	Y

Current Transit Service
- Route B-Highland Park

The Highland Park route currently serves commuters to the Allen Office Park. The route provides access from the Market Square Transfer Center through Lemoyne and Shiremanstown. The route also carries riders from the Lower Allen and Shiremanstown area into downtown Harrisburg. The route has been moderately successful.

C) Regional Transportation

Highway
The HATS region is at the crossroads of Interstate 83 and 81. Along with PA 581, these interstates form the Capital Beltway. The region is also contains sections of limited access state highways and a network of arterials that serve local traffic. There is a high rate of

single occupancy vehicle commutes in the region. Commuting trips occur on all classifications of roadways and are a principal cause of congestion problems during peak periods (7 to 9 a.m. and 3 to 6 p.m.). The 2007 Regional Transportation Plan predicts that congestion during peak commuting periods will continue to worsen without an expansion in travel mode choice. (RTP 2007 III-1)

The regional highway network runs mostly on an east-west axis and is affected by several natural and built barriers. The Susquehanna River divides the region and restricts east to west travel. The Conodoguinet Creek runs west to east through Cumberland County and has long north-south switchbacks. It restricts both north-south travel and east-west travel in Hampden, East Pennsboro, and Silver Spring Townships. The Kittatinny Ridge runs east-west, dividing Dauphin County into Upper and Lower sections and restricting travel in and out of Perry County. Several railroad corridors restrict both north-south and east-west travel. The most significant railroad barrier is on the east side of Harrisburg, which limits traffic into the city to a few overpasses. There are also lines running north-south along the river, and east-west through the metropolitan area.

Public transportation

The Harrisburg metropolitan region has a number of public transportation options available for those who live in the area, commute into the area for work, and visit the Pennsylvania State Capital area for work or pleasure. Capital Area Transit (CAT) provides fixed-route bus service to downtown Harrisburg and the surrounding communities in Cumberland and Dauphin Counties. CAT also provides paratransit services for residents in Dauphin County, while the Cumberland County Transportation Department serves residents in Cumberland County and the Perry County Transportation Authority serves those in Perry County. Other important services include several inter-city and private charter bus companies, AMTRAK passenger rail service, the Harrisburg International Airport, and other private transit providers. Public transit in the area is funded by user fees, as well as local, state, and federal transportation funds.

Raider Regional Transit (RRT) is a local bus system, administered by CAT, serving the Shippensburg University, Shippensburg borough, and the surrounding area. RRT is jointly sponsored by the Shippensburg University Student Association, Shippensburg University, Shippensburg Borough, Shippensburg Township, Cumberland County, Southampton Township-Franklin County, and Capital Area Transit with funds provided by the Pennsylvania Department of Transportation. Raider Regional Transit in Shippensburg brought the region's combined FY 2008 passenger trip total to 2,735,558. The RRT provides service Monday through Saturday during the University's regular academic year and on Tuesdays and Thursday's (Modified Schedule) during the summer and fall, spring and holiday breaks. Service is provided around campus, and the Shippensburg area. Riders may go to local shopping areas as well as the regional Chambersburg Mall.

Two intercity bus companies provide service within the HATS area, connecting the region to other areas within and outside Pennsylvania. Bieber Trailways is based in Harrisburg and provides service connecting the Harrisburg area with various markets outside the region. The carrier's Harrisburg to Reading line has four weekday runs and two weekend

runs in each direction. Bieber has recently discontinued stops in Cleona, Annville, and Palmyra on this route. Another route is run from Harrisburg to York and then Lancaster, eventually going through King of Prussia and ending in New York City. This route runs four times during the week and six times on the weekend. Bieber Trailways has recently made cuts in service that have had a significant impact on the HATS region and CAT service, including the discontinuation of service to Hummelstown. Hegins Valley Lines have also cut service, discontinuing service to Millersville and Halifax that was replaced by CAT.

Greyhound, the national intercity bus carrier, also operates routes in the HATS area. Greyhound has two routes that serve locations within the HATS area besides Harrisburg. On the carrier's Harrisburg to Pittsburgh routes via the Pennsylvania Turnpike, two westbound and three eastbound buses also stop in the Carlisle area. On the carrier's Harrisburg to Pittsburgh routes via State College/Altoona/Johnstown, one of the westbound routes also stops in Millerstown. Greyhound also provides service between Harrisburg and the following markets: Wilkes-Barre/Scranton (via Pottsville/Hazleton), Baltimore/Washington (via York), Philadelphia/New York (via King of Prussia), and Allentown/Bethlehem/Easton/New York.

Cumberland, Dauphin, and Perry Counties provide Share-A-Ride transportation for residents of each county. "Share-a-Ride" service is designed so passengers share the vehicle with other riders taking similar trips. Share-A-Ride is neither "taxi" nor "limousine" service and the availability of certain trips depends on the other trips scheduled at a particular time. Many of the vans in the County fleets are handicapped accessible for those needing such facilities

Park and Ride Facilities

CAT has established 18 park and ride facilities (P&R) in the HATS area. Several CAT routes feature park and ride lots and CAT offers Express Service from many of those locations. There are a few park and rides located outside Harrisburg that simply offer parking for those who wish to carpool into the city. Many locations have also developed informal park and ride areas where people just leave their cars but there is no formal lot associated with them. There are numerous P&R facilities along the major roadways in the region including on US 322/22 north of Harrisburg, US 11/15 north of Duncannon, SR 283 between Harrisburg and Lancaster, and on I-81.

Bicycle and Pedestrian Network

Although not as prominent as other modes of travel, bicycle and pedestrian modes make up an important part of the region's transportation system. Many people bicycle for work-related, general transportation, or recreational purposes and everyone at some time travels by foot to get to where they are going, even if it is as simple as walking from their home to their car or walking from their car to the store. For those reasons, both bicycle and pedestrian transportation concerns need to be adequately addressed.

Environmental Justice
A 1994 Presidential Executive Order directed every agency working with federal funding to identify and address the effects of all programs, policies, and activities on minority populations and low-income populations. To fulfill this requirement HATS uses US Census 2000 data to compare the current transportation system and future plans with location of environmental justice (EJ) populations. The GIS department has identified census block groups with concentrations of minority population, Hispanic population, isolated language households, and households in poverty. For this study, a concentration is defined as having a number of occurrences one half of a standard deviation or greater above the mean for all block groups in the three counties. Comparison of identified areas of EJ population and the existing CAT system did not show a deficiency in service to these population households. The greatest concentration of CAT service is in areas identified by the EJ process.
See: Environmental Justice and existing CAT system, Map 2-2

D) Congestion Management Process

A congestion management process (CMP) is a federal requirement of all transportation management areas (TMA). The process is intended by federal law to be a systematic, transparent way to manage congestion through identifying performance measures for prioritizing projects and strategies. The HATS CMP 2008 measures the performance of major corridors with volume measures and level of service measures (LOS). Volume measures simply compare the volume of traffic on the roadway to the capacity of the roadway. This type of measure is useful for identifying potentially congested areas, which are then measured by LOS. LOS is a more in-depth analysis of a roadway based on speed, travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. The LOS is then designated by a letter "A" through "F" depending on performance.
See: Congested Corridors, Map 2-3

Among the defined requirements, a CMP must give consideration to strategies that reduce single occupancy vehicles. One strategy for attaining that goal is to provide reliable, competitive bus service. The CMP identifies a network of key corridors that have the potential to be congested. The CMP includes a summary of existing conditions, projected conditions, and strategies for addressing congestion particular to each corridor. Several of the corridor strategies for reducing congestion include recommendation of expanded or new bus service. This section gives an overview of the recommendations given in the CMP:

Park and Rides

- US 15 (Corridor 21, 22) — this corridor is defined as US 15 between the York/Cumberland county line and PA 581, through Upper Allen and Lower Allen townships. There are many business office uses and some industrial uses along or near the corridor. There is moderate to severe peak hour congestion on the corridor. Currently, the Dillsburg Express route runs along this corridor, carrying commuters from Dillsburg in York County to Harrisburg. There is one stop along the identified congested segment, at Winding Hill Road. The CMP recommends an additional park and ride facility.

- PA 283 (Corridor 19) — this corridor is defined as PA 283 between I-283 and the Vine Street interchange north of Middletown. The corridor is a major route between southeastern Dauphin County and Lancaster to the Harrisburg area. The corridor also provides access to Harrisburg International Airport, and supports various warehousing/distribution facilities. There is currently no CAT service on the corridor, but CAT route 7 runs parallel to the corridor. Amtrak also operates local commuter service parallel to the corridor. The CMP recommends park and ride facilities at one or more of the PA 283 interchanges, especially to the north of Middletown.

Expanded Service

- PA 39 (Corridors 56, 57) — this corridor is defined as PA 39 between Front Street and Mountain Road. There is moderate to heavy congestion on the corridor due to increasing residential development, and numerous office and commercial uses. Currently CAT route 3 serves the western segment of the corridor and route 12 serves some of the area with park and rides at the Colonial Park Mall. Neither of these routes is fully serving the corridor. The CMP recommends consideration of full CAT service along the corridor.

- US 22 (Corridor 34) — this corridor is defined as US 22 between PA 230 and I-81. This is one of the major roadways connecting central and northern Dauphin County and Perry County with the urban area. The major generators are the main campus of Harrisburg Area Community College and the Harrisburg Intermodal Yard. The main source of congestion identified in the CMP is special events at the Farm Show Complex. The CMP recommends that CAT consider providing more service on route CI when major events are occurring at the Farm Show Complex.

New Service

- US 11/15 (Corridor 26) — this corridor is defined as US 11/15 between I-81 and US 22/322. This is a major commuter route for Perry County residents and experiences major congestion during the peak hours. The CMP recommends expanded CAT service along this corridor in order to capture some of these commuters.

- PA 34/Sunnyside Drive (Corridor 52) — this corridor segment is located between Landisburg Road and PA 944. This is one of the few roads that connect Perry County to central and eastern Cumberland County, and it is also used by commuters to Harrisburg. There is currently no CAT service in this area. The CMP recommends consideration of bus service between Shirmansdale in Perry County and the urbanized areas of Cumberland and Dauphin Counties.

- PA 114 (Corridor 61) — this segment is located between US 11 in Silver Spring Township and PA 641 in Mechanicsburg. It connects Mechanicsburg with the major commercial development along US 11. Currently there is no bus service on this corridor. The CMP recommends consideration of service between Carlisle and Mechanicsburg to address congestion both on PA 114 and US 11.

Corridor	CMP Existing Service	CMP Recommendation
US 15: York/Cumberland County line to PA 581	Dillsburg Express	Additional park and ride facilities.
PA 283: I-283 to Vine Street	Route 7 and Amtrak	Additional park and ride facilities.
PA 39: Front Street to Mountain Road	Route 3 and Route 12	Full CAT service along the corridor
US 22: PA 230 to I-81	Route CI	Expanded service for Farm Show events.
US 11/15: I-81 to US 22/322	No Service	Commuter service.
PA 34/Sunnyside Drive: Landisburg Road to PA 944	No Service	Add Shirmansdale route.
PA 114: US 11 to PA 641	No Service	Add Carlisle to Mechanicsburg route.

Chapter III: Alternatives Development and Screening

A) Process for identifying, developing, and screening alternatives

The first step in identifying alternatives for this study was a review of past studies. These studies include:

- Carlisle – Mechanicsburg Interborough Transit Feasibility Study – 1984
- Carlisle Intraborough Transit Feasibility Study – 1984
- CAT Short Range Transit Plan – 1993
- Phase II Regional Transit Alternatives Study – 1996
- 2030 Regional Transportation Plan – 2007 Update
- Congestion Management Process – 2007 Update

Alternatives were also identified through the use of census data. The Census Transportation Planning Package was used to identify worker flow at the municipal level. The number of commuters and their origin and destination were plotted on a map and compared to the CAT fixed route network. The census data also provided information on households with low income and without automobile access. These areas were also compared with the existing CAT fixed route network.

At a finer scale, census population data was combined with existing land use data to show population density. Within each transportation analysis zone (TAZ), areas identified as residential land use were assigned the total population of that TAZ. The resulting map shows the population of the residential area of the TAZ, rather than the density of the TAZ as a whole. This gives a more accurate picture of household concentrations than simply showing the population density for an entire TAZ.

Employment data used in alternative identification came from Tri-County Regional Planning Commission employment projections. These are the same projections that are used in traffic demand modeling. The projections use base year 2000 census data and allocate projected employment growth by county TAZs. Allocation is based on municipal zoning and land available for development. Employment is projected in five year intervals. In this study, the 2005 projections are considered existing conditions.

B) Alternatives

Expanded and updated maintenance facility
Need 4: Inadequate resources impact transit expansion
This proposal includes alternatives that would meet the current and future storage and maintenance needs of the CAT bus fleet. The needs for the maintenance facility include adequate space for larger buses and for expanding the fleet to meet future needs, integration of current hardware technology and accommodation for future upgrades, and a site accessible by CAT ridership. This alternative was retained for detailed study (see next section).

Allocate one half of HATS CMAQ funding to Capital Area Transit
Need 4: Inadequate resources impact transit expansion

HATS has been allocating one half of the CMAQ funding received by the MPO to Capital Area Transit. These funds have been used to purchase buses and to fund operation of new routes. It is recommended that this practice continue.

Movement Enhancement
Need 2: Transit time is not always competitive with automobile travel.
These proposals include all improvements to roadways and traffic control to improve the speed and efficiency of bus movement. Many of this series of alternatives use bus rapid transit (BRT) technology. Examples of this proposal are dedicated bus lanes, signal prioritization, and queue jumping. Possible locations for applying one or more of these strategies should be collected through CAT route managers and drivers and GIS analysis of congestion. This series of alternatives was retained for detailed analysis (see next section).

New/Extended Service
Need 1: Traditional direct radial transit service has difficulty serving an area with dispersed development
Proposals under this category identify new or expanded fixed route service based on employment centers and surrounding residential density. This series of alternatives was retained for detailed analysis (see next section)

Bus Rapid Transit (BRT)
Need 2: Transit time is not always competitive with automobile travel.
This proposal is a traditional BRT including stations and dedicated right-of-way. BRT service from Cumberland County to Harrisburg depends on the use of the CAT Bridge and a grade-separated connection in Lemoyne as a means of separating the buses from traffic when crossing the river. The Lemoyne Connector project is considered the highest priority project by the Harrisburg MPO. Currently, there is not sufficient available funding to construct the Lemoyne Connector project which makes the BRT alternative less feasible than other alternatives. BRT has been studied as an alternative mode for the Lancaster to Harrisburg corridor, initially known as Corridor One. The Corridor Two study, which examines transit service between Lebanon and Harrisburg, also includes a BRT alternative. Because of the delay in the Lemoyne Connector project and the other studies completed and in process traditional BRT was not selected for further study.

Hummelstown Service
Need 2: Transit time is not always competitive with automobile travel.
Hummelstown service is planned to begin with the construction of a park and ride within the borough. Because the borough and CAT are proceeding to implement this alternative, further study was not necessary in this study.

Fare Structure
Need 2: Transit time is not always competitive with automobile travel.
Need 4: Inadequate resources impact transit expansion
The CAT fare structure has grown to be unwieldy and confusing. A streamlined fare structure would make the system more useable and ensure correct fares are collected. An

alternate fare structure was studied by a consultant and the finding presented as a part of this report.

Fare Technology
Need 2: Transit time is not always competitive with automobile travel.
Need 4: Inadequate resources impact transit expansion
This includes any technology that will make paying fares easier on CAT riders and/or collecting fares easier on CAT drivers. Possibilities include a pass that can be paid online or by cell phone and can be used for CAT, parking, or other transit systems. Another possible strategy is coordination with the region's universities and colleges on card technology. This alternative was not retained for detailed study because it would be more difficult to implement in the near term compared to the alternatives retained for detailed study.

Perry County Service
Need 2: Transit time is not always competitive with automobile travel.
Proposals for service into Perry County include a radial route on 11/15, and radial service into Carlisle. This series of alternatives was not retained for detailed study, but this study recommends revisiting extending CAT service to Perry County in the near future after the current HATS Park & Ride Project is completed.

Municipal contribution of operating funds
Need 4: Inadequate resources impact transit expansion
Municipalities would directly contribute operating funds in order to increase service. While this proposal would increase funds, it was not retained for detailed study because it would complicate membership on the CAT board and lead to potential service fragmentation.

CAT operation/ownership of park and ride lots
Need 4: Inadequate resources impact transit expansion
Currently CAT real estate ownership is limited to offices, maintenance, and storage facilities. Under this proposal, CAT would negotiate partnerships with other public and/or private entities to purchase real estate for one or more transfer hubs and/or park and rides. This alternative is being studied in greater detail in the HATS Park & Ride Project.

New downtown transfer center
Need 1: Traditional direct radial transit service has difficulty serving an area with dispersed development.
A new transfer center would replace the current transfer center at Market Square. The new facility would address the problems with the current center which include outdated geometry, congestion, safety, ADA standards, inadequate shelter and a lack of amenities. This alternative was retained for detailed study (see next section).

C) Alternatives selected for detailed analysis

1. Expanded and updated maintenance facility

The current facility is inadequate for the existing fleet, let alone an expanded fleet. A CAT facilities requirement analysis had been begun in July 2009 but did not lead to a project

because funding could not be identified. For that analysis, the following issues/needs were identified:

- Unsafe mixing of vehicle and pedestrian traffic onsite
  Physical size of the maintenance bays is insufficient. Bays are approximately 45'x15', buses are up to 40'x10.5' and will be 45' long in the future
- Height of garage doors will not accommodate higher vehicles such as MCIs and trolley buses
- There are an insufficient number of maintenance bays
- Insufficient space for storage of all the fleet inside the facility
- Bike racks cannot be installed because they will increase bus length approximately 2'
- Light and ventilation in the storage garage is poor
- Cannot remotely open and close overhead doors to garage
- Floor slabs are raised and cave-in 2 to 3 times a year
- There is no background data for the facility – data was destroyed by hurricane Agnes
- Buildings are not connected
- The location of the fare collection equipment is unsafe
- Use of wireless technology is lacking an there are issues with the location of the wireless unit on site
- Odors and exhaust from the maintenance areas ender the administrative areas
- Paint prep area and paint booth are remotely located
- Admin staff must go through shop to get to snack room and dispatch
- Functional work areas with required adjacencies are not located close to each other, including dispatch and fare collection and dispatch and admin
- Office space is inadequate
- Drivers' facilities are inadequate
- There is no area for individual training on computers
- Locker and shower areas are insufficient
- The location of the large conference room in not efficient or secure
- The site is not secure
- Dispatch does not have noise separation
- Equipment must be shared by bus and paratransit staffs simultaneously
- Washer does not adequately wash the smaller vehicles
- Employee parking is inefficient
- Buses and employees cause evening congestion on Cameron Street
- Storm water drainage is inadequate
- Space in insufficient for Corridor 2 premium bus service, which may be in the near future
- Facility is not located for easy access by the customer
- Buses cannot turn left out of the lot onto Cameron Street
- Facility is in the flood zone
- There is some duplication of office equipment due to remote spaces
- Ventilation in the office is poor

2. Fare Structure

As a part of this service study, an outside consultant was hired to make recommendations for improving the CAT fare structure. The focus of the recommendations are to make a fare structure that is equitable, easily administered, and easily understood. With those needs in mind, the recommendations made were:

- Changing the student fare program to be applicable to only those in grades K to 12 and re-pricing the student pass program;
- Eliminating the 25-Ride ticket program and re-pricing the 11-Ride ticket with either a 20% of a 15% discount over the cash fare and offering a similar percentage discount for trips in all zones;
- Increasing the base fare to either $1.70 or $1.75 while leaving the remaining fare media at the same price; and
- Revamping the CAT zone structure by reducing the number of zones from four to three, increasing the charge for crossing into another zone from 40¢ to 60¢ and eliminating the 25¢ express surcharge.

The Fare Structure Analysis is included in its entirety in the appendix.

3. Movement Enhancement

Signal Priority

Signal priority gives special treatment to buses at signalized intersections. Proper implementation can shorten bus travel times in congested corridors. The Federal Transit Administration splits signal prioritization into two types: passive and active. Passive signal priority simply gives priority to roads with heavy transit usage when implementing signal timing strategies. Active prioritization involves detecting the presence of a bus and then giving that bus special treatment. Usually this means giving an early green light or holding a green light for the movement that the bus is going to take.

Queue Jumpers

A queue jump lane is a second type of movement enhancement, and the most effective in moving buses in congested traffic. It is basically a short bus lane combined with signal prioritization. When approaching a signalized intersection, the bus by-passes waiting traffic in a dedicated lane. That dedicated lane then gets an early green signal, which allows the bus to move back into the regular travel lanes ahead of the rest of the traffic stopped at the light. An existing right turn lane may be used for this lane, or an existing shoulder to avoid acquiring new right of way and to make a project more economical. Queue jumpers give the transit route similar travel time savings that signal prioritization does, and they allow passengers to perceive that they are moving faster than the rest of traffic. The psychological effect of moving past traffic and being given the priority at an intersection will be attractive to ridership, and could cause more commuters to try transit as they see buses moving past them in congestion.

Corridors

To find potential corridors for signal prioritization, CAT ridership data was compared with the corridors identified in the congestion management process (CMP) to find where there is both high ridership and high congestion. Where there are multiple CAT routes on the same congested corridor, ridership is added together. The corridors are listed in order of

total yearly ridership, and the lowest peak level of service (LOS) is given. The accompanying maps show each corridor along with the affected CAT routes and the location of each signalized intersection. The purpose of the data in this section is to identify where the priorities for signal prioritization or queue jumpers are. Further study of the feasibility of movement enhancement strategies at a given intersection will have to be done, as well as cost estimates. Because of right of way constraints queue jumper lanes will not be feasible at every signalized intersection.

Derry Street, 29th Street to 63rd Street (Map 3-1)
CMP Corridor 91, lowest peak LOS D

CAT Routes	***Total Ridership***	***Average Weekday Daily***	***Weekday Hourly***
Route 8	182,111	609	17
Route 20	65,152	219	14
Totals	247,263	828	31

Simpson Ferry Road, Market Street Mechanicsburg to 32nd Street Camp Hill (Map 3-2)
CMP Corridor 95, lowest peak LOS D

CAT Routes	***Total Ridership***	***Average Weekday Daily***	***Weekday Hourly***
Route B	95,578	375	12

Union Deposit Road, 25th Street to Rutherford Road (Map 3-3)
CMP Corridor 88, lowest peak LOS D

CAT Routes	***Total Ridership***	***Average Weekday Daily***	***Weekday Hourly***
Route 15	95,319	342	19
Route 14	20,681	81	14
Totals	116,000	828	31

PA 230, Paxton Street Harrisburg to Steelton Borough (Map 3-4)
CMP Corridor 63, lowest peak LOS C

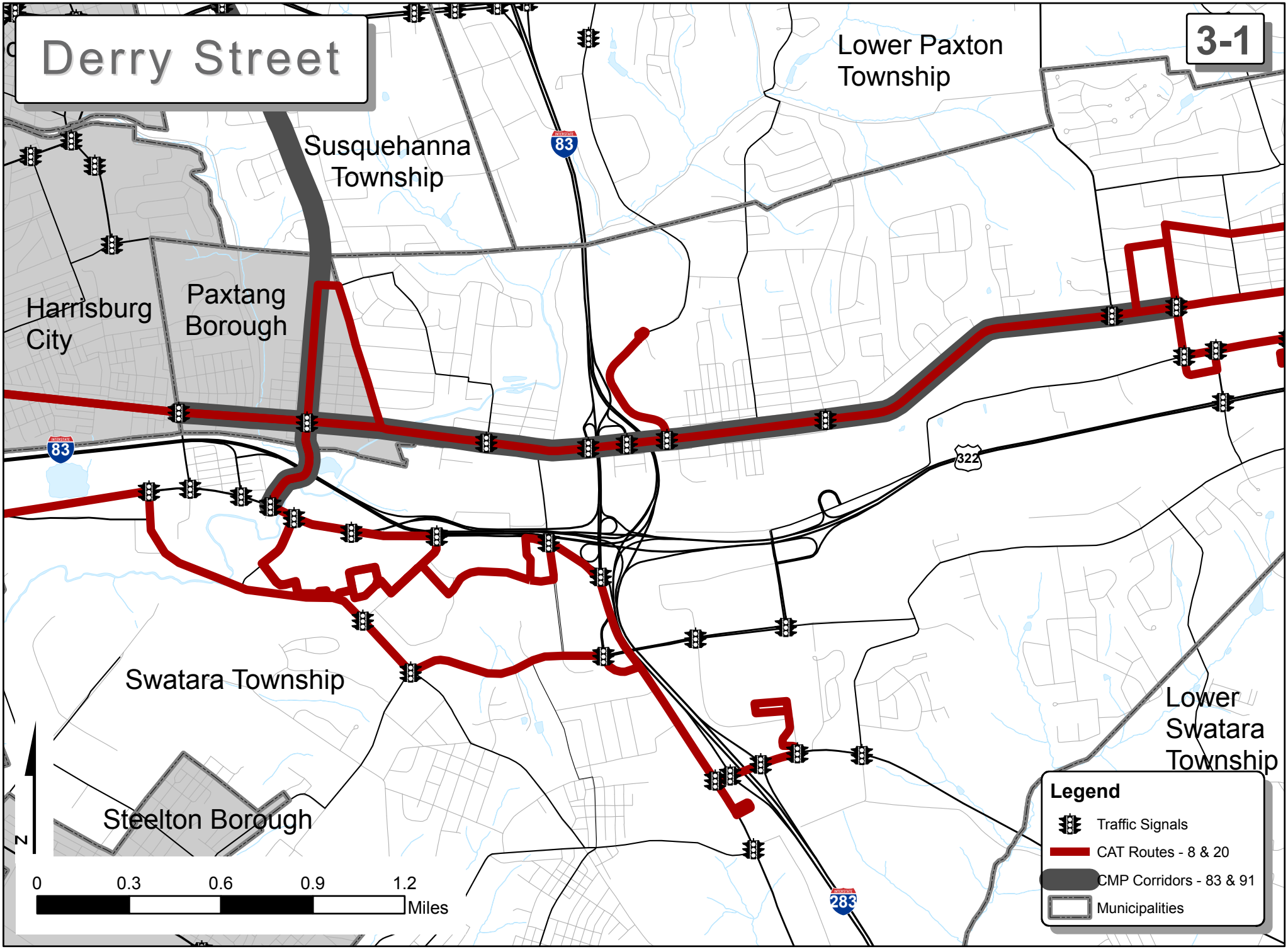
CAT Routes	*Total Ridership*	*Average Weekday Daily*	*Weekday Hourly*
Route 7	192,304	710	18

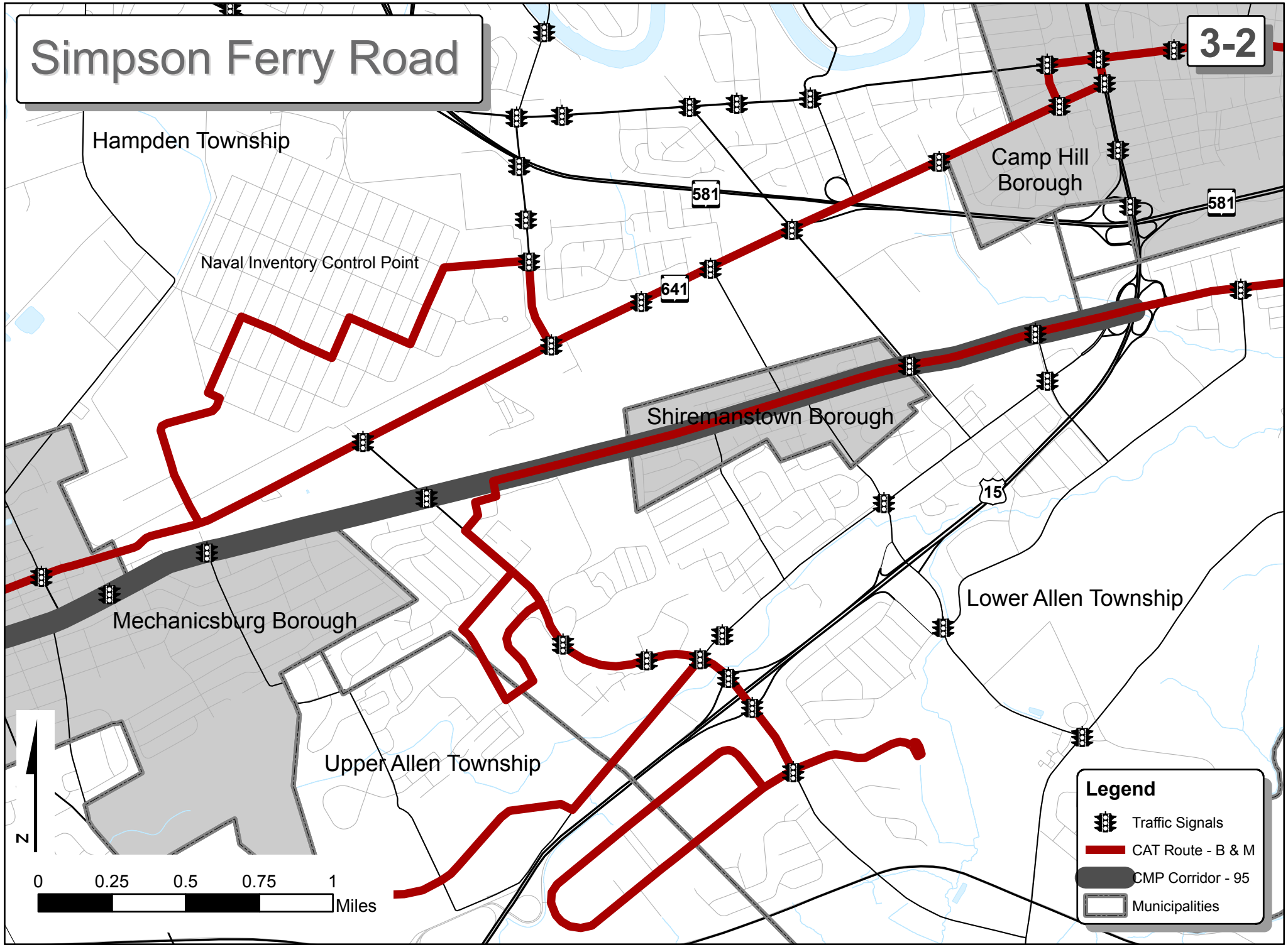
Trindle Road, Mechanicsburg to Camp Hill (Map 3-5)
CMP Corridor 47, lowest peak LOS D

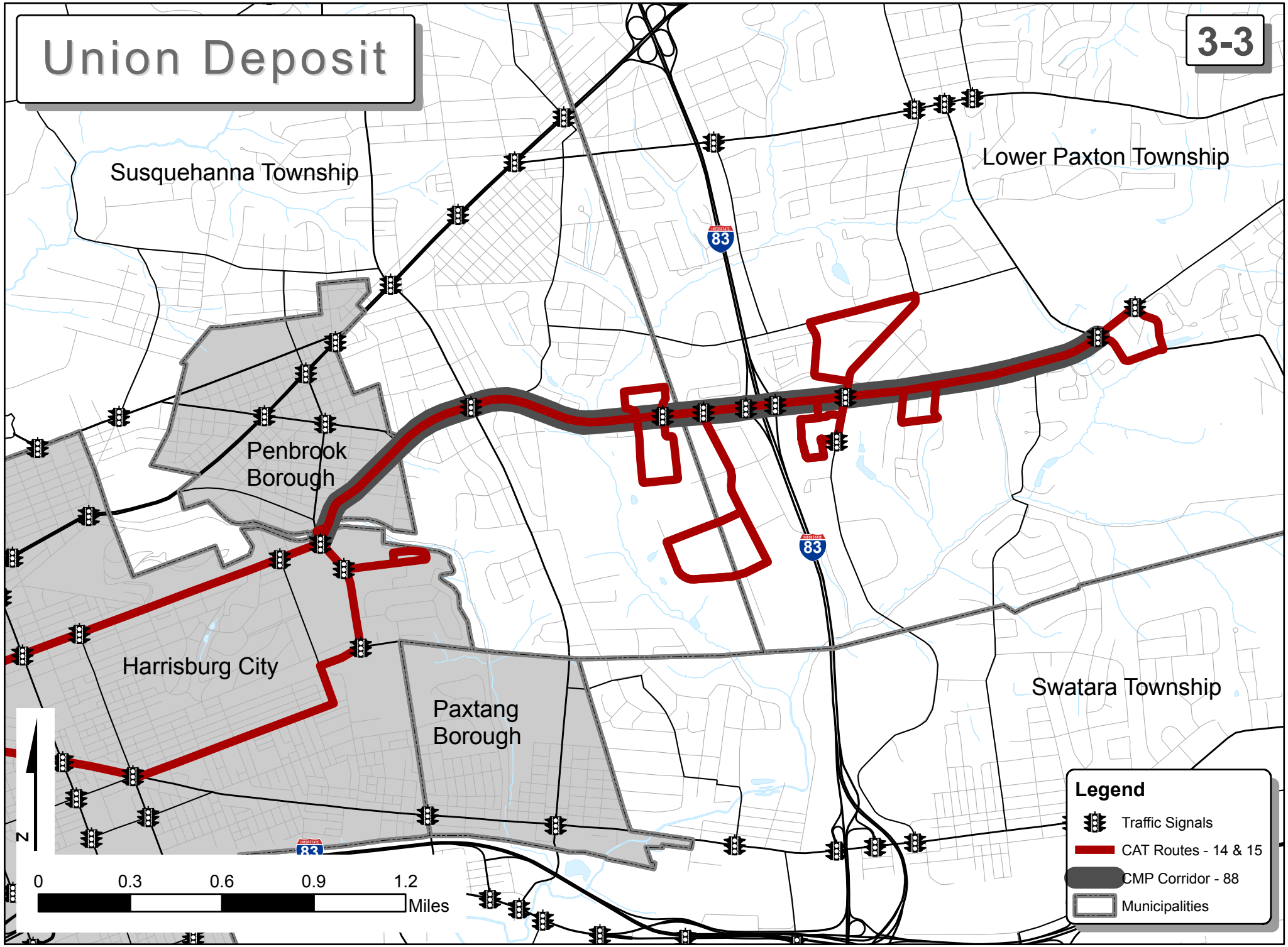
CAT Routes	***Total Ridership***	***Average Weekday Daily***	***Weekday Hourly***
Route M	95,537	340	16

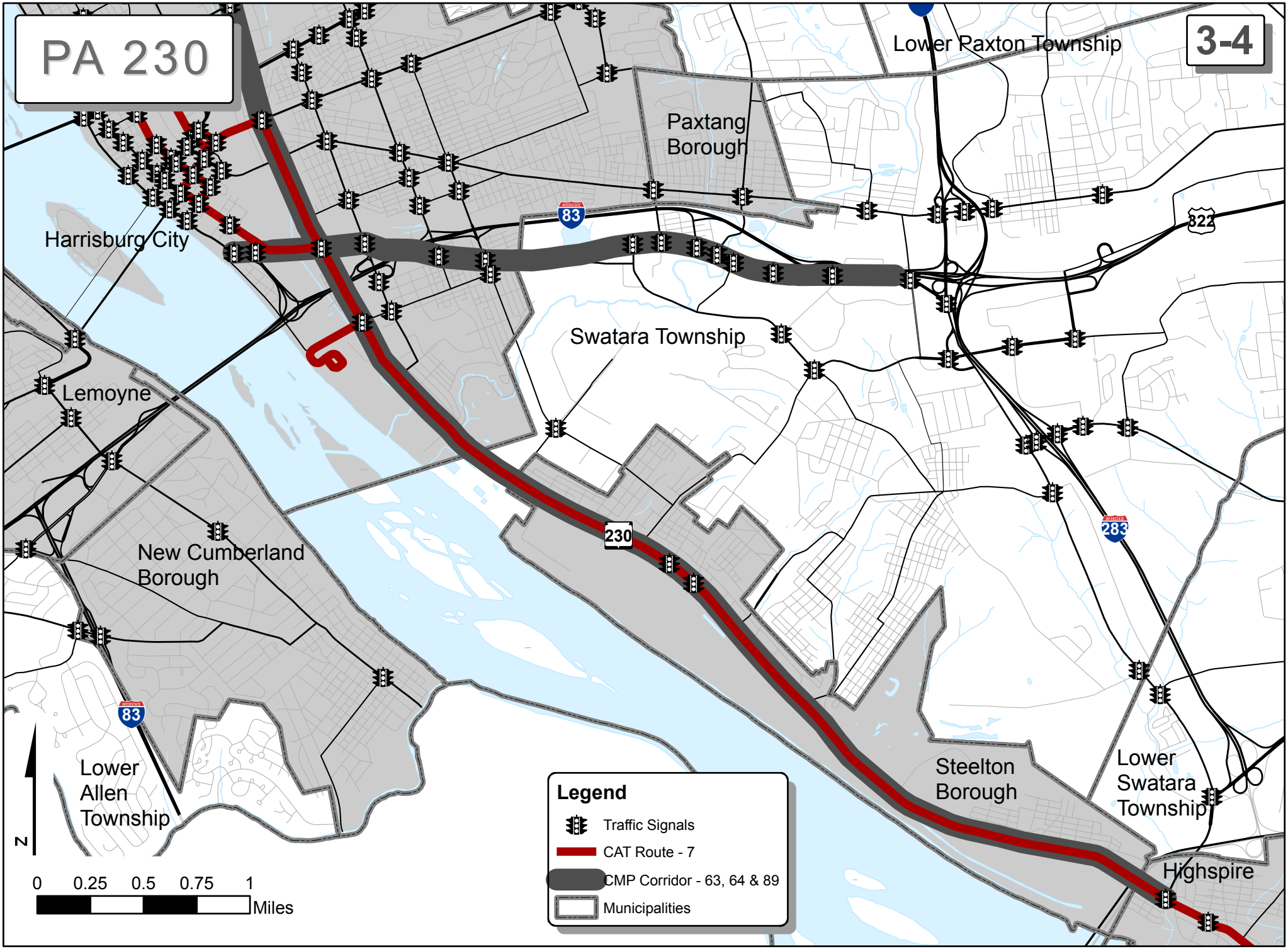
Carlisle Pike, 32nd Street Camp Hill to PA-581 Ramp (Map 3-6)
CMP Corridor 73, lowest peak LOS D

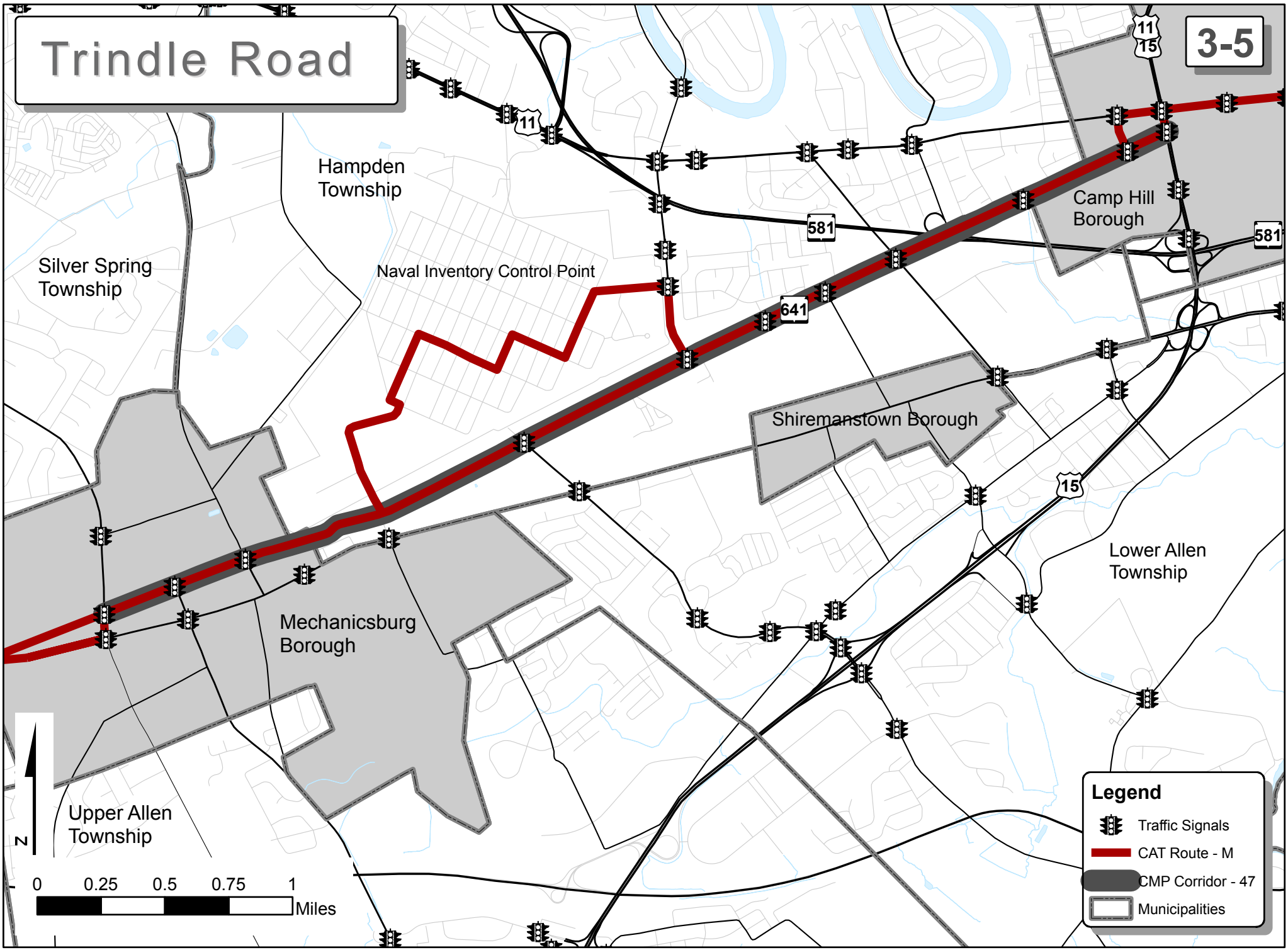
CAT Routes	*Total Ridership*	*Average Weekday Daily*	*Weekday Hourly*
Route C	113,202	436	13

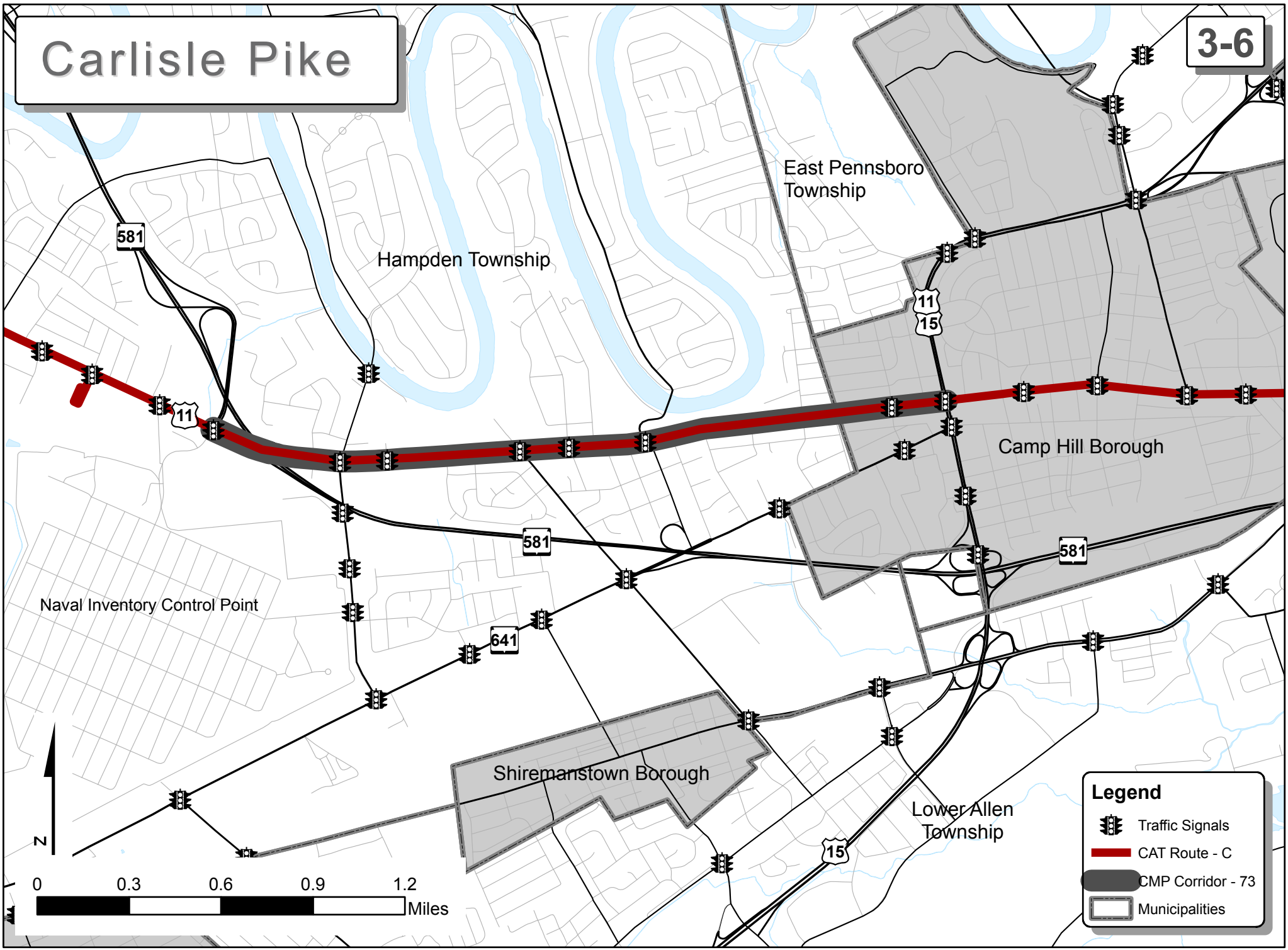

Derry Street
3-1
Lower Paxton Township
Susquehanna Township
Harrisburg City
Paxtang Borough
Swatara Township
Steelton Borough
Lower Swatara Township
83
322
283
N
0
0.3
0.6
0.9
1.2
Miles
Legend
Traffic Signals
CAT Routes - 8 & 20
CMP Corridors - 83 & 91
Municipalities


Simpson Ferry Road
3-2
Hampden Township
Naval Inventory Control Point
Camp Hill Borough
581
581
641
Shiremanstown Borough
15
Mechanicsburg Borough
Lower Allen Township
Upper Allen Township
N
0
0.25
0.5
0.75
1
Miles
Legend
Traffic Signals
CAT Route - B & M
CMP Corridor - 95
Municipalities


Union Deposit
3-3
Susquehanna Township
Lower Paxton Township
Penbrook Borough
Harrisburg City
Paxtang Borough
Swatara Township
83
83
N
0
0.3
0.6
0.9
1.2
Miles
Legend
Traffic Signals
CAT Routes - 14 & 15
CMP Corridor - 88
Municipalities


PA 230
3-4
Lower Paxton Township
Paxtang Borough
Harrisburg City
Swatara Township
Lemoyne
New Cumberland Borough
Lower Allen Township
Steelton Borough
Lower Swatara Township
Highspire
83
322
230
283
N
0 0.25 0.5 0.75 1
Miles
Legend
Traffic Signals
CAT Route - 7
CMP Corridor - 63, 64 & 89
Municipalities


Trindle Road
3-5
Hampden Township
Silver Spring Township
Naval Inventory Control Point
Camp Hill Borough
Shiremanstown Borough
Lower Allen Township
Mechanicsburg Borough
Upper Allen Township
11
15
581
641
N
0
0.25
0.5
0.75
1
Miles
Legend
Traffic Signals
CAT Route - M
CMP Corridor - 47
Municipalities


Carlisle Pike
3-6
East Pennsboro Township
Hampden Township
Camp Hill Borough
Naval Inventory Control Point
Shiremanstown Borough
Lower Allen Township
581
11
15
641
N
0
0.3
0.6
0.9
1.2
Miles
Legend
Traffic Signals
CAT Route - C
CMP Corridor - 73
Municipalities

4. New/Extended Service

Susquehanna Township

One area of dense development that is not currently served is Susquehanna Township north of I-81 and east of US 22/322. Since the character of development in this area is not conducive to curbside transit service, opportunities for one or more park and ride lots should be explored. On the south side of I-81, the City Island/HACC route provides service on Elmerton Avenue almost to Progress Avenue and the Glenside route provides service on Progress Avenue, turning onto Elmerton Avenue just east of the furthest extent of the City Island/HACC route. A park and ride lot near the intersection of Progress and Elmerton could provide an opportunity to link these two routes and to attract ridership from the residential area north of I-81. Linking these two routes could also provide better access for commuters to office employment on Elmerton Avenue. On the north side of this area of Susquehanna Township there is an opportunity for a park and ride lot and service on Linglestown Road. Such a route could potentially draw ridership all along Linglestown Road in Susquehanna Township and into Lower Paxton Township. Another option is a route linking Linglestown Road to Elmerton Avenue on Progress Avenue. This route would start at a park and ride on Linglestown Road, perhaps at the new Giant grocery, and serve some of the neighborhoods and apartment complexes along Progress Avenue until it meets with the area served by the Glenside route and the City Island/HACC route. This new route could either serve transfers onto the other two routes or continue down Elmerton Avenue to downtown Harrisburg.

See: Proposed Bus Route -- Susquehanna Township, Map 3-7

Service to Carlisle

The Carlisle Intraborough Transit Feasibility Study from 1984 prepared by Tri-County Regional Planning Commission and CAT has proposals for two different routes. The first route delivers commuters from Schlusser in North Middleton Township into downtown Carlisle and ends at the Carlisle Commons shopping center. The second route is a circulating route through downtown Carlisle and its residential neighborhoods, also providing service to the Carlisle Plaza Mall. A commuter route from North Middleton Township is still feasible. The route could serve the dense neighborhood on the north side of Carlisle before delivering riders to downtown Carlisle. On the southern side of the downtown, this route could serve the Carlisle Medical Center and have a timed transfer opportunity at the Carlisle Commons park and ride with routes C and 81. The timed transfer would allow commuters from Shippensburg, Newville, and points west to choose transit into downtown Carlisle, and allow commuters from Carlisle and North Middleton to access routes to Harrisburg and the Mechanicsburg Naval Base.

To the south of Carlisle, service along Forge Road to Boiling Springs should be considered. There is denser residential development and a traditional street pattern there that can facilitate ridership. The congested Holly Pike which runs south from Carlisle to Mount Holly Springs may also have some potential to generate ridership. Mount Holly Springs has some residential density to support curbside ridership, and a park and ride lot in or near that town could potentially draw riders from the surrounding area in South Middleton and Dickinson Townships and points south.

See: Proposed Bus Routes – Carlisle Commuter Routes, Map 3-8

A circulating route similar to the route proposed in the 1984 study may be successful today. A circulating route should consider providing access to Dickinson College, the Medical Center, downtown shops, and transfers at the Carlisle Commons park and ride. The residents of the Army War College are also a potential source of ridership into Carlisle to access downtown businesses. This route may not require its own bus. The vehicles serving Route C could provide circulator service before beginning the trip back towards Harrisburg.
See: Proposed Bus Routes – Carlisle Circulator Routes, Map 3-9

Service to the West Shore Office Park
Consideration should be given to service from the residential areas of the other west shore boroughs of Camp Hill and New Cumberland. Residential density also points to possible routing from Susquehanna Township to Enola and West Fairview to the office complex. Since there is high density of employment, services, and employment on both shores of the Susquehanna, there should be consideration of a circulating route crossing the river on the I-81 bridge in the north and I-83 bridge in the south. Such a route would serve both downtown Harrisburg and the office park, as well as the residents and business of midtown and uptown Harrisburg, Enola, Camp Hill, Lemoyne, and Wormleysburg.
See: Proposed Bus Route – Susquehanna Loop, Map 3-10

Service to the Allen Office Park
A local version of the Dillsburg Commuter route, which currently only operates as an express route into downtown Harrisburg, could provide access to workers who live to the south and commute to the office park on US 15. This could provide access from Dillsburg and points south, and have stops in Grantham and Shepherdstown. A route that delivered riders to the offices and then continued north to loop through Shiremanstown and Mechanicsburg could stop again at the offices to deliver commuters from north of the offices park. Besides serving commuters, this route could also provide access to the retail establishments near the offices, in Shiremanstown, and in downtown Mechanicsburg.
See: Proposed Bus Route – Allen Routes, Map 3-11

Hanover Service
West Hanover and South Hanover Townships are the fastest growing residential areas of Dauphin County. As more commuting trips originate in those townships, there will be a need to extend transit service. Journey to work data shows residents commuting to Harrisburg and to Hershey. The trip to Harrisburg seems to be the type of long distance transit trip that has seen a lot of growth in the past few years, comparable to the successful Hershey route. There is also an opportunity to connect West Hanover with retail, services, and medical facilities in Lower Paxton Township. Commuters to Hershey could be connected to the Penn State Hershey Med Center and downtown businesses.
See: Proposed Bus Route – Hanover Service, Map 3-12

Proposed Bus Route
Susquehanna Township

3-7

Giant
P
39
3
Widener University
Susquehanna Township
3
322
23
9
HACC
6
Harrisburg City
Uptown Plaza
CX
81
Farm Show Complex
21
DGS Annex Complex
Elmerton Avenue
Progress Avenue
81
18
12
Colonial Park Mall
22
K-Mart
Paxton Town Center
Lower Paxton Township
83
Osteopatic Hospital
15
16

Legend

- P Giant Park & Ride
- Progress & Elmerton 1/2 mile buffer
- Proposed - Progress Extention
- CAT System
- Area of Interest
- Municipalities

Residential Density

people per square mile

- 3000.1 - 6000.0
- 6000.1 - 9000.0
- 9000.1 - 12000.0
- 12000.1 - 15000.0

N

0 0.25 0.5 1

Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION

Proposed Bus Routes
Carlisle Commuter Routes

3-8

North Middleton Township

Lower Frankford Township

West Pennsboro Township

Carlisle Borough

Middlesex Township

South Middleton Township

Monroe Township

Penn Township

Dickinson Township

Mount Holly Springs Borough

Carlisle War College

Dickinson College

Carlisle Plaza

MJ Mall

Carlisle Commons

Stonehedge Square

Walnut Bottom Towne Center

Carlisle Medical Center

Legend

P Park and Rides

Proposed Route

- Carlisle - Boiling Springs
- Carlisle Commuter
- Carlisle - Mt Hollly
- CAT System
- Area of Interest
- Municipalities

Residential Density

people per square mile

- 3000.1 - 6000.0
- 6000.1 - 9000.0
- 9000.1 - 12000.0
- 12000.1 - 15000.0

N

0 0.5 1 2

Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION

Proposed Bus Route
Carlisle Circulator Route

3-9

North Middleton Township

Middlesex Township

Carlisle Borough

West Pennsboro Township

Dickinson Township

South Middleton Township

Carlisle War College

Dickinson College

Carlisle Plaza

Carlisle Commons

Stonehedge Square

Carlisle Medical Center

Walnut Bottom Towne Center

74 34 81 76 641 11 C CX P 465

Legend

- P Park and Rides
- Proposed - Carlisle Circulator
- CAT System
- Area of Interest
- Municipalities

Residential Density

people per square mile

- 3000.1 - 6000.0
- 6000.1 - 9000.0
- 9000.1 - 12000.0
- 12000.1 - 15000.0

N

0 0.25 0.5 1

Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION

Proposed Bus Route
Susquehanna Loop

3-10

Widener University
Central Pa College
Summerdale Plaza
Dixon University
HACC
Uptown Plaza
Farm Show Complex
DGS Annex Complex
Dauphin Plaza
Point Mall
Union Square
Kline Plaza
HACC Midtown
Capital Area Transit
Broad St Market
Harrisburg Science and Technology
Harrisburg Hospital
Harrisburg Mall
Riverfront Office Center
Holy Spirit
West Shore Plaza
Camp Hill
Hampden Commons
Gateway
Hampden Centre

81
322
11
15
230
22
581
83

Legend
- P Park and Rides
- Susquehanna Loop
- CAT System
- Area of Interest
- Municipalities

Residential Density
people per square mile
- 3000.1 - 6000.0
- 6000.1 - 9000.0
- 9000.1 - 12000.0
- 12000.1 - 15000.0

N
0 0.25 0.5 1
Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION

Proposed Bus Routes
Allen Routes

3-11

Hampden Township
Shiremanstown Borough
Camp Hill
Bon-Ton
Capital City Mall
Windsor Park
Weis Market
Seidle Memorial
Silver Spring Township
Mechanicsburg Borough
Lower Allen Township
Rossmoyne Business Center
Monroe Township
Upper Allen Township
Messiah College
To Dillsburg

C
81
M
641
MX
B
D
P
15
120
114
76

Legend

P Park and Rides

Proposed Routes

- Dillsburg Office
- Mechanicsburg/Shiremanstown Office
- CAT System
- Area of Interest
- Municipalities

Residential Density

people per square mile

- 3000.1 - 6000.0
- 6000.1 - 9000.0
- 9000.1 - 12000.0
- 12000.1 - 15000.0

N

0 0.25 0.5 1

Miles

PREPARED DATE: OCTOBER 2009
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, & COUNTY PLANNING COMMISION

Proposed Bus Route
Hanover Service

3-12

Amelias
Paxton Square
Colonial Commons
K-Mart
Paxton Town Center
Colonial Park Mall
Colonial Park Mall
Osteopatic Hospital
Osteopatic Hospital
uphin Plaza
Point Mall
Point Mall
Union Square
Swatara Crossing
Walmart
Hershey Outlets
Hershey Amusement Park
Cocoaplex Center
Hershey Plaza
Park Village Plaza
Penn State Hershey Med Center

22
39
322

Legend

- P Park and Rides
- CAT System
- Hanover Service
- Area of Interest
- Municipalities

Residential Density

people per square mile

- 3000.1 - 6000.0
- 6000.1 - 9000.0
- 9000.1 - 12000.0
- 12000.1 - 15000.0

N

0 0.25 0.5 1

Miles

PREPARED DATE: DECEMBER 20103
PREPARED BY: TRI-COUNTY REGIONAL PLANNING COMMISSION
SOURCE DATA: PENNDOT, CENSUS 2000, COUNTY PLANNING COMMISSION

5. Market Square Transfer Center

Currently the main hub of the CAT system is the Market Square Transfer Center in downtown Harrisburg on the corner of 2nd and Market Street. The transfer center is very convenient to the high concentration of employers within a short walk of the square. However, the facility is also becoming outdated. The geometry of the facility was done based on shorter length buses. At that time 35' buses were the standard. Today CAT is running 45' commuter buses. Automobile and pedestrian traffic is increasing annually in the square, compromising safety. There is inadequate shelter space for the number of peak hour riders, and waiting riders are crowding the sidewalk. The transfer center does not have good signage or user-friendly schedules. To enhance service to downtown Harrisburg and service all along the CAT network, the feasibility of acquiring and constructing a new main transfer hub should be explored.

Although space is already limited in the downtown, there may be space available if a new transfer center is given priority. A natural place for a transfer center might be on the ground floor of a parking garage, and there are several in the downtown. The most cost effective way to create a new transfer center may be to work with a new public or private project in the Southern Gateway area. Blocks of new construction are expected on the southern side of downtown Harrisburg when this project gets off the ground. Locating a new transfer center in the Southern Gateway project area will keep the transfer center close to downtown Harrisburg and will help with the success of the redevelopment project.