Regional Monorail Exploratory Study

DRAFT

prepared by

Lea+Elliott, Inc.

in
association
with

HNTB Corporation
SG Associates, Inc.
Remline Corporation
Nossaman Guthner Knox & Elliott, LLP

for

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EXECUTIVE SUMMARY

The Wilmington Area Planning Council (WILMAPCO) Regional Exploratory Study was designed to answer specific questions regarding the technical feasibility of monorail. Since the early 1980s, there have been discussions among some state officials about monorail service connecting a number of tourist, recreational, cultural centers, and several suburban office parks surrounding and to the north of Wilmington. Leaders in the Delaware Legislature recently issued a discussion document entitled, Innovative Transportation Opportunities for Delaware in the 21st Century that proposes a statewide multi-modal (high speed ferries, rail, Monorail/AGT) approach to addressing traffic congestion and air quality problems in the State of Delaware. Monorail is the centerpiece of this strategic approach.

In this report, the term monorail is used in a generic sense in that it refers to a broader class of driverless fixed guideway technologies referred to as Automated Guideway Transit (AGT).

Where and how have monorails been implemented, and with what results? How do these locations compare with the WILMAPCO region?

In recent years, a number of Monorail/AGT technologies have been built in urban areas. The existing monorail systems in Jacksonville, Seattle and Las Vegas serve as circulators/ distributors. The systems in Seattle and Las Vegas have extensive system expansions that will change them from small-localized services to major regional line-haul systems. The most extensive current line-haul AGT is the 32-mile Vancouver SkyTrain.

The plans for expansion of the Seattle and Las Vegas systems are moving forward as their existing small scale localized systems have met with much success. The Jacksonville Skyway ridership has not met the projected levels. The transit authority attributes the lack of riders to a declining downtown economy during the 1990s that led to a decrease in development in the area. The impact of the Vancouver SkyTrain has been very positive. The ridership and route length of SkyTrain has had several economic benefits, including an increase in land development along the right of way.

The Seattle Green Line and Vancouver are probably most similar to what is being considered for the WILMAPCO region. All are regionally oriented line-haul systems. The Seattle Green Line is just one part of an extensive regional network with good linkages between bus, train, and ferry services, which is identical to the objectives contained in Delaware Legislature discussion document.

The Las Vegas Monorail will be a line-haul service that is somewhat similar to Wilmington in that linkages are provided between major employment and recreational generators. The markets each system is expected to serve, however, are quite different. The Jacksonville Skyway is least like what is being considered for Wilmington because it is a downtown oriented circulator/ distributor system. The Skyway was of interest because of its bridge crossing the St. John River, similar to the Tyler McConnell Bridge crossing contained in one of the potential Wilmington alignment segments.

Leaders and stakeholders in the Wilmington region have a great opportunity to monitor developments in Las Vegas and Seattle as their large-scale monorail projects begin to take shape. Both of these projects have extensive public outreach programs that have been crucial in moving these projects forward. Lessons can be learned from these efforts as Wilmington proceeds with the development of its regional transportation plans.

Would a Monorail/AGT elevated fixed guideway system be effective in the WILMAPCO region? Effectiveness should be based on public acceptance, demographics, and technical feasibility.

A Monorail/AGT system is technically feasible and sufficiently effective to be included in a future transit alternatives analysis. The feasibility of two Monorail/AGT system concepts (large/high speed versus small/moderate speed) was assessed from the perspective of FTA New Start criteria and as well as the refined alternative land use scenarios contained in the WILMAPCO 2025 Regional Transportation Plan. The projected 2025 daily ridership was estimated at 12,800 total boardings with the surged peak-hour demand estimated at 1,500 passengers in the peak direction.

The system operations analysis showed that both the small and large systems were capable of effectively meeting the peak-hour demand with headways in the four-minute range. The large monorail, provided end-to-end travel times that would be 17 minutes (approximately 30%) less than the slower, small monorail technology. All of the Metropolitan Transportation Plan (MTP) land use scenarios show projected increases in transit ridership compared to current levels. There were two scenarios chosen to assess monorail implementation in the region, one reflected current zoning while the other featured greater concentrations of development in the transit service areas. The number of additional transit daily trips projected ranged from 2,500 to 3,500 for the two scenarios with the implementation of Monorail/AGT. The ridership gains reflected in both scenarios as well as the ridership projections based on the 2025 MTP trip tables show that the Monorail/AGT is effective in the WILMAPCO region.

There were no technical or environmental fatal flaws identified that would eliminate Monorail/AGT from further consideration. Public acceptance, as shown through public meetings and a Workshop, has been very strong, however, there have been some concern about the cost of the system. The life cycle cost analysis showed that there is no significant cost difference between the large and small systems. The large Monorail/AGT 24-mile system is estimated to cost $1.4 billion or $59 million per mile. As with other areas that have implemented Monorail/AGT, a shorter initial system could be built for approximately $250 million.

If deemed effective, what would be the preferred alignment and technology? Also, what issues need to be addressed through further study to advance Monorail/AGT planning, i.e., what changes in land use, innovative sources of funding, and overcoming major obstacles would be needed to make a Monorail/AGT system a success?

A feasible, initial Monorail/AGT alignment is shown at the end of the Executive Summary. The key segments that comprise the initial 24-mile alignment corridor begins at Peoples Plaza on Route 40, proceeds via Route 1 to downtown Wilmington and then on to Route 202 to the Blue

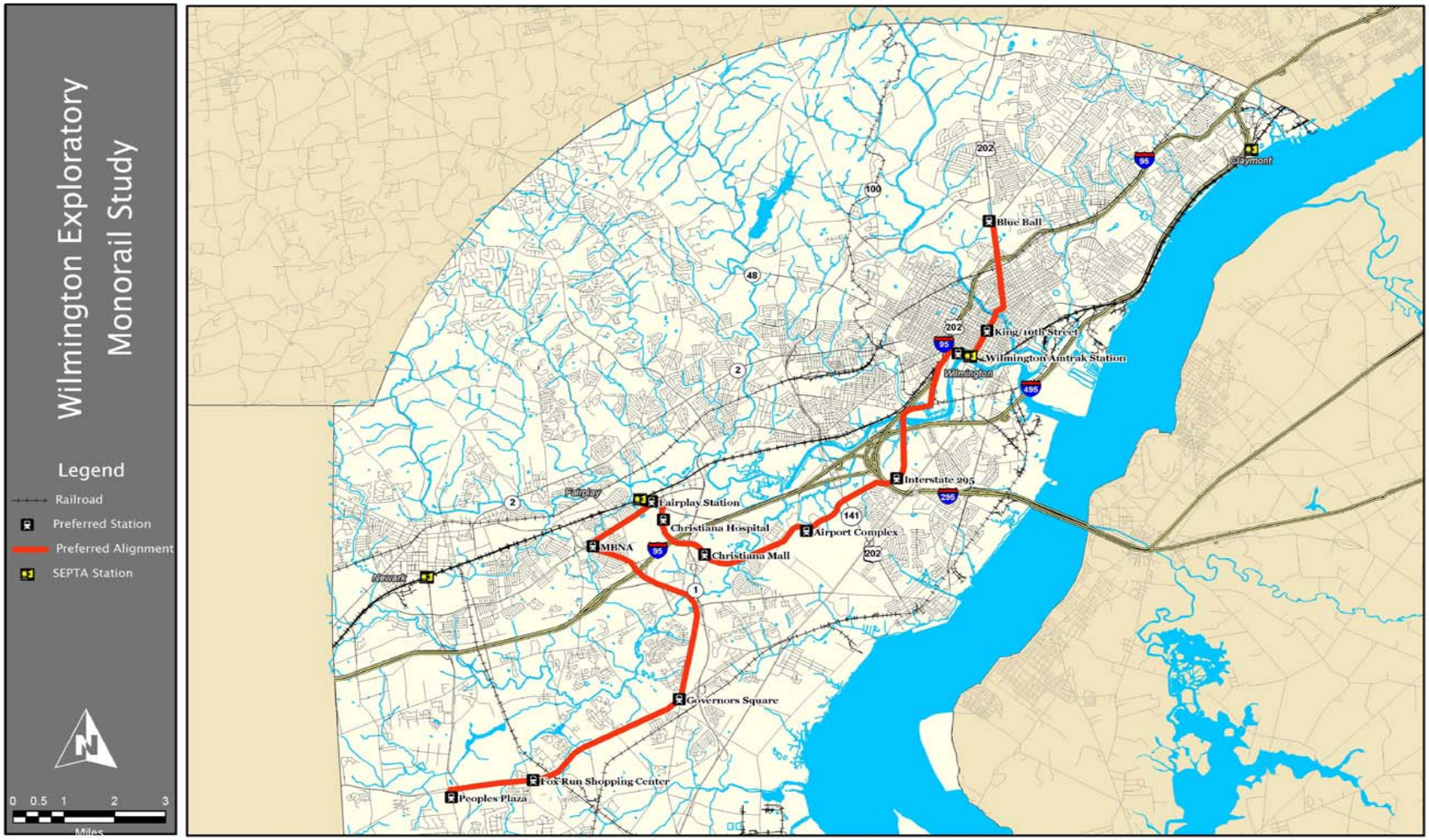
Ball Properties. The estimated capital costs for a Monorail/AGT system using this alignment is between $1.3 and $1.4 billion. A life cycle cost estimate showed that there is no significant cost difference between the large and small Monorail/AGT systems. Transit has the potential to influence the direction of land use development as New Castle County grows. In accordance with MTP goals, land use and future transit should be carefully coordinated and developed to promote higher residential and commercial density. Careful attention should be paid to the areas immediately surrounding the proposed Monorail/AGT stations.

Assuming that the final alignment has been developed to complement the land use and development patterns in the region, the principal environmental issues that need to be addressed are floodplain impacts, wetlands impacts, park and recreation facilities, and noise impacts. Generally, anticipated impacts can be mitigated with minor shifts in the alignment, construction of physical barriers, and other means to affect alignment feasibility.

Since the early 1990s, the federal government has played a lead role in facilitating the development innovative procurement and finance techniques that can be applied to the process of implementing public mass transportation systems. Many of these techniques result in credit enhancement, advance construction financing, pooled financing, and public/private partnerships. Many of these techniques require state and local legislative authorization in order to proceed with the public financing process. There is certainly a role for innovative financing in support of advancing a Monorail/AGT project in the WILMAPCO region. The following steps would be required to advance a Wilmington Monorail/AGT project:

- Conduct a FTA Transit Alternatives Analysis
- Prepare a FTA New Start Evaluation
- Conduct an Environmental Impact Study

Once these steps are completed, the project can begin to take on physical form with preliminary and final design engineering and, eventually construction. Public outreach will continue to be important throughout all of these steps. Appropriate outreach programs would need to be included in each of these phases.


Wilmington Exploratory Monorail Study
Legend
Railroad
Preferred Station
Preferred Alignment
SEPTA Station
0 0.5 1 2 3
Miles
Blue Ball
King/ 10th Street
Wilmington Amtrak Station
Interstate 295
Fairplay Station
Christiana Hospital
Airport Complex
MBNA
Christiana Mall
Governors Square
Fox Run Shopping Center
Peoples Plaza
Claymont
Wilmington
Fairplay
Newark

1.0 INTRODUCTION

The purpose of the WILMAPCO Monorail Exploratory Study is to investigate the feasibility of monorail transit in Northern New Castle County. The study is to determine if driverless fixed guideway technology referred to herein as "Monorail", also referred to in the industry as "Automated Guideway Transit (AGT)", should be incorporated into a larger Alternatives Analysis of other high capacity transit options for the Wilmington metropolitan area.

1.1 REPORT ORGANIZATION

In addition to the Executive Summary, the report is comprised of seven major sections. The first section provides the background for the study along with the comments the study process and methodology. Section 2 describes the study area and existing conditions. It also refers to recent studies and presents regional goals and plans. The third section presents the study's Purpose and Need Statement developed by the project Management and Steering Committees and lists the major questions contained in the study's Scope of Work. Section 4 summarizes driverless technologies and describes system in four North American cities. Section 5 addresses the feasibility of Monorail/AGT in the Wilmington Metropolitan area and Section 6 outlines the major implementation issues. The final section presents recommendations and describes the steps required to move the Monorail/AGT project forward towards implementation.

1.2 BACKGROUND

In the early 1980s, state officials began serious discussions about connecting a train station north of Wilmington with a monorail-type technology that would serve various transit, recreational, cultural, and business centers in the region. When SEPTA terminated all commuter service to Delaware during this period, Senator Harris McDowell and Representative David Ennis provided the leadership in the establishment of a Task Force that recommended the opening of at least two suburban stations north of Wilmington, Claymont and Edgemoor, as well as others. The Claymont station was reopened and has been expanded three times. A new station opened in Newark, Delaware, as well as on Route 4 at Fairplay/Churchman's Crossing. The Task Force also called for the reestablishment of train service to the State Capital in Dover.

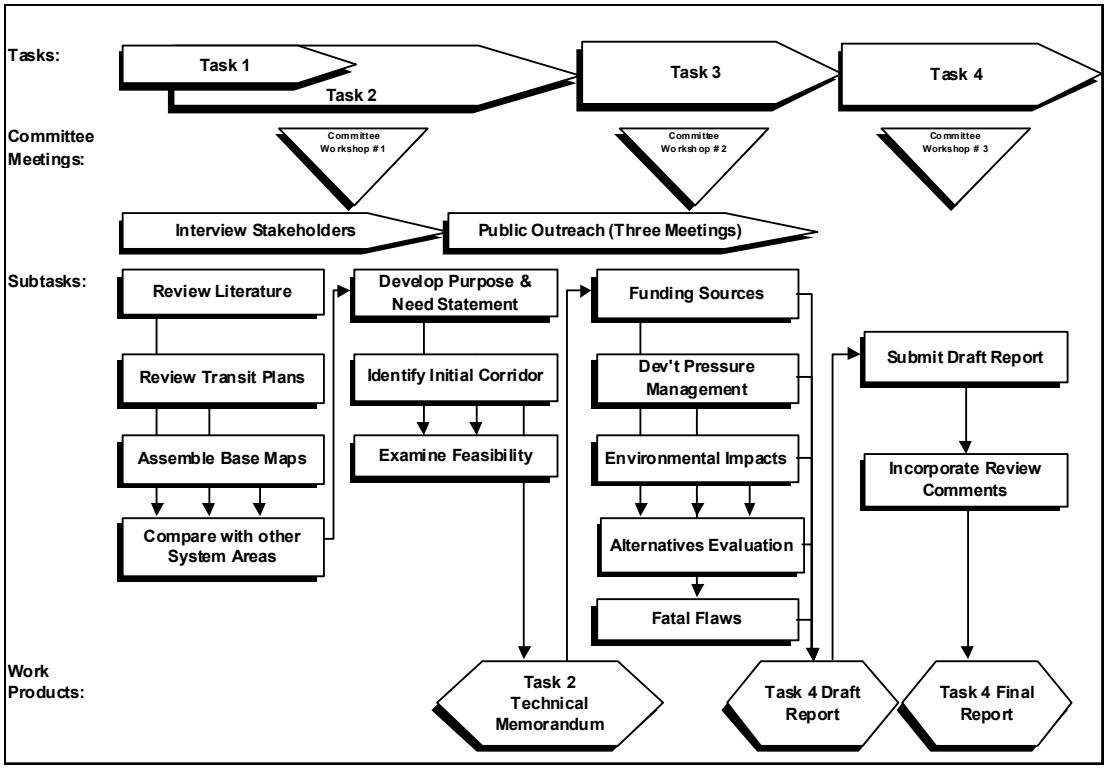
In the mid-1990s, the Delaware Department of Transportation (DelDOT) performed a rail study that contained the observation that Amtrak might be willing to stop some of their regular trains at station (s) north of Wilmington if the station was part of an intermodal system.

In recognition that public transportation is crucial for addressing future travel needs and meeting federal air quality requirements, as described in the 2025 Metropolitan Transportation Plan, WILMAPCO has undertaken this exploratory study to determine if Monorail/AGT should be incorporated in a comprehensive study of high capacity transit options. The study was conducted in a partnership with DelDOT, Delaware Transit Corporation (DTC), the City of Wilmington, New Castle County and elected officials in the region.

1.3 THE STUDY PROCESS

The report chronicles the processes used and salient issues addressed regarding the feasibility of a Monorail/AGT in the Wilmington metropolitan area. While the feasibility questions are addressed in this report, a separate task technical memorandum entitled Feasibility Analysis was produced and may be considered a companion document to this report. The Work Schedule (Figure 1.3-1) shows the approach to the study. Each of the project tasks were reviewed and commented on by the project Steering Committee and decision making and overall study guidance was provided by the project Management Committee. The Management Committee was made up of eight representatives from the project partner organization entities. The Steering Committee consisted of more than ninety individuals representing a cross section of stakeholder groups, transit and transportation officials, community and civic organizations, business leaders and elected officials. Membership was open to anyone who wished to participate. Public outreach was a critical component of the process. Modes of outreach included a Workshop, a Project web page, contacting elected officials and business leaders, and the Steering Committee Meetings and available Minutes.

Figure 1.3-1: Work Schedule



The study process was designed with the premise that valuable information can be gained from prior studies of the region, and from discussions and working sessions with members of the Management and Steering Committees, as well as from stakeholders and members of the community at-large. The study process and project background is described fully in the Task 2 Feasibility Analysis Technical Memorandum.

1.4 STUDY METHODOLOGY

The study methodology combined sketch planning and consensus-building techniques to develop and assess an identified monorail corridor in exploring the feasibility of Monorail/AGT in northern New Castle County. Due to the nature and scope of this project, these techniques are used at a macro analysis level. On the demand side, GIS based sketch planning techniques are used to identify areas in the region that are transit supportive. This type of analysis utilizes data items such as land use, population and employment indices, and the locations of major trip generators.

On the supply side, sketch planning data on the most important transit system characteristics such as vehicle capacity, maximum and average speed, vehicle costs, civil (station, guideway, etc.) costs, operations and maintenance cost are used to identify the most appropriate transit technology, if any, to fit the demand and topographic/geographic characteristics.

Consensus building is a critical element of the feasibility analysis. The process involved working with three distinct groups. The first group was comprised of the study team, the project Steering Committee and the Management Committee. The second group was comprised of the major stakeholders such as major employers and institutions. Many in this group may overlap with members of the Steering Committee. The third group was the general public.

Providing as many opportunities as possible to comment on the project can insure that a public consensus is gained. Opportunities such as public meetings, a project web site, and other tools such as newsletters, mailouts and comment sheets were utilized on the Project.

The project technical work was presented before the Management and Steering Committee where consensus was attained and guidance given. This process was used to:

- Develop a Purpose and Need Statement
- Develop Potential Alignment Corridor Segments
- Select an Initial Alignment Corridor
- Obtain Concurrence on Feasibility Analysis
- Obtain Concurrence on Recommendations

The Project Steering Committee provided the following categorical motivations in support of the Purpose and Need Statement:

- Transportation Improvement (Intermodal Connectivity)
- Monorail/AGT as an impetus for improved Quality of Life
- Work, home, retail, and tourist destinations
- Insure a logical and sound Monorail/AGT system

The contents of the resulting Purpose and Need Statement was the rationale behind the seven (7) proposed alternative alignment corridor segments. The Project Management Committee led their subsequent evaluation. A group consensus was attained by both the Management and Steering Committees through the use of seven evaluation criteria contained in the Purpose and Need

Statement to assess the alternative segments and assemble the initial 24-mile alignment corridor for further analysis.

The feasibility of two Monorail/AGT system concepts (large/high speed versus small/moderate speed) was then assessed from the perspective of FTA New Start criteria and recently refined alternative land use scenarios contained in the WILMAPCO 2025 Regional Transportation Plan.