



# **ROUTES 55 / 42 / 676 BUS RAPID TRANSIT**

## **LOCALLY PREFERRED ALTERNATIVE**

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**April, 2012**

## **1 INTRODUCTION**

The need for transit service improvements in the Routes 42/55/676 corridor was identified during the “Southern New Jersey to Philadelphia Mass Transit Expansion Alternatives Analysis”<sup>1</sup>, conducted by the Delaware River Port Authority (DRPA) that concluded in the fall of 2009. That work identified and evaluated five options for improving transit in the area south and east of the City of Camden. The preferred alternative was light rail transit (LRT) service from the Town of Glassboro, Gloucester County, to the City of Camden, Camden County, and is now being advanced by DRPA as the “Glassboro-Camden Line”. The study also identified a need for Bus Rapid Transit (BRT) on portions of the Atlantic City Expressway (ACE), NJ Routes 42 and 55 and Interstates 76 and 676. That concept provided the foundation for an Alternatives Analysis for transit improvements in the Routes 55 /42/ 676 corridor.

As a result, New Jersey Transit Corporation (NJ TRANSIT) as the Project Sponsor has studied alternative transit services to address the need for improved transit mobility in the corridor by expanding and extending transit service, increasing transit speeds and service frequencies through capital and operating improvements, and expanding access through additional park-ride facilities. NJ TRANSIT may apply for federal funds administered by the Federal Transit Administration (FTA).

## **2 THE ROUTES 55/42/676 ALTERNATIVES ANALYSIS**

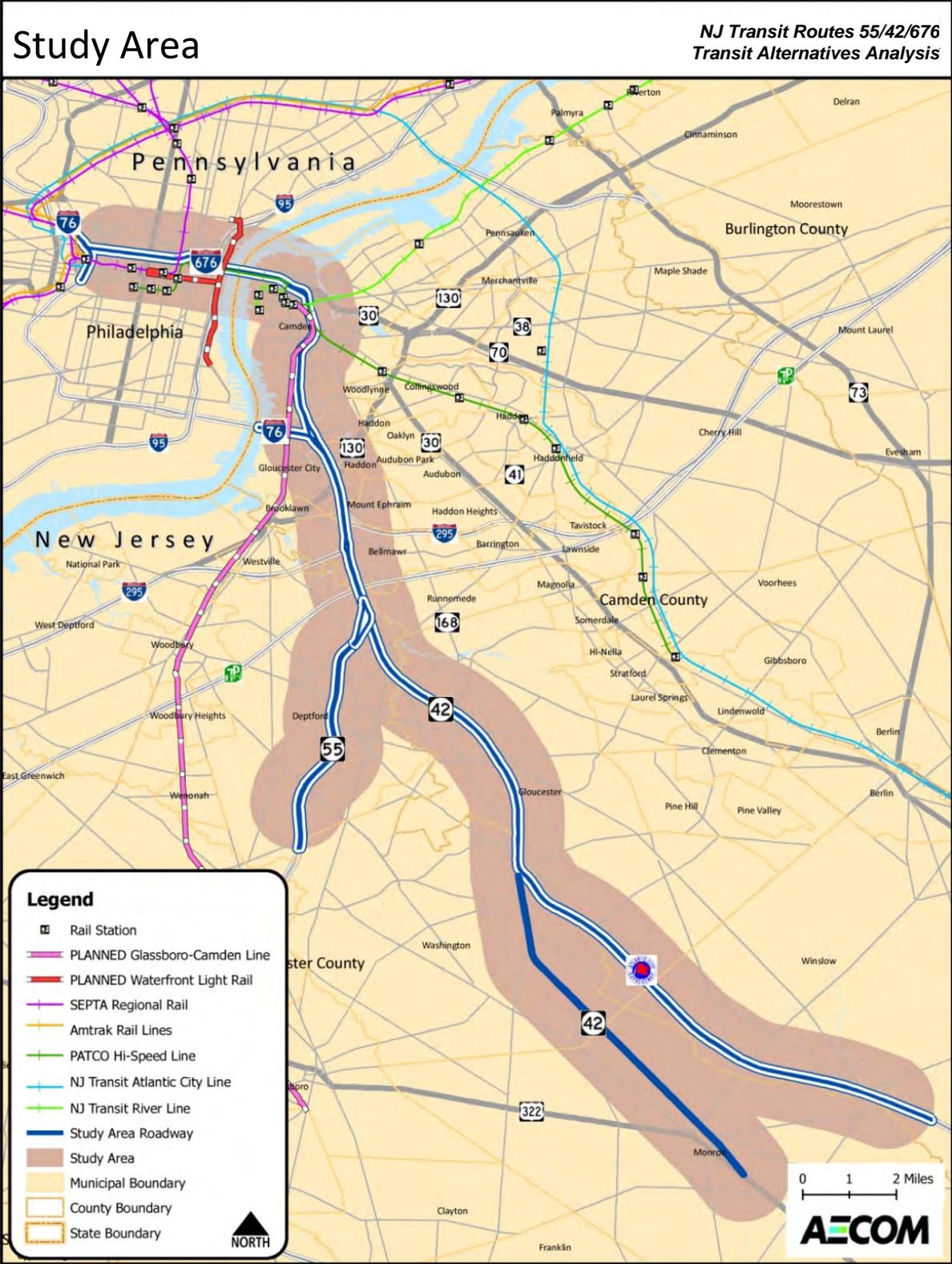
The Routes 55/42/676 Alternatives Analysis was initiated in February, 2010. The Study Area is shown in Figure 1, and encompasses communities within Camden County and Gloucester County, New Jersey, primarily along and near NJ Route 55, NJ Route 42 and the Atlantic City Expressway (ACE); communities along and near Interstates 76 and 676 including the City of Camden; and, within Philadelphia, the Center City and University City areas. The evaluation process considered physical design and operating plans, costs, benefits, operational effects, and potential environmental impacts for a range of alternatives that could address the transportation and mobility needs of the corridor.

The evaluation of alternatives and recommendation of the LPA included participation of the public, elected officials and interested parties. A Technical Advisory Committee (TAC) was established to

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<sup>1</sup> Southern New Jersey to Philadelphia mass Transit Expansion Alternative Analysis Study, Final Report, October 2009, Delaware River Port Authority, prepared by STV Incorporated.

Figure 1: Study Area Map



facilitate coordination with interested stakeholders, including representatives of relevant city, county and state agencies. Four TAC meetings and three public open houses were held during the AA. Each phase of the process was described during these meetings and open houses, and input was solicited and incorporated into the evaluation. A project web site was established to disseminate information and receive public input.

The purpose of the AA was to identify the alternative that best met the goals established for the Analysis, and to select and advance that alternative as the LPA. The goals and objectives of the AA were to:

- **Enhance mobility options for travel to/from the Routes 55/42/676 corridor to/from Center City and University City, Philadelphia and the City of Camden, and to/from other activity centers in the study area.**

Objectives:

- Provide attractive, competitive and reliable bus transit alternatives to congested highway travel.
- Increase bus transit speeds in the corridor.
- Improve the image, value and awareness of bus transit.
- Reduce reliance on single-occupant-vehicle (SOV) travel.
- Seek cost-effective solutions that attract new riders to the bus transit system in addition to better serving current bus riders.
- Improve access to the bus system.
- Provide improved access to jobs and other opportunities for transit dependent travelers.
- Increase accessibility to major activity centers for all users (residents, employees, students, visitors and shoppers).
- Mitigate the rate of growth in regional traffic congestion.
- Make accommodations for bus transit improvements in highway projects.

- **Minimize environmental impacts.**

Objectives:

- Maximize the possible use of existing transportation right-of-way (ROW).
- .Improve regional air quality.
- Reduce energy consumption.
- Avoid adverse effects to farmland, historic, archaeological and natural resources.
- Minimize adverse impacts on existing neighborhoods and communities.

- **Stimulate and support economic growth.**

Objectives:

- Support state, regional and community smart growth initiatives and policies including the New Jersey State Development and Redevelopment Plan.
- Encourage sustainable development and land use patterns, including transit-oriented development.
- Plan development and redevelopment in concert with transportation investments.

These goals and objectives were presented at an initial TAC meeting and at an initial public open house.

## **Long List of Alternatives**

The alternatives that were developed and evaluated for this corridor ranged from the most capital intensive – PATCO-like commuter rail – to much less costly bus-based and Bus Rapid Transit (BRT) alternatives. The AA built upon prior studies conducted by the Delaware River Port Authority (DRPA), specifically the “Southern New Jersey to Philadelphia Mass Transit Expansion Alternatives Analysis”. That study evaluated the feasibility and effectiveness of commuter rail in the Routes 55/42/676 corridor. It was found that the costs, physical impacts, and potential ridership were such that commuter rail would not be an appropriate alternative for the corridor. In addition an analysis of light rail options was conducted during the AA. It was concluded that light rail would not be an appropriate technology for the setting of this corridor, given the significant environmental and community impacts as well as the overall investment cost for the service. Consequently the AA focused on Bus Rapid Transit (BRT) alternatives as the most likely solution for the corridor.

An initial “Long List” of alternatives was developed that included a Transportation Systems Management (TSM) Alternative, as required by the FTA AA process. Other alternatives included a variety of BRT operating plans and routes, highway and park-ride support infrastructure, and attendant technologies that would provide advanced BRT service from the vicinity of the Avandale Park-Ride, located at the interchange of the Atlantic City Expressway (ACE) with Williamstown Road in Winslow Township, to Downtown Camden and Center City Philadelphia; and from the vicinity of the interchange of NJ Route 55 with Delsea Drive (NJ Route 47) in Deptford Township to Downtown Camden and Center City Philadelphia. The Long List of Alternatives was presented at a TAC meeting and at a public open house.

## **Short List of Alternatives**

The refined Long List was narrowed based on the ability of each alternative to meet the project’s goals. If an alternative did not at least partially meet all three project goals, it was eliminated from consideration. This analysis narrowed the range of options: From an initial 22 park-ride sites a total of nine were advanced, at locations along the Atlantic City Expressway, the NJ Route 42 Freeway, the arterial segment of NJ Route 42, and along NJ Route 55. Alternative BRT services were defined to link the identified park-ride sites to Downtown Camden and Center City Philadelphia. Supporting highway infrastructure was focused on shoulder-based bus guideway along the NJ Route 42 Freeway and NJ Route 55. Bus-on-shoulder operations were limited to northbound during the morning peak period only.

An intermediate list of five Short-List Alternatives was developed, consisting of the following combinations of BRT service, park-ride locations and supporting highway corridors:

- Alternative 1: BRT service from Avandale to Philadelphia via ACE and Route 42 Freeway
- Alternative 2: BRT service from Avandale to Philadelphia via ACE and Route 42 Freeway and from Avandale to Philadelphia via Route 42 Arterial and Freeway
- Alternative 3: BRT service from Avandale to Philadelphia via ACE and Route 42 Freeway and from Avandale to Philadelphia via Route 42 Arterial and Freeway; BRT service from Delsea Drive to Philadelphia via Route 55

- Alternative 4 BRT service from Avandale to Philadelphia via Route 42 Arterial and Freeway
- Alternative 5 BRT service from Avandale to Philadelphia via ACE and Route 42 Freeway and from Delsea Drive to Philadelphia via Route 55

Further evaluation of these alternatives was based on preliminary draft ridership estimates that were prepared using a travel forecast model. The objective of this winnowing was to reduce the number of alternatives that would be advanced to detailed evaluation from five to two. Several key observations were made:

- Alternative 3 contained the full set of BRT component corridors, including use of the ACE/NJ Route 42 Freeway, the NJ Route 42 Arterial, and NJ Route 55. It also attracted the most riders.
- Comparing Alternatives 2 and 3, the ridership on NJ Route 42 Arterial and the ACE / NJ Route 42 Freeway were similar, but adding Route 55 service (Alternate 3) added a significant number of riders. This was similar to the number of Route 55 riders in Alternative 5, indicating that Route 55 ridership levels are not strongly related to the amount of service on the NJ Route 42 Freeway or Arterial. BRT Service on Route 55 is an important component.
- Comparing Alternatives 1 and 2 indicated that service on both the NJ Route 42 Arterial and the NJ Route 42 Freeway together yields essentially the same ridership as would service on the NJ Route 42 Freeway alone. Riders using the Arterial service can shift to the Freeway service.
- Alternative 5 would attract the second highest ridership even though it does not include the NJ Route 42 Arterial service.

Based on this assessment it was concluded that Alternative 3 (service on the ACE/NJ Route 42 Freeway, NJ Route 42 Arterial, and NJ Route 55); and Alternative 5 (NJ Route 42 Freeway and NJ Route 55) should be advanced to detailed evaluation.

As the detailed evaluation of these Short-List Alternatives proceeded, an additional alternative was developed that was a subset of Alternatives 3 and 5. Identified as “Alternative 6”, this third short-list alternative was designed to have lower infrastructure costs while still serving the corridor’s needs. Seeking to reduce capital investment while minimizing impacts on ridership, it involved shortening the length of shoulder bus guideway, and reducing the number and size of park-rides and stations.

As with the Long List, the Short List included, per the FTA AA process requirements, a Transportation System Management (TSM) option that would attempt to meet the same goals as the above Alternatives but with minimal capital investment in infrastructure. The resulting short list of alternatives was presented at a TAC meeting and public open house.

## **Selection of the Locally Preferred Alternative**

Each of the Short List Alternatives was evaluated in detail, considering its consistency with the project's goals and with the objectives established for each goal (see above). The alternatives were compared to identify the alternative that best met each of the goals and objectives.

### **Alternative 3: NJ Route 42 Freeway and Arterial, NJ Route 55**

Alternative 3 was the most extensive of the BRT alternatives. It featured four coordinated BRT bus routes, seven new or expanded park-rides, and a shoulder bus guideway on the northbound NJ Route 42, from the vicinity of the College Drive interchange to just south of the junction of NJ Route 42 with NJ Route 55. Reflecting this service extent, Alternative 3 was estimated to attract the highest ridership of the alternatives, but also at the highest capital and operating cost..

### **Alternative 5: NJ Route 42 Freeway and NJ Route 55**

Alternative 5 was a subset of Alternative 3: The arterial service that was proposed in Alternative 3 was dropped in this Alternative, and in exchange BRT service along the Atlantic City Expressway and NJ Route 42 was strengthened with more frequent service. Also, in Alternative 3 BRT service was proposed to originate at a northern park-ride (Leaf Avenue). This service variation was dropped in Alternative 5 due to low ridership levels that did not justify the cost of providing the service. The capital and operating costs of this alternative were not as high as Alternative 3, but like Alternative 3 were still high relative the number of projected riders.

### **Alternative 6: Modified NJ Route 42 Freeway and NJ Route 55**

While Alternatives 3 and 5 provided high quality BRT service to the Routes 55/42/676 corridor, assessment of the alternatives' performance relative to anticipated funding sources led to a desire to develop and test an alternative with lower infrastructure costs that could still serve the corridor's mobility needs. As a result Alternative 6 features a shortened shoulder bus guideway (to about three miles), elimination and reduction in size of park-rides and carefully targeted BRT service adjustments.

### **TSM Alternative**

The TSM Alternative represents the best that can be done to improve mobility without a substantial investment in new infrastructure, such as no substantial investment in running ways. It does include enhancements to existing bus service, and also includes new or expanded park-ride facilities to insure access to the transit system is consistent with that offered by the Build alternatives. The TSM alternative as defined resulted in costs that were substantially lower than the other alternatives, but estimated ridership levels were substantially lower as well. The TSM alternative does not address the mobility goals of the project as well as do the other alternatives.

Figure 2 compares the capital costs (for rolling stock, highway infrastructure, park-rides and stations and technology) of each alternative with the estimated daily ridership for each alternative. It is clear from this diagram that Alternative 6 has the lowest capital cost (\$46 million) while attracting a level of

ridership (6,400 persons per day) that is comparable to the more costly alternatives. Alternative 6 also attracts substantially more riders than the TSM Alternative, and at lower cost.

Based on the findings of the evaluation, Alternative 6 was recommended as the Locally Preferred Alternative.

The results of this analysis were presented to the TAC and at a public open house. Local support was offered by both the public and TAC members. The project team believes that, given the extensive public outreach during the entire AA process, all issues of concern to the public have been aired and addressed as appropriate.

**Figure 2: Comparison of Capital Costs and Ridership**



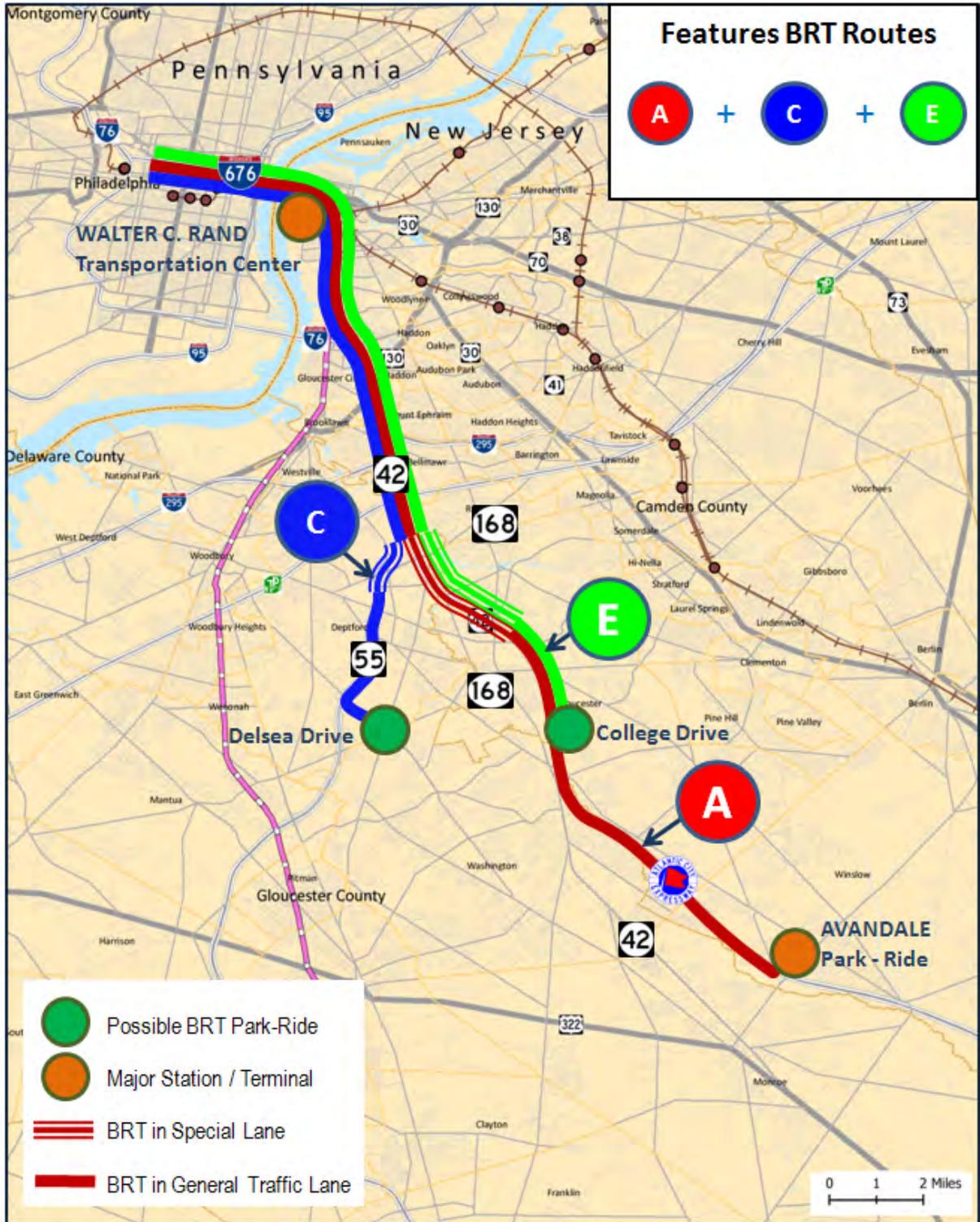
## THE LOCALLY PREFERRED ALTERNATIVE

Key features of the Locally Preferred Alternative include (See Figure 3):

- **Park-ride and highway infrastructure**
  - Expanded Avandale park-ride, and new park-rides at College Drive and Delsea Drive, with 1800± new parking spaces
  - A three-mile section of improved shoulder guideway for buses on NJ Route 42 northbound
  - Transit Signal Priority (TSP) in Downtown Camden and Center City Philadelphia
- **Bus Rapid Transit (BRT) elements**
  - Off-board fare collection and “Next Bus” displays
  - Enhanced shelters and stops at New Jersey park-rides and in Center City, Philadelphia
  - Purchase of additional BRT-type buses
  - Use of branding to provide a BRT identity
- **BRT Service Plan**
  - Peak hour service frequency will be 10-15 minutes or better, depending on location
  - Existing NJTRANSIT Route 551 will remain in place, stopping at Avandale and Camden

Preliminary estimates of the capital costs of the LPA, including roadway infrastructure, parking lots / stations and rolling stock, were approximately \$46.4 million. The annual operating and maintenance (O&M) cost was preliminarily estimated to be about \$6.1 million for the BRT vehicles and park-rides / stations. Revenue offsets are not included in this amount.

Figure 3: The Locally Preferred Alternative



Project funding is anticipated to come from a variety of sources. The AA described in this report was performed consistent with FTA regulations, and NJ TRANSIT may apply to the FTA for funding. Additional funds may be generated from other public and private sources. Other discretionary grant programs, local or State provision of matching funds, and opportunities for private participation will be investigated.

Selection of the LPA was based on a comparative evaluation of Bus Rapid Transit alternatives with respect to physical, operating, social, economic and environmental criteria. Positive features of the LPA included:

- The LPA strategically addresses the greatest needs in the corridor: The limited supply of existing park-ride spaces will be augmented by 1,800± new spaces. The proposed shoulder guideway on NJ Route 42 will allow buses to bypass slowed or stopped traffic in the most congested sections of the corridor.
- Roadway infrastructure improvements can be constructed almost entirely within the existing right-of-way of NJ Route 42. Park-ride construction will require acquisition of new right-of-way.
- The LPA is consistent with statewide “Smart Growth” policies and programs. Park-rides and stations are located in areas that are also planned for development, thereby enhancing the transportation – land use connection at the critical nodes.
- Improved service to Downtown Camden and to Center City Philadelphia will be provided from the NJ Route 42 and NJ Route 55 corridors, increasing the opportunities for more convenient connections to areas of Philadelphia not currently directly served by NJ TRANSIT.