I. INTRODUCTION

Due to the efforts of city and county officials and many others, the past 15 years have witnessed a turnaround in the economic fortunes of Jersey City. New initiatives in economic development programs have led to the downtown redevelopment of brownstones and row houses and the improvement of the abandoned rail yards along the Hudson River into Liberty State Park. Jersey City's location and the availability of open space on the waterfront have lured developers seeking to create high-density housing and commercial properties. Over the past few years, many financial businesses in New York City have moved to Jersey City in search of plentiful office space and access to transportation.

Major investments in transportation infrastructure have occurred throughout the years, and rehabilitation of the area's main roadways are planned or are already underway. These current or proposed transportation facilities have helped fuel the tremendous economic and urban redevelopment that has taken place along the Hudson riverfront. As this trend continues, the transportation network needs to be improved in a way such that it is capable of addressing the area's transportation needs.

The Bergen Arches provide a valuable opportunity to provide a new link in this rapidly redeveloping region, promoting future economic growth and enhanced regional mobility. The Bergen Arches right-of-way is an abandoned railroad corridor less than one mile long that cuts through the Palisades in Jersey City. The Arches were originally constructed to bring Erie Lackawanna Railroad passengers to the Pavonia Avenue Terminal on the Hudson River waterfront in Jersey City. The Bergen Arches run parallel to Route 139 between J.F. Kennedy Boulevard near Tonnele Avenue to the west, and Palisades Avenue to the east. They lie in an area that is rich in multi-modal transportation facilities, including Route 1&9, Route 139, I-78, the New Jersey Turnpike, Holland Tunnel, PATH rapid transit system, Hudson Bergen Light Rail system, NJ Transit commuter rail lines, and various freight rail lines and yards.

The New Jersey Department of Transportation (NJDOT) has embarked upon a study of the Bergen Arches with its planning partner for the region, the North Jersey Transportation Planning Authority (NJTPA). The purpose of this study is to determine the best transportation use or uses for this valuable right-of-way. This "best use" must serve the area's mobility needs, be practical from a construction and financial standpoint, be environmentally acceptable, and be supported by the community. The alternatives that have been explored include using the right-of-way for freight movement, constructing a mass transit facility, creating a new roadway to provide an alternative route into downtown Jersey City, or a combination of these or other alternatives.

The study has determined the current and future transportation needs of the area and identified important economic, environmental, and community factors. Different alternatives or concepts have been developed and analyzed to see how well they meet the city's and region's mobility needs while still respecting identified constraints. The evaluation of the alternatives was conducted using an open planning process, ensuring that all stakeholders were able to express their opinions, ideas, and concerns.

To conduct the study, the project team determined current and future transportation needs for the area based on extensive data collection, analysis, and fieldwork. The team developed information on constraints from both a civil engineering perspective as well as environmental screening viewpoint. The data on needs and constraints has permitted the development of a set of improvement concepts or modal alternatives. The concept development process focused on developing a range of transportation modes or alternatives using the Bergen Arches right-of-way. The alternative evaluation process considered each mode's use of the Bergen Arches

right-of-way as a means to pass through the region and also to provide connectivity to other existing or proposed transportation networks in the area. These alternatives addressed a broad range of transportation issues, and some integrate roadway, transit, and freight aspects.

This report describes the results of the study, the study's conclusions on the "best use or uses" of the Bergen Arches, and provides an overview of the various tasks conducted.

REPORT ORGANIZATION

This report presents the results of the concept development study of the use of the Bergen Arches right-of-way for transportation purposes. Through extensive community involvement and exhaustive data collection and analysis, the study has identified transportation alternatives that are buildable, environmentally acceptable, and achieve a wide degree of community support.

These alternatives are developed at a conceptual level and will be subject to further study and development by the appropriate transportation agencies. Further studies are needed to determine feasibility and project scope before the alternatives can advance.

In terms of report organization, the report first provides an overview of the study area. Following this discussion, the report describes the study's public involvement program and what was learned from these efforts. An overview of the major tasks involved in the study is also provided.

The next section of the report provides a summary of the work conducted to establish existing conditions in the study area. This section of the report also provides background information on the analysis tools used to identify travel demand and the measures used to determine transportation system performance.

Following the section summarizing existing conditions, the report then provides a snapshot of future conditions for the "No Build" or "do nothing" condition. This information establishes a future base case from which alternative modal uses of the Bergen Arches right-of-way were evaluated.

After establishing future conditions, the report describes the development process used to identify transportation alternatives, the particular transportation alternatives that were evaluated in the study, and the opportunities and constraints that were identified for each mode.

Following the section on alternatives development, the report then provides information that was developed during the alternatives analysis process. This section provides information on potential ridership for the transit alternatives under consideration as well as system performance measures for the roadway and transit alternatives.

The next section of the report provides the results of the study's alternatives screening and evaluation process. The criteria used to evaluate each alternative are discussed and the findings presented in a matrix format for the reader.

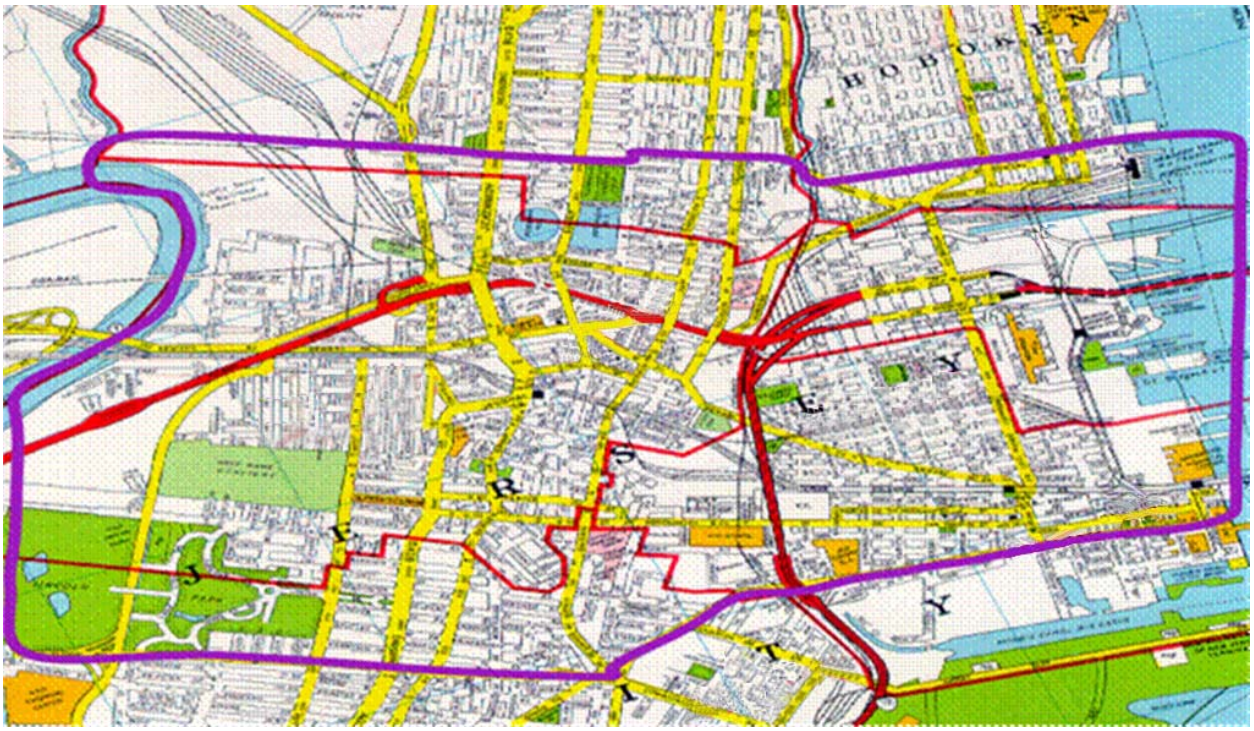
The final section of the report provides the conclusions emanating from the study.

STUDY AREA

The study area for the Bergen Arches study is divided into two levels: regional and local. In order to analyze the "best" transportation use or uses for the Arches, it was necessary to examine the impacts of alternative modal uses of the Arches at both the regional scale and at a local level, so as to gauge effects of a particular alternative on the regional and localized transportation network. Thus, for analysis and evaluation purposes, the study area was examined from both a regional and local impact perspective.

The regional study area consists of the thirteen counties that comprise the NJTPA region. The map below depicts the regional study area.

The local impact area is depicted in the map below and consists of key roadways in Jersey City.



WHAT IS THE BERGEN ARCHES?

The Bergen Arches is a 4,400-foot long open cut through the Bergen Hill in Jersey City. It was constructed by the Erie Railroad from 1907 to 1910 to provide four track passenger rail operations to the waterfront in Jersey City. The Bergen Arches consists of open cut sections with bridges and tunnels. It was designated the Bergen Arches Historic District by the New Jersey State Historic Preservation Office in 1998.

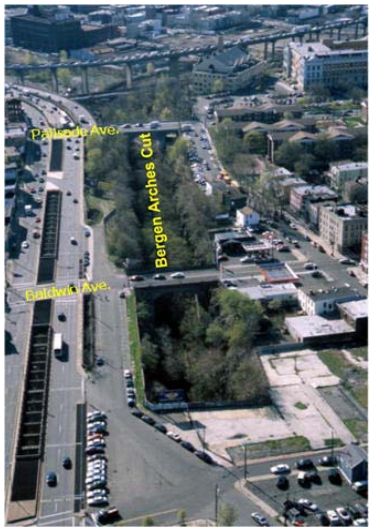
The open cut sections of the Bergen Arches were developed by the Erie Railroad by blasting through solid rock. The open cut sections are approximately 60-feet wide at the base and the depth of the cut sections from street level varies from 40 to 75-feet. Concrete walls or fences surround the top of the cut sections at street level.

There are four tunnel sections. The typical tunnel cross section is concrete-lined with an arched roof, contains a clear span (width) that varies with the minimum at 56-feet and has vertical clearance that also varies from 9 to 26-feet.

There are two concrete arch bridges at Baldwin Avenue and at Palisades Avenue. Additionally the Conrail Viaduct was later constructed in 1927 by the State Highway Department and carries Route 139 over the Bergen Arches cut and it has a clear span of 56-feet and a vertical clearance of 22-feet.

The Route 139 Covered Highway adjoins the Bergen Arches area and was constructed in 1927 by the State Highway Department. Additionally, the Bergen Tunnel, built in 1861 by the Erie Railroad, adjoins the Bergen Arches area and now operates as a single track freight line.

The following photos show tunnel and open cut sections of the Bergen Arches.



STUDY TASKS

The technical activities interacted with the public involvement and coordination activities at major milestones to define the study's overall work effort.

The goal of the study is to identify the "best use" or "best uses" of the Bergen Arches right-of-way that meets the following objectives:

- Satisfies a transportation need,
- Is feasible,
- Is environmentally acceptable and,
- Is supported by study stakeholders.

The study framework, conducted in an open planning process with a variety of stakeholders consisted of the following activities to reach the objectives:

- Identifying existing and future transportation needs, problems and issues,
- Identifying transportation markets and associated impacts,
- Identifying operational, geometric, and environmental constraints, and,
- Identifying potential use options with respect to mobility and accessibility.

Major tasks in the study consisted of:

- Reviewing prior studies and project background materials,
- Collecting current data such as traffic volumes, turning movements, existing roadway geometry, information on roadway structural elements, building locations, and aerial photography reconnaissance surveys and developing base mapping,
- Assembling the information on the current transportation system to provide a picture of existing conditions and current transportation system performance in Jersey City and in the larger, northern New Jersey region,
- Forecasting future travel conditions in Jersey City and in the larger, northern New Jersey region for the 2025 horizon year to depict transportation system performance under a "no

build" or "do nothing" alternative (a snapshot of future year travel conditions if no transportation investment was made in the Bergen Arches right-of-way),

- Developing modal concepts for a transportation improvement in the Bergen Arches by:
    - developing feasible typical sections for various modes using the Bergen Arches cut,
    - identifying possible connections to the existing roadway network and to the current transit system to the Bergen Arches on its east and west sides, and,
    - reviewing the geometric feasibility of potential connections by conducting a "fatal flaw" analysis to determine what grades would work and what alignments could be provided within the tunnel and open cut segments of the Arches.
- Assembling, evaluating, and mapping environmental inventory data for the study area, though field reconnaissance and review of existing data regarding historical and archaeological resources, natural resources, noise sensitive receptors, and potential contaminated sites,
- Screening and evaluating the modal concepts using criteria reflecting transportation need, transportation performance, feasibility, environmental impacts, and stakeholder support, and,
- Ranking the modal concepts according to the evaluation criteria and developing a recommended "best use" or "best uses" of the Bergen Arches right-of-way.