Section 2 – TECHNICAL PROPOSAL

Project Understanding

In a sustained era of limited funding for transportation service, MPOs, transit agencies, local governments and other mobility providers are forced to develop innovative solutions to help meet growing transportation needs. We are excited by the potential of this analysis effort to build on our prior projects in Delaware and beyond to inform short-term changes to Newark's transit system that can be implemented in the next zero to five years.

WSP has performed similar survey and analysis efforts at more than 25 cities and regions large and small across the country in the past ten years. With offices in Philadelphia and Baltimore, our team knows Delaware's transportation needs and resources, and its transportation officials and staff. Our experience, knowledge and proximity make WSP ideally suited to lead this study, to reach out to Newark's transportation providers to obtain data, perform analysis, and make recommendations to help address mobility challenges in and around Newark. Our team's collective project experience directly relates to the scope and needs that are identified in your RFP. In Section 1, we present descriptions of similar projects based on their relevance to what we see as the primary study areas:

- Collection and analysis of data/identifying gaps
- Operations planning and development of recommendations to better coordinate transit service
- Stakeholder outreach and public involvement

This effort is primarily a route and service optimization project, focused on identifying the needs of mobility-challenged populations and the gaps and barriers to fixed route ridership, and integrating the four transit systems currently serving Newark to efficiently meet those needs. Building on the earlier University of Delaware Institute for Public Advancement (IPA) -led effort, this project includes a focus on incorporating customer and stakeholder-driven information to better inform planning for future transportation options and potential transit system integration and improvements.

Our task-by-task approach follows the task structure provided in the RFP and details our approach in developing feasible transit service improvements. We maintained the arrangement and numbering of tasks from the RFP, but have slightly adjusted the sequencing and duration of tasks to better demonstrate their interrelationships and flow.

In addition, realizing the importance of public and stakeholder involvement to this study, we have indicated the activities shown to support the PMC in Task 2 throughout the project with activities that will be performed as part of needs determination as well as general outreach activities and informational materials. A detailed staff hour chart and schedule provided later in this proposal complement the work program and show in more detail the breakdown of staff hours as linked to the project's schedule.

> A key consideration throughout the project is the importance of public and stakeholder input. We are prepared to deploy creative means of obtaining input on transit challenges and presenting these issues, opportunities and recommendations to the community and stakeholders.

As mentioned in our cover letter, based on our prior experience on similar projects, we propose shortening the project effort to nine months to more efficiently advance the project outcomes. Our proposed schedule in Section 4 graphically depicts this approach, including targeted timeframes for work products and public involvement activities.

The following pages describe our team's approach to address the scope of work.

Task 1: Data Collection

WSP and Century will work together in this task to obtain, review and analyze existing conditions data from the prior study performed by the IPA at the University of Delaware on behalf of DTC. As part of our multi-faceted program for reaching various layers of stakeholders, we will work with the PMC to ensure that each potential stakeholder has multiple opportunities to learn about the project and provide input. The following outreach elements will be collected as part of this task:

- **Newark Resident Survey:** WSP will develop content for a survey of Newark residents regarding public transportation needs, gaps in service, and how improvements to the bus network can more effectively and efficiently meet customer needs. We will use Survey Monkey or a similar on-line survey platform for deployment of the survey. If the City of Newark Planning and Development Department has a different, preferred method, WSP can discuss potential implementation of that approach or will analyze results provided by the City.
- **Business Community Interviews**: we will develop a standard set of questions specifically geared towards business related interest to guide the conversations and elicit input on their perceived strengths, weaknesses, and opportunities of Newark's existing transit network for their employees and customers. These interviews will be held over a two-day period, in person or over the phone, at times and locations to be arranged by WILMAPCO.
- **Passenger Intercept Surveys:** we will prepare content for an intercept survey for review by WILMAPCO and DTC staff, and will provide one WSP staff member to survey riders at the Newark Transit Hub to administer the survey for one weekday, ideally joined by one or two WILMAPCO or DTC staff members to administer additional surveys The purpose of the survey will be to obtain input on riders' perception of the existing transit service and their suggested recommendations for improvement, e.g., hours or frequency of service. If additional support or time duration is warranted it is assumed to be provided by DTC or can be arranged for as an optional task.
- **Bus Driver Interviews:** over a one-day period we will interview bus drivers from DART, UD, CCT and UNICITY to obtain their input and ideas for improved service delivery based on their first-hand experience. These discussions with front-line staff provide insights on the "nuts-and-bolts" service issues as well as their view of public perceptions of the agency and service. These interviews could include a reference to various graphics in which participants are asked to indicate on maps the locations of difficult turns, congested roadway links and intersections, difficult to serve bus stops, and areas of high and low ridership and overloading.

As part of the interviews conducted for this task, we will discuss with the transit stakeholders and riders their view of the networks' strengths, weaknesses and possible deficiencies. In these discussions, we will examine the roles and potential roles of existing transit services and facilities, including bus services, transit facilities, paratransit operations, Amtrak and SEPTA rail service, and other components of the transit system, as appropriate.

These efforts will have four primary focuses:

- Understanding the functions of various existing services
- Understanding what isn't being served
- Evaluating the potential for more coordinated integration of the various system components
- Evaluate ways to leverage improved transit performance to support or increase the economic viability of the region

WSP and Century will develop all surveys and interview materials and present to the PMC for review before deployment. After these efforts, we will document all surveys and comments which will inform the recommendations development process as part of Task 4. Survey results and comments will be summarized in the Task 5 final report, and all comments will be recorded in an appendix to the final report.

This task also involves obtaining and analyzing existing data from several existing sources:

- **IPA 2017 Project** to assess the need to improve transit in Newark through improved coordination
- **UD Transportation Survey:** launched October 16, 2017
- **City of Newark UNICITY bus service survey:** Newark New Night June 10, 2017
- **Cecil County Transit:** any available data on the CCT Elkton Newark Connection service

With this data and information in hand, we will take a high-level look at existing conditions from these interviews, data, and reports. Our efforts will examine demographics, transit modes and facilities, planned transportation-related projects, and patterns of travel throughout the study area. Depending on availability and reliability, data will show present and future population and employment densities, auto ownership, and age variables, and will be overlaid onto the existing transportation network's transit routes to show intensity of service. We will also use the survey results, driver interviews and other anecdotal information to help assess the transit and paratransit needs of Newark residents, employers, employees, and visitors. Where possible, these characteristics will be mapped using GIS and overlaid to show relationships useful to transit service planning.

Century will lead GIS mapping efforts to show existing fixed bus and key paratransit routes as well as where transit service is potentially warranted merging with the Task 4 efforts. A specific list of GIS layers and other data to support the analysis that WSP does not already have, or that cannot be gathered through the internet or General Transit Feed Specification (GTFS), will be prepared and submitted to WILMAPCO as the project is initiated to help facilitate the data-gathering process. It is our understanding that the primary features as generally outline above are readily available in GIS or database formats, and will not require extensive primary data collection. We will refine the scope as needed, if critical data proves unavailable. From this information, we will identify a "baseline profile" of current transit service in Newark, including significant facilities, services, service levels, system performance and service patterns and determine what gaps exist in the system as part of Task 4.

If not contained in the prior sources, we will work with WILMAPCO, the transit providers, and the City of Newark Planning and Development Department to obtain available data to potentially include:

- Journey to work data (2010 census)
- Transit system maps
- Current ridership, fare-box recovery, and operating subsidies
- Operating methods, contracting, funding arrangements, costs, and miles and hours operated
- Current population density (census-based) and future growth areas
- Existing major employers and projected employment centers
- Existing and future land use patterns
- Average daily traffic counts on arterials and major collector routes
- Existing density of households and employment

- Demographics – distribution of income, age, and car ownership
- Community design features including pedestrian oriented areas and existing or projected future mixed use or TOD-style development areas
- Character – current and future urban growth boundaries vs. suburban and rural areas

Deliverable
Summary document describing data collection efforts, stakeholder interview summaries, overall purpose statement, supporting goals and objectives for the study, and GIS mapping to graphically depict data obtained.

Task 2: Support the Project Management Committee (PMC)

We appreciate the importance of having a group established to evaluate plans and recommendations, and provide overall direction to the project. As project manager, Anna Lynn will be in frequent communication with the client PM and the PMC as needed to provide progress updates, respond to inquiries, gather information and make ongoing project decisions. Other WSP and Century staff will join Anna Lynn at these meetings/calls as appropriate based on the subject matter being discussed.

The first PMC meeting will serve as a project kickoff meeting, to be held at a location of WILMAPCO's choosing. The purpose of this meeting is to:

- Introduce the project participants, exchange contact information and establish lines of communication for the project
- Review and confirm the scope of work, schedule and budget
- Select a date for standing PMC meetings
- Review and confirm the public outreach efforts
- Begin the process of collecting available data and other information
- Confirm the public outreach process and select a tentative date for the first public workshop
- Review and confirm project goals and objectives

WSP will attend up to nine meetings with the PMC and suggests that in months where there is less activity the meetings could be held by teleconference. We will provide agendas, notes and follow-up items from each PMC meeting.

Deliverable
Notes from PMC meetings and comments on study documents.

Task 3: Snapshot Analysis of Paratransit Data for the Newark Area

From our earlier work in the state, we quickly learned that paratransit costs continue to grow in Delaware – demand continues to grow, similar to other areas in the US. Like elsewhere, continual efforts are advanced to try to obtain efficiencies by making fixed route service easier to access, at least for a portion of the trip.

We will work with DTC to obtain data for a certain specified time period of up to one year to understand the number, frequency, key origins and destinations of paratransit trips. We will also analyze boarding and alighting data and origin-destination pairs such as group homes and medical facilities.

Similar to the data collection in Task 1 we will graphically represent the data via GIS with special attention on understanding high-volume origin and destination points such as group homes and medical facilities. Maps will be developed documenting concentrations of boardings and origin-destination patterns for these services. This data could suggest possible changes to fixed-route alignments or services to make them better serve existing disabled customers. Together with the data analysis in Task 4, we will understand whether there are opportunities to reshape transit routes to better serve disabled passengers and reduce reliance on paratransit. WSP also will review eligibility requirements, travel training and cost recovery strategies to provide the agencies with the full range of options for providing high quality services while managing paratransit service costs.

Deliverables
Results of the analysis including maps documenting concentrations of boardings and origin-destination patterns for paratransit services in the City of Newark. Our team will also identify any potential gaps in fixed route service that if addressed could reduce certain individual's dependency on paratransit service. New approaches such as the use of shared mobility companies and/or microtransit opportunities will also be evaluated to determine if they could be utilized in a way to reduce operating or capital cost associated with providing additional options within the paratransit program.

Task 4: Data Analysis

Using the goals and objectives of the project established in Task 1, and documenting the characteristics of the existing transit network in Tasks 1 and 3, the next step in the process is analyzing the performance of the transit network and the market in which it serves. The performance and market analysis provides the PMC/AC, other stakeholders, and the public with a firm understanding of the transit system and the market, and will be used extensively in the development of recommended service improvements as part of this task.

The performance and market analysis consists of three main elements:

- Performance analysis of the existing transit systems
- Market analysis of the area that the transit systems serve
- Development or refinement of key performance indicators (KPIs) and service standards.

Each of these is examined in detail in the following sections.

Performance Analysis
The performance analysis documents the existing Newark transit routes and facilities, and analyzes them in terms of their efficiency and effectiveness. The analysis compares the existing performance of the various routes, using the data collected in Task 1, to existing performance or service standards, or is used by the agencies to establish new or update existing service standards for each agency, as appropriate. This analysis will provide insights about the performance and will support the development of recommendations for optimizing the Newark-area transit system into a more cohesive network.

WSP assumes that no new data will be developed by WSP or any of the transit providers to perform this analysis, and that this effort will be completed using readily-available data obtained in Tasks 1 and 3. Should the PMC desire WSP's support in collecting or developing additional data or analysis, we will provide a scope of work and cost estimate for these efforts.

Existing Ridership Patterns

Ridership patterns on the existing transit services are relevant not only to the evaluation of the existing service, but also are the most fundamental document of the existing transit market, serving as a foundational element to the market analysis. Ridership is also critical to many performance measures and service standards. Route, link and stop-level ridership data will be the key to developing draft recommendations as part of this task.

Using the data gathered as part of the IPA study, we will build on this document and provide the following data items as practicable:

- Listing of routes by provider, ranked by daily and annual ridership by route, disaggregated by time of day (AM and PM peak, midday, evening), weekday vs. weekend, and service type (local vs. express)
- Listing of routes ranked by productivity as measured in terms of boardings per service (revenue) hour and mile, per trip, and cost per boarding
- "Dot maps" showing relative volume of boarding and alighting data at route-stop level
- Maps showing relative volume of boarding at the route and route-link (time point to time point) levels and identification of under- and over-performing routes and links
- Maps showing the relative productivity of the routes in terms of boardings per revenue/service hour, mile, trip and cost per rider, at the route and (where possible) route-link levels
- Total ridership by stop and link, for all routes using a common stop or link on the roadway network
- Total load on board by link and time of day, and identification of routes and links/peak load points were overloading often or regularly occurs, and identification of the issues causing overloading
- Other products agreed to between WSP and the PMC, as can be supported by the available data

Existing Service Performance Analysis

We will next evaluate the efficiency and effectiveness of the existing services based on data provided in Tasks 1 and 3. Aside from the ridership analysis described above, the analysis will include the following elements:

- *Service delivery:* We will analyze and present information, as available, on missed trips and missed pullouts on the various system. Should an agency experience a significant level of missed trips and pullouts, we will discuss with agency staff and assist in identifying causes and potential remedies as part of the recommendations process.
- *On-Time Performance:* WSP will process AVL/APC data as available to compare actual performance to schedules at the route and route-time-point levels, to quantify network-wide and route on-time performance and to identify causes for any on-time performance issues on existing routes.
- *Efficiency:* We will examine the efficiency of the various routes based on the ridership per service and revenue hour (using revenue hours by route data provided by each agency) and the ratio of revenue to service hours (deadhead percentage) at the system and route levels.
- *Cost efficiency and cost effectiveness:* WSP will analyze cost of service per service and revenue hour and mile, and cost per passenger trip at the system and route levels to establish the cost efficiency and cost effectiveness of the service.

- *Cost recovery:* We will use data at the system and route-levels to quantify cost-recovery. For agencies and services currently charging a fare, revenue per passenger trip at the route level will be calculated and used to help quantify cost recovery, and average fare collected at each system's level will be calculated and compared to the nominal and actual fare collected to a group of peer agencies to determine whether the fare is within the range of fares of similar agencies. WSP also will analyze the relationships between the nominal single-ride cash fare and the prices of the agency's discounted and multi-ride fare products to support recommendations for changes to fare procedures, fare collection techniques or equipment.
- *Transit propensity:* Based on available data, WSP and Century will develop a transit propensity analysis for the Newark service area, performing regression analysis on existing transit ridership and demographic data to identify the demographic and economic characteristics that most clearly support transit (such as population and employment density, average income and household auto ownership). From there we will map locations that are under and over-served by the existing transit network based on the relative transit propensity of each part of the service area. We will provide the transit propensity map to WILMAPCO and the PMC in GIS format, and will provide the analysis of the transit propensity data and the transit propensity equations for ongoing transit provider use at the end of the project.

Market Analysis

The analysis of the transit market describes the market and context in which transit operates now, and (based on available data) will operate in the near future. In addition to analysis of existing ridership patterns, and the transit propensity analysis described above, WSP will explore five additional aspects of the market for public transportation in the Newark area:

- Demographics
- Key destinations
- Land use & zoning
- Access
- Transportation system

Each of these is described in detail below.

- *Demographics:* WSP will develop a series of thematic maps showing various demographic and economic characteristics of the Newark service area, overlaid with the existing route alignments of the various transit services. These maps will allow comparison of the existing route alignments with concentrations of population density area and areas of high concentrations of various demographic groups that tend to be over-represented among transit users, e.g., population and employment density, minority households, and concentrations of youth and elderly. Together with the transit propensity analysis described in the previous section, this data will help the planning team identify potential under- and over-served parts in Newark, and locations in which routes might be better coordinated for efficiency or extended to serve under-served populations.
- *Key Destinations:* We will develop an initial map of key destinations in the Newark service area. These destinations include major employers, major shopping centers, middle and high schools, UD, concentrations of medical services and clinics, government service centers, entertainment destinations and other key destinations in the service area. A special emphasis will be made to include destinations of interest to lower-income, elderly and disabled people, and will include public housing, senior centers, and service centers for people with disabilities. This map will be overlaid with the existing route alignments to determine whether any of these key facilities are

unserved or underserved by transit, and will used in the development of service change recommendations to ensure that no facilities lose service.

Development of Service Changes

With the performance and market analysis complete, team efforts will pivot to the development of service changes. WSP will develop a set of initial service change suggestions based on the project goals and objectives to include operating, maintenance and capital cost estimates for the proposed changes as well as other evaluation measures for the proposed recommendations. The recommendations will be refined in collaboration with the PMC before being finalized and presented to the public at the second public workshop.

Based on the findings of the earlier analysis efforts and input from the first public workshop, WSP and Century staff will prepare initial recommendations to address the issues and opportunities that were identified. WSP will prepare a draft scenario for PMC input that will contain the following information for each service provider:

- Route alignments, documented in KMZ files
- Running times by time of day
- Frequencies by time of day and span of service for weekday and weekend
- Operating and maintenance costs
- Peak vehicle requirement

Evaluation and Refinement of Service Changes
The draft scenario will be evaluated in terms of its productivity and effectiveness using the service and performance standards developed earlier in this task. We will present the proposed scenario at a PMC meeting, and seek input from the PMC on any proposed changes. The PMC will be invited to refine the proposed service changes based on our team's evaluation of their anticipated performance. Attendees will review the recommendations on a route-by-route and area-by-area bases and have the opportunity to review the recommendations in detail and test alternative approaches including testing the performance of alternate route alignments, service frequencies, and span of service in real time during the meeting.

WSP staff will have a detailed excel spreadsheet model of the operation of all existing routes and proposed changes to the route network, and maps of all existing and proposed route alignments as well as all the data analyzed in GIS during the initial phase of the project. In this interactive meeting, ideas can be tested for their cost and fleet requirements, relationship with existing ridership patterns, ability to connect to destinations and high-transit propensity groups, and other considerations.

At the end of this meeting, WSP, Century and the PMC will reach consensus on the draft recommendations to carry forward to review by the public and other stakeholders in the second round of public involvement.

Refinement of Service Changes
The draft scenario will be evaluated in terms of its productivity and effectiveness using the service and performance standards developed earlier in this task. We will present the proposed scenario at a PMC meeting, and seek input from the PMC on any proposed changes.

Deliverable
A report will be prepared for PMC review summarizing our identification and evaluation of the corridors where transit service exists, may be needed, or could be better coordinated. WSP and Century will

prepare additional maps and GIS shapefile layers from this data analysis for use in developing findings and in supporting development of service recommendations. Maps and GIS will be used to highlight service deficiencies, by showing contrasts between service intensity and service need and viability. Additionally, the maps prepared for this task will be used in the slide show prepared for the second public workshop and will be documented in the final report. We will also provide the shapefiles to WILMAPCO at the project's conclusion.

Task 5: Prepare Final Report

At the conclusion of the project and following the second public workshop, WSP and Century will compile all information generated in the previous tasks and organize into a final report that will include clear, cost-constrained and implementable recommendations for service changes that will optimize Newark's existing transit network.

Deliverables

Report detailing study recommendations and results, along with supporting appendices.

WSP will work with WILMAPCO and the PMC to create a dynamic and useful plan that will document how existing services match transit needs, and provide a step-by-step guide to implementing transit system improvements. The final report detailing study results will be intended to provide practical future reference and application.

Task 6: Public Outreach

WSP's approach to public outreach is a comprehensive 360-degree focus on public and stakeholder involvement that includes an active public and stakeholder outreach program, as well as "inreach" with agency management and staff, including front-line staff, e.g., the bus operator interviews in Task 1. We appreciate the importance of connecting with stakeholders and the general public – riders and non-riders alike and our plan considers their input throughout the project, interacting with them at strategic intervals. Each of these elements is discussed in detail below.

WSP will work with DTC to prepare proposals for public service change hearings under the agency's policies and procedures for such meetings. This strategy will be documented in an initial public and stakeholder involvement plan including detailed descriptions of all outreach and inreach activities, materials, and documentation for the PMC's review prior to the kickoff meeting, and will discuss any changes to the plan at the project kickoff meeting. WSP will revise the plan for PMC approval prior to beginning the process.

Given the recommendation to condense the schedule for this project, WSP suggests that the study process include two rounds of public outreach – one at the end of the analysis and gap identification phase, and again after the development of initial proposed recommendations for service changes and coordination.

In the first public workshop, we will deploy a broad-based approach to public outreach with a special emphasis on ensuring that existing transit users and groups with higher levels of transit propensity (such as students and lower income, disabled or elderly people) have appropriate and convenient opportunities to provide input. This first workshop will be at the end of the data collection efforts in Tasks 1 and 3 and mid-way through the data analysis phase, with the following elements:

- Introduce the project, including goals and objectives
- Present the results of stakeholder interviews and initial analysis of existing conditions
- Present the initial gaps identified and seek input from attendees to confirm or refine

For the first public workshop we will prepare a formal presentation for a traditional public meeting including presentation and question and answer period to receive input on community preferences. WSP will provide content for advertising materials for the meeting including a press release, advertising poster, and material for inclusion on websites and social media. We will also support WILMAPCO and the PMC in the preparation of materials to be used in the public workshop including display boards, handout(s), sign-in sheets, nametags for participants, and comment cards. A hard copy and links to the intercept survey developed in Task 1 may also be distributed at the public meeting.

Throughout the process it will be essential to consider community preferences to ensure the recommendations reflect the needs of those that actually use these services. There are a variety of stakeholders involved who possess a diversity of concerns – counties, transit agencies, municipalities, a university, and civic and business stakeholders – but all are linked by their interest in provide transit solutions for their residents, visitors, and employees.

For the second public workshop we will present draft recommendations to the public, stakeholders and agency decision-makers after initial review by the PMC/AC. As in the first workshop, the second workshop will consist of a formal public meeting, with existing transit users encourage to review the recommendations, as their feedback provides a vital element in the recommendations development process. In addition, during the same day as the public meeting, WSP staff suggests conducting an open house at the Newark Transit Hub to provide transit customers an additional opportunity to review the proposed changes and offer comments and suggestions. Similar to the beginning of the study, WSP will provide an on-line survey to solicit feedback on the proposed recommendations as well as comment cards to solicit feedback on the recommendations.

Based on feedback received at this second workshop, WSP and Century will modify the recommendations for final approval by the PMC/AC prior to finalizing the final report in Task 5, which will document the analysis and process undertaken in all prior tasks.

Deliverables:

- Content for WILMAPCO's and other stakeholders' websites
- Development of workshop materials for PMC/AC review and comment
- Materials and attendance at up to two public workshops; prepare summaries after each event identifying issues and priorities