



FUTURE BUS PLAN

MERCER COUNTY



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Executive Summary

Roadway congestion and a lack of effective mobility alternatives threaten to stifle growth and impair the high quality of life enjoyed in Mercer County and central New Jersey. As a result, regional, county, and local stakeholders have pursued a series of planning efforts seeking ways to improve the linkages between transportation facilities and land development. This work includes New Jersey Transit's (NJ TRANSIT's) recent near-term implementation plan for the Route 1 Bus Rapid Transit (BRT) system; NJ TRANSIT's longer-term plan for a complete BRT network; and the New Jersey Department of Transportation's (NJDOT's) Route 1 Regional Growth Strategy.

The purpose of the Mercer County Future Bus Plan is to define a vision for the future of bus service in Mercer County, and propose short- and long-term strategies to achieve that vision. To this end, this report gathers, inventories, and analyzes the thinking on future bus routes, networks, and operating patterns that have already been done, and considers the degree to which the bus services that have been envisioned meet the needs of existing county residents and workers, as well as forecast's demand under a series of long-range growth scenarios. The results of this project are intended to inform an update to the transportation element of Mercer County's Master Plan.

Above all, this plan is conceived with an eye on flexibility: the Future Bus Plan consists of a series of routes and transit enhancement projects that can be implemented in phases or singly as capital and operating funding becomes available. Following an evaluation of policy considerations, U.S. Census journey-to-work data, NJ TRANSIT passenger survey data, ridership estimates, and significant stakeholder outreach, **this Plan suggests 10 bus routes as an early-action implementation phase.**

As routes from the suggested early action phase (or other routes) are considered for implementation, one way to mitigate the operating cost burden of new services is to look for opportunities to redeploy existing fleet resources from routes that are made partially redundant by the new routes. To this end, this plan identifies existing routes that share market areas with early-action phase routes, as well as the remainder of the plan network.

The shared vision articulated here is intended as a roadmap for investments made over time, so that each project and proposal can be understood as a strand in a broader fabric. Together, these investments will help Mercer County maintain mobility and economic competitiveness while making transit a useful, affordable, and attractive option for an increasing number of county residents and workers.

DVRPC will continue to work with Mercer County, NJ TRANSIT, and other planning partners in central New Jersey to improve the efficiency and effectiveness of transit service. As a next step, a study has been proposed under DVRPC's FY2013 Planning Work Program to evaluate and prioritize routes and locations for Transit Signal Priority in Mercer County.

Vision and Policy Questions

Project vision statement

By 2035, Mercer County has become a place where land development is much more efficiently integrated with the transportation network, and mobility for county residents has been greatly improved as a result. The **Route 1 Bus Rapid Transit (BRT)** system has been completed, and its impact on county mobility has been transformative: service is ubiquitous throughout the core of the BRT network at all times of day. Together with a series of BRT feeder routes that extend into Bucks, Burlington, Middlesex, and Somerset counties, this high level of service has helped to make bus service a **primary mode of choice** for Mercer County residents and workers for many trips. This fully invested bus network has helped to anchor growth around a series of transit hubs, where passenger transfers between and among bus and rail services are **convenient, comfortable, and fast**. These hubs and other major transit facilities have been integrated with existing communities through **improved bicycle and pedestrian access**, as well as creative first-mile and last-mile transit solutions. By adding an efficient, fully multimodal transportation network to its 20th century strengths—desirable neighborhoods and high-value job centers—**Mercer County has improved its high quality of life and economic vitality** amidst a century of energy, environmental, and economic transition.

How to get there: actions and policy questions

The vision above is an aggressive one, and by no means an inevitable outcome—nor even the most likely one. In order for it to be achieved, a series of significant funding and policy challenges need to be met.

Capital and operating funding for the Route 1 BRT

Completing the Route 1 BRT will be an expensive undertaking amidst a time of funding uncertainty, when even maintaining existing transportation facilities in a state of good repair is a challenging proposition. The system as envisioned will require upfront capital investment in new vehicles, enhanced BRT stations and stops, new maintenance facilities and equipment, and limited dedicated rights-of-way; all with significant combined cost. Commitment of additional local, regional, state, or federal funding will be required for the BRT to fulfill its potential. In addition, the Route 1 BRT will represent a dramatic expansion of the level of bus service provided in Mercer County and central New Jersey. Since operations for even the most successful transit lines are not self-sustaining from farebox revenue alone, ongoing operations of the BRT will require the

ability and willingness of NJ TRANSIT and its funding entities to provide much higher levels of operating subsidy than are presently provided.

Challenges relating to incremental implementation

NJ TRANSIT currently plans to pursue incremental implementation of the Route 1 BRT, with investments being made as funding becomes available. This general strategy is reflected in the distinction between 2015 and 2025 BRT routes, also detailed in this plan. Even among 2015 investments, however (the ‘near-term concept plan’), the approach will be incremental. This is a prudent and necessary approach given the funding challenges noted above. However, an incremental approach is not without its own risks. Chief among these is the possibility that if a robust system is not launched as a single, cohesive package—including new routes, new and visible facilities, and specially branded vehicles—it may not achieve the visibility and momentum necessary to effectively differentiate itself from current bus services among discretionary riders, limiting the ability of NJ TRANSIT to attract the public support necessary for the system to reach its full potential.

Local decision maker buy-in for center-based zoning and land development

There is broad agreement among state, regional, county, and agency planners in support of “livability”-oriented planning, where growth is concentrated in and around walkable and bikeable “centers of place” with a mix of land uses: communities where residents have meaningful choices about whether to drive, walk, bike, or take transit for any given trip. Such centers (some of which already exist in the form of Mercer County’s historic towns and boroughs, as well as recent developments such as Robbinsville Town Center) have the concentrations of activity to be efficiently served by transit, are more energy- and infrastructure-efficient, and can act as attractors for bike and walking trips from less dense surrounding development. This “smart growth” concept is reflected in this plan, and in the vision above, but will require the support of local communities in the form of zoning regulations that support mixed-use, walkable development where it makes sense.

The first-mile/last-mile problem

Major transit service investments like the Route 1 BRT can only have the transformative impact envisioned here if they are ubiquitous: if they can be conveniently and comfortably accessed by the vast majority of residents and workers. In a place like Mercer County, where many homes and jobs are dispersed in residential subdivisions and corporate campuses, providing this level of convenient access is particularly challenging. The Route 1 BRT itself has been designed in a way that helps to enhance accessibility (by extending its reach across the county through a series of feeder routes), but even these feeder routes will provide “door to door service” for only a handful of county residents. The first-mile/last-mile challenge is a complex one that can only be addressed through a comprehensive approach, including:

- ▶ **Enhanced bicycle and pedestrian access on roads throughout the county.**

If people are able to safely and comfortably access good transit (or neighborhood centers) on foot or by bike, they are less likely to get in their car. The New Jersey Department of

Transportation (NJDOT) has adopted a statewide Complete Streets policy. Better bicycle and pedestrian accommodation should be routine for new streets, consistent with this policy, and strategic investments in sidewalk connections and bike lanes (or usable shoulders) along existing streets are also desirable. As streets are repaved and restriped, an enhancement to bike and pedestrian accommodation should be routine. Bike racks and/or lockers should also be provided at transit stations, hubs, and other appropriate facilities.

► **Creative solutions for funding and operating smaller-scale transit routes, such as local circulator buses.**

Given the preponderance of single-use, low-density development across Mercer County, enhanced bicycle and pedestrian accommodation will not always be sufficient to provide access: in many cases, the distances involved will be too great for some residents. As a result, there will be a need for additional local circulator transit services (such as the Princeton FreeB) that provide access to BRT facilities, rail stations, and neighborhood centers. This will be an increasing need as the county population ages in the coming decades. Unfortunately, such services are expensive to operate and challenging to fund through current state and federal programs. There is a need for creative solutions that would include other partners, such as employers, institutions, neighborhood groups, and schools, matching funds with gaps and pursuing innovative ways to maximize the use of existing resources. School buses, for example, could be used outside of school hours to meet other local transport needs.

Coordination to benefit passengers and operators

While NJ TRANSIT operates the vast majority of current county bus service, Mercer County is also served by a variety of other routes operated by other providers. As noted in the first-mile/last-mile section above, the number of such ancillary or supportive services is likely to increase in the coming years and decades. As the county increasingly looks to transit as a primary means of mobility, it will be increasingly important for service providers to coordinate services, fares, and passenger information. To the greatest extent practical, the boundary between service operators should be invisible to the passenger (as are the boundaries between local, county, state, and federal roads for drivers). Fortunately, the proliferation of personal internet devices offers the promise of the internet becoming the primary means of delivering schedule information to passengers, which in turn can help reduce the burden on operators of coordinating information. Google Transit offers an early window into this potential.

Flexibility: A key principle of this plan

This plan attempts to define a coordinated transit network that will effectively serve Mercer County 25 years in the future, and that will in turn help guide county development patterns over that same time horizon. Any long-range plan necessarily relates to an uncertain future, and the next 25 years are perhaps more uncertain than most. A whole range of issues are in transition that will have significant bearing on transportation and development in Mercer County: from the sectors that will drive the national, regional, and local economies, to climate change and energy policy, to the price of gasoline. Accordingly, **this should be viewed as an aspirational plan: a best guess on future trends, and a strategic design on the best way to meet them.** Not all of the projects and outcomes detailed here will be implemented, and changes among other potential

projects and priorities will also have an impact. If the extension of the RiverLINE in Trenton or the West Trenton Line are pursued, for example, the bus services envisioned here would necessarily change, but the broader concepts and strategies would not. Planners, leaders, and other stakeholders should remain adaptable as priorities change, funding opportunities become available, and new factors emerge.

Background and Current Conditions

Project purpose

A great deal of planning has recently been done in Mercer County (and central New Jersey) to consider transportation investments in the context of present congestion and future growth. This work includes NJ TRANSIT's recent near-term implementation plan for the Route 1 BRT system; NJ TRANSIT's longer-term plan for a complete BRT network; and NJDOT's Route 1 Regional Growth Strategy. This project gathers and explores all the thinking on future bus routes, networks, and operating patterns that has already been done, and considers to what extent the bus network that is envisioned would serve expected growth and development. The results of this project will inform an update to the transit element of Mercer County's Master Plan.

Background

Located along the broader US 1 corridor through central New Jersey, Mercer County has benefited from a wealth of locational advantages. It is situated along the Northeast Corridor, with convenient highway and rail access from both New York and Philadelphia, as well as suburban portions of southeastern Pennsylvania and New Jersey. The county's many access and transportation advantages enable residents to conveniently reach jobs within the county and also throughout the broader region. These same locational advantages enabled dramatic economic development and job growth within Mercer County in the latter part of the 20th century; the US 1 corridor became a major job center in its own right, with most development being of a large tract, auto-oriented configuration.

This massive two-way trip flow (across auto, rail, and bus modes) within, through, to, and from Mercer County has enabled enormous investment and a resulting high quality of life for county residents. It also presents challenges of a unique scale. **Despite significant planning and both private and public investment, congestion threatens county quality of life and limits future economic development.** As a consensus increasingly emerges that central New Jersey cannot build its way out of congestion with new roadway capacity (because of financial limitations and also doubt about the effectiveness of such a strategy), planners, leaders, and stakeholders have shifted focus toward creative investments that maximize mobility within the framework of existing infrastructure and rights of way.

From the perspective of this project, the centerpiece of these strategies—and the backbone of Mercer County's future bus transit network—is the Route 1 BRT system. As currently envisioned, the Route 1 BRT will be comprised of a series of investments that are uniquely appropriate for

Mercer County's relatively dispersed and multidirectional trip and development patterns. In contrast to a new rail line or rail-like BRT line, the Route 1 BRT is envisioned as a "feeder and trunk" system. Many feeder routes serving a multitude of origins and destinations (as exist throughout Mercer County and surrounding areas) will each travel along the US 1 "trunk" of the network, and will all benefit from investments in rights-of-way and operating enhancements along US 1. This means that in comparison to a new rail line, many more trips will be able to be served by a one-seat ride.

Summary of current bus service in Mercer County

Mercer County is currently served by a host of bus operations serving a variety of trip purposes. NJ TRANSIT's bus networks provide the backbone of county bus service and interface with NJ TRANSIT and SEPTA rail service. NJ TRANSIT's routes are supplemented by local shuttles operated by the Greater Mercer Transportation Management Association (GMTMA) and other providers, as well as intercity service operated by Coach USA. These existing services are summarized in this section.

Summary of existing NJ TRANSIT and SEPTA bus service

New Jersey Transit currently operates 14 fixed bus routes (plus variations) serving some part of Mercer County. Taken together, these routes generally form a "hub and spoke" service pattern, connecting downtown Trenton with the remainder of Mercer County. Additionally, these routes provide connections to NJ TRANSIT rail service and with other parts of New Jersey.

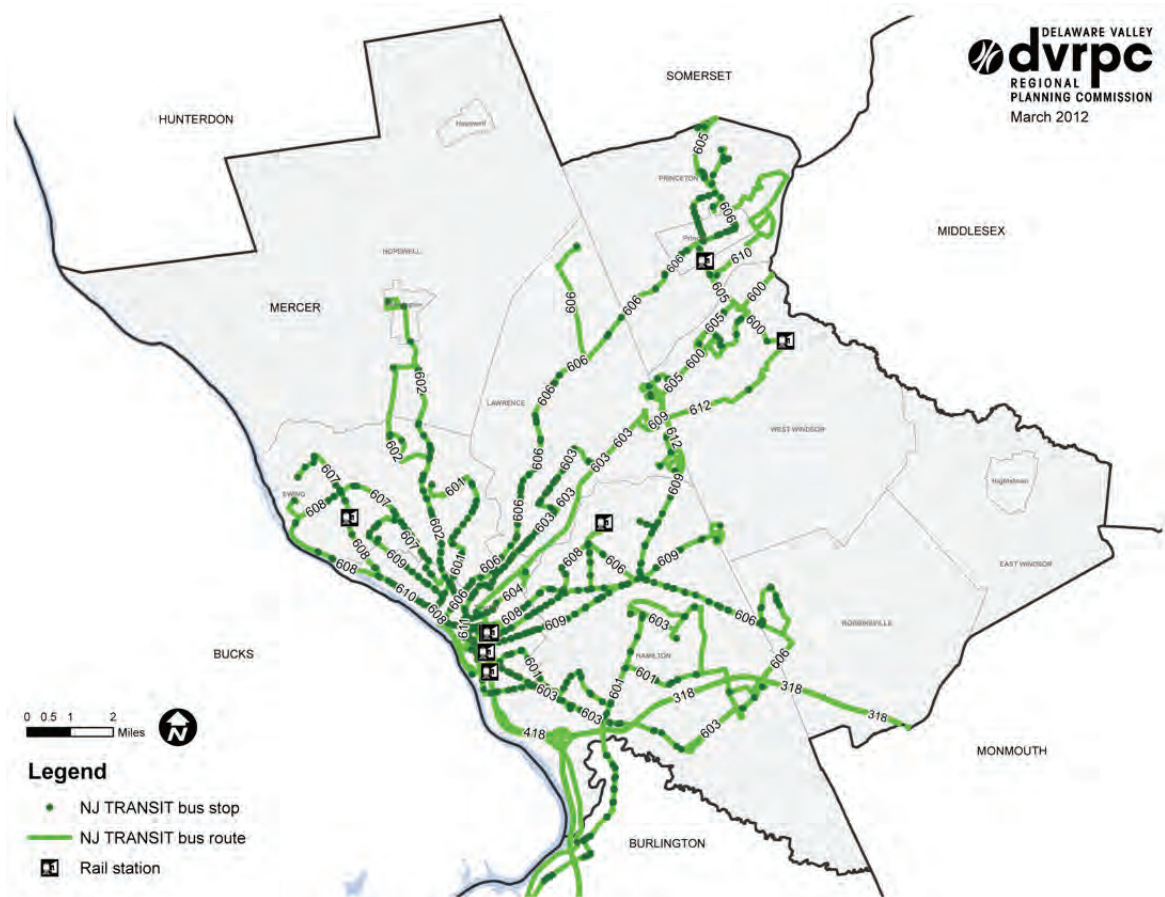
- ▶ **Route 409/417/418:** Trenton to Philadelphia via the Route 130 corridor through Burlington and Camden counties
- ▶ **Route 600:** Trenton to Plainsboro (Middlesex County), serving employment centers along US 1 and also connecting with Princeton Junction Station
- ▶ **Route 601*:** College of New Jersey (Ewing) to Hamilton Marketplace via Trenton
- ▶ **Route 602:** Pennington to Trenton, also serving the College of New Jersey and Educational Testing Service (ETS)
- ▶ **Route 603/613:** Mercer Mall to Hamilton Marketplace via US 1 and Trenton
- ▶ **Route 604:** Downtown Trenton to East Trenton via Clinton Ave
- ▶ **Route 605:** Montgomery Township (Somerset County) to Lawrence Township (Quaker Bridge Mall) via Princeton
- ▶ **Route 606*:** Princeton to Hamilton Marketplace via Trenton
- ▶ **Route 607:** Ewing to Hamilton Township (Independence Plaza) via Trenton
- ▶ **Route 608*:** Hamilton to Ewing (including service to Trenton and West Trenton stations)
- ▶ **Route 609/619*:** Ewing to Mercer County College and Quaker Bridge Mall via Trenton

- ▶ **Route 610:** local seasonal routings providing service to several schools in Trenton and Princeton
- ▶ **Route 611:** Downtown Trenton circulator/shuttle
- ▶ **Route 612 (formerly 976):** Lawrence Township (Quaker Bridge Mall vicinity) to Princeton Junction Station, timed to meet key express trains
- ▶ **SEPTA Route 127:** Neshaminy Mall in Bensalem, Pennsylvania to Trenton Station

*Capital Connection route (Trenton Transportation Center to Downtown Trenton)

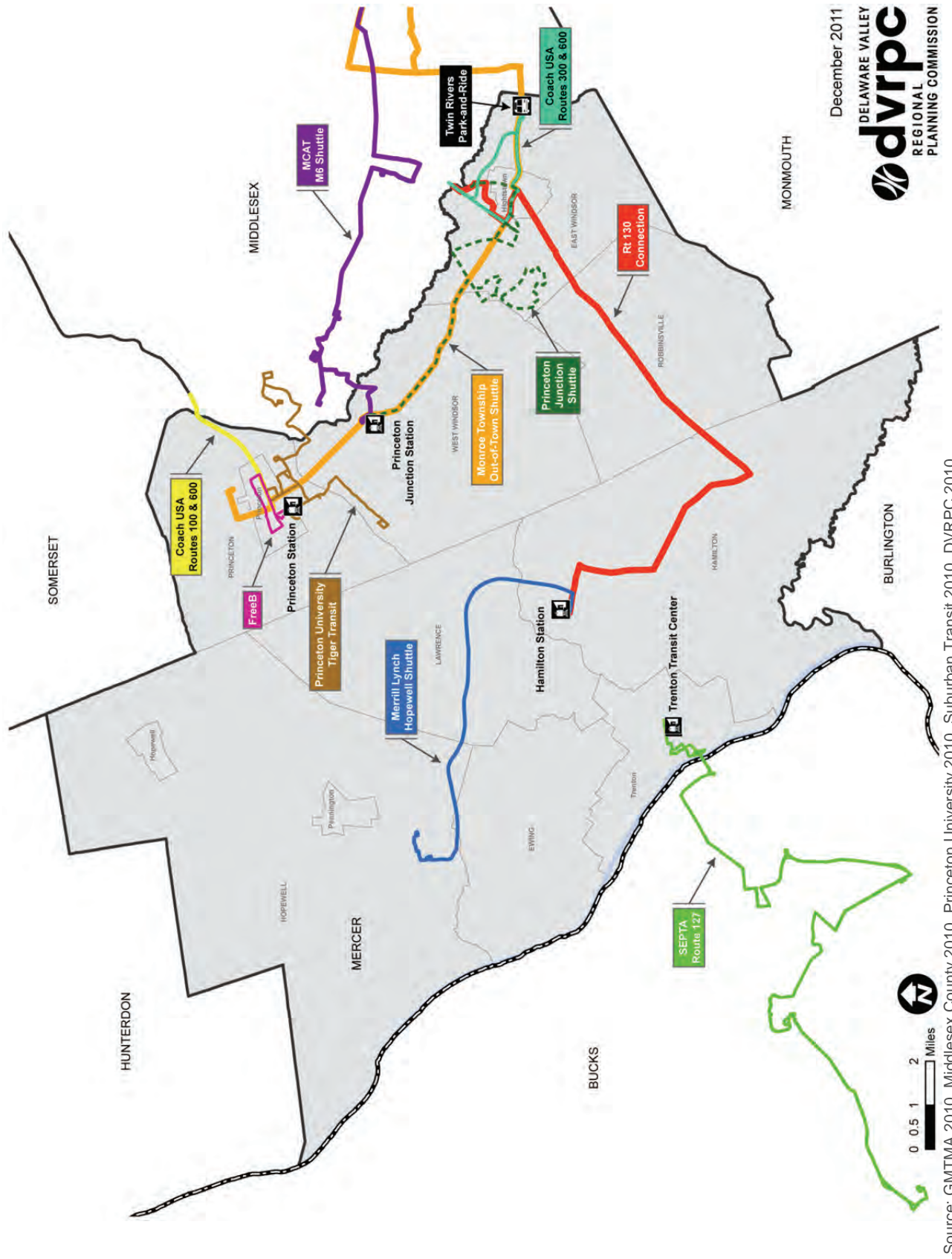
Figure 1 summarizes the distribution of current NJ TRANSIT bus routes and stops across Mercer County.

Figure 1: Current NJ TRANSIT bus service in Mercer County



Source: NJ TRANSIT 2011

Figure 2: Summary of Mercer County bus services operated by carriers other than NJ TRANSIT



Source: GMTMA 2010, Middlesex County 2010, Princeton University 2010, Suburban Transit 2010, DVRPC 2010

Summary of other operations (including shuttles)

As noted previously, there are many bus services in Mercer County operated by providers other than NJ TRANSIT. These are illustrated in Figure 2 (for fixed-route services) and summarized in this section, organized by operator and location.

East Windsor Township

- ▶ **The Princeton Junction Shuttle (formerly titled the East Windsor Shuttle) commuter bus** provides service between the neighborhoods of East Windsor Township and Hightstown Borough, and NJ TRANSIT Northeast Corridor service by way of Princeton Junction Station. This shuttle is funded by a federal and state bus grant program and is locally supported by East Windsor Township, the Borough of Hightstown, and Mercer County. The service is operated by a private bus company under contract with East Windsor Township. Cash fare is \$1 each way, and three morning and two evening fixed-route trips are provided during weekday peak travel times.
- ▶ **Community Bus** is also operated by East Windsor Township for shopping, doctor appointments, and planned trips on a planned schedule. Stops include the Senior Center, Saint James, Twin Rivers, Downtown Hightstown, Windsor Regency, and Wheaton Point. Service is provided to local retail destinations and medical centers. The monthly schedule is posted on the East Windsor Township website; nonretail and medical center trips are provided on a varied schedule, with different destinations each week. Fare is \$0.25 each way, and one midmorning round trip is provided each weekday.

Princeton Borough and University Shuttles

- ▶ The **FreeB Shuttle** is funded through combined resources from the Borough of Princeton and Princeton University. The FreeB provides transportation for residents of Princeton Borough and commuters using parking garages and parking lots. This is a free bus that loops around Princeton Borough on a frequent rotation during morning and evening commuter hours. The FreeB is a fixed route, with 10 stops throughout the community, and serves the NJ TRANSIT Dinky Rail Station. The shuttle runs on 30-minute headways from 5:30 a.m. to 9:30 a.m., and 5:30 p.m. to 9:30 p.m.
- ▶ **Monroe Township's Transportation Office** provides free shuttle service to Princeton for Monroe residents of all ages. The Princeton shuttle runs Sunday through Thursday from Monroe Township, through East Windsor, West Windsor, and Princeton, with connections to shopping locations, medical facilities, and Princeton Junction Station. This shuttle provides two runs approximately 2.5 hours apart each morning from Monroe to Princeton, and two return trips each afternoon from Princeton to Monroe.
- ▶ **Princeton University Tiger Transit** is the university transit system that provides transportation through the Princeton campus and surrounding community on a fixed-route schedule during the academic year, and on a reduced service schedule through summer. Tiger Transit provides eight fixed routes from morning to evening Monday through Friday, and on-demand service during late-night hours throughout the week. Shuttles include: West Line, East Commuter Line, 701 Carnegie Center Line, Central Line, and the Forrestral/PPPL. Additionally, the Tiger Line, East Line, and Campus Circulator routes operate during the academic year only. These provide connections to academic and administrative buildings;

faculty, staff, graduate, and undergraduate student housing; Nassau Street; and the Forrestal Campus and Princeton Plasma Physics Lab. The service is free and open to the public and shuttles run on 20- to 30-minute headways throughout the day.

Greater Mercer TMA

The Greater Mercer TMA works with local employers to develop and operate a variety of transit-related services, and operates one shuttle route at the present time:

- ▶ **Merrill Lynch and Co./Bank of America Shuttle** connects Hamilton Station with the Merrill Lynch Hopewell Campus in Hopewell Township. The bus route is scheduled to meet most NJ TRANSIT Northeast Corridor trains during weekday rush hours. The shuttle boards at Hamilton Station for morning commute trips to the Hopewell Campus, with three stops at the campus, and returns from the campus to the rail station for evening commute trips. This free service is available to Merrill Lynch and Bank of America employees and runs on 20- to 30-minute headways during morning hours, and 20- to 40-minute headways in the evening.

Mercer County Workforce Investment Board (WIB)

Mercer County's WIB is a public-private policymaking body that is engaged in issues related to county workforce development. The WIB operates one fixed-route shuttle service:

- ▶ **Route 130 Connection** provides service between Trenton and Hamilton stations and Jamesburg. The shuttle makes fixed stops at Hamilton Station, Hamilton Township, Robbinsville Township, Hightstown, East Windsor Township, and South Brunswick. Two round trips each day extend from Hamilton Station to serve Trenton Station. The service is provided by the Mercer County Workforce Investment Board. Shuttle fare is \$1 each way and shuttles run on 60-minute headways from 5:30 a.m. to 10:30 a.m., and 2 p.m. to 7 p.m.

Mercer County TRADE

Mercer County provides door-to-door, nonemergency transportation with its TRADE service. The Transportation Resources to Aid the Disabled and Elderly, or TRADE, is available as subscription or demand-response service to Mercer County residents with disabilities or senior citizens 60 years and over. Trip origins may be anywhere within the county and destinations may fall up to five miles outside of it.

Middlesex County Area Transit (MCAT)

The Middlesex County Department of Transportation MCAT Shuttle program provides modified fixed-route transit service in areas with little or no bus service coverage. Shuttles are available to senior citizens, individuals with disabilities, and the general public. The M6 Shuttle provides service between Jamesburg in Middlesex County and Princeton Junction Station in West Windsor Township, Mercer County. MCAT transit is provided with a suggested fare of \$1 for the general public and fifty cents for persons over 60 or individuals with a disability of any age. The wheelchair-accessible shuttle operates Monday through Saturday, 6 a.m. to 7 p.m., with 30- to 60-minute headways.

Summary of intercity and commuter operations

Suburban Transit Coach USA operates commuter shuttles from several New Jersey locations to New York City. Three shuttles make Mercer County connections through East Windsor and Princeton:

- ▶ East Windsor bus lines connect to New York City through Hightstown. The **300 Line** arrives in New York City at the Port Authority Bus Terminal in Midtown Manhattan; the **600 Line** arrives in New York City at Wall Street. Both shuttles from East Windsor travel on the New Jersey Turnpike via US 130. Cash fare from East Windsor to New York City is \$14 each way and approximately five daily round trips are made from East Windsor.
- ▶ Princeton bus lines connect to New York City on a parallel route. The **100 Line** travels from Princeton to the Port Authority in Midtown Manhattan; the **300 Line** provides crosstown connections from Princeton to Midtown Manhattan; and the **600 line** arrives in Downtown Manhattan at Wall Street. These shuttles from Princeton travel on the New Jersey Turnpike via NJ 27. Cash fare from Princeton to New York City is \$14 each way and the shuttle leaves Princeton on approximately 60-minute headways from 6 a.m. to 11 p.m.
- ▶ Coach USA indicates that two additional shuttles may be added soon for additional service to New York City in an effort to fill gaps left by NJ TRANSIT service cuts.

Survey of current bus riders in Mercer County

In January 2009, DVRPC and NJ TRANSIT staff conducted mailback passenger surveys on a number of Mercer County bus routes: NJ TRANSIT Routes 601, 602, 603/613, 604, 606, 607, 608, 609/619, 611, and 976 (now 612), as well as the East Windsor Shuttle (EWS) and Train Link Shuttle (TL). The full results of this survey are detailed in DVRPC publication 09052: *NJ Transit Mercer County Bus Survey* (November 2009), but several summary points are worth highlighting:

- ▶ These routes serve a transit-dependent population:
 - Across all routes, 73 percent of respondents indicated that they had no other option but the bus for making the surveyed trip.
 - Fifty-six percent of respondents indicated that they lived in households with no vehicle available (an additional 26 percent had one vehicle available).
 - Sixty-four percent of respondents indicated a median household income less than \$35,000, with 34 percent of respondents indicating incomes less than \$15,000.
- ▶ Most riders are regular riders (78 percent indicated that they rode the surveyed route five to seven days per week), but the plurality used one-way cash fares (43 percent) rather than monthly passes (31 percent). This is a further indication of transit dependence, since lower income users often purchase cash fares when they cannot afford the larger single cash outlay for a monthly pass.
- ▶ Most riders indicated that they reached both the bus and their eventual destination on foot (79 and 76 percent, respectively).

- ▶ Route 976/612, the East Windsor Shuttle, and the Train Link Shuttle (now discontinued) — routes which interface with NJ TRANSIT Northeast Corridor service—are dramatic exceptions to all the above points:
 - For each of these routes, between 80 and 90 percent of riders indicated a transfer to or from NJ TRANSIT rail service at one end of their bus trip.
 - Roughly two-thirds of riders indicated that they choose to ride transit: the bus is their best option, but not the only one.
 - Most of Route 976/612 and East Windsor Shuttle riders indicated that they used rail monthly passes for their fare (Train Link Shuttle riders typically paid by cash).
 - Average estimated household incomes for these three routes ranged from roughly \$80,000 to \$120,000.

- ▶ On the whole, riders expressed general satisfaction with the quality of bus service. When asked to rate their overall satisfaction from 0 to 10 (with 10 being most satisfied), the average weighted rating across all respondents was 7.2. The generally transit-dependent rider base for all routes but the 976/612, EWS, and TL had a slightly higher level of satisfaction than the more discretionary riders of those three routes: 7.25 and 6.71, respectively.

Mercer County journey to work trip patterns

To determine how well Mercer County’s existing bus services serve origin-destination trips that are in demand, and to identify potential gaps that are not served as well as they should be, it is useful to explore municipal-level trip flows across all transportation modes. The most significant available resource in this regard is journey-to-work (JTW) data from the 2000 Census.

2000 Census

Census Transportation Planning Package (CTPP) JTW data from 2000 remains the most robust recent dataset for real-world (not simulated) travel data. By considering trips for all modes, including trips made by auto, it is possible to identify car trips that could be captured by bus service if it were provided or enhanced. Figure 3 summarizes work trip flows between Mercer County municipalities from 2000. As this figure indicates, the dominant trip flows are along a northwest to southeast axis between Ewing Township, Trenton, and Hamilton Township. Significant flows are also present throughout central Mercer County along the greater US 1 corridor, between and among Ewing, Trenton, Hamilton, Lawrence, West Windsor, and Princeton.

Figure 3: Municipal-level work trip flows within Mercer County

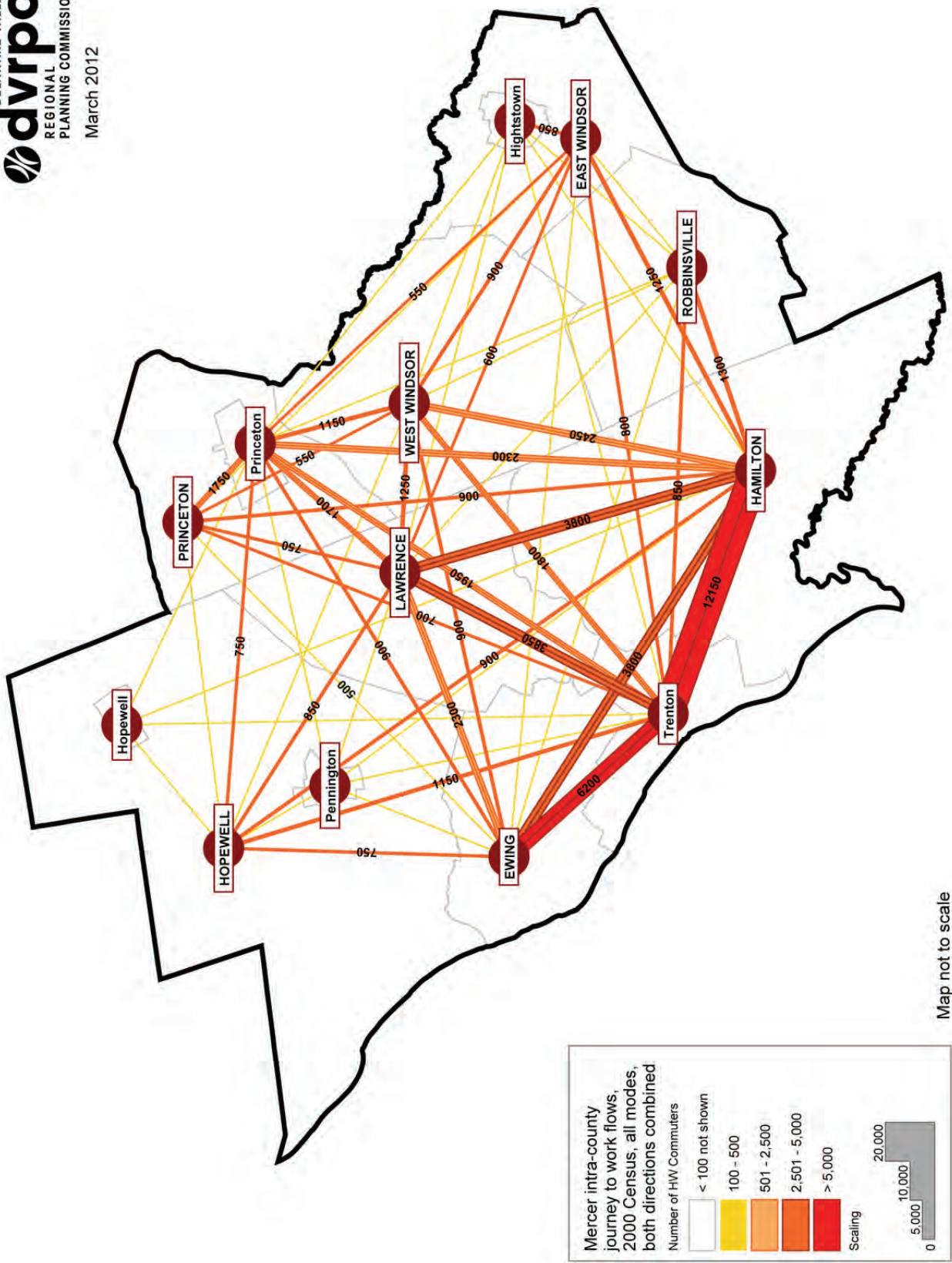


Figure 4: Municipal-level work trip flows between Mercer and Bucks, Middlesex, and Somerset counties

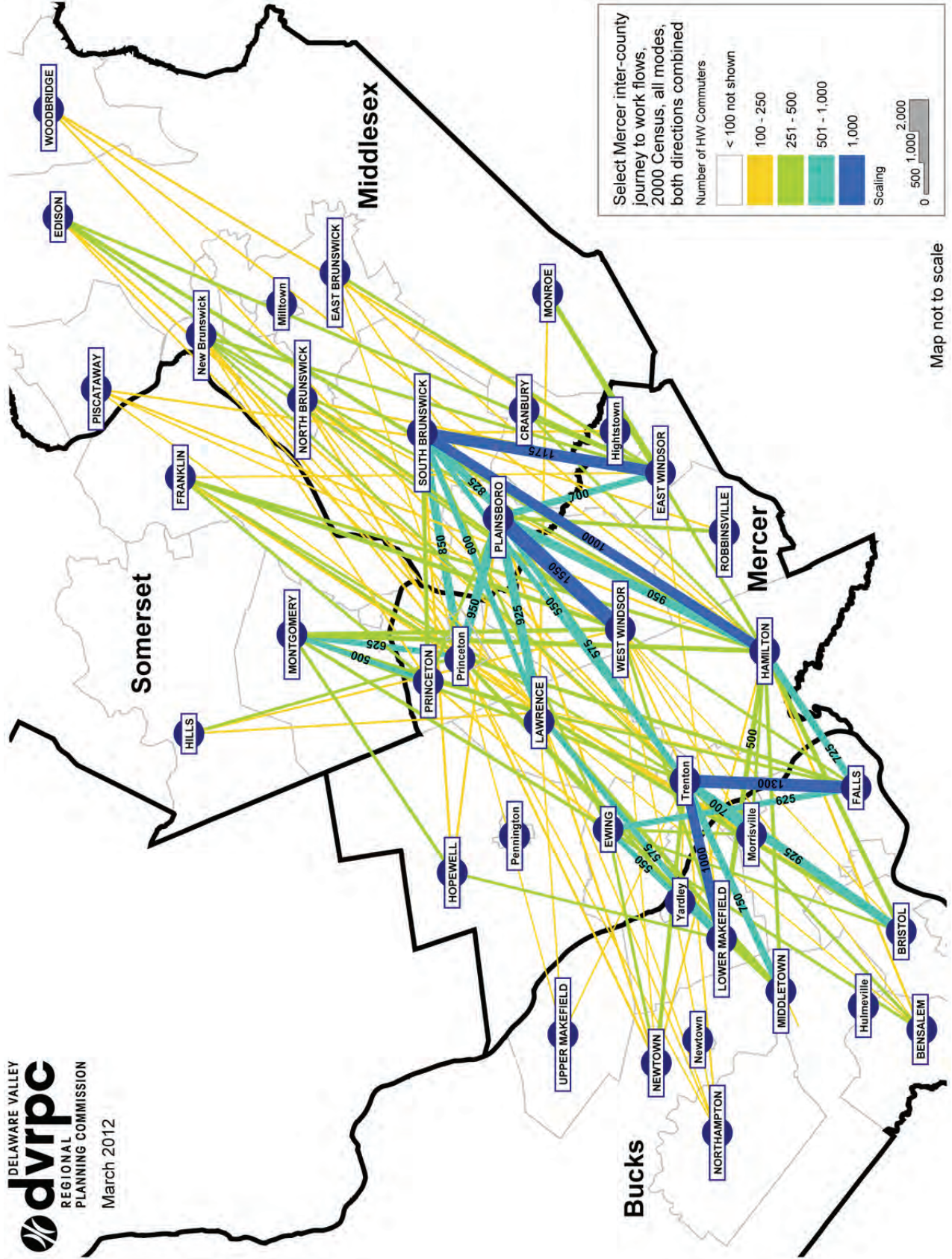


Figure 4 summarizes work-trip flows between Mercer municipalities and municipalities in three adjacent counties: Bucks County (PA), Middlesex County, and Somerset County. While the trip patterns shown here are fairly complex, several specific intercounty flows bear noting:

- ▶ There are heavy volumes between southeastern Bucks County and Trenton, as well as the broader I-95 and US 1 corridors. These trips were considered in detail in a prior DVRPC study (*Bucks-Mercer Transit Needs Assessment & Concept Development*; DVRPC publication 09042); recommendations from that study will inform this plan.
- ▶ There are significant volumes between Princeton Borough/Township and Montgomery Township in Somerset County. These trips are partly served by NJ TRANSIT Route 605, which is proposed for higher levels of service under NJ TRANSIT’s 2015 near-term BRT concept plan (see Chapter 4).
- ▶ There are high-volume flows between most of Mercer County and both Plainsboro and South Brunswick along the US 1 corridor. These connections will be greatly enhanced through various proposed Route 1 BRT services (see Chapter 4).

2009 New Jersey State Employees Travel Survey

In early 2009, NJ TRANSIT staff conducted an electronic (email) travel survey to obtain work trip travel data for New Jersey state employees working in downtown Trenton. Since state employees represent about 80 percent of all workers in downtown Trenton (roughly 20,000 of 25,000), this travel survey represents a fairly complete dataset on recent work trip trends to Trenton. The results of the survey are summarized in Table 1.

Table 1: Work trip mode share for state employees in downtown Trenton

Primary trip mode	Percentage of respondents
Drove alone	74.7%
Carpool	9.0%
RiverLINE	6.4%
Drop-off or taxi	3.2%
NJ TRANSIT bus	2.2%
NJ TRANSIT commuter rail (includes AMTRAK)	2.1%
Vanpool	1.3%
SEPTA rail	0.5%
Walk or bike	0.5%
Other	0.1%

Source: 2009 NJ TRANSIT

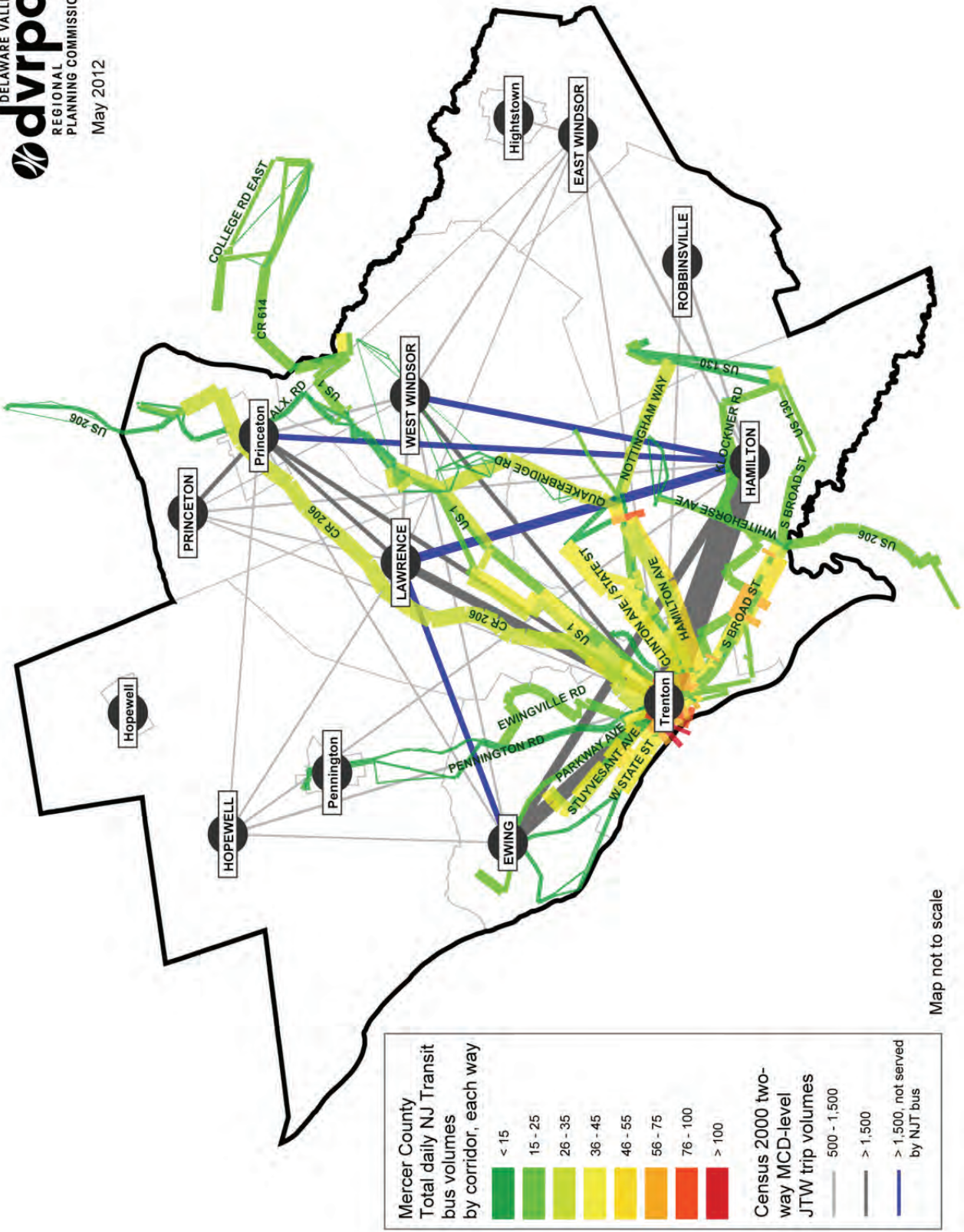
As Table 1 indicates, despite the enormous levels of transit accessibility for downtown Trenton, roughly three in four state employees drive to work alone each day. In total, just over 11 percent of state employees regularly use NJ TRANSIT or SEPTA transit service for their work commute.

This is no doubt related to the fact that nearly every state employee has access to free parking, and this bears highlighting here. In addition to significant levels of rail service from the northeast, southeast, and southwest, the City of Trenton has among the highest levels of bus accessibility in the State of New Jersey. That this only results in a 2.2 percent mode share for state employees is illustrative of the challenges in making bus service attractive for discretionary riders. For this reason, ideas to improve the convenience and quality of bus service will factor heavily in this plan document.

Current levels of NJ TRANSIT bus service in comparison to journey-to-work demand

Having explored municipal-level journey to work trip volumes in the prior section, it is useful to consider how well Mercer County's current bus network serves these trip pairs (in order to identify gaps where high-demand trips are not currently served). Figure 5 reflects the Census 2000 JTW volumes within Mercer County (from Figure 1), with current NJ TRANSIT daily bus volumes overlaid on top in order to enable a visual comparison. NJ TRANSIT bus volume data has been extracted from Google Transit data, visualized through the DVRPC's regional travel demand model (TIM 1.0).

Figure 5: Mercer County NJ TRANSIT bus volumes in comparison to work trip demand



Source: 2000 Census; Spring 2010 NJ TRANSIT schedule data from Google Transit

This figure illustrates the very high levels of bus service in the City of Trenton, where many Mercer County routes converge, and also illustrates the relative levels of bus service for other corridors. As this map indicates, most high-volume municipal trip pairs are currently served by one or more bus routes (i.e., along the US 1 corridor and the Ewing-Trenton-Hamilton corridor), although there may be opportunities to improve service effectiveness. However, this map also indicates that gaps remain: trip pairs highlighted in purple are those with greater than 1,500 daily work trips, but no current NJ TRANSIT bus connection. Specifically, these are:

- ▶ **Ewing-Lawrence:** No transit connection for this east-west link
- ▶ **Hamilton-Lawrence:** No direct connection for this north-south link
- ▶ **Hamilton-Princeton:** No direct connection for this north-south link
- ▶ **Hamilton-West Windsor:** No direct connection for this north-south link

Summary

As all of the summary and analysis in this chapter demonstrates, in conjunction with SEPTA and NJ TRANSIT rail service, Mercer County's present bus network already serves most of the priority trip origins and destinations throughout the county, with a handful of exceptions. In addition to filling these few gaps, the remainder of this plan will focus on ways to enhance the quality of service for routes and corridors that are already served (in order to improve mobility for current riders and make service more attractive for discretionary riders).

Future County Growth Scenarios

The purpose of this project is to envision an effective and efficient bus network for Mercer County in the future, and it is therefore essential to consider what that future will look like. This project will explore services and estimate ridership under two long-range county growth patterns: a trend scenario (with a mix of development types but typified by generally auto-oriented residential and commercial growth), and a smart-growth scenario in which most future growth is concentrated in existing and planned centers of place.

During early project discussions with Mercer County, NJ TRANSIT, and other project stakeholders, a key initial project task emerged: that is, a careful consideration of the scenario planning for future county development that had already been conducted through NJDOT's Route 1 Regional Growth Strategy (RGS) and DVRPC's scenario analysis for the 2035 Long-Range Plan (*Connections: The Regional Plan for a Sustainable Future*). Assembling cohesive countywide growth scenarios for the purposes of this project was a challenging undertaking, since some portions of Mercer County fall within the Route 1 RGS study area and others do not. Further, whereas DVRPC's scenario planning had a defined time horizon (2035), the Route 1 RGS explored conditions under a more distant full buildout. Following a detailed technical exploration of these issues (a memorandum detailing this analysis can be found in Appendix A), two scenarios were selected by consensus of Mercer County, NJ TRANSIT, and DVRPC staff:

- ▶ The trend scenario uses population and job forecasts from DVRPC's 2035 trend scenario, which are the region's board-adopted forecasts.
- ▶ The smart-growth scenario is a center-based concept drawn from a combination of DVRPC's 2035 recentralization scenario, which anticipates growth in core cities and older suburbs, and the Route 1 RGS "smart growth vision." Where Route 1 RGS figures are used—for municipalities within the Route 1 RGS study area—the RGS job projections are reduced to bring them into line with the level of growth anticipated under the trend scenario time horizon of 2035. The centers of development identified through the Route 1 RGS planning process will be maintained.

Table 2 summarizes municipal-level population and jobs under the two 2035 growth scenarios, along with Census numbers from 2005 for purposes of comparison.

Table 2: Summary of Mercer County municipal population and jobs in 2005 and in 2035 under this project's two growth scenarios

<i>Municipality</i>	<i>2005 Actual</i>		<i>Trend Scenario</i>		<i>Smart-Growth Scenario</i>	
	Population: 2005 Actual	Jobs: 2005 Actual	Population: DVRPC Trend 2035	Jobs: DVRPC Trend 2035	Population: Route 1 RGS Smart Growth with DVRPC Recentralization*	Jobs: Route 1 RGS Smart Growth (growth from 2005 cut by 75%) with DVRPC Recentralization*
East Windsor Township	26,576	9,947	29,225	12,798	29,717	11,983
Ewing Township	36,137	28,031	39,385	37,953	<u>45,973</u>	<u>38,460</u>
Hamilton Township	89,939	34,792	98,565	39,959	<u>105,202</u>	<u>49,313</u>
Hightstown Borough	5,220	3,377	5,386	3,453	6,079	3,970
Hopewell Borough	2,040	421	2,058	447	2,332	502
Hopewell Township	17,454	9,475	24,668	14,985	17,684	10,301
Lawrence Township	29,774	25,524	33,912	32,968	<u>32,904</u>	<u>28,441</u>
Pennington Borough	2,580	1,170	2,930	1,194	3,182	1,391
Princeton Borough	15,067	10,690	15,089	11,596	<u>16,117</u>	<u>11,493</u>
Princeton Township	16,976	6,253	18,425	8,290	<u>16,737</u>	<u>7,306</u>
Robbinsville Township	11,730	2,560	16,523	7,951	12,381	4,310
Trenton City	85,477	59,136	88,973	62,139	<u>98,687</u>	<u>76,813</u>
West Windsor Township	23,120	23,457	28,837	35,713	<u>37,658</u>	<u>33,630</u>
MERCER TOTAL	362,090	214,833	403,976	269,446	424,653	277,912
Montgomery Township (Somerset County)	18,131	4,589	22,652	8,055	23,364	7,142
Plainsboro Township (Middlesex County)	21,232	23,208	31,151	31,388	24,224	26,403

Source: DVRPC 2009, NJDOT 2009, NJTPA 2009

*Smart-growth scenario: underlined values are from the Route 1 RGS smart-growth vision, adjusted as indicated in the column header. Other values are from the DVRPC 2035 recentralization scenario.

NOTE: For modeling the future bus network, Plainsboro (Middlesex County) and Montgomery (Somerset County) townships will also be included. Population and job numbers for each of these municipalities will be drawn from the Route 1 RGS buildout (reduced as for Mercer locations), along with the closest equivalent North Jersey Transportation Planning Authority (NJTPA) scenario projections to the DVRPC scenarios that are used for Mercer County.

Future Bus Service Concepts

Route 1 Bus Rapid Transit (BRT)

As envisioned through a series of planning analyses and years of stakeholder outreach, the Route 1 BRT will be an integrated system of trunk and feeder bus routes, serving many origins and destinations and building on NJ TRANSIT's existing bus network. Rather than a single line serving a linear set of stations (i.e., "rail on tires"), this network approach will permit many more of Mercer County's origins and destinations to be served via a "one seat ride" —key for attracting discretionary riders—and will allow passengers riding each route in the BRT network to benefit from the targeted improvements to service quality that are envisioned. These include:

- ▶ Exclusive rights-of-way to allow buses to bypass key traffic choke points, including targeted shoulder operating segments and exclusive guideway along US 1, peak-period bus-only lanes on the new Scudder Falls Bridge, and the installation of an exclusive bus right of way along the Princeton Dinky right of way;
- ▶ Transit Signal Priority (TSP) along certain corridors, granting buses extended green signal phases (or shortened red phases). TSP could be simple (where the bus is always granted signal priority upon detection) or conditional (where the bus is only granted priority when it is behind schedule, for example);
- ▶ Significant improvements to passenger information and amenities, including real-time "next bus" arrival information at stops, as well as enhanced shelters and connectivity (i.e., improved sidewalks);
- ▶ Enhanced and specially branded buses;
- ▶ Higher levels of bus service, including greater frequency and extended hours; and
- ▶ Strategically located park-and-ride facilities to capture drive-up passengers.

The Route 1 BRT concept was detailed in the 2006 *Central New Jersey Route 1 Bus Rapid Transit Alternatives Analysis Study*, available through NJ TRANSIT. That study estimated a total capital cost of \$600M to \$700M if the entire network were to be implemented at once. Since that time, NJ TRANSIT and local stakeholders have pursued an incremental approach to implementation. Most recently, NJ TRANSIT completed a near-term concept plan (with a targeted 2015 time horizon) for Phase I implementation, which includes a number of elements that would affect Mercer County passengers.

Summary of NJ TRANSIT Route 1 BRT near-term concept plan

The near-term concept plan for the Route 1 BRT includes upgraded service on a handful of existing routes, as well as six new proposed routes that will be implemented in a phased way as funds become available. Figure 6 summarizes each of these route-level investments.

Enhancements to existing routes:

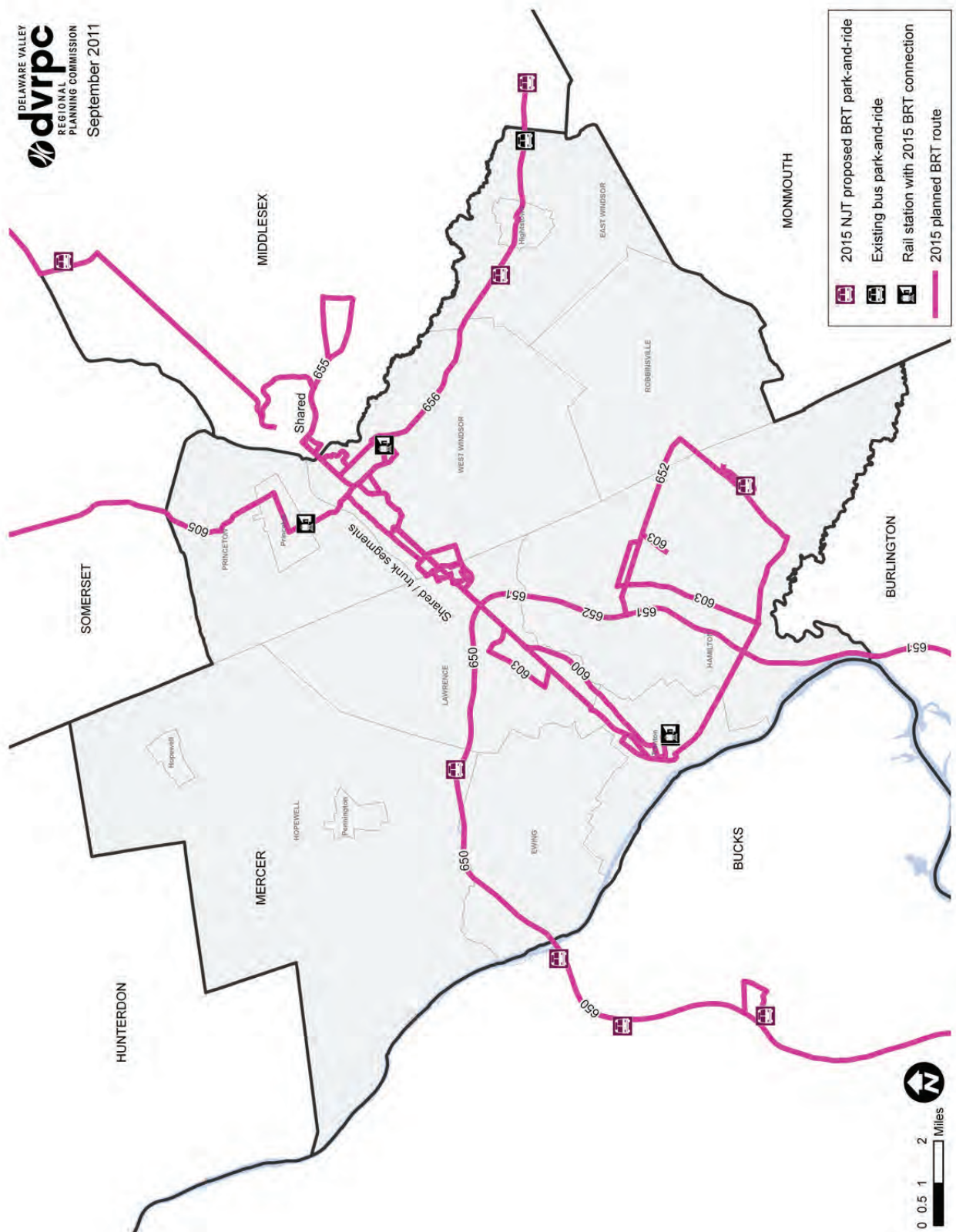
- ▶ **Route 600:** higher frequencies, roughly every 20 minutes during the peak (current headways are roughly every 30 minutes during the peak, and hourly off peak);
- ▶ **Route 603/613:** higher frequencies, roughly every 20 minutes during the peak (current headways are 30 minutes all day), plus extension to connect with Carnegie Center and Princeton Junction Station;
- ▶ **Route 605:** higher frequencies (current headways are low; generally every hour or less all day), plus extension to Belle Mead.

Proposed new routes:¹

- ▶ **Route 650:** direct service between park-and-ride lots in Lower Bucks County and destinations along US 1 (including Princeton Junction Station and Plainsboro) via I-95 (30-minute peak headways);
- ▶ **Route 651:** Burlington City to Quaker Bridge Mall, Princeton Junction Station, and Princeton via I-295 (30-minute peak headways);
- ▶ **Route 652:** Edgebrook/US 130 to Quaker Bridge Mall, US 1 destinations, Princeton Junction Station, and Princeton via I-295 (30-minute peak headways). Note: this route would help to address the Hamilton-West Windsor work trip gap identified in Chapter 2;
- ▶ **Route 653:** Quaker Bridge Mall, Princeton Junction Station, and Plainsboro to South Brunswick, North Brunswick, and New Brunswick (30-minute peak headways);
- ▶ **Route 655:** Princeton Borough and Forrestal Village to Princeton Meadows and Plainsboro (30-minute peak headways);
- ▶ **Route 656:** Connecting Monroe, East Windsor (including Twin Rivers), and West Windsor to Princeton Junction Station and Quaker Bridge Mall via CR 571 and US 1 (30-minute peak headways).

¹ Note: each of these routes is proposed to be routed along Alexander Road between US 1 and Princeton Junction Station, with transit priority improvements along Alexander Road to speed bus movement.

Figure 6: NJ TRANSIT near-term (2015) BRT concept plan bus routes



Source: NJ TRANSIT 2009

Other investments proposed in the near-term concept plan:

In addition to these route-level improvements, NJ TRANSIT’s near-term concept plan also proposes a number of supportive capital investments (which will be implemented incrementally as funding becomes available). These are summarized in Table 3.

Table 3: Supportive capital investments in near-term BRT concept plan

Type of investment	Details
Capacity	35 additional buses
	New/expanded maintenance facilities
BRT stations/nodes (incorporated into corridor development projects as they occur)	Princeton Junction Station, coordinated with West Windsor Redevelopment Planning
	Princeton Station, coordinated with University Arts and Transit District
	Quaker Bridge Mall (coordinated with the Mall’s expansion project)
Park-and-ride facilities (new or expanded)	Burlington South RiverLINE station
	CR 541/Burlington Center Mall
	US 130/Hamilton Marketplace
	NJ 33/Twin Rivers (East Windsor)
	South Brunswick
	Hopewell: I-95 median
	Along I-95 in Bucks County: Oxford Valley, PA-332, and Yardley
Bus priority treatments	Bus right-of-way along Dinky line or priority treatments along Alexander Rd.
	Priority treatments and facility investments in Carnegie Center and Forrestal Center
	US 1 shoulder lanes in North Brunswick, South Brunswick, Plainsboro, West Windsor, and Lawrence
	Queue-jumping lanes or other improvements at the Quaker Bridge Rd./Clarksville Rd./Grovers Mill Rd. intersection in West Windsor Township
	Queue-jumping lanes along US 1 at the Franklin Corner Rd./Baker Basin Rd. intersection (Lawrence Township)
	Priority treatment along US 1 (Business) in Lawrence Township
	Shoulder bus lanes on new Scudder Falls Bridge

Source: NJ TRANSIT 2009

Summary of long-term (full-buildout) Route 1 BRT network

While incremental completion of the Route 1 BRT near-term concept plan will represent a significant upgrade in bus service quality in its own right, the nature of the Route 1 BRT as an integrated system is that additional routings and higher levels of service will continue to be added as demand matures, development occurs, and funding becomes available. In addition to the near-term concept plan described above, a number of additional routings in the BRT network have already been identified by NJ TRANSIT as part of the 2006 BRT Alternatives Analysis or as part of NJ TRANSIT's participation in NJDOT's Route 1 RGS planning process. These routes are grouped into either "trunk" routes (which are the BRT's primary routes and would have higher frequencies) and "feeder" routes (which would have lower frequencies but will enable easy transfer to more-frequent trunk routes). In addition to these new trunk and feeder routes, the initial 2015 routes would continue to operate (as trunk routes, but at their 2015 levels of service). The estimated time horizon for completion of the full BRT system is 2025. Figure 7 illustrates the complete 2025 BRT network as envisioned by NJ TRANSIT; the numbers in the route list below correspond with Figure 7.

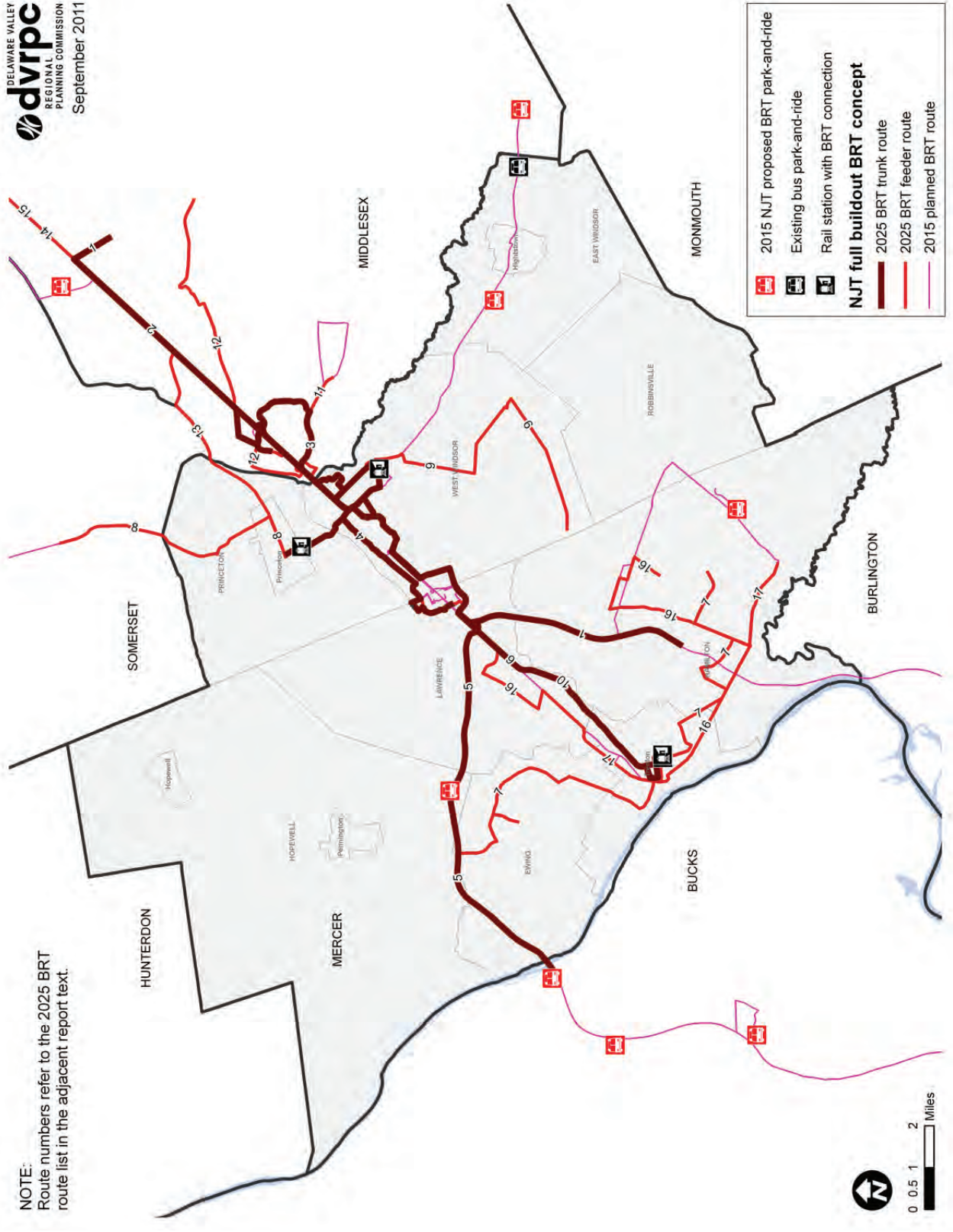
2025 BRT trunk routes

1. **Hamilton Park (Hamilton Township) to South Brunswick [BRT 1]** via US 1 corridor destinations, including Princeton Junction Station. Note: the Hamilton–Princeton Junction segment of this route was proposed as a near-term (2015) route in the Route 1 Regional Growth Strategy with 20-minute peak headways. This is an adjusted and extended variation of proposed near-term route 652, and would have 10-minute peak headways;
2. **Quaker Bridge Mall to South Brunswick [BRT 2]** via US 1 corridor destinations, including Princeton Borough. This is an adjusted and extended variation of proposed near-term route 653, and would have 10-minute peak headways;
3. **Quaker Bridge Mall to South Brunswick [BRT 3]** via Plainsboro (northbound only); 10-minute peak headways;
4. **South Brunswick/Deans to Quaker Bridge Mall [BRT 4]** via US 1 (southbound only); 10-minute peak headways;
5. **Yardley/I-95 park-and-ride (Bucks County) to Princeton Borough [BRT 5]** via I-95 and US 1 (this is proposed as a peak-only subsegment variation of 2015 Route 650 and would have 10-minute peak headways);
6. **Forrestal Village and Princeton Junction Station to Downtown Trenton [BRT 6]** 30-minute peak headways.

2025 BRT feeder routes

7. **Hamilton Park (Hamilton Township) to proposed I-95 median park-and-ride (Hopewell Township) [BRT Link 1]** via Trenton; 20-minute peak headways;
8. **Princeton Borough/University to Bridgepoint (Montgomery Township) [BRT Link 2]** via US 206 (this is a segment of existing Route 605); 20-minute peak headways;

9. **Princeton Junction Station to Edinburg [BRT Link 3]** (adjacent to Mercer County Park) 20-minute peak headways;
10. **Princeton Junction Station to Downtown Trenton [BRT Link 4]** 20-minute peak headways;
11. **Princeton Junction Station to Plainsboro Center [BRT Link 5]** via Scudders Mill Road and US 1; 20-minute peak headways;
12. **Princeton Junction Station to Dayton (Middlesex County) [BRT Link 6]** at US 130 via US 1 and Ridge Road; 20-minute peak headways;
13. **Princeton Borough to South Brunswick [BRT Link 7]** via Lincoln Highway; 20-minute peak headways;
14. **Princeton Junction Station to New Brunswick [BRT Link 8]** via US 1; 20-minute peak headways;
15. **Princeton Junction Station to Milltown and South River (Middlesex County) [BRT Link 9]** via US 1 (and also serving Plainsboro Center); 20-minute peak headways;
16. **Hamilton Park (Hamilton Township) to Clarksville / Nassau Park [BRT Link 10]** via Whitehorse Road, Broad Street (Trenton), and US 1; 45-minute peak headways;
17. **US 130/Yardville Heights to Clarksville/Nassau Park [BRT Link 11]** via Broad Street (Trenton) and US 1; 45-minute peak headways.



NOTE:
 Route numbers refer to the 2025 BRT route list in the adjacent report text.

Figure 7: NJ TRANSIT full-buildout (2025) BRT concept plan

Source: NJ TRANSIT 2009

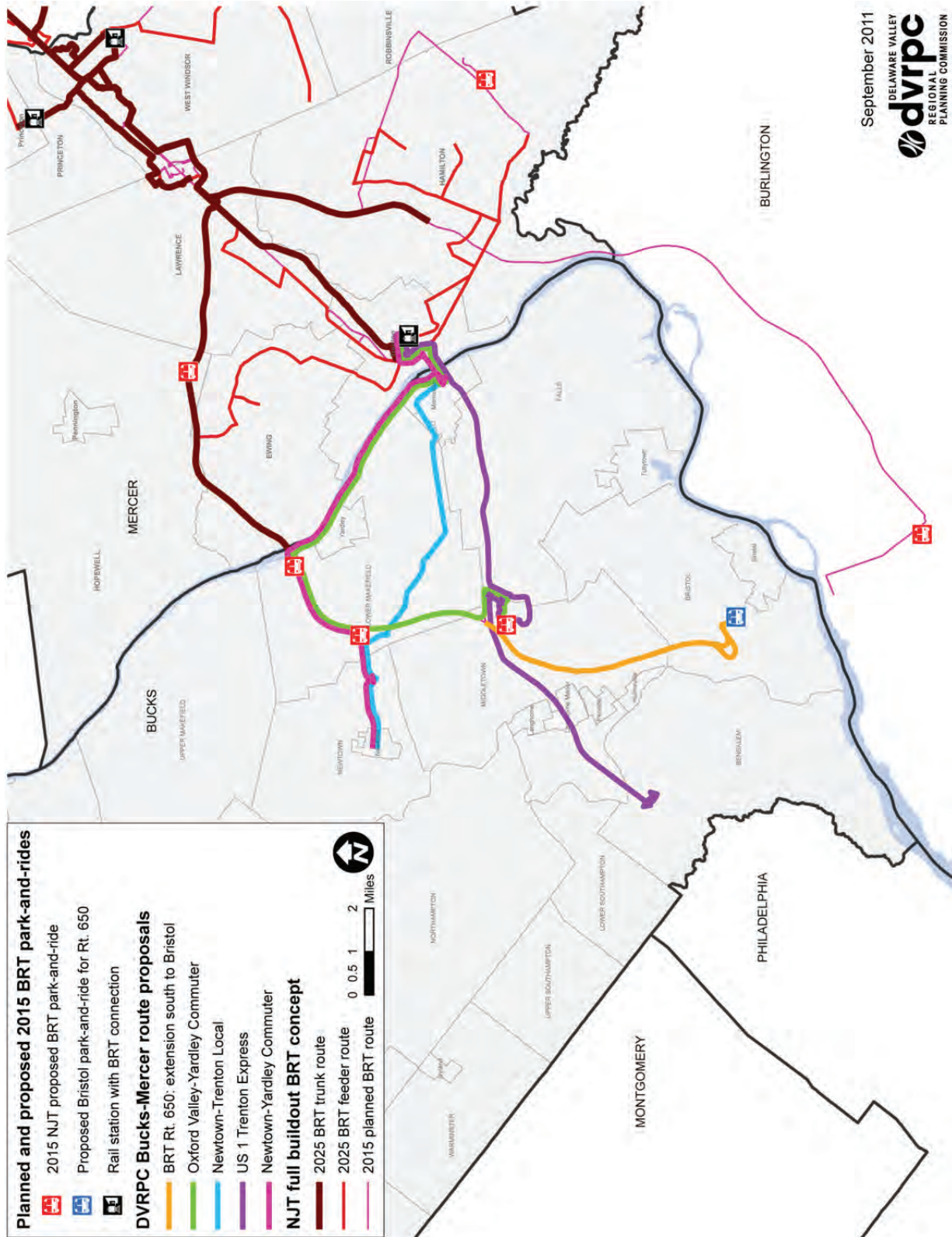
DVRPC Bucks-Mercer bus service recommendations

In 2009, DVRPC completed a detailed exploration of additional transit service needs for trips from Bucks County to Mercer County (*Bucks-Mercer Transit Needs Assessment and Concept Development*, DVRPC publication 09042). This study drew upon an analysis of Census journey-to-work and transit survey data, and resulted in a series of specific bus service concepts to meet existing and emerging demand. These were:

- ▶ **US 1 highway/park-and-ride routing [“Route 1 Trenton Express”/R1TX]:** This is a highway commuter service with three park-and-ride locations: Neshaminy Mall, Oxford Valley Mall, and central Morrisville Borough. The Neshaminy Mall terminus would draw from northern portions of Bensalem Township, the Oxford Valley Mall park-and-ride would draw from Middletown/Levittown and portions of Lower Makefield, and the Morrisville stop would capture walk-up and local riders similar to SEPTA Route 127. The end-to-end running time would be roughly 30 to 35 minutes.
- ▶ **Oxford Valley-Yardley commuter route [OVY]:** This is a park-and-ride service similar to the above, connecting each of the three park-and-ride locations proposed as part of the Route 1 BRT (2015 Route 650) with downtown Trenton via River Road. This route would also include service to Morrisville. End-to-end running time would also be roughly 30 to 35 minutes.
- ▶ **Newtown-Yardley commuter route [NYTX]:** This route is intended to capture walk-up and/or park-and-ride passengers from Newtown, and would also connect with the Route 332 and Yardley park-and-rides (shared with the Route 1 BRT), reaching Trenton by way of River Road. This routing concept would also include service to Morrisville. The end-to-end running time would also be roughly 30 to 35 minutes.
- ▶ **Newtown-Trenton local route [NTL]:** This routing would connect Newtown Borough with Trenton via Lower Makefield and Morrisville (Newtown-Yardley Road → PA 332 → Stony Hill Road → Big Oak Road → Pennsylvania Avenue). This route would be intended to attract mostly walk-up and/or bike-up ridership, and would directly serve portions of Lower Makefield Township that were identified as significant origin hotspots in the Bucks-Mercer analysis. These residential areas are of low to moderate densities and most local streets have sidewalks that connect with the routing proposed above. The end-to-end running time would be roughly 40 minutes.
- ▶ **Extension of NJ TRANSIT proposed 2015 BRT Route 650 further south to serve Bristol and Bensalem:** Several possible locations for a new park-and-ride terminus were suggested in the report. For the purposes of conceptual planning here, the most northerly of these will be used (the Bucks County Office Center in Bristol Township).

Each of these routing concepts would reach Trenton via the US 1 expressway bridge and would terminate at Trenton Station after routing through downtown Trenton. These routes could be pursued independently of one another. If the suggested US 1 Trenton Express were implemented, for example, an Oxford Valley terminus might not make sense for the Oxford Valley/Yardley commuter route, since passengers from the vicinity of Oxford Valley Mall would have a much faster ride to Trenton on the express service. Figure 8 summarizes these recommended routings in the context of other planned and existing services.

Figure 8: Proposed bus services from DVRPC Bucks-Mercer study



Consensus routes and recommendations from April 2010 stakeholder workshop

In April 2010, DVRPC staff held a project stakeholder workshop for the Mercer County Future Bus Plan at the Lawrence (main) branch of the Mercer County Library. There were roughly 50 attendees, including participation by Mercer County, NJ TRANSIT, numerous municipalities, and others. As groups and individuals, participants were asked to consider the current and planned (Route 1 BRT) Mercer County bus network in the context of anticipated county growth and help to identify underserved gaps and opportunities for changes in the level of service in various locations. A complete summary of workshop feedback and a list of attendees can be found in Appendix B; several consensus suggestions were as follows:

- ▶ Improved service along US 130;
- ▶ Better connections between West Trenton Station and areas to the north and west;
- ▶ An emphasis on hubs, enhancing facilities for transfers between bus routes and bus/rail;
- ▶ Enhanced coordination between service providers, as well as greatly enhanced passenger information; and
- ▶ Creative/enhanced "last mile" services, particularly to serve senior communities.

Together with Mercer County staff, DVRPC staff reviewed each of the routes, connections, and transit hubs identified by workshop participants and selected a number of proposals that will be included in the planned bus network. These are:

Routes added to planned bus network based on workshop feedback

1. **West Trenton-Hamilton-Hightstown via Olden Avenue & US 130 [OLD130]:**

This proposed route addresses several suggestions made during the workshop: better connections to SEPTA's West Trenton Station, better northwest/southeast "cross Trenton" access, and service along US 130 that would provide enhanced access to Hightstown and Robbinsville Town Center. This route would also provide direct BRT connectivity to Ewing Township's planned redevelopment along the Olden Avenue corridor. Because of heavy congestion and right-of-way constraints along Olden Avenue in Trenton, for this route to effectively move forward, there would need to be significant investments in transit priority in that corridor. At its eastern terminus, this route would serve development concentrations in East Windsor Township (including Twin Rivers), as well as Hightstown Borough. Note that for reliability, this route might be more practically implemented as two routes (Olden Avenue and US 130).

2. **West Trenton-Pennington-Hopewell [WTX]:**

This route addresses workshop suggestions to enhance northeast/southwest cross-county connectivity, serve walkable communities in Pennington and Hopewell boroughs, and enhance connectivity from West Trenton Station. This route would also act as a bus-based proof-of-concept of the proposed West Trenton rail extension alignment, helping to build transit patronage in the rail extension corridor. The routing between West Trenton Station and Pennington Borough is proposed to pass along Scotch Road, enhancing transit options for

employees at Merrill Lynch and Capital Health. With a direct connection at West Trenton Station, transit accessibility to these major employers from Bucks County would be greatly enhanced.

3. **CR 518-Princeton Borough-Lawrence via Princeton Pike [“Princeton Pike Local”/PPL]:**
This proposed route combines two connections that were suggested by workshop participants: Princeton Borough with Belle Mead vicinity, and Princeton Borough with major employers along the Princeton Pike corridor in Lawrence Township.
4. **Mercer County College to CR 571:**
A number of workshop participants suggested extending the proposed 2025 Princeton Junction-Edinburg BRT feeder route to Mercer County College. This connection goes further in connecting Mercer County College to CR 571 via both an eastward extension of existing NJ TRANSIT Route 619 and a westward extension of one BRT feeder route (BRT Link 3) to Mercer County College.
5. **BRT upgrades to NJ TRANSIT Route 606 (Princeton-Trenton via US 206):**
This is not a new route, but an enhancement of current Route 606 (which is a direct connection between Princeton Borough and Downtown Trenton), with BRT-type service levels and operational enhancements.
6. **West Trenton Station-Franklin Corner Road transit hub [“Ewing-Lawrence Local/ELL”]:**
This route addresses two primary suggestions made during the workshop: enhanced connectivity with West Trenton Station and improved east-west transit access. This connection would provide a direct BRT link to both proposed Ewing Township redevelopment areas (Olden Avenue and the former GM plant) and would help to address the Ewing-Lawrence journey-to-work gap identified during the JTW gap analysis (the other identified gaps to/from Hamilton Township will be addressed by routes already planned under the 2025 BRT network).

New transit hubs identified following workshop discussions



High-quality bus transfer hub at shopping mall near Seattle, WA ([Source](#): DVRPC 2010)

As noted above, many workshop suggestions centered on increasing the number of transit hubs where bus-bus and bus-rail transfers would be made more convenient via strategies such as enhanced passenger amenities, fare interoperability, expanded passenger information systems, and connectivity to surrounding development (particularly bicycle and pedestrian accessibility). A number of natural transit hubs occur where bus routes connect with rail stations, such as at West Trenton Station, Princeton Junction Station, Princeton Station (which will become a BRT station at the end of the Dinky right-of-way), and Trenton’s RiverLINE stations. This plan anticipates hub-type amenities and

connectivity at these places. In addition, a number of new proposed hubs were also identified through the workshop process and planning that followed. These include:

Quaker Bridge Mall, Lawrence Township:

This is a location where a number of planned Route 1 BRT routes (both 2015 and 2025) terminate or converge, and which has long been a key node in the anticipated BRT network. The mall remains a key node in this plan; it will be important to find a configuration of alignments and facilities that support the needs both of transit passengers and mall patrons and management.



Source: DVRPC 2010

Princeton Pike at Franklin Corner Road, Lawrence Township:

Multiple planned BRT feeder routes, as well as one of this plan's new proposed routes, converge at this location, which is situated near several major employers.



Source: DVRPC 2010

I-95 at Reed Road/Lower Ferry Road, Hopewell Township:

This would be a multilevel transit hub, where transfers between BRT routes on I-95 and north-south local services would be enabled via elevators. Space for transit facilities at this hub, including a park-and-ride lot, is potentially available from NJDOT-owned parcels located to the north of I-95 (between Reed Road and the West Trenton right-of-way). This hub would become an intermodal center upon extension of the West Trenton Line, housing a new station.



Source: DVRPC 2010

State Street between Broad and Warren Streets in Downtown Trenton:

This is a central location in the City of Trenton, where many NJ TRANSIT bus routes already converge. Connectivity would be enhanced.



Source: Cityfeet.com 2011

Hamilton Township 5-Points intersection (Quakerbridge Road/Nottingham Way/Edinburg Road):

This is a location where a number of local bus routes already converge. Connectivity would be enhanced as a transit hub. Additionally, under a proposal identified through a June 2006 corridor study of NJ 33 (DVRPC publication 06025), the I-295/NJ 33 interchange is proposed to be reconfigured by replacing cloverleaves with roundabouts. While expensive, this would enable transfers between BRT routes on I-295 and other local and BRT routings. This project is a long-range aspiration of the county, and if it were to advance, the 5-Points transit hub proposed here could be relocated to that location.



Source: DVRPC 2010

Each of the proposed routes and hubs developed through the workshop process are summarized in Figure 9, which also reflects the rest of the planned bus network for context. The numbered list of routes above corresponds with the route numbers in Figure 9.

Figure 9: Routes and connections identified through the stakeholder workshop



Source: NJ TRANSIT 2009, DVRPC 2010

Summary of the complete planned bus network

This section summarizes the complete network of fixed-route bus services that together comprise the Mercer County Future Bus Plan. Table 4 (page 39) includes each of the routes detailed in the prior sections, with a handful of changes for this plan as summarized below.

Higher frequencies for certain planned routes

New Jersey Transit and other planners have been careful to balance planned service levels with reasonably anticipated funding levels, resulting in certain routes, even BRT routes, having limited proposed levels of service. However, the purpose of this plan is to explore a vision for Mercer County where BRT and bus networks are integrated with center-based growth in the county and become a primary means of mobility for a much larger number of discretionary riders than those riding buses in Mercer County today. With this long-range vision in mind, this plan anticipates higher frequencies for the following routes:

- ▶ Each of the 2015 BRT routes is proposed to have 20-minute peak headways versus the 30-minutes proposed in NJ TRANSIT's near-term concept plan. This matches the 20-minute headways proposed for the 2025 feeder BRT routes.
- ▶ Two BRT feeder routes (BRT Links 10 and 11 in Table 4) are proposed to have 20-minute peak headways and 30-minute midday frequencies (matching the other feeder routes), as opposed to the 45-minute all day headways proposed by NJ TRANSIT.
- ▶ Current Route 606 is proposed to have 20-minute peak and 30-minute off-peak headways, reflecting its upgrade to a BRT feeder route as proposed during stakeholder outreach for this project.
- ▶ The Forrestal Village–Trenton 2025 BRT route (BRT 6 in Table 4) is proposed to have 10-minute peak and 15-minute off-peak headways, matching those of the other 2025 trunk routes, as opposed to the 30-minute all-day headways proposed by NJ TRANSIT. In addition, rather than exactly matching the routing of Route 600 in Trenton, BRT 6 would be routed directly to/from Trenton Transit Center via the US 1 expressway, and then continue along the downtown routing of Route 600. This will provide a direct connection between services at Trenton Transit Center (including RiverLINE service) and the core of the BRT network, allowing passengers making that connection to bypass congestion in downtown Trenton, reducing travel time as a result.

Modifications to select planned routes and facilities

- ▶ To address the workshop consensus to improve east-west connections between Mercer County College and CR 571, current Route 619 will be extended to a BRT park-and-ride on CR 571, and the Princeton Junction-Edinburg BRT feeder route (BRT Link 3 in Table 4) will be extended to Mercer County College.
- ▶ As proposed in DVRPC's prior Bucks-Mercer planning study, 2015 BRT route 650 will be extended from Oxford Valley to Bristol Township.

- ▶ NJ TRANSIT's proposed I-95 median park-and-ride will be replaced by parking at the proposed multilevel I-95/Reed Road BRT hub, and the 2025 BRT route serving this park-and-ride (BRT Link 1 in the table below) will be redirected to serve this location.

The complete fixed-route bus network for the Mercer County Future Bus Plan is summarized in Table 4 and Figure 10. The Route IDs in Table 4 correspond with the route labels in Figure 10.

Table 4: Summary of fixed-route bus services included in the Future Bus Plan network

Route ID	Summary	Peak freq.	Midday freq.
Current routes continuing			
409/417/418	Trenton to Philadelphia via US 130	30 min	60 min
601	College of NJ to Hamilton Marketplace	30 min	60 min
602	Pennington to Trenton	60 min	60 min
604	Downtown Trenton to East Trenton	60 min	60 min
606	Princeton to Hamilton Marketplace	20 min	30 min
607	Ewing to Hamilton Township	30 min	30 min
608	Hamilton to Ewing	15 min	30 min
609 / 619	Ewing to Mercer County College (and CR 571 park-and-ride) and Quaker Bridge Mall	15 min	30 min
611	Downtown Trenton circulator	12 min	n/a
612	Lawrence to Princeton Junction	60 min	n/a
SEPTA 127	Bensalem to Downtown Trenton	60 min	60 min
2015 BRT routes, including enhancements to existing routes			
600	Trenton to Plainsboro	20 min	30 min
603/613	Carnegie Center/Princeton Jct. to Hamilton Marketplace	20 min	30 min
605	Montgomery Township to Quaker Bridge Mall	20 min	30 min
650	Lower Bucks County park-and-rides to Plainsboro	20 min	30 min
651	Burlington City to Princeton via I-295	20 min	30 min
652	Edgebrook/US 130 to Princeton	20 min	30 min
653	Quaker Bridge Mall to New Brunswick	20 min	30 min
655	Princeton Borough to Plainsboro	20 min	30 min
656	Monroe to Princeton Jct. and Quaker Bridge Mall	20 min	30 min
2025 BRT trunk routes			
BRT 1	Hamilton Park to South Brunswick	10 min	15 min
BRT 2	Quaker Bridge Mall to South Brunswick	10 min	15 min
BRT 3	QB Mall to S. Brunswick via Plainsboro (NB only)	10 min	15 min
BRT 4	S. Brunswick / Deans to QB Mall via US 1 (SB only)	10 min	15 min
BRT 5	Yardley/I-95 park-and-ride to Princeton Borough	10 min	n/a
BRT 6	Forrestal Village and Princeton Junction to Trenton	10 min	15 min

Table 4 (continued)

Route ID	Summary	Peak freq.	Midday freq.
2025 BRT feeder routes			
BRT Link 1	Hamilton Park to I-95/Reed Road transit hub	20 min	30 min
BRT Link 2	Princeton to Bridgepoint	20 min	30 min
BRT Link 3	Princeton Junction to Mercer County Comm. College	20 min	30 min
BRT Link 4	Princeton Junction to Downtown Trenton	20 min	30 min
BRT Link 5	Princeton Junction to Plainsboro Center	20 min	30 min
BRT Link 6	Princeton Junction to Dayton	20 min	30 min
BRT Link 7	Princeton Borough to South Brunswick	20 min	30 min
BRT Link 8	Princeton Junction to New Brunswick	20 min	30 min
BRT Link 9	Princeton Junction to Milltown and South River	20 min	30 min
BRT Link 10	Hamilton Park to Clarksville/Nassau Park	20 min	30 min
BRT Link 11	US 130/Yardville Heights to Clarksville/N. Park	20 min	30 min
DVRPC Bucks-Mercer routes			
R1TX	US 1 Trenton Express	20 min	45 min
OVY	Oxford Valley-Yardley commuter route to Trenton	20 min	45 min
NYTX	Newton-Yardley-Trenton commuter route	20 min	45 min
NTL	Newtown-Trenton local route	20 min	30 min
New plan routes			
OLD130	W. Trenton-Hamilton-Hightstown-Twin Rivers: Olden Ave & US 130	15 min	30 min
WTX	West Trenton Station-Pennington-Hopewell	20 min	30 min
PPL	CR 518 to Princeton and Lawrence via Princeton Pike	20 min	30 min
ELL	West Trenton Station to Franklin Corner Rd	20 min	30 min

Source: DVRPC 2010, NJ TRANSIT 2009

Modeling Results and Project Prioritization

Model scenario description

In order to explore the effectiveness of the planned transit improvements in meeting travel demand needs and to prioritize routes for implementation, this project's Future Bus Plan network was simulated using DVRPC's regional travel demand model (TIM 1.0) under multiple long-range (2035) land development scenarios:

▶ **No-build scenario**

The no-build scenario used population and job forecasts from the trend scenario in DVRPC's 2035 Long-Range Plan (*Connections*), along with a transportation network that is comprised of present-day services and facilities, plus any road project in either the DVRPC or NJTPA Transportation Improvement Program (TIP) and 2035 Long-Range Plan. The no-build scenario is used to allow apples-to-apples future-day ridership comparisons for the other scenarios.

▶ **Trend scenario**

The trend scenario also used population and job forecasts from the trend scenario in DVRPC's 2035 Long-Range Plan (*Connections*), and adds routes and services from the Future Bus Plan network to the 2035 transportation network.

▶ **Smart-growth scenario**

The smart-growth scenario is a center-based development scenario drawn from a combination of the recentralization scenario in DVRPC's 2035 Long-Range Plan (*Connections*), which anticipates growth in core cities and older suburbs, and the Route 1 Regional Growth Strategy (RGS)'s "smart-growth vision." For the DVRPC region south and west of Mercer County, population and job projections were the same as for the no-build and trend scenarios. The transportation network for the smart-growth scenario is the same as for the trend scenario, including the Future Bus Plan network.

▶ **Automobile cost constraint scenario**

The automobile cost constraint scenario is an additional scenario designed to test the impact of higher vehicle operating and ownership costs on transit demand. The demographic forecasts and transportation network were the same as for the smart-growth scenario, but automobile cost factors were revised as follows:

- Per-mile vehicle operating costs were increased by 50 percent relative to the other scenarios.

- \$10 parking fees were added in downtown Trenton, Princeton Borough, and the immediate Princeton Junction station area. \$5 parking fees were added in Pennington Borough, Hopewell Borough, and Hightstown Borough.

Additional details on these scenarios and their development can be found in Chapter 3 and Appendix A.

Notes on modeling for this project

It is important to remember that the modeling results are forecasted estimates rather than precise truths. They are most useful for comparing routes with one another in the context of this plan, rather than as a guarantee of a certain level of ridership. There are a number of other details related to this project's modeling that are worth noting:

- ▶ For each scenario, all rail lines, stations, and services were simulated with their present-day operating alignments and service characteristics. This includes the Dinky, which captures many trips that would otherwise be potential bus/BRT trips. Further, continued operation of the Dinky in this project's simulations likely limited the travel time attractiveness of certain BRT services, since BRT routes between Princeton Borough and US 1/Princeton Junction were routed along Alexander Road rather than having their own (Dinky) right-of-way. A 10 percent bus travel time improvement along Alexander Road by making improvements such as TSP was assumed.
- ▶ Bus services were simulated using the current NJ TRANSIT fare structure. For new routes, stops were assigned within each TAZ so as to approximate likely real-world operating patterns.
- ▶ For routes and corridors in the Future Bus Plan Network where specific transit enhancement strategies were proposed throughout this document, such as Transit Signal Priority (TSP), queue jumping lanes, or exclusive shoulder lanes, buses were assigned order-of-magnitude travel time enhancements for modeling purposes (10 percent time savings for TSP, and 25 percent time savings for shoulder operations).
- ▶ The passenger activity detailed in Table 5 reflects passenger demand from this project's simulation area only (Mercer County, Plainsboro Township, and Montgomery Township), plus the remainder of the DVRPC region. Demand to and from more northern areas is not reflected in these numbers. Some BRT feeder routes (BRT Links 6 through 9) were not able to be effectively modeled, as a significant component of these routes' alignments and passenger activity is generated outside of the simulation area.
- ▶ The modeling process simulates passenger demand and activity based on a framework where residents and commuters using the transportation network seek to maximize the utility of their trips and minimize their costs (with regard to monetary cost and time cost): they will tend to use whichever travel option has the lowest overall cost. The mode choice models do not directly reflect the impact of "soft" factors that in reality can have a meaningful impact on ridership. Research suggests, for example, that branding and marketing of services and facilities has a significant impact on perceptions and usage of BRT services. For trips where the auto and transit trip cost (time and monetary) is comparable, such perception factors, which are difficult to simulate, can make a meaningful difference in the real world. The impact

of individual preference and soft factors that are not directly included is considered by using a logit-type choice model, in which some people will choose a higher cost or longer-travel-time mode. The number of people choosing this “worse” mode is a function of just how unattractive it is relative to the optimal mode.

- ▶ For the purposes of comparing routes with one another for planning and prioritization, the modeling scenarios reflect full buildout of all Future Bus Plan services at a long-range time horizon. A phased implementation could allow early-action routes to have larger ridership over the near to medium term, while they are not competing with longer-term alternative routes that siphon some of their ridership.

Summary of results

Table 5 summarizes estimated ridership for each route in the plan network under the four scenarios that were modeled, as well as the changes in ridership relative to the no-build scenario (simulated ridership gains are shaded in green and ridership losses in red). Figure 11 summarizes the weekday ridership estimates for all plan routes under the smart-growth scenario, as well as the locations that were forecast to experience significant levels of transit ridership growth as compared to the no-build scenario.

While there are a number of conclusions that can be drawn from the modeling results, a handful of takeaways are worth highlighting:

- ▶ Taken as a whole, the estimated passenger activity make sense: while some routes are projected to lose riders to new competing routes, net ridership is significantly higher for all three build scenarios than for the no-build scenario, with passenger activity increasing from the trend scenario base as transit-supportive conditions are added under the smart-growth and auto cost scenarios.
- ▶ While many new services generate a meaningful level of ridership, there is a clear separation of the best performing routes from the others. Under the trend scenario, for example, the top eight routes (in terms of gains compared to the no-build scenario) attracted 7,755 additional trips; the top four routes attracted 5,210 of these. This suggests an opportunity to prioritize implementation of the highest performing routes for quick wins: a simplified early-action BRT network comprised of the highest-performing route variations could attract the lion’s share of ridership at full buildout, at a fraction of the operating cost.

Table 5: Summary of modeling results for the Future Bus Network

Route		Weekday boards					Change in weekday boards from no-build scenario					Shares market with
ID	Summary	Current Ridership	No-build scenario	Trend scenario	Smart-growth scenario	Auto cost scenario	Trend scenario	Smart-growth scenario	Auto cost scenario	Auto cost scenario	Auto cost scenario	Shares market with
Current routes continuing												
409	Trenton to Philadelphia via US 130	2,709	3,098	3,230	3,462	3,596	+132	+364	+498			
601	College of NJ to Hamilton Marketplace	1,243	1,169	767	805	624	-402	-364	-545			BRT Link 1
602	Pennington to Trenton	359	318	196	219	173	-122	-99	-145			
604	Downtown Trenton to East Trenton	240	188	135	161	197	-53	-27	+9			
606*	Princeton to Hamilton Marketplace	2,283	1,807	1,853	1,929	2,407	+46	+122	+600			PPL
607	Ewing to Hamilton Township	1,095	468	450	606	431	-18	+138	-37			
608	Hamilton to Ewing	1,993	2,302	1,456	1,945	2,524	-846	-357	+222			
609	Ewing to Hamilton and Quaker Bridge Mall	2,734	1,014	673	781	1,084	-341	-233	+70			619, BRT Link 1
611	Downtown Trenton Circulator	135	108	61	68	69	-47	-40	-39			BRT Link 4, BRT 6, 600
619*	Ewing to Mercer County College & CR 571	1,036	1,641	727	817	773	-914	-824	-868			609, BRT Link 1
SEPTA 127	Bensalem to Downtown Trenton	447	436	426	494	562	-10	+58	+126			R1TX
2015 BRT routes												
600*	Trenton to Plainsboro	996	460	409	440	628	-51	-20	+168			BRT Link 4, BRT 6, 603, 655
603*	Carnegie Ctr. / Princeton Jct. to Hamilton Mktplace	1,397	966	584	649	820	-382	-317	-146			BRT Link 10, BRT Link 11
605*	Montgomery Twp. to Quaker Bridge Mall	518	207	223	220	236	+16	+13	+29			BRT Link 2, BRT 5
613*	Carnegie Center / Princeton Jct. to Hamilton Marketplace	1,507	281	118	145	175	-163	-136	-106			BRT Link 10, BRT Link 11
650	Lower Bucks County park-and-ride to Plainsboro	n/a	n/a	137	103	30	+137	+103	+30			651, R1TX, BRT 5
651	Burlington City to Princeton via I-295	n/a	n/a	962	670	475	+962	+670	+475			650, 652, BRT 1
652	Edgebrook / US 130 to Princeton	n/a	n/a	86	78	80	+86	+78	+80			651, BRT 1
653	Quaker Bridge Mall to New Brunswick	n/a	n/a	96	95	10	+96	+95	+10			BRT 2, BRT 3, BRT 4
655	Princeton Borough to Plainsboro	n/a	n/a	77	72	57	+77	+72	+57			600
656	Monroe to Princeton Jct. and Quaker Bridge Mall	n/a	n/a	186	189	192	+186	+189	+192			
2025 BRT trunk routes												
BRT 1	Hamilton Park to South Brunswick	n/a	n/a	41	43	65	+41	+43	+65			651, 652, BRT Link 10, BRT Link 11, BRT 2
BRT 2	Quaker Bridge Mall to South Brunswick	n/a	n/a	75	73	77	+75	+73	+77			653, BRT Link 8, BRT Link 9, BRT 1, BRT 3, BRT 4
BRT 3	QB Mall to S. Brunswick via Plainsboro (NB only)	n/a	n/a	1,366	906	416	+1,366	+906	+416			653, BRT 1, BRT 2, BRT 4
BRT 4	South Brunswick /Deans to Quaker Bridge Mall via US 1 (SB only)	n/a	n/a	28	28	27	+28	+28	+27			653, BRT 1, BRT 2, BRT 3, BRT 6
BRT 5	Yardley/I-95 park-and-ride to Princeton Borough	n/a	n/a	30	27	33	+30	+27	+33			605, 650

Table 5: Summary of modeling results for the Future Bus Network

Route		Weekday boards					Change in weekday boards from no-build scenario					Shares market with	
ID	Summary	Current Ridership	No-build scenario	Trend scenario	Smart-growth scenario	Auto cost scenario	Trend scenario	Smart-growth scenario	Auto cost scenario	Auto cost scenario	Smart-growth scenario	Auto cost scenario	
BRT 6	Forrestal Village and Princeton Jct. to Trenton	n/a	n/a	1,336	1,508	1,420	+1,336	+1,508	+1,420	+1,420	+1,508	+1,420	600, 611, BRT Link 4, BRT 4
2025 BRT feeder routes													
BRT Link 1	Hamilton Park to I-95/Reed Road Transit Hub	n/a	n/a	1,546	2,001	2,291	+1,546	+2,001	+2,291	+2,291	+2,001	+2,291	601, 609, 619, OLD130
BRT Link 2	Princeton to Bridgepoint	n/a	n/a	229	163	177	+229	+163	+177	+177	+163	+177	605
BRT Link 3	Princeton Junction to Mercer Community College	n/a	n/a	53	52	55	+53	+52	+55	+55	+52	+55	
BRT Link 4	Princeton Jct. to Downtown Trenton	n/a	n/a	799	665	229	+799	+665	+229	+229	+665	+229	600, 611, BRT 6
BRT Link 5	Princeton Jct. to Plainsboro Center	n/a	n/a	113	67	52	+113	+67	+52	+52	+67	+52	
BRT Link 10	Hamilton Park to Clarksville/Nassau Park	n/a	n/a	496	516	895	+496	+516	+895	+895	+516	+895	603, 613, BRT Link 11, BRT 1
BRT Link 11	US 130/Yardsville Heights to Clarksville/N. Park	n/a	n/a	470	530	487	+470	+530	+487	+487	+530	+487	603, 613, BRT Link 10, BRT 1
DVRPC Bucks-Mercer routes													
R1TX	US 1 Trenton Express	n/a	n/a	659	691	759	+659	+691	+759	+759	+691	+759	650, SEPTA 127, OVY
OVY	Oxford Valley-Yardley Commuter Route to Trenton	n/a	n/a	40	43	82	+40	+43	+82	+82	+43	+82	NYTX, R1TX
NYTX	Newton-Yardley-Trenton Commuter Route	n/a	n/a	350	342	344	+350	+342	+344	+344	+342	+344	OVY, NTL
NTL	Newton-Trenton Local Route	n/a	n/a	582	760	902	+582	+760	+902	+902	+760	+902	NYTX
New plan routes													
OLD130	W. Trenton-Hamilton-Hightstown-Twin Rivers: Olden Ave. to US 130	n/a	n/a	204	202	229	+204	+202	+229	+229	+202	+229	BRT Link 1
WTX	West Trenton Station-Pennington-Hopewell	n/a	n/a	331	191	219	+331	+191	+219	+219	+191	+219	
PPL	CR 518 to Princeton & Lawrence via Princeton Pike	n/a	n/a	161	110	76	+161	+110	+76	+76	+110	+76	606
ELL	West Trenton Station to Franklin Corner Rd.	n/a	n/a	505	541	540	+505	+541	+540	+540	+541	+540	
		BUS TOTAL	14,463	22,281	23,422	24,518	+7,818 (+54%)	+8,959 (+62%)	+10,055 (+70%)	+10,055 (+70%)	+8,959 (+62%)	+10,055 (+70%)	
RiverLINE	Camden to Trenton		9,874	9,534	10,030	10,424	-340	+156	+550	+550	+156	+550	
Princeton (DINKY) ²	Princeton Junction to Princeton		1,610	1,480	1,497	1,534	-130	-113	-76	-76	-113	-76	
		COMBINED TOTAL	25,947	33,295	34,949	36,476	+7,348	+9,002	+10,529	+10,529	+9,002	+10,529	

Source: DVRPC 2011

*Route has enhancements and/or extensions detailed elsewhere in this report

² Counts for Princeton Station are passengers (an average of boards and alights)

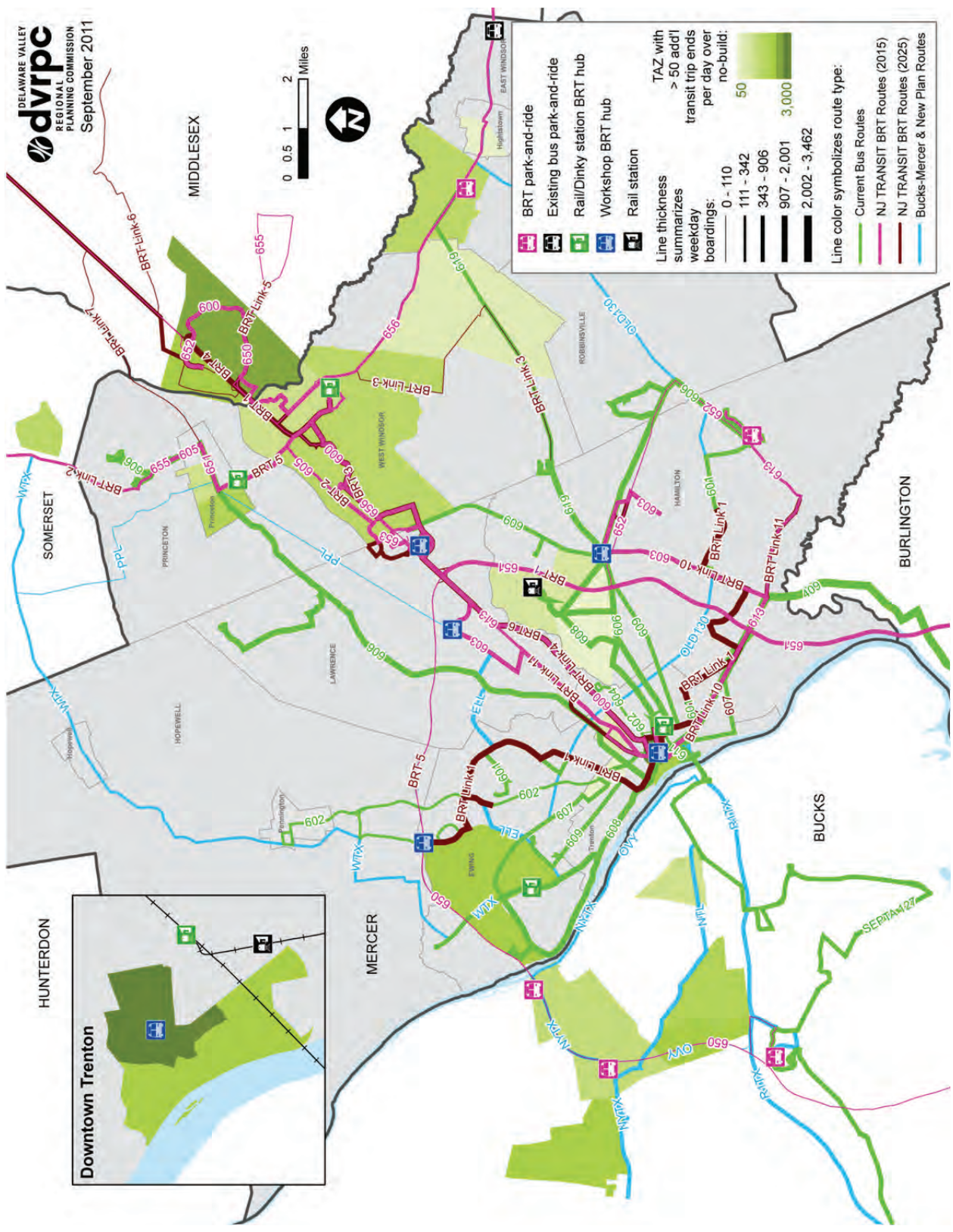
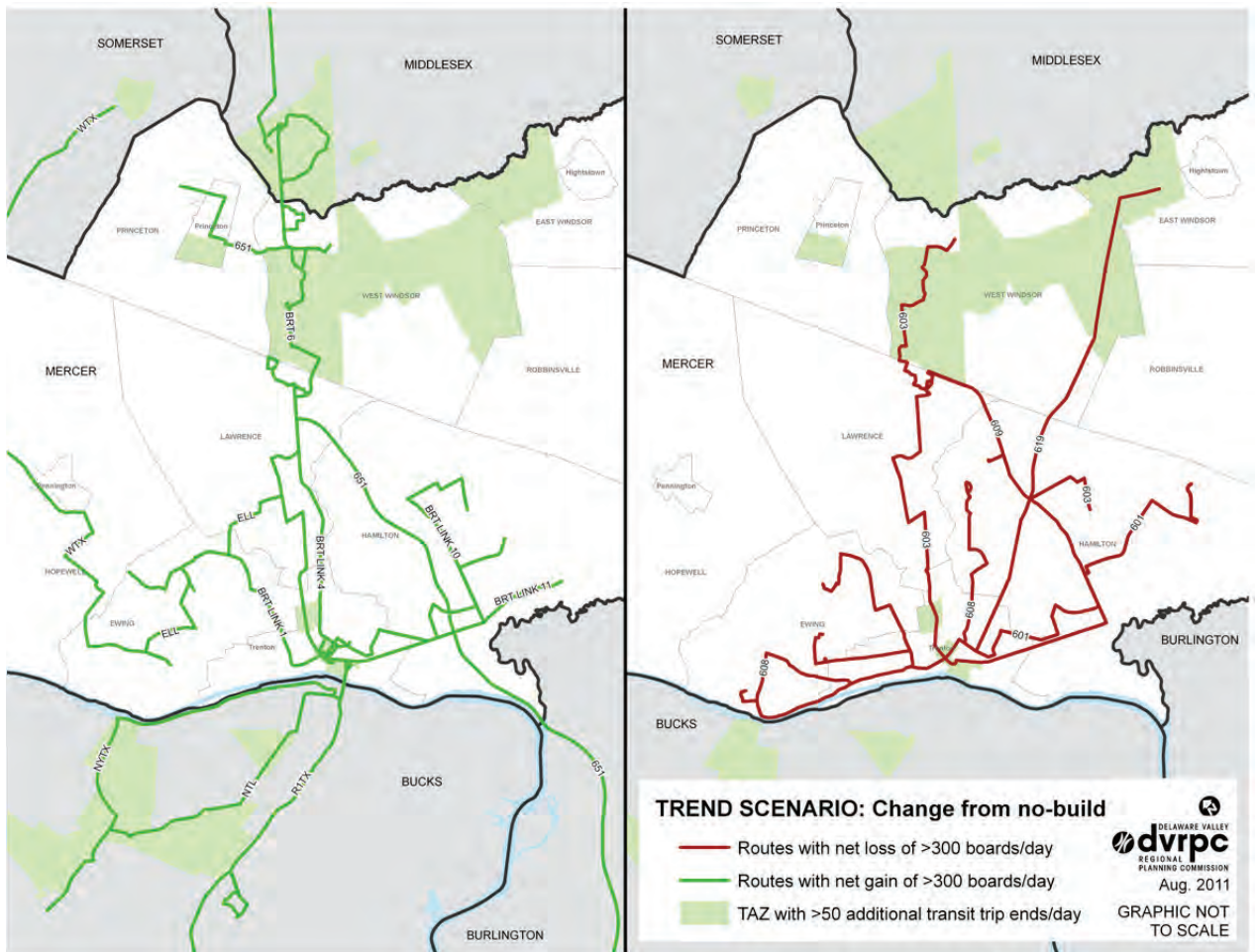


Figure 11: Summary of modeling results for smart-growth scenario

Ridership comparison: no-build network to Future Bus Plan network

Comparing the trend scenario's modeling results to those of the no-build scenario permits an exploration of net changes in ridership (routes that gained and lost significant daily passenger boardings). Since these scenarios both had the same demographic information (development under the trend forecast), any differences in ridership between the two are due to the new bus routes and service enhancements proposed under the Future Bus Plan. Figure 12 summarizes the results of this comparison.

Figure 12: Summary of change between no-build and trend scenarios



Source: DVRPC 2011

As Figure 12 indicates, the net changes in ridership that were modeled suggest a general shift in passenger activity away from local services oriented radially around downtown Trenton, and toward new longer-distance options connecting Trenton to US 1 job centers and Bucks County origins. New cross-county options, such as the Ewing-Lawrence Local (ELL) route that was developed through the stakeholder workshop, also attracted significant passenger activity.

Figure 12 also illustrates the locations that were forecast to experience the highest levels of transit ridership growth, shaded in green. These were the CR 571 corridor, the core of the BRT network along US 1 in West Windsor and Plainsboro townships, downtown Trenton, and Lower

and Central Bucks County, where the Newtown-Trenton Local (NTL) and US 1 Trenton Express (R1TX) provide new service options for high-demand work trips.

Ridership comparison: trend growth to smart growth

Comparing modeling results between the trend and smart-growth scenarios permits an exploration of the impacts of more center-based distribution of future growth on anticipated ridership. The modeled transit services—the build network—are the same under both scenarios, but the underlying distribution of population and jobs is more highly concentrated in the transit-supportive development centers that are proposed under the smart-growth scenario.

Figure 13 illustrates total forecast ridership for all routes under both scenarios, as well as the forecast increases in transit trip demand by location for both scenarios (relative to the no-build scenario). As Figure 13 indicates, ridership levels under the two scenarios are generally similar, but there are some differences that are worth highlighting:

- ▶ The smart-growth scenario forecasts higher ridership from Ewing Township and several of the planned routes that would serve it. This is due to the proposed center-based redevelopment projects in Ewing being more directly reflected in the smart-growth projections than the trend projections.
- ▶ Under the smart-growth scenario, higher ridership is forecast for the western portion of Hamilton Township. This is due in part to TOD development in the vicinity of Hamilton Station that is reflected in the smart-growth demographic projections.
- ▶ The smart-growth scenario shows additional concentrations of transit trip growth in Princeton and Hightstown boroughs, as well as the City of Trenton, reflecting the higher levels of growth anticipated for these development centers as compared to the trend scenario.

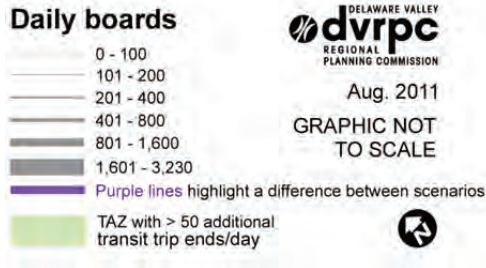
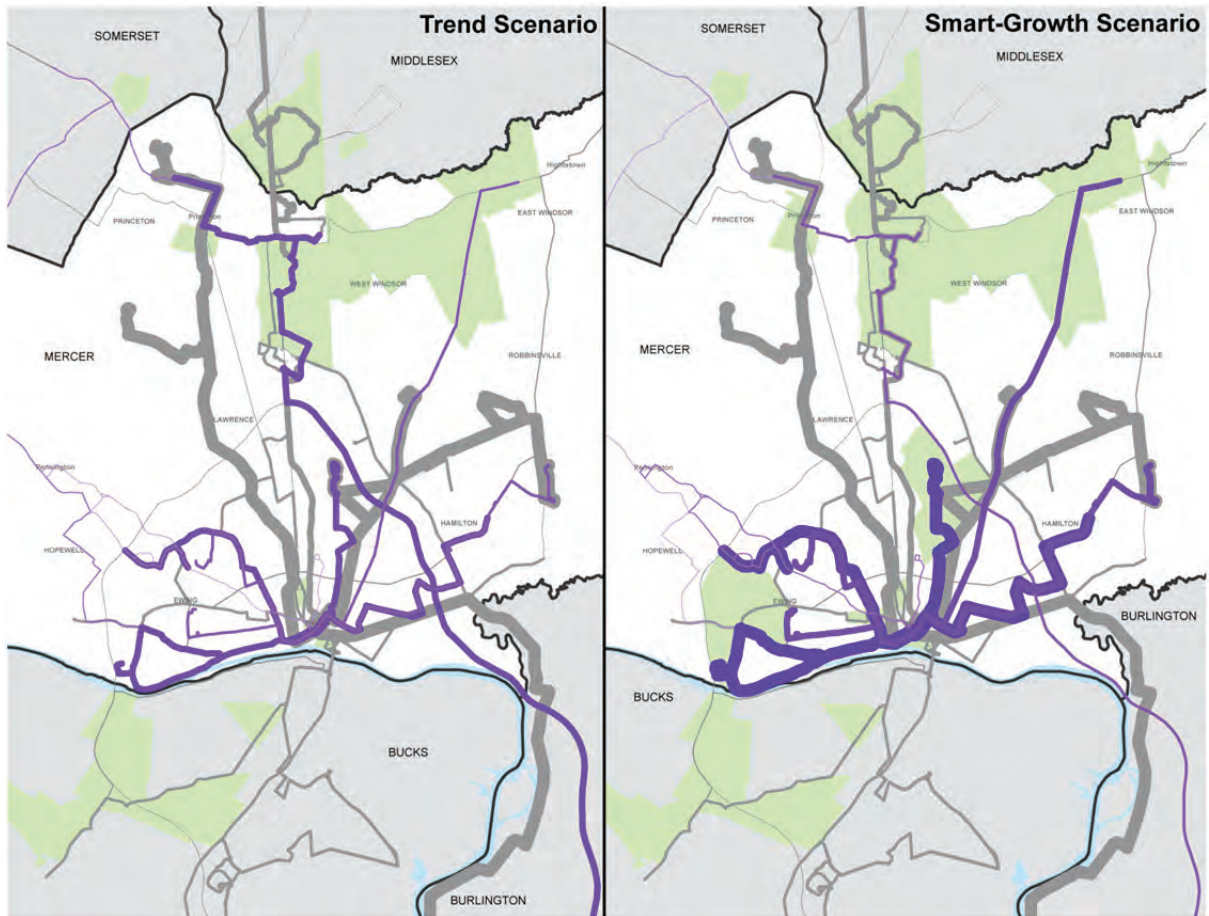


Figure 13: Comparison of ridership under trend and smart-growth scenarios

This figure is intended to permit an overall visual summary comparison. For legibility and simplicity, individual routes are not labeled.

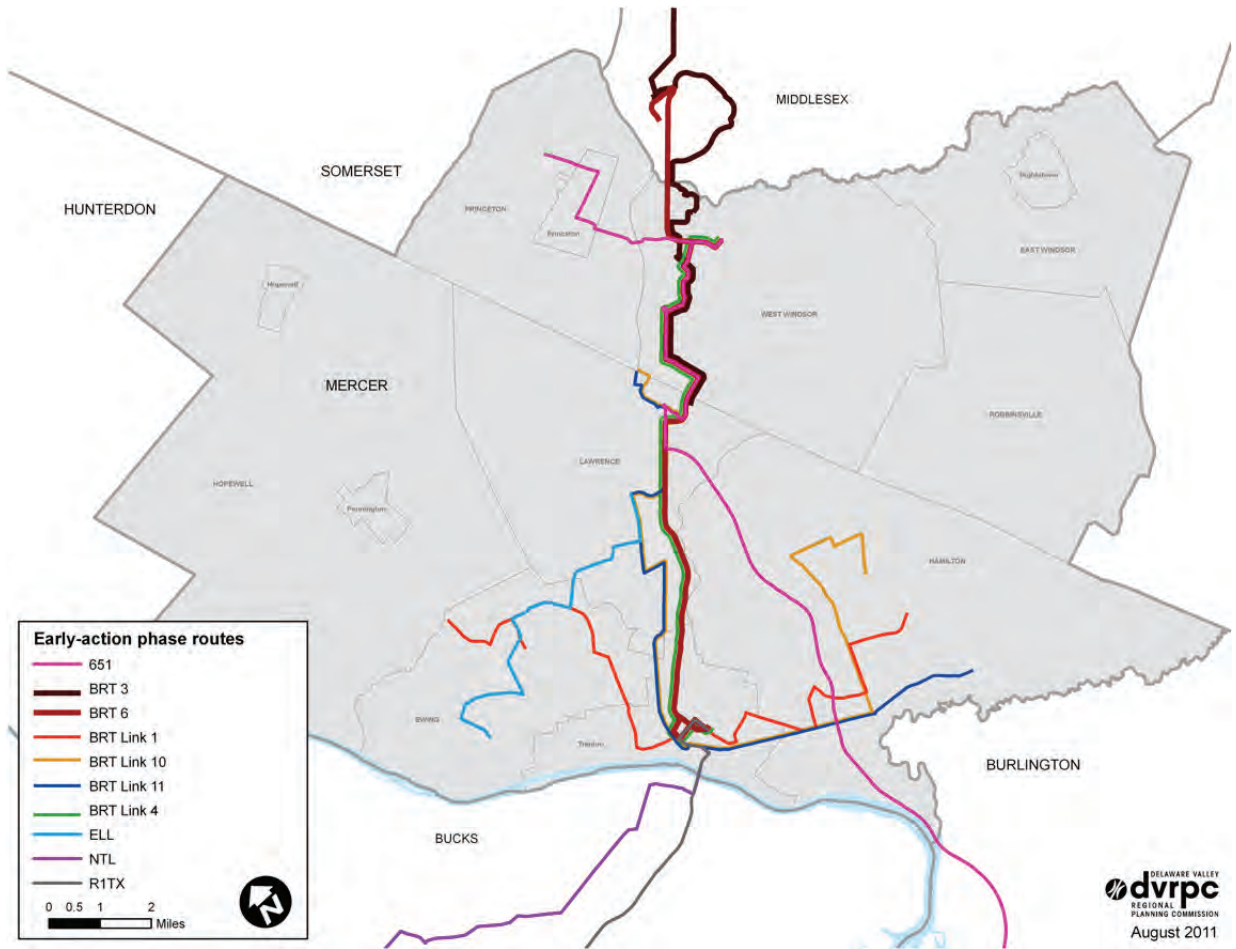


Source: DVRPC 2011

Prioritizing for implementation: Suggested early-action phase

One of the main purposes of the modeling exercise for this project was to identify the highest-performing plan routes and use them to prioritize new services for implementation as funding becomes available. Based on the ridership estimates summarized in Table 5, a handful of planned services emerge as candidates for early-action prioritization. These routes are summarized in Figure 14 and discussed below.

Figure 14: Candidate routes for early-action implementation



Source: DVRPC 2011

► **Route 651: Burlington City to Princeton via I-295**

Among NJ TRANSIT's proposed set of 2015 BRT routes, Route 651 had the highest forecast ridership. This demand was high across all three growth scenarios.

► **BRT Link 1**

This is the planned BRT feeder route with the highest forecast ridership, connecting Hamilton Park to the proposed Reed Road park-and-ride at I-95 and passing through Downtown Trenton. While the park-and-ride itself is likely a longer-term project with significant capital cost, this route could be pursued in the near term with a different western terminus (possibly as a revision and rebranding of an existing route).

► **BRT Links 10 & 11**

These two planned BRT feeder routes connect Hamilton Township to Nassau Park via Trenton, differing principally in that they serve different Hamilton Township origins. Taken together, they have a combined forecast ridership that is second only to BRT Link 1 among BRT feeder routes.

▶ **BRT 3, 6, and BRT Link 4**

While BRT Link 4 was designated as a BRT feeder route and BRT 3 and 6 as trunk routes, these three routes share a significant portion of their alignments, and together serve much of the proposed core of the Route 1 BRT between Trenton and Plainsboro. In addition to its shorter length, BRT Link 4 differs from BRT 6 principally in terms of its alignment through Trenton. BRT Link 4 enters and exits the US 1 expressway at Perry Street, and is routed through Downtown Trenton (along a different alignment from BRT 6) at both the end of its southbound trip to Trenton Station and the beginning of its northbound trip from Trenton Station.

In contrast, BRT 6 enters and exits the expressway at Market Street adjacent to Trenton Station in order to provide a direct connection between Trenton Station and the BRT core, with a local loop through downtown Trenton at the end of its southbound trip (returning to Trenton Station before heading northbound). As a result, for trips between Trenton Station and the US 1 corridor, BRT 6 provides a faster option, whereas for many trips between Downtown Trenton and the US 1 corridor, BRT Link 4 may well be faster.

Taken together, these three routes are forecast to attract roughly 3,500 passenger boardings for the trend growth scenario and would make an effective first-phase BRT trunk.

▶ **Ewing-Lawrence Local (ELL)**

This route had the highest forecast ridership among new routes that were developed through this project and serves a key underserved journey-to-work trip pair. Since ridership in the western portion of this route is supported by anticipated development and redevelopment activity in Ewing Township, implementation of this route should be considered in the context of those ongoing development plans.

▶ **Newtown-Trenton Local (NTL) and Route 1 Trenton Express (R1TX)**

These two routes were developed through prior studies to serve high-demand work trips from Bucks County to Trenton that are currently not directly served by transit and are each forecast to attract roughly 700 daily boardings depending on the growth scenario. Implementation of these routes is made more challenging by their interstate nature, which introduces potential coverage area or jurisdictional challenges for transit carriers.

Next steps and plan implementation

As detailed in Chapter 1, this plan is conceived with an eye on flexibility: the Future Bus Plan consists of a series of routes and transit enhancement projects that can be implemented in phases or singly as capital and operating funding becomes available.

As routes from the suggested early action phase (or other routes) are considered for implementation, one way to mitigate the operating cost burden of new services is to look for opportunities to redeploy existing fleet resources from routes that are made partially redundant by the new routes. As detailed in Table 5, the current routes that share markets and operating segments with the suggested early action routes are Routes 600, 601, 603, 609, 611, 613, and 619. These routes should be considered for service reduction or consolidation as early action routes are considered for implementation. In addition, detailed route-level service planning,

including a more detailed consideration of origins, destinations, and stop locations, should precede any service changes.

The shared vision articulated here for the future of bus service in Mercer County is intended as a roadmap for investments made over time, so that each project and proposal can be understood as a strand in a broader fabric. Together, these investments will help Mercer County maintain mobility and economic competitiveness, while making transit an option of first rather than last resort for an increasing number of county residents and workers.

DVRPC will continue to work with Mercer County, NJ TRANSIT, and other planning partners in Central New Jersey to improve the efficiency and effectiveness of transit service. As a next step, a study has been proposed under DVRPC's FY2013 Planning Work Program to evaluate and prioritize routes and locations for Transit Signal Priority in Mercer County.

Appendix A



Preliminary Analysis of County Growth Scenarios

Note

What follows is a memo originally drafted in November 2009 that details the results of an analysis to explore various options for long-range county growth scenarios to be used in the modeling stages of this project. The final outcomes of this process are summarized in Chapter 3 of this report.

Original memo text

Date: November 17, 2009

To: Matthew Lawson, Ph.D., Mercer County Planning Department

From: Gregory Krykewycz, PP, AICP

Subject: Comparison of Mercer County growth scenarios for Long-Range Strategic Bus Plan

As previously discussed and scoped, this project envisions a Mercer County bus network and estimates ridership patterns under two long-range county growth patterns: a “trend” scenario typified by generally auto-oriented residential and commercial growth, and a “smart growth” scenario in which most future growth is concentrated in existing and planned centers of place. During early project discussions with Mercer County, New Jersey Transit, and other project stakeholders, a key initial project task emerged: that is, a careful consideration of the scenario planning for future county development that has already been conducted through NJDOT’s Route 1 Regional Growth Strategy (RGS) and DVRPC’s scenario planning for the Connections 2035 Long-Range Plan. By exploring what the county could look like under a full range of scenarios (i.e., consider the full trajectory cone, to borrow a weather analogy), it is possible to make a more informed selection of specific scenarios (or tracks) for the current project. This memo summarizes the results of this analysis.

Scenario Background

The Route 1 RGS was a multicounty exercise to envision land use and transportation futures along the broader US 1 corridor in Central New Jersey. In Mercer County, the Route 1 RGS study area covers 89 of DVRPC’s 107 Mercer County Traffic Analysis Zones (TAZs) and 7 of 13 municipalities (it excludes Hopewell Borough, Hopewell Township, Pennington Borough, Hightstown Borough, East Windsor Township, and Robbinsville Township). For “apples to apples” comparisons of TAZ data, this memo compares each of six development scenarios’ population

and job projections for shared TAZs (i.e., TAZs within the Route 1 RGS Mercer County study area). The scenarios compared were:

▶ **NJDOT:**

- Route 1 RGS “Smart-Growth Vision”
- Route 1 RGS Trend
- Route 1 RGS Buildout

▶ **DVRPC:**

- DVRPC 2035 Recentralization (i.e., smart-growth proxy)
- DVRPC 2035 Trend (this is the Board-adopted regional forecast)
- DVRPC 2035 Sprawl

The Route 1 RGS used PlanSmartNJ’s Goal-Oriented Zoning (GOZ) model to generate its demographic projections, whereas DVRPC’s scenario planning (for details, see DVRPC publication 08059) employed UC Davis’ Urban Growth Model (Uplan). Both methods use a spatial approach to assign growth in the context of constrained or unconstrained areas, although their specific procedures differ. One favorable similarity from the standpoint of the current project is that both methods yield TAZ-level demographic datasets, permitting convenient comparisons, as well as—potentially—some ability to combine the datasets in certain ways.

One key distinction between DVRPC’s 2035 scenarios and the Route 1 RGS is that DVRPC’s scenarios distribute a relatively fixed level of regional growth that is expected at a specific time horizon based on various trend analyses. In contrast, the Route 1 RGS relates more to capacity than expectations, and factors municipal zoning and desires into its projections. From the perspective of the current project, neither approach is necessarily superior: it seems that expectations should be balanced with aspirations, and that the chosen scenarios should reflect both in some way. Because of the extensive municipal and stakeholder outreach reflected in the results of the Route 1 RGS, the initial consensus inclination for this project was to lean on the RGS scenarios to the greatest practical extent.

Method of Comparison and Summary of Results

As noted above, the purpose of this analysis was both to inform the selection of two scenarios from among the six above for use within the Route 1 RGS study area, and also to observe similarities between the DVRPC scenario datasets and Route 1 RGS datasets. This would in turn inform the selection of datasets from DVRPC’s scenarios for TAZs outside the Route 1 RGS study area.

Courtesy of NJDOT and its consultants (AECOM and URS), DVRPC was able to obtain the Route 1 RGS TAZ-level datasets in October 2009. Since the RGS split a number of DVRPC’s (and NJTPA’s) TAZs into smaller zones of analysis, the first step in our comparison was to re-aggregate these zonal projections into DVRPC’s TAZ boundaries so that they could be

compared with DVRPC’s scenario datasets in an “apples to apples” way. This was done using GIS by identifying the centroids of the smaller RGS zones and then aggregating their component data to the DVRPC TAZ boundaries that they fell within. Once this was done, an initial summary data comparison could be made. Table 1 compares the characteristics of each scenario’s population and job projections, and also includes actual 2005 values for context.

Table 1: Comparison of Mercer County population and job estimates under six long-range forecasts for shared TAZs

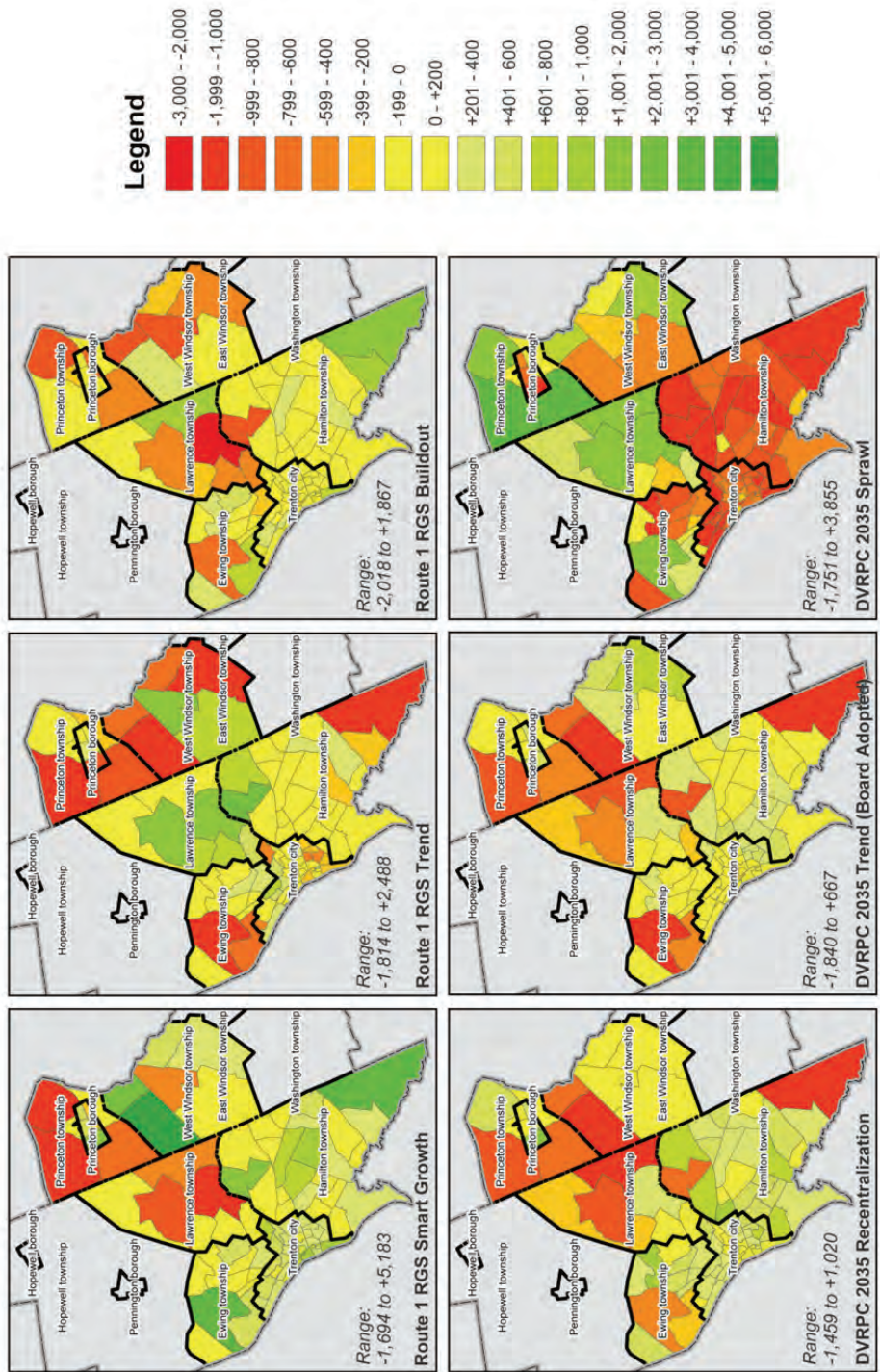
	2005 Actual	Rt 1 RGS Smart Growth	Rt 1 RGS Trend	Rt 1 RGS Buildout	DVRPC 2035 Recentralization	DVRPC 2035 Trend (Board Adopted)	DVRPC 2035 Sprawl
POPULATION							
Mean	3,331	3,969	3,647	3,599	3,794	3,631	3,182
Median	3,328	3,807	3,454	3,576	3,837	3,615	2,703
Standard Deviation	1550.5	1924.1	1847.3	1736.7	1776.9	1748.7	1994.5
Minimum	260	638	105	250	285	271	185
Maximum	8,772	11,510	10,960	9,129	9,388	9,126	10,973
Total	296,490	353,278	324,577	320,268	337,645	323,186	283,197
JOBS							
Mean	2,111	4,699	2,377	4,489	2,569	2,569	2,395
Median	1,360	1,445	1,306	2,776	1,591	1,467	1,362
Standard Deviation	2455.8	8950.5	3068.4	5640.4	2980.5	3188.2	3105.6
Minimum	23	23	147	23	24	24	17
Maximum	14,737	48,190	19,470	39,570	17,952	21,606	23,890
Total	187,883	418,169	211,580	399,522	228,657	228,618	213,198

Source: DVRPC 2009, NJDOT 2009

A number of interesting conclusions can be drawn from this data:

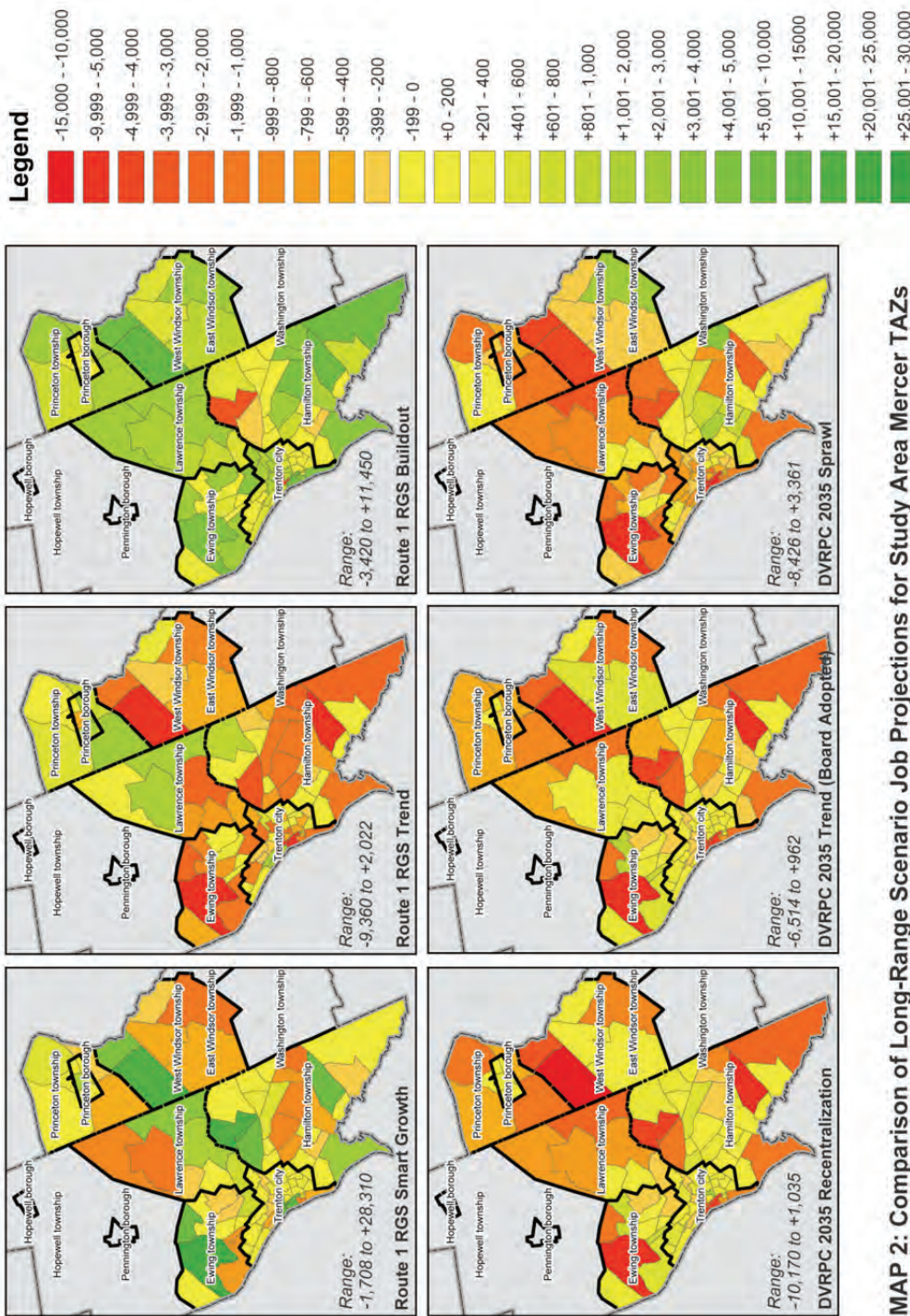
- ▶ Each scenario anticipates total population growth over 2005 of 10 to 20 percent, with the exception of the DVRPC sprawl scenario, which projects a small population loss. This is because significant portions of the RGS study area are identified as developed areas in the DVRPC model framework, and the sprawl scenario anticipates population shifts from developed to undeveloped places.
- ▶ There is less variability in the population projections than in the job projections with respect to the total projected population, mean population, and population ranges.
- ▶ These summary statistics are also fairly comparable across the job projections, with the exceptions of the Route 1 RGS buildout and smart-growth scenarios, which are fairly dramatic outliers (with roughly twice the job growth of the other scenarios).

The next step was to compare the scenarios' distribution of population and jobs across the study area. Maps 1 and 2 summarize the six scenarios' projections in each TAZ for population and jobs, respectively.



MAP 1: Comparison of Long-Range Scenario Population Projections for Study Area Mercer County TAZs

For "apples to apples" comparisons, the above images include Mercer County TAZs that fall within the Route 1 Regional Growth Strategy study area. Each map compares TAZ-level values for each respective scenario to the average values for all six scenarios. Red/orange TAZs reflect values that are lower than average, and green TAZs reflect values that are higher than average.



MAP 2: Comparison of Long-Range Scenario Job Projections for Study Area Mercer TAZs

For "apples to apples" comparisons, the above images include Mercer County TAZs that fall within the Route 1 Regional Growth Strategy study area. Each map compares TAZ-level values for each respective scenario to the average values for all six scenarios. Red/orange TAZs reflect values that are lower than average, and green TAZs reflect values that are higher than average.

In each scenario's projection, each TAZ is compared to a calculated average value for that TAZ across all six scenarios. This enables consistent visual comparisons across all scenarios, since they are each compared to the same baseline. Further, the same scale for color symbology is used across all six scenarios, which permits a visual identification of outlying values across the six scenarios. Red and orange shades represent TAZs with lower projected values than average, and green shades represent higher-than-average values. Yellow TAZs reflect projections that are

fairly close to average (+/- 200 persons or jobs). While these maps are complex and present a variety of interesting points of comparison, several points are worth noting from the perspective of this study:

- ▶ The clear visual outliers for each map are identical to those from the initial data comparison (Table 1). On the population side, DVRPC's sprawl scenario projects much lower than average growth for Trenton City and Hamilton Township (since the model considers them to be developed areas). Among the jobs projections, the Route 1 RGS buildout and smart-growth scenarios present dramatic outliers on the positive side—in the former case sprawling fairly evenly across the study area, and in the latter case concentrated heavily in a handful of targeted development centers.
- ▶ Apart from these obvious broad outliers, several TAZs present interesting points of comparison across both maps. Specifically, the Route 1 RGS smart-growth scenario anticipates significant population and job growth for development centers in eight TAZs:
 - **TAZ 1765 (Ewing Township):** Rt1RGS proposed Center Neighborhood V, West Trenton TOD
 - 31,101 projected job gain from 2005 (6,839 → 37,940)
 - 5,644 projected population gain from 2005 (3,236 → 8,880)
 - **TAZ 1032 (West Windsor Township):** Rt1RGS 3x proposed Alt. Transit Core I (University Square, Canal Pointe, General Growth Site); Alt. Core II (Carnegie Center); Transit Core (Princeton Junction); 2x SUD Commercial (Nassau Park, Quaker Bridge & Mercer Malls)
 - 41,495 projected job gain from 2005 (4,745 → 46,240)
 - 10,657 projected population gain from 2005 (853 → 11,510)
 - **TAZ 1006 (Hamilton Township):** Rt1RGS proposed Transit Core (Hamilton Station)
 - 21,500 projected job gain from 2005 (2,040 → 23,540)
 - 2,297 projected population gain from 2005 (2,629 → 4,926)
 - **TAZ 1010 and 1755 (Hamilton Township; combined here since they share a proposed center):** Rt1RGS proposed Main Street Core (Hamilton Marketplace)
 - 18,987 (combined) projected job gain from 2005 (3,452 → 22,439)
 - 5,333 (combined) projected population gain from 2005 (6,201 → 11,534)
 - **TAZ 987, 988, and 1742 (downtown Trenton; combined here since they share a proposed center):** Rt1RGS proposed Urban CBD (Trenton)
 - 69,506 (combined) projected job gain from 2005 (22,874 → 92,380)
 - 3,354 (combined) projected population gain from 2005 (4,040 → 7,394)

- ▶ The two sets of trend scenarios (Rt1RGS and DVRPC) are reasonably consistent with one another compared to the other scenarios.

Recommendations

Based on the data and map comparison summarized above, we suggest the following strategies for projections to be used in the Long-Range Strategic Bus Plan:

Smart-growth scenario: Within the Route 1 corridor, use the Rt1RGS smart-growth dataset modified for reduced job growth. Outside the Route 1 corridor, use DVRPC's recentralization dataset.

- ▶ For Mercer TAZs within the Route 1 RGS study area, we propose to use the Route 1 RGS "smart-growth vision" dataset. This dataset has the benefit of significant municipal input on the desired locations for new development centers. We propose to accept the population projections as is; however, to mitigate the impacts of the enormous job gains anticipated for certain development centers (detailed above), for the purposes of our project, we propose to reduce the expected job numbers by some percentage. We would welcome feedback from other project participants on this issue, but two initial possibilities present themselves:
 - Reduce projected job gains in each of the above "outlier" TAZs by a fixed percentage; we recommend 40 percent as an appropriate number. This reduction would still leave each of these TAZs as a significant job center, but would reduce total job growth in the Rt1RGS study area by roughly 73,000. Total job growth under the smart-growth scenario would still be much higher than under the trend scenario (see Table 1), but less so.
 - Reduce projected job gains countywide by a fixed percentage (such as 50 to 75 percent), and reduce the gains in each TAZ by the same percentage. This would retain the smart-growth vision's distribution of growth across the county, but would bring total growth closer in line with that expected under the trend scenario. Reducing total job growth by 75 percent (i.e., gains from 2005 of roughly 68,000 for the Route 1 RGS study area rather than 231,000) would bring total jobs for the study area to roughly 250,000, which compares to 230,000 for the DVRPC trend scenario.
- ▶ For Mercer TAZs outside the Route 1 RGS study area, we propose to use values from DVRPC's recentralization scenario. Although none of the DVRPC scenarios match very closely with the Rt1RGS smart-growth vision, Maps 1 and 2 indicate that the recentralization scenario comes closest, with the largest differences being generally limited to the RGS "outlier" TAZs/centers (summarized above). Further, the DVRPC recentralization scenario is the most similar in concept to the Rt1RGS smart-growth vision in that it anticipates limited growth outside of existing or planned centers of place.
- ▶ For TAZs from the NJTPA region that may need to be included for modeling purposes, we propose to use values from NJTPA's 2035 "aspirational" scenario.

Trend scenario: Use DVRPC Board-adopted 2035 forecasts.

- ▶ For all Mercer County TAZs, we propose to use DVRPC's trend scenario (our Board-adopted forecasts). This dataset is not dramatically different from the Route 1 RGS trend dataset, and has the benefit of being a clean, consistent countywide dataset. DVRPC's trend numbers have been county vetted through our long-range planning and Board adoption processes.
- ▶ For TAZs from the NJTPA region that may need to be included for modeling purposes, we propose to use values from NJTPA's 2035 "baseline" scenario (which is NJTPA's trend scenario).

Appendix B



Details on Feedback from Stakeholder Workshop

Summary of written feedback received

April 12, 2010

NOTE: Notations such as “(x2)” or “(x3)” indicate written comments that were received from multiple participants.

Question 1: Do the proposed bus routings and network effectively serve: existing development; the development anticipated under our scenarios, and; the locations where you think development is most likely to occur? Are there missing links that should be more effectively served?

- ▶ Robbinsville Town Centre (underused or underserved)
- ▶ Robbinsville – Hightstown
- ▶ Haven't asked for dense/mixed-use to make service more efficient
- ▶ Better link residential areas to employment
- ▶ Bus service to Bucks County
- ▶ Hopewell – West Trenton Station – Trenton
- ▶ Connections to proposed Belle Meade Train Station (from Princeton)
- ▶ Connections between Princeton and Hopewell Borough, Pennington Borough, and Capital Health
- ▶ Connections between Princeton and Quaker Bridge Mall, new Princeton Hospital, and Hightstown
- ▶ Strong links to Hopewell: from 31 (x2), between PT./Rocky Hill
- ▶ Link 2025 West Windsor BRT route to Mercer County College
- ▶ Link to North Brunswick
- ▶ Pennington – Hopewell – Princeton
- ▶ US 1 corridor into South Brunswick and North Brunswick
- ▶ Service to feed into West Trenton extension at Hopewell, Montgomery, and West Trenton
- ▶ Use existing resources to convert local buses as feeder routes for BRT

- ▶ Have 2015 BRT stop at Hamilton Station (x3)
- ▶ Important to implement NJ TRANSIT near-term BRT investments ASAP; specifically, higher levels of service along US 1 (x2).
- ▶ Former “wheels” community shuttle should be expanded to all-day service
- ▶ Hard to get east-west; could be a need met by shuttles
- ▶ 206 – Quaker Bridge Mall without going into Princeton; loop around mall
- ▶ Need local route along Spruce Street in Lawrence – Ewing – Trenton
- ▶ Princeton Pike
- ▶ Hightstown – Robbinsville US 130 (x3)
- ▶ Need to serve over-55 developments and apartments (Old Trenton Road)
- ▶ East-west (Route 571) is critical
- ▶ Princeton Pike Corporate Center – needs local access
- ▶ Route 571 to Mercer County Community College
- ▶ Scotch Road – Merrill Lynch/Capital Health
- ▶ Include Princeton Forrestal Center as an employment center
- ▶ New Capital Health location in Hopewell
- ▶ Main Core BRT Transitway – As currently underway, planning should continue for BRT-quality service from the Junction Station to Nassau Street and a local service loop along Harrison Street with stops opposite Pine Street and then on Harrison opposite Spruce Circle to the Princeton Shopping Center, coming back via Witherspoon Street. Stops on the way would be at Princeton Township Hall, the current Hospital site, the Arts Council, Palmer Square, the University Arts District, and Faculty Road. Eventually additional stops might be created in the vicinity of Canal Pointe Boulevard and on the Penns Neck side of US 1. Frequent 10-minute service would be provided at peak periods.
- ▶ New Route 655 – Establish the new 655 BRT route from Princeton Shopping Center via Witherspoon Street through downtown Princeton, then on the dedicated BRT transitway to the Junction, to the new Hospital site, and to the Plainsboro Town Center loop. Add an alternative leg to Forrestal Village and Princeton Landing.
- ▶ New Route 651 – Establish the new 651 BRT route from Burlington/Bordentown via I-295 through Carnegie Center to the Junction Station, then via the BRT transitway into downtown Princeton, Nassau Street, Harrison Street, and the Princeton Shopping Center.
- ▶ Future BRT Service:
 - Consider future BRT service from the Junction via the BRT transitway up to Nassau Street, then left via Stockton Street to Elm Road, the Great Road, out to

Blawenburg and Skillman to the new Belle Meade Train Station on the reactivated West Trenton line.

- Consider legs of this service branching off at Rosedale Road to ETS and Hopewell.
- We have not as yet considered BRT connections beyond Plainsboro to Cranbury, Rossmore, Jamesburg, and South Brunswick.

Question 2: Are there routes that will warrant higher levels of service than other routes, or notably higher levels of service than they have today? Are there other routes that will become less important than they are today?

- ▶ Services to “hubs” should become more important
- ▶ NJT Route 606 (Trenton-Princeton) deserves “BRT like service”
- ▶ 656: links from turnpike
- ▶ BRT along US 1 corridor link to New Brunswick
- ▶ 650/657 to implemented immediately
- ▶ Recommendation of private contractors to meet demands of the routes; this will enable more flexibility
- ▶ Princeton Pike should be a local access route to connect to train station; extend to Princeton. Another route – on I-295 to Hamilton Station
- ▶ CR 571
- ▶ New development along Clarksville in West Windsor
- ▶ Improve service on NJT Route 600, including higher levels of night service (x2)
- ▶ BRT “starter routes” (650s)
- ▶ US Coach northbound from Princeton – Besides through passengers to New York City, this private bus line provides drop off and pick up between Princeton, Kingston, Kendall Park, and New Brunswick.
- ▶ 605 – As the Regional BRT System develops, the 605 should be integrated into it, so that after it reaches University Place it continues on the new BRT dedicated transitway as far as Canal Pointe Boulevard where it turns off to the right and continues down to stops at the University Finance Office Building, Marketfair, Seminary Apartments, across a new bridge over Duck Pond Run, around Nassau Park, across to Mercer Mall, and finally to Quaker Bridge Mall and its adjacent residential area.

Question 3: What other “big possibilities” do you think the plan should consider that could have significant impacts on future transit service patterns and usage (i.e., fuel prices, development trends, economic trends, etc.)?

- ▶ Pricing state employee parking in Trenton and other areas (coordinated with TDM)
- ▶ Regionwide TRO
- ▶ Add another track to the ROW of the Northeast Corridor
- ▶ Use NJ TRANSIT’s Bus Density Tool
- ▶ West Trenton Line extension, coordinated with land use (x2); dual mode
- ▶ Frequent peak-period (commuter) service from West Trenton Station to/from Downtown Trenton and Trenton Station (on the south) and Hopewell (on the north). This would get people to think about what the West Trenton Line could do and serve.
- ▶ Remote parking needed: Princeton/Mercer Airport? Princeton Shopping Center? Capital Health?
- ▶ Shoulder improvements to US 1
- ▶ Better bike/ped integration with transit (x2)
- ▶ Development of routes should take into consideration individual needs regarding work and recreation
- ▶ How do the future buses combine with “local” shuttle service? Lawrence needs shuttles
- ▶ Bus routes now should go every 30 minutes or 15 would be best – add displays at stops to tell people when the bus will come
- ▶ Bus shelters at every stop – now
- ▶ Shuttles should have posted routes
- ▶ Park/ride/community-shared seats on shuttles
- ▶ Hard to get east-west; could be a need met by shuttles
- ▶ A central clearinghouse for countywide transit information on fixed-route and paratransit/demand responsive services that exist throughout Mercer County and surrounding areas—in high-activity centers. Consider providing real-time information of bus running times at major stops
- ▶ Better coordinate demand-response/paratransit/JARC services at county boundaries
- ▶ West Trenton Line: up and running soon!
- ▶ BRT amenities: better shelters, better signage, real-time information, high visibility/branding, and extra amenities, such as free wi-fi

- ▶ Enhance connections and facilities at hubs where multiple bus routes converge, or where bus routes meet rail stations
- ▶ Need a way to effectively serve the larger number of age-restricted developments currently existing, under development, and planned (“shared-use agreement” to share resources?)
- ▶ Transit Signal Priority (TSP) for BRT should be compatible with emergency vehicle preemption

List of workshop attendees

Barry Ableman, Principal Planner, NJ Department of Community Affairs, Office of Smart Growth
 Kristin Appelget, Director, Princeton University Community & Regional Affairs
 Dianne Brake, President, Plan Smart NJ
 Sandra Brillhart, Executive Director, Greater Mercer TMA
 Patrick Cacacie, United Way of Greater Mercer County
 Beth Carey, ARC Mercer
 Martin Denero, Director, Mercer County TRADE
 Steve Fittante, Director, Middlesex County Transportation Department
 Tony Gambilonghi, Supervising Planner for Transportation, Middlesex County Dept. of Planning
 Basil Giletto, Mercer Regional Chamber of Commerce (MRCC)
 Danielle Graves, Principal Engineer, NJ Dept. of Transportation, Bureau of Statewide Planning
 James Hess, AECOM Transportation
 Karen Jezierny, Director of Public Affairs, Princeton University
 Cheryl Kastrenakes, Transportation Planner, Greater Mercer TMA
 Ron Kohn, Coach USA
 Richard Krawczun, Municipal Manager, Lawrence Township
 Anton Lahnston, Head of Traffic and Transportation Committee, Princeton Borough
 Walter Lane, Principal Planner, Somerset County Planning Division
 Matthew Lawson, Transportation Planner, Mercer County Planning Department
 Carl Lindbloom, Hopewell Borough Municipal Planner, Borough of Hopewell
 Otilie Lucas, Mercer County Trade Advisory Council
 Tom Marchwinski, Director of Systems Planning, NJ TRANSIT
 Donald Mayer-Brown, Assistant Engineer, Princeton Borough
 Bernard Miller, Mayor, Princeton Township
 Pam Mount, Fmr. Councilperson, Lawrence Township
 Martin Newell, ARC Mercer
 James Parvese, Lawrence Township Engineer, Lawrence Township
 Tushar Patel, Senior Project Manager, URS Corporation
 Erica Pennacchi, Mercer County Office on Aging
 James Purcell, Task Force Chair, Lawrence Township
 Marvin Reed, Chairman - Master Plan Committee, Princeton Regional Planning Board
 Carmella Roberts, Hightstown Engineer, Roberts Engineering Group, LLC
 Walter Schmidlin, Sarnoff Corporation
 Natalie Shivers, Princeton University

Anthony Soriano, Engineering Assistant, Princeton Township
Mildred Trotman, Mayor, Princeton Borough
Les Varga, Director, Plainsboro Township Planning and Zoning
George Ververides, Director, Middlesex County Department of Planning
Mike Viscardi, NJ TRANSIT
Patricia Ward, Director, Community Development, West Windsor Township
Jeffrey Wilkerson, Plan Smart NJ

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Key Words: NJ TRANSIT, Mercer County, Route 1, US 1, Bus Rapid Transit, BRT, Buses, Transit, Scenario Planning, TOD

Abstract: The purpose of this project was to gather, inventory, and analyze all the thinking on future bus routes, networks, and operating patterns in Mercer County that has already been done, and consider the degree to which the services envisioned meet the needs of current and forecast county residents and workers under a series of long-range growth scenarios. Following an evaluation of policy considerations, US Census journey-to-work data, passenger survey data, ridership estimates, and significant stakeholder outreach, this plan suggests 10 bus routes as an early-action implementation phase. The shared vision articulated here for the future of bus service in Mercer County is intended as a roadmap for future investments to be made in a coordinated way.

Staff Contact:

Gregory R. Krykewycz, PP, AICP
Senior Transportation Planner
☎ (215) 238-2945
✉ gkrykewycz@dvrpc.org

Delaware Valley Regional Planning Commission
190 N. Independence Mall West, 8th Floor
Philadelphia PA 19106
Phone: (215) 592-1800
Fax: (215) 592-9125
Internet: www.dvrpc.org



190 N Independence Mall West
8th Floor
Philadelphia, PA 19106
215-592-1800
www.dvrpc.org

