

A Geographic Evaluation of Gloucester County Commuter Rail Corridor Options



Executive Summary
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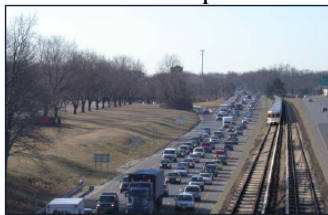
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Executive Summary*

Introduction

This analysis examines and compares the geographic characteristics of the commuter transit alternatives currently proposed for Southern New Jersey. The Delaware River Port Authority (DRPA) has proposed three alternative routes for a future commuter rail system: NJ-1 utilizing the Route 42 median to Williamstown, NJ-2 utilizing the Route 55 median to Glassboro, and NJ-3 utilizing the existing Conrail rail line corridor to Glassboro. In addition to these high-speed *heavy rail* options proposed by the DRPA, this analysis also examines a fourth option (designated NJ-3b) which also utilizes the Conrail corridor but employs a *light rail* system as an extension of the Trenton to Camden River Line. This fourth option was added to the study in order to illustrate a number of substantial cost and benefit advantages of a *light rail* over a *heavy rail* PATCO type train. The DRPA originally considered connecting the River Line but abandoned this option at an earlier phase of their study. This analysis supports reconsideration of that option.

Four evaluated options



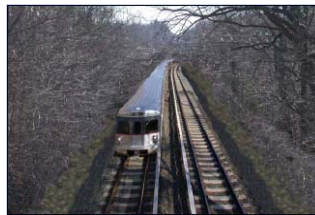
DRPA

NJ-1 (RT 42)



DRPA

NJ-2 (RT 55)



DRPA

NJ-3 (Conrail – PATCO)



NJ-3b (Conrail Riverline)

Methods

The study provides a detailed examination of the geographic context of each proposed commuter rail option focusing on locational factors. Utilizing Geographic Information Systems (GIS) modeling techniques, the study measures the road network distance from each proposed rail line station to each residence within the Gloucester County/southern Camden County region. Figures 1a and 1b demonstrate the analysis for two selected stations that exemplify the substantial locational differences between a Conrail corridor-based route (NJ-3 and NJ-3b) and a highway corridor-based route (NJ-1 and NJ-2). Residential accessibility was evaluated at three distances including: 1) walking distance (1/2 mile), 2) biking distance (1 mile) and 3) kiss-n-ride distance (2 miles). These distances represent the geographic likelihood for the proposed rail options to reduce automobile traffic. Walking distance (1/2 mile) is the most significant factor. Distances beyond 2 miles (“park-n-ride” only distances) were also measured but do not reduce automobile trip generation because users must first drive and then park in order to use the system.

* This executive summary is an excerpt from a larger technical report which is available from Dr. John Hasse via e-mail request hasse@rowan.edu

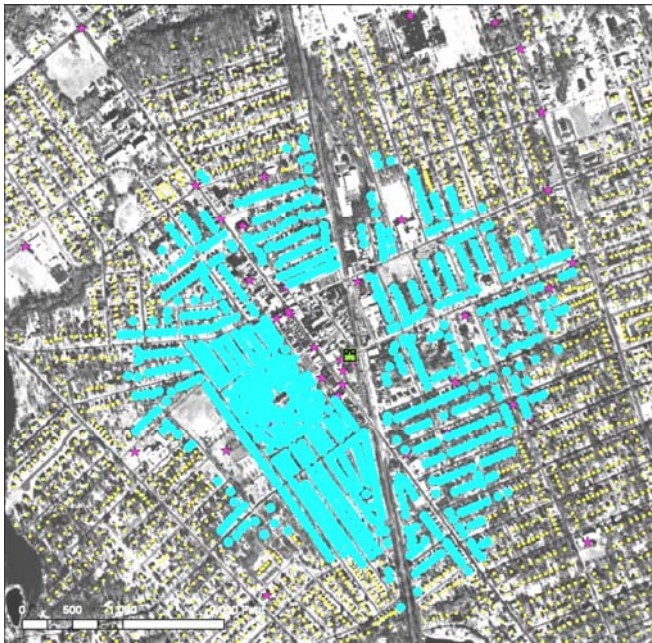


Figure 1a. NJ-3 Pitman station



Figure 1b. NJ-1 Williamstown Station

Geographic Analysis of Pedestrian Accessibility- this study measured the travel distance from each proposed train station (green) to each housing unit (yellow) as well as a set of destinations (purple). Housing units within walkable accessibility (1/2 mile) are highlighted in blue. The graphics demonstrate the locational advantages of a Conrail corridor-based system (NJ-3 and NJ-3b) over a highway-based system (NJ-1 and NJ-2) for providing significantly greater residential access to the proposed commuter line.

Study Results

Pedestrian Accessibility

The results demonstrate that the routes evaluated have significantly different accessibility characteristics indicating different prospects for success. Figure 2a depicts the number of residents with walking access to each proposed corridor. The weakest performing corridor for residential accessibility is the RT 55 option (NJ-2) which has pedestrian accessibility to 2,491 residents (1.0% of Gloucester County's population). The second weakest performing route for residential accessibility is the RT 42 option (NJ-1) which has pedestrian accessibility to 5,211 residents (2% of Gloucester County's population[†]). The Conrail *heavy rail* PATCO option (NJ-3) performed significantly better with pedestrian accessibility to 17,876 residents (7.0% of Gloucester County population) whereas the Conrail *light-rail* Riverline extension was the best performing with pedestrian accessibility to 25,739 residents (10.1% of Gloucester County population). Walking accessibility is a major factor in commuter rail success. The Conrail corridor (NJ-3 and NJ-3b) provides substantially better access to walk-on riders than either the RT 42 (NJ-1) or RT 55 (NJ-2) options because the Conrail corridor serves the concentrated settlements of Gloucester County. Accessibility for biking (1-mile) and kiss-n-ride (2-mile) were also measured and also significantly favor the Conrail corridor options (NJ-3 and NJ3b) over highway-based NJ-1 and NJ-2 options.

Destination Accessibility

In order to be successful, a commuter rail system must not only have reasonable access to the potential users' residences but must also provide a connection to the users' desired destinations. The analysis also looked at destination accessibility by mapping and measuring the distance from a set of selected possible destinations to the proposed rail station locations. A destination index was created utilizing 12 common community destinations including: *schools, restaurants, doctors, libraries* among others. While the destination of any

[†] The RT 42 corridor (NJ-1) mostly services Camden County residents with 91% of the accessible population living in Camden County, a county already served by the Lindenwald PATCO line. In addition, the residences within the 1/2 mile distance in many cases do not have sidewalks.

particular rider is unknowable, these 12 destination types provide an *index for potential destinations* similar to the way that the Dow Jones provides an index of stock activity. Accessibility distance from stations to potential destinations was measured at ½ mile. Any destination beyond ½ mile walking distance would require a shuttle or cab connection, substantially diminishing the likelihood of system usage.

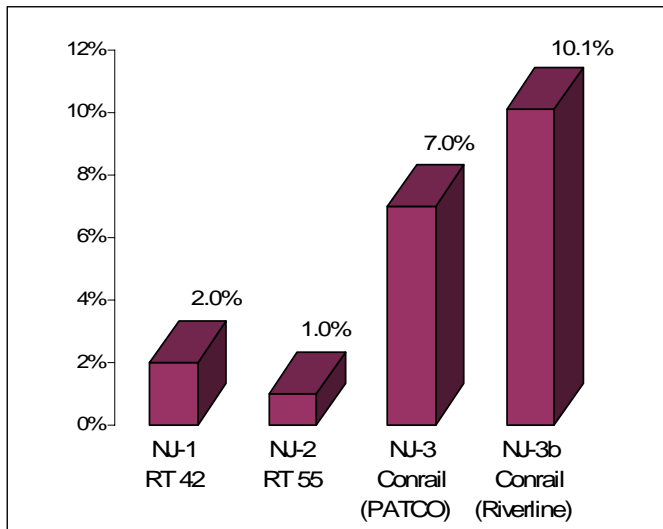


Figure 2a. Residential Pedestrian Accessibility – graph depicts the proportion of Gloucester County residents that are located within pedestrian accessibility (1/2 mile) to proposed route stations.

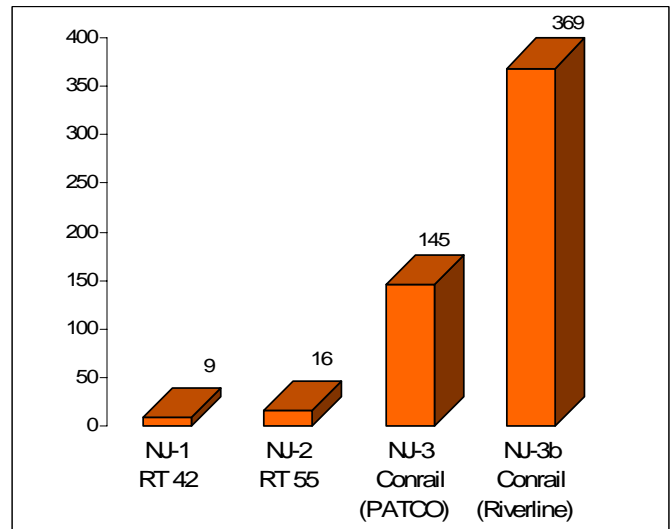


Figure 2b. Destination Accessibility – graph depicts the number of selected destinations that are within pedestrian accessibility (1/2 mile) to proposed route stations.

The results of the destination analysis also demonstrate the substantial advantage of the Conrail corridor. The RT 42 (NJ-1) and RT 55 (NJ-2) options largely focus on center city Philadelphia and Camden as destination for NJ bedroom communities. While center city is an important destination to serve, the vast majority of transportation trips generated by South Jersey residents are to other destinations within South Jersey. The Conrail corridor (NJ-3 and NJ-3b) provides direct access from a substantial number of residences to many destinations within southern New Jersey in addition to also serving Camden and center city Philadelphia. Figure 2b depicts the destination index for each proposed corridor.

The destination analysis found that the RT 42 corridor (NJ-1) had the weakest performance with only 9 selected destinations within pedestrian accessibility to stations[‡]. The RT 55 corridor (NJ-2) performed second weakest with 16 destinations accessible to pedestrians. Moreover, the poor performance of the NJ-1 and NJ-2 options for pedestrian accessibility is most likely less than indicated because the analysis only calculated road distance and did not account for the lack of sidewalk infrastructure in many of these highway interchange areas.

In contrast, the Conrail corridor performed substantially better with the Heavy Rail option (NJ-3) accessible to 145 destinations and the *Light-Rail* Riverline option (NJ-3b) accessible to 369 selected destinations. Furthermore, the study found that accessibility to destinations of special significance also favored the Conrail option with Gloucester County's largest employer (Rowan University), Woodbury (the county seat), Underwood Hospital and numerous town centers benefiting from station stops directly on the line. The destinations along the entire length of the Conrail line and a major user, Rowan University, on the Southern terminus provides a more balanced usage pattern with substantial numbers of commuters going both north towards Philadelphia and south towards Glassboro during rush hours. This contrasts with the RT 42 (NJ-1) and RT 55 (NJ-2) options that

[‡] (excluding Philadelphia and Camden stations)

would service mostly one-way city-bound traffic requiring empty trains to be sent counter to rush-hour traffic flow.

Why Riverline instead of PATCO on NJ-3

Conrail corridor has many geographic advantages because it serves concentrated centers of population that are historically connected to the commuter rail service once provided on this line. While the proposed PATCO *heavy rail* option (NJ-3) will be substantially more successful than the highway corridor-based systems (NJ-1 & NJ-2) due to this geographic advantage, it may nonetheless not be the most appropriate model for the Glassboro to Camden connection. A system modeled on PATCO will serve Philadelphia commuters but should be gauged against important considerations regarding costs, benefits and a number of disadvantages. Creating an off-grade system to accommodate the high-speed *heavy rail* trains will require substantial amounts of capital, construction time, environmental permitting and disruption to local communities. The result will be towns divided by mounds and canyons substantially changing the character of these communities.

The Riverline *light rail* option would provide a more elegant solution providing an appropriate scale public transit system on the existing rail bed that connects New Jersey communities with other New Jersey communities as well as to center city. The on-grade crossing concerns that have worried many community residents have proven to be an insignificant issue on the Riverline and while *light rail* would run somewhat slower than an off-grade line, the additional stations would allow additional populations to be closer to a station thereby saving time for those users. The time savings of a PATCO-type *heavy rail* system would have to be carefully evaluated against a Riverline *light rail* system to justify the excessive cost and potential impact.

A potentially problematic issue with an extension of the Riverline is the need to transfer to PATCO in order to reach Philadelphia. While a transfer to Philadelphia is not ideal, connecting directly to the Riverline system would eliminate the need for a transfer to reach north Jersey and would also provide direct access to the Camden waterfront. The current transfer connection from the Riverline to PATCO has proven reasonably efficient. Additional benefits of the NJ-3b option being an extension of the Riverline include:

- Substantially lower cost
- Able to have more stations serving more residents and destinations
- Less disruptive to the character of existing towns
- Significantly shorter construction time
- Supports redevelopment of Camden waterfront
- Will enhance the public investment already spent on the Camden to Trenton Riverline
- Creates an important North Jersey to South Jersey link.



Figure 3. This study concludes that an extension of the Riverline on the existing Conrail corridor (NJ-3b) is the most appropriate and cost-effective mode for a future South Jersey commuter rail system.

Conclusion

There is an old adage in real-estate that the three most important factors are location, location and location. In a similar manner, the success of a commuter rail system will largely hinge on its route location. While there are other important factors that should also be carefully evaluated, this analysis focused primarily on the geographic aspects of the proposed commuter rail corridors. The study concludes that the Conrail corridor (NJ-3 and NJ-3b) has substantial geographic benefits over the highway-based RT 42 (NJ-1) and RT 55 (NJ-2) options. While either the NJ-3 or NJ-3b Conrail corridor option will effectively serve the center city bound commuter with several strategically located park-n-ride stations, a Conrail-corridor-based system would also serve a number of other transportation/public planning objectives and goals that the highway-based systems (NJ-1 and NJ2) will fail to provide including:

- 1) walk-on and short-trip accessibility to a significant portion of Gloucester county residents,
- 2) revitalization of older town centers,
- 3) reduction of automobile trips within existing towns,
- 4) fosters reverse commuting flow (ex. Rowan University),
- 6) promote smart growth redevelopment rather than sprawl.

Conrail has the greatest chances of success because it connects where people live to a multitude of destinations. Conversely, the highway-based RT 42 (NJ-1) and RT 55 (NJ-2) options would primarily serve center city commuters requiring users to first drive to park-n-ride stations. However, the trends of center city commuting have been changing over the past decade due to employers increasingly locating in outlying suburban areas. The jobs that remain in center city will increasingly be occupied by center city's booming residential influx. As work patterns continue to change in coming decades due to telecommuting and the internet, the prediction of continued demand for center city employment commuting from Southern New Jersey is questionable. A park-n-ride *heavy rail* commuter system designed for 1970's center city commuting patterns such as NJ-1 and NJ-2 may not justify the significant public dollars that will need to be expended for construction.

The analysis demonstrates that Conrail corridor options (NJ-3 & NJ-3b) stand a significantly better chance of success due to their geography. A Conrail corridor system will most efficiently serve multiple transit needs of the region because center city commuting is only one of many functions that it will provide. A Conrail corridor-based system would foster economic revitalization while providing a substantial and viable option for non-auto travel to many within-county destinations. Finally, the analysis demonstrates that a *light-rail* version of the Conrail option (NJ-3b) which extends the Riverline will provide the greatest transportation benefit, cost substantially less than other options and would offer the most appropriately scaled solution for serving the transportation needs of the Gloucester County region.

Note: This executive summary is a scaled-down version of the full technical report available for Dr. Hasse via e-mail: hasse@rowan.edu