



### **Advantages of the Parsons Team**

*The Parsons Team offers DRPT a detailed understanding of the Corridor and Richmond region, national experience in the conduct of AAs for FTA New Start and Small Start projects, and the study and implementation of Bus Rapid Transit.*

This section contains the Parsons Team’s understanding of the scope of work, our approach, and a draft schedule for completion of the Broad Street Corridor Alternatives Analysis (AA). One of the key benefits of our team is the combination of our experience. The Parsons Team offers DRPT a detailed understanding of the Corridor and Richmond region, national experience in the conduct of AAs for FTA New Start and Small Start projects, and the study and implementation of Bus Rapid Transit. Our approach is built on the successful completion of transportation studies and corridor improvements throughout the Richmond region.

## **UNDERSTANDING OF SCOPE**

The Broad Street Corridor AA represents the culmination of years of effort put forth by DRPT, GRTC, and the City of Richmond to develop a fixed-guideway spine to the regional transit network. While initial studies focused on the feasibility of rail alternatives, the current AA allows for a more incremental approach, looking at how an initial Bus Rapid Transit (BRT) line could test the market for premium transit services, encourage corridor-focused development efforts, and allow for the phased implementation of a longer, regional transit service capable of fulfilling the needs of both traditional and choice transit rider markets. Successful execution of this study will require a team well-versed in the local context of the Broad Street Corridor and the Federal requirements of the Small Starts program. By supplementing a Richmond-based staff with national BRT and Small Starts expertise, the Parsons Team will be able to develop alternatives that respond to local needs and maximize the funding available to implement transit improvements in the Broad Street Corridor.

### **The Broad Street Corridor**

The Broad Street Corridor is truly the spine of activity throughout the City of Richmond. Not only does it present a string of activity centers that includes major employment, government, university and cultural centers, but it also is the focus of intensive redevelopment activities. Both existing and planned nodes of transit-supportive densities line the corridor from Willow Lawn in the west end to Rockett’s Landing in the east. The diversity of activity in the corridor is an important aspect of the potential rapid transit development, as the proposed services would not only support traditional commuter trips but also university-related travel and travel to the cultural and entertainment amenities in the corridor. A simple example is the connection the transit service would provide between VCU’s main campus and the brand new Movieland Theater just a few blocks from the proposed Boulevard Station on Broad Street. The Movieland Theater, in turn, is a prime example of transit-supportive redevelopment within the City of Richmond that serves the growing population base in the Broad Street corridor, drawing trips closer to the urban core and creating a diversity of trips that could be served by a new rapid transit line.

As a result of multiple concurrent planning processes in the study corridor, there are several exciting synergies that could occur as a result of the BRT project. One example is the accessibility via BRT to the Main Street Station in Richmond, which will soon be hosting more frequent and reliable rail service from Richmond to

### Local Expertise and National New Starts Experience

The Parsons Team offers DRPT the combination of Baker's local experience with Parsons national experience with New Starts Project, Small Starts Projects, and BRT.

Baker recently completed the FTA Initiation Package for the Broad Street Corridor and has also authored previous Long Range Transportation Plans for the City of Richmond and Henrico County. Parsons is currently working on several Small Start projects – (the E Street Corridor in California (a BRT project) and the Los Colinas Automated People Mover Transit System in Texas.

Washington, D.C. BRT could be a catalyst for more residential development drawn to the rail accessibility, particularly when increased rail service becomes available as a result of the Southeast Corridor High Speed Rail Project. Other examples include a new ballpark that will likely be a focus of mixed-use redevelopment in an area that may be constrained for parking, and the ongoing development of VCU. A key focus of the Alternatives Analysis will be to make the case for a rapid transit investment that can ignite these possibilities and help make them a reality.

The re-introduction of a transit spine has long been planned along the Broad Street Corridor by the City of Richmond. Broad Street itself, and the City of Richmond, first developed as a trolley community and trolleys were invented in Richmond. Some of the Parson's team staff developed the initial Broad Street transit concepts as part of the Transportation Plan and Downtown Plan efforts in the 1990s conducted for the City of Richmond. Transit has long been seen as a way to offer modal options for the residents of the City, tourists, and business commuters. Through the years, several transit initiatives have focused on Broad Street – including studies for improving bus transit operations in the downtown core and concepts for providing rubber-tired trolley services to such destinations as Shockoe Bottom and the museum district along Boulevard. By implementing the proposed BRT service, DRPT will be building upon a historic legacy of transit in the Broad Street Corridor, and the Parsons Team fully understands the importance of the corridor for the City and the region.

### FTA Requirements

Successful implementation of the Broad Street Corridor BRT will depend on ensuring the Locally Preferred Alternative meets Federal Transit Administration (FTA) requirements for fixed guideway investments, as defined under the Section 5309 New Starts program. The two key criteria that must be met include:

- **Support of economic development.** As documented by the Parsons Team in the Initiation Package, there are several redevelopment projects in the corridor that will help build the case that improvements in the Broad Street Corridor will support both existing activity centers and new initiatives under development throughout the corridor.
- **Cost effectiveness.** Cost effectiveness is defined as the cost of providing an hour of user benefit. User benefit, in turn, is measured in terms of the travel time savings accrued to all transportation users in the region. While congestion relief is traditionally the largest source of such savings, Broad Street offers several other opportunities, including: reducing travel times for existing transit riders in the corridor; and reducing conflicts between automobiles and transit vehicles in the corridor. The Parsons Team will work with GRTC and DRPT to identify the ways that alternatives would provide travel time savings to regional transportation users.

The Parsons Team's approach to the Alternatives Analysis will be tailored to meet the requirements of two relatively new programs included under Section 5309 funding: the Small Starts program and the Very Small Starts program. Both of these



### Detailed Understanding of the Broad Street Corridor

*Continuing our work from the Initiation Package, the Parsons Team will work with DRPT, GRTC, and FTA to determine if any of the initial alternatives could meet the requirements for a Very Small Starts application.*

*These programs offer an opportunity to fast-track implementation of the initial BRT service, making it possible to test the market for premium transit services in the study area.*

programs are designed to support smaller-scale investments in fixed guideway transit that could optimize, enhance, and/or expand existing transit operations. Four characteristics of the Broad Street Corridor BRT lend themselves very well to participate in either of these programs:

- **High corridor ridership.** The corridor handles over 9,700 weekday boardings—three times the minimum threshold for Very Small Starts funding. The corridor also handles 20 of the 31 routes operated by GRTC, making it easier to demonstrate the significance of the corridor to the regional transit network.
- **Low capital costs.** Initial estimates indicate that the BRT alternative would cost approximately \$54.4 million—one fifth the maximum capital cost allowed by the Small Starts program. While the Very Small Starts program is limited to projects with a capital cost of less than \$50 million, there may be opportunities to develop alternatives that would meet this criterion.
- **Opportunities for incremental improvements.** The conceptual BRT alternative is defined in a way that preserves maximum flexibility in its implementation. This will make it possible to develop and test alternative approaches to BRT implementation, including: combinations of dedicated and shared travel lanes, shared use of BRT lanes and infrastructure by other fixed-route services, and route consolidation and optimization strategies. By focusing on incremental approaches rather than the all or nothing approach required for rail alternatives, we will be able to develop alternatives that are eligible for immediate FTA funding and preserve opportunities for future investments in BRT, streetcar, or LRT.
- **Advantages of using opening year forecasts.** With both the New Starts and Small Starts programs, the key criteria to meet is cost effectiveness as expressed in terms of costs per hour of user benefit. Under the Small Starts program, ridership is forecast for the first year of operation, and user benefits are adjusted upwards 50%. This is a major advantage for medium-sized metropolitan areas, where population and employment increases may not be large enough to generate such a large boost in benefits by 2030. This is an even greater advantage for the Broad Street Corridor, where 2030 user benefits may suffer from the forecast decline in employment of 11,000 jobs.

Continuing our work from the Initiation Package, the Parsons Team will work with DRPT, GRTC, and FTA to determine if any of the initial alternatives could meet the requirements for a Very Small Starts application. If so, this could offer an opportunity to fast-track implementation of the initial BRT service, making it possible to test the market for premium transit services in the study area.

### Keys to Success

Based on our understanding of the Broad Street Corridor and FTA's requirements, the keys to successful implementation of transit include:

**Understanding the corridor context and local history of transit.** Broad Street is not only an important commuting corridor, but also the “Main Street” of Richmond, the

seat of the Commonwealth, and a major medical and education center. The BRT initiative is as much about transforming this corridor as it is about re-creating a historic transit spine for the region. The Parsons Team brings a Richmond-based team that understands this context and can convey this to Broad Street's stakeholders and funding partners.

**Developing viable alternatives and preserving all options.** The future of transit on Broad Street depends on having options that can demonstrate short-term benefits while laying the groundwork for future improvements. The Parsons' team knows how to structure BRT alternatives so they can leverage existing Small Starts funds, and we will also work with DRPT and GRTC to determine if an incremental approach could be used to access Very Small Starts funding. Under both circumstances, we will ensure that all alternatives are developed so to allow further expansion and enhancement in the future.

**Responding to current financial conditions.** The study has to show that the corridor is financially feasible in light of the market for transit in the Richmond region. The City of Richmond and the Commonwealth of Virginia are both under severe financial constraints. The Parsons Team will capitalize on the streamlined financial requirements of the Small Starts program to put the Broad Street Corridor in the best possible perspective for federal funding. We will also leverage our experience with projects such as the Dulles extension to identify a full range of potential funding sources so that transit alternatives may be implemented within the fiscal constraints of the times.

**Integrating transit improvements into land use planning.** The BRT system will need to not only provide access between mixed-use nodes at the origin and destination points, but all along the corridor. Station areas need to be properly located and planned so that all modes of arrival are feasible and integrated seamlessly into the transportation network. Building off of our work on the Initiation Package and leveraging the knowledge of our Richmond-based staff, the Parsons Team will develop alternatives that improve accessibility and provide opportunities for economic development within the corridor.

**Engaging the public to understand and meet their needs.** Public and stakeholder engagement will be needed to build a constituency among existing transit users, the business community, and choice riders, any/all of whom might have to agree to new taxes to make this corridor happen. The types of partnerships and regional support that helped re-establish the Main Street Station will be needed for the implementation of a higher level of transit than has traditionally existed in Richmond.

## Management Approach

The Parsons Team proposes the use of an integrated team made up of staff from Parsons, Michael Baker Jr., Inc. (Baker), Renaissance Planning Group, Public Financial Management, and Cordell & Crumley. Our Project Manager Gibran Hadj-Chikh, will serve as the administrator of the project and primary point-of-contact. Gibran's wealth of experience with Small Starts projects is critical to the success of

this project; he will lead the development and analysis of alternatives with a focus on the user benefit calculations that drive FTA decision-making. Gibran will oversee data collection as well, with the intention of utilizing as much existing data as possible while strategically supplementing the data set with information that will add useful and credible information to the user benefit calculations.

Working closely with the project manager will be our Deputy Project Manager, Anne Darnall. Anne's combination of Alternatives Analysis and NEPA experience for FTA New Start and Small Start projects will be leveraged to streamline completion of the NEPA process and ensure that as the various AA tasks are completed, the output is as needed for use in the NEPA studies.

Working closely with Gibran and Anne will be Lorna Parkins, AICP. Her local presence just minutes from DRPT and the project corridor will facilitate a constant stream of communication and foster rapid and efficient progress on the project tasks. Lorna has a staff of 8 transportation planners in Richmond, who are available to conduct analyses, meetings and public outreach in a very cost-effective manner while taking advantage of their intimate knowledge of the corridor. For example, three of her staff are VCU graduates who have lived (and in some cases still do live) in the project corridor.

Ongoing communication and accountability will be the basis of the management approach for this project, and that will be the primary focus of the project manager. Weekly project update meetings will be quite feasible for our management team, and our team will integrate the monthly Policy Advisory Committee (PAC) and Technical Advisory Committee (TAC) meetings with the project milestones to make maximum use of the policy and technical leaders' input, thereby advancing the project efficiently.

We have crafted our team to meet the exact needs of this project with team members who all have highly relevant experience. Our experience is discussed further in Tab 2, Experience and Qualifications, and an organization chart is also located in that section.

## Approach to Scope of Work

Our scope of work is presented below. All deliverables will be submitted in draft form to DRPT and other review agencies prior to completion and at minimum, two weeks will be incorporated into the schedule for review, longer as requested. Parsons will also implement a comprehensive QA/QC process for all deliverables prior to releasing them.

### ***Task Item #1: Data Collection***

The Parsons Team will build upon its work from the Initiation Package to rapidly assess the data needs for the Alternatives Analysis. Our team already possesses several of these key inputs, including: up-to-date estimates of population and employment, copies of the previous studies performed by DRPT, GRTC, and the City of Richmond, VDOT traffic counts, and the results of GRTC's Comprehensive Operations Analysis (COA). The Parsons Team will be able to complete the data

collection report within the first 5 business days following notice to proceed. This will ensure that the study is able to move at an aggressive pace, with no time lost to the learning curve needed for a new study team.

More recent data to be collected includes: results of the current home interview study, data collected as part of the City of Richmond's signal optimization project, and the most up-to-date analysis of the key intersections in the corridor. Due to recent changes in oil prices and economic conditions, it is likely that the on/off counts listed in the 2006 COA may need to be supplemented with current information on ridership patterns in the corridor. As part of the data collection report, the team will recommend a sampling strategy by which GRTC's Automatic Passenger Counter (APC)-equipped buses may be used to determine if there have been significant changes in ridership volumes and distribution that may affect recommendations for BRT routing and station locations.

***Task Item #2: Detailed Work Program***

As soon as our Team is selected, the Project Manager will finalize the detailed work program for the project, including a detailed project schedule with milestones and critical path of information development and reviews/approvals identified. All deliverables and target dates will be identified in the work program. The work program will be included in a Project Management Plan that also includes a communications plan, contact list, quality management plan, and a risk assessment that identifies factors that could jeopardize the project schedule or budget. The work program will also delineate roles, responsibilities, and lines of communication between the Parsons team, DRPT, GRTC, and other stakeholders. The Project Management Plan including the Detailed Work Program will be delivered within 15 days of notice to proceed.

***Task Item #3: Purpose and Need Statement***

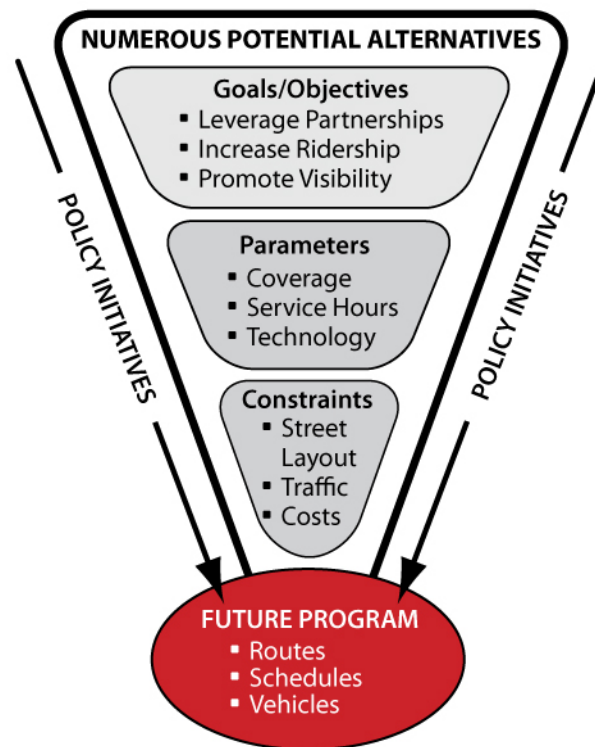
The Consultant Team believes that a strong Problem Statement is more than just satisfying a requirement in the NEPA compliance process. This statement, verified through stakeholder collaboration and resulting from public input, will form the basis for the study goals and objectives, essential for the comparative analysis of alternatives in later stages of the study. Goals and objectives are developed to answer the question of "what is the desired future state" of public transit along Broad Street and its surroundings, as well as "what are the measurable outcomes" for evaluating progress and success in moving toward this future vision. The Problem Statement will ultimately point to this vision and the measurable changes desired for the corridor, later used in helping decision-makers to choose between competing alternatives.

The Consultant will approach the formulation of a problem statement through the findings of previous studies, public desire for improved transit operations and esthetics, the current conditions and trends in the corridor, and future forecasts for linking development patterns with public transportation. These items will be packaged in a manner that draws upon our Team's experience with FTA requirements and

guidance to address Small Starts project justification criteria, recognizing and highlighting key strengths and opportunities the Broad Street corridor represents. In order to establish the framework for entry into a federal funding grant and Small Starts project development process, this statement must demonstrate that the agency has a credible rationale for proposing actions in the Broad Street Corridor. A key focus will identify those factors that currently challenge the Greater Richmond Transit Company (GRTC) in attracting choice ridership in this core service area. The statement will link and detail the gaps between these challenges and the ability of the corridor to achieve its full potential as envisioned by residents, planning staff and the transit agency.

**Task Item #4 Alternatives Development (including Baseline):**

The Consultant Team is committed to evaluating the performance of the existing transit system (baseline) and to formulating transit system improvements and new modes that will address unmet transit service needs articulated in the Problem Statement. This process begins with numerous alternatives that are eventually screened and reduced to an LPA that is advanced for further refinement as part of a FTA Small Starts project. The various parameters used to create these alternatives are illustrated in Figure 1.



**Figure 1.** Alternatives Development/Screening Process

Per FTA requirements, the team will develop a baseline alternative against which all “build” alternatives may be compared. Initial discussions with the FTA have indicated that they are looking for a Transportation Systems Management (TSM) approach to

### The “Kit of Parts” Approach: Metra UP-W Line Upgrade.

Metra was looking to fund a series of capital improvements that would allow for additional service on the UP-W Line, the oldest railroad in the City of Chicago. Parsons worked with Metra to identify three key improvements (rebuild interlocking, add third mainline track, improve signals) and package them into three distinct alternatives:

- “Full” (all improvements),
- Moderate 1 (interlocking only), and
- Moderate 2 (third mainline track, improve signals).

This modular approach to alternatives development made it very easy to determine the impacts and benefits associated with each improvement under consideration.

be included in the baseline alternative. TSM alternatives are typically defined as being the most that can be done to meet the Purpose and Need for the study without investing in a new or extended fixed-guideway. Several of the recommendations of the COA (route rationalization, improved frequency of service), would fall under this general definition. As the “build” alternatives (i.e. the BRT alternatives) will be measured for their ability to provide user benefits above and beyond those provided by the baseline, a baseline that performs “too well” may jeopardize the cost-effectiveness of the “build” alternatives. The Parsons Team will coordinate with FTA to reach a consensus on the minimum requirements necessary to satisfy the definition of a baseline alternative. As part of the development of alternatives, the Parsons Team will also ensure that both the TAC and PAC understand the ramifications of the baseline improvements on the viability of the “build” alternatives as candidates for Small Starts funding.

The main focus of this task will be on the “build” alternatives: combinations of fixed guideway improvements, new services, vehicles, and facilities that will meet the Purpose and Need for the study while simultaneously achieving or exceeding FTA requirements for a Small Start. Building off of previous studies and capitalizing on the reduced number of alternatives generally associated with Small Starts projects, it is anticipated that the Parsons Team will be able to ensure that all alternatives will utilize the Broad Street alignment described in the Initiation Package. Alternatives will be developed in close collaboration with GRTC staff to assure facilities and services are compatible with GRTC existing operations and service plans, as well as in accordance with existing or proposed land use regulation and design criteria.

Recognizing that the objectives of a BRT service may be met through different combinations of improvements, the Parsons Team will work with GRTC, DRPT, and the TAC to develop a “kit of parts”: a set of service, facility, and vehicle improvements that are acceptable to stakeholders and can be used to meet the mobility, economic development, and cost-effectiveness requirements of the Small Starts process. These parts will then be assembled in different combinations to define alternatives that yield distinct combinations of service, cost, and user benefit. Defining alternatives in this way will preserve the broadest range of options for implementation and help demonstrate to stakeholders the trade-offs associated with each level of investment.

The conceptual designs for each alternative will be critical in (a) minimizing the contingencies on capital costs; (b) explaining the potential impacts of alternatives to stakeholders; and, (c) providing input to both the traffic and travel demand forecasting exercises. To this end, each alternative will include conceptual designs of stations, guideway, and associated facilities.

#### ***Task Item #5 Capital and Operating Cost Estimates***

Both the Small Starts and Very Small Starts programs have upper limits on the total capital costs of a project, and annualized costs are a critical input to determining whether a project meets the cost-effectiveness thresholds established by the FTA.

**Reverse Engineering  
Cost Effectiveness:  
MTA Green Line:**

Parsons and Baker have successfully worked together to use preliminary modeling results to “reverse engineer” estimates of the cost and travel time savings necessary to receive a “medium” cost effectiveness rating from the FTA.

Using initial estimates of user benefits developed by Baker, Gibran Hadj-Chikh estimated the capital cost reductions that would be necessary to achieve a cost-effectiveness index of \$23.99 (equivalent to a “medium” rating.) This technique was able to demonstrate that the cost reductions necessary to achieve a “medium” rating for heavy rail alternatives were not feasible, but that an improved TSM alternative could be developed that would be a candidate for Small Starts funding.

With this in mind, it will be critical for the cost methodologies and their resulting estimates to be impervious to scrutiny. The Parsons Team will establish cost methodologies for both capital and operating costs that reflect the most recent cost inputs (labor, materials, vehicles) from GRTC, DRPT, VDOT, the City of Richmond, and other applicable sources. Costs for initial alternatives will be developed in sufficient detail to allow for order-of-magnitude comparisons between alternatives. Costs for detailed alternatives will be developed in sufficient detail to (a) allow preliminary estimates of each alternative's cost effectiveness index; and, (b) allow for costs to be developed for segments of the corridor. Costs for the Locally Preferred Alternative will be developed in sufficient detail to allow completion of the FTA's Standard Cost Category (SCC) worksheets. In all cases, allocated and unallocated contingencies will be developed and documented in sufficient detail to ensure that cost estimates are robust and will remain applicable through project development and implementation.

As seen in other New Starts we have participated in, the difference between a competitive LPA and an uncompetitive LPA can often come down to pennies in the cost-effectiveness index (CEI). The “kit of parts” approach discussed in Task #4 will allow the team to easily add or subtract elements from an alternative to test their effects on the cost-effectiveness index. This will make it possible to refine an LPA without having to completely rebuild the cost estimates for the alternative, improving our team's responsiveness to inquiries from DRPT, GRTC, the TAC, and the FTA.

***Task Item #6 Preliminary Financial Plans***

The Parsons team will evaluate and identify financial strategies that provide for the capital and operating needs of the proposed alternatives while ensuring necessary resources are available for operations and state of good repair of GRTC's service network. The analysis will begin with a review of GRTC's existing financial operations. This will encompass analyzing recent audited financial statements, budgets and other financial reports to assess current financial capacity to provide existing services. As part of this effort, the Parsons team will review GRTC's proposed service plans and capital investments to maintain and improve existing operations such as new/reconfigured bus routes, bus fleet replacement, fleet expansions, etc. Information describing GRTC's current financial condition and expected funding requirements for the existing system will serve as key inputs for the financial analysis to determine the commitments on and sufficiency of existing resources to meet baseline operating and capital needs. Baseline GRTC needs will be considered along with the capital and operating needs of the BRT and other alternatives in order to develop a comprehensive financial strategy.

The core of the financial analysis will be the development of a comprehensive cash flow model that will annually project over a twenty year period:

- Base line system operating costs reflecting planned service levels and capital costs considering fleet replacement cycles, expansions and fixed facility needs.

- BRT and other alternative operating costs based on operating plans developed for the options under consideration
- BRT and other alternatives capital costs reflecting initial construction to implement the proposed options as well as renewal and replacement needs including vehicle replacement and state of good repair needs
- Fare and other operating revenues reflecting the fare policy and travel demand estimates for the base line GRTC system and BRT and other alternatives as well as income derived from purchased transportation services
- Existing funding sources including the Commonwealth of Virginia Transportation Trust Fund which is the primary state funding source for transit and highways, intergovernmental grant contributions from the City of Richmond and Federal Transit Administration (“FTA”) Section 5307 formula, CMAQ and other grant programs
- Federal Funding under the Section 5309 Major Capital Investments and Fixed Guideway programs that would fund a portion of BRT capital expenses. In addition other federal funds available under CMAQ and the Surface Transportation Program will be considered.

While FTA grants can statutorily provide up to 80% of capital funding, DRPT's/GRTC's ability to secure this level of funding under the Section 5309 New Starts Program will be difficult given the combination of Federal Highway Trust Fund resource constraints and increasing competition for federal resources. As a result, it is important that the analysis consider a range of state, local and private funding sources that could be available to meet project needs. These include:

- Additional contributions for the project's construction from the Commonwealth's Transportation Trust Fund and local intergovernmental grant contributions
- Local Dedicated Tax Contributions: These encompass special taxes that can be used for transportation infrastructure and levied by the individual local governments such as a commercial and industrial (“C&I”) real estate tax, a C&I tax imposed on a specific geographic district that directly benefits from the transportation improvements—also known as a transportation improvement district, or a tax on residential, commercial and industrial properties within a defined district. Such districts have been established to finance improvements for Route 28 in Fairfax and Loudon counties and to provide a portion of the funding for the Dulles rail project.
- Richmond Metropolitan Authority contributions: Surplus toll revenues may be considered as an additional source of funding for the project. Revenues generated from the Dulles Toll Road are being applied to finance a portion of the Dulles rail project.

- Private Sector Participation: Improved access provided by the transit investments will increase the attractiveness of commercial, retail and residential properties served by the new transit services. Recognizing the benefits of improved transportation access, developers may be willing to fund a portion of park and ride lots, overpasses, walkways and other facilities that connect transit services to these properties. In addition, GRTC may have the opportunity to enter into a long term lease of any adjacent property not directly needed for the transit services that could be used for commercial or retail development. Income derived from such a lease arrangement could help support a portion of the project's needs.

Alternative revenue sources will be assessed using evaluation criteria that identifies their potential revenue yield, stability/vulnerability to economic cycles, legal authorization and limitations on its implementation, administrative ease/challenges in collecting revenues, and taxpayer/fee payer equity—that is assessing whether the person paying the fee or tax will benefit from the transportation improvements. As part this effort, the Parsons Team proposes to first meet with DRPT, GRTC, PAC and TAC to review the range of alternative revenue sources to be considered and the evaluation measures used to assess them. Once DRPT, GRTC, PAC and TAC have given their approval of the revenue options and evaluation criteria, the Parsons Team will conduct its analysis and evaluation of the revenue options. This work will entail estimating the yield and growth of the revenue options, applying the cash flow model to assess how the proposed revenue options align with annual capital and operating needs, and determine the need, magnitude and general structure for debt financing to close any gaps between revenues and expenses. As part of this effort, the revenue options will be ranked relative to the evaluation criteria presented to and agreed upon by DRPT, GRTC, PAC and TAC.

Based on the structuring of the cash flow model and results of the financial analysis the Parsons Team will provide to DRPT, GRTC, the PAC and the TAC:

- The cash flow model including documentation of its structure, assumptions and inputs
- The results of the financial analysis identifying the recommended options for constructing and operating the BRT and other alternatives under consideration as well as the base GRTC system.
  - The financial analysis will be documented in a Financial Capacity Analysis Report for DRPT, GRTC, PAC and TAC review and comment. The Parsons Team will convene a workshop with project participants to discuss the results of the financial analysis and the recommended options as well as seek feedback.
  - Based on comments received, a Revised Capacity Analysis Report will be submitted to FTA for review and comment.

- A Final Capacity analysis Report will be submitted incorporating feedback and comments received from DRPT, GRTC, PAC, TAC and FTA.

As part of this task, the Parsons team will use the deliverables discussed above to prepare all materials required for the financial element of the Small Starts application. The deliverables for this would be as follows:

- Small Starts Project Finance Worksheet. Parsons would use the FTA Small Starts template to summarize the costs, funding sources, and operating characteristics of the existing system and proposed alternative.
- Detailed funding plan. Similar to the plan required by a New Starts application, this document would focus on the sources, amount, and steps needed to secure funding commitments for the local match for the proposed alternative.
- Detailed operating and maintenance cost estimate. This would be developed as part of Task #5.
- Documentation of existing costs and GRTC's financial health. As required by the Small Starts application, this would include: the current agency budget and three years of audited financial statements.

***Task Item #7 Evaluation of Alternatives and Methodology***

The Consultant Team will provide an iterative and transparent process to reduce the various alternatives to the most promising transit solution for the Broad Street Corridor. Recognizing that the Small Starts program is oriented towards a smaller set of alternatives with lower capital costs, the team will conduct a pre-screening of technologies. Using information from previous studies the team will determine if rail alternatives may be eliminated from consideration as part of this study. As part of this pre-screening process, stakeholders who have previously expressed an interest in rail alternatives will be engaged to ensure the amenities and services they wish to see incorporated into the Broad Street Corridor are either considered as part of this Small Starts project or not precluded from being incorporated in future transit improvements to the corridor. The results of this pre-screening effort will be summarized in a technical memorandum.

Mirroring the programmatic requirements for FTA project selection, the Consultant proposes a methodology targeted to project justification and local financial commitment measures as applied to each alternative. The goals and objectives from the Problem Statement will be given measures that will rank each alternative in terms of project justification. Initial alternatives will be developed and analyzed in sufficient detail to allow them to be measured and compared according to criteria including:

- Cost Effectiveness
- Ability to Support Existing and Future Land Uses
- Ability to Improve Transit Patronage in the Corridor
- Ability to Improve Regional Mobility
- Ability to Integrate with the GRTC system

The alternatives that survive the initial screening would then be refined to allow for more detailed assessments of their costs, impacts, and benefits. The refined alternatives will be compared using financial performance indicators. This primarily revolves around the determination of any alternative-specific impacts identified in the financial planning component of this study, such as an ability to leverage existing resources or substantial increases in operating costs.

This evaluation approach will be documented in a stepwise fashion that will further illustrate how the outcomes of the initial evaluations may require the refinement of some alternatives or the combination of the most favorable portions of various alternatives into a new hybrid alternative. The process will further be documented to capture the feedback and input from the public during evaluation and screening to illustrate to both the reader and the FTA how the multiple objectives of public support, best solution to the Problem Statement, and a competitive and justifiable Small Starts project have been reconciled into the LPA.

***Task Item #8 Traffic Impact Assessment***

The Parsons' team will prepare the traffic impact assessment needed to complete a draft and final Traffic Impact Report. Our traffic engineers will work with the microsimulation model being developed outside of this scope of work to assess complex intersections along the corridor. More traditional methodologies, including the use of HCS and Synchro will be used to assess mainline performance and more traditional intersections. Parsons will work with the consultant for the microsimulation to develop the outputs required to prepare a comprehensive Traffic Impact Assessment, including summaries of performance, travel time, capacity and delays for the entire corridor. During the data collection task, we plan to work with the City of Richmond staff to determine if collaboration with their traffic signal optimization project will allow a streamlined process for the BRT Alternatives Analysis traffic impact assessment, for example, by utilizing any Synchro models they have already prepared. The results of this assessment will be used to determine the potential impacts of different BRT lane configurations on traffic operations in the corridor.

***Task Item #9 Station Area Identification***

The convenience, safety, and amenities at passenger waiting facilities are a primary and practical consideration for people considering whether to take public transit. There are two main concerns when selecting station sites, access for the existing base of potential riders and opportunities for future transit oriented development to attract additional future riders. In addition, there must physically be the space needed to construct station area facilities – such as platforms, shelters, and other transit amenities that are a vital component of a transit system.

The Parsons Team will prepare base mapping of the entire corridor to be used in the station area identification task and the overall assessment of the land use in the corridor and in looking at the environmental document that will be required. As part of the base mapping, right-of-way information will be developed for the entire corridor so that station areas can be identified. Station area plans will be prepared for each

station area – including identification of the typical section, station area design elements (platform dimensions, etc.), right-of-way, and land uses, both existing and future. If there are potential right-of-way impacts (which will be avoided as much as possible in the development of alternatives and selection of station areas) these will be documented on the mapping – it is anticipated that only partial acquisitions would be potentially required for the corridor, if any are needed at all. Right-of-way mapping will be prepared for the entire corridor and all station areas.

The Parsons Team has developed a methodology for assessing station areas, including identification and prioritization of station access modes and as part of overall corridor analyses – including development of inputs for microsimulation modeling and ridership projections. For example, as part of the Dulles Corridor Rapid Transit Project, staff from Parsons conducted detailed land use evaluations for each station area by using parcel-level GIS data and then projecting development potentials in conjunction with localities based on a review of their economic development potential and land use mix as noted in comprehensive plans and transit-oriented development plans for station areas. We then developed population and employment projections for each station area for each alternative by using the GIS to layer parcel information into Traffic Analysis Zones (TAZs) so that the effects of the transit-supportive land use policies in the corridor could be tested for ridership and mode of arrival impacts. A similar methodology will be used in the Broad Street corridor to test station area locations and the potential for transit supportive land uses to supplement ridership in the corridor.

***Task Item #10 Corridor and Station Area Land Use Assessment***

The Parsons Team will follow on the work conducted in Task 9 to complete a more comprehensive analysis of the entire Broad Street Corridor, with an emphasis on comparing scenarios to FTA land use criteria that are designed to measure transit-supportive land use policies. The Parsons Team has access to land use information through our work in the first phase of the Broad Street project and can use that to develop some of the information to the study area, including all land within a quarter mile of the station areas. As noted above, we will use a GIS to layer parcel information into a TAZ structure so that existing and future land use can be assessed and then converted into population and employment projections. These projections will then be compared to FTA criteria using the GIS to calculate such measures as density per acre in the station areas and associated corridor wide statistics.

Parsons will look at enhancing all modes of arrival in the station areas, including bicycle and pedestrian connectivity. Within the station areas we will prepare a comprehensive inventory of sidewalks and bicycle lanes and where they do not exist, propose enhancements that can be incorporated into the design or as part of future development activities. For pedestrian and bicycle connectivity we will assess physical conditions and identify any potential barriers to access that might exist within the corridor. As part of this evaluation, Parsons will develop “walkability” indices for each station area by looking at measures that promote complete streets and multimodal corridors such as wide sidewalks, pedestrian-scale lighting and design,

and streetscaping amenities. The Parsons Team will develop recommendations to improve land use conditions and multi-modal connectivity within the Broad Street Corridor and a quarter mile around station areas as part of a comprehensive assessment.

***Task Item #11 Travel Demand Forecasting:***

The Parsons Team has experience coordinating with AECOM's travel demand forecasting team, as demonstrated by collaboration on the UP-W Line Upgrade Alternatives Analysis in Chicago, IL. As the Small Starts process allows for ridership forecasts to be developed by pivoting off of existing data instead of conducting a traditional four-step modeling exercise, the Parsons Team will coordinate with the modeling team early in the development of alternatives to ensure we understand what parameters will be measured by the model, and what level of detail will be required of each alternative. Specific areas of concern to be addressed will include: level of detail necessary for operations plans for Build Alternatives and feeder services, precision of station locations and layouts, treatment of pedestrian connections, and the impacts of different guideway configurations on modeling results. Because the Small Starts program is relatively new, FTA has not released detailed guidance for Small Starts forecasts, as has been done for New Starts. The study team recognizes that this introduces a level of uncertainty to the modeling methodology, and will be responsive to requests from the modeling team to ensure any changes requested by FTA or required by the modeling process can be readily accommodated. The team will also be able to draw from its experience with other Small Starts across the United States and offer examples of how other agencies have approached Small Starts modeling.

***Task Item #12 NEPA Evaluation and Determination***

An important first step will be to work closely with DRPT in coordination with FTA regarding the level of documentation needed to satisfy NEPA. Based on the level of impacts anticipated and the types of improvements that will make up the alternatives slated for study, a Categorical Exclusion is possible (particularly if a package of improvements that qualifies as a Very Small Start is selected as an LPA). However, FTA has required Environmental Assessments (EAs) for several recent Small Start BRT projects. For the purposes of defining a scope of work and budget for this task order, the Parsons Team has assumed that an EA will be completed.

The data developed as a part of Tasks 1 (Data Collection), 3 (Purpose and Need), 4 (Alternatives Development), 5 (Capital and Operating Costs), 7 (Evaluation of Alternatives), 8 (Traffic Impact Assessment), 10 (Land Use Assessment), Task 13 (Public Relations and Participation) fulfill many of the requirements for an Environmental Assessment. Notable exceptions include the work to complete the existing conditions and impact assessments for the social and environmental impact areas (i.e., cultural resources, noise and vibration, etc.). Some the data needed to fulfill the requirements of a NEPA document will be collected as a part of the AA screening efforts; however, more detailed data is needed to support an EA. Further, some impact assessment work is labor intensive than others (i.e., noise and vibration

**Early Actions to Help Streamlining the NEPA Process**

The Parsons Team includes a core group of professionals that have completed both feasibility and environmental impact studies. This ensures that environmental considerations are integrated with the alternatives development to maximize the avoidance of impacts.

analysis) and some requires a good deal of agency coordination/consultation (i.e., Cultural Resources).

The following additional work will be conducted to complete the NEPA documentation:

- **EA Schedule and Outline.** An early task will be to develop the detailed schedule for the Environmental Assessment and its outline. This work should be conducted in conjunction with the Task #2, the Detailed Work Program, so that the work associated with the development of the EA can be planned according to when the needed inputs for impact assessment will be available from the AA efforts. For example, setting the Area of Potential Effects for historic properties with the Virginia Department of Historic Resources (DHR)/State Historic Preservation Officer, will require fairly detailed knowledge of station locations. This will allow us to set a focused APE, thereby reducing the number of potentially affected historic properties that have to be inventoried and assessed. Similarly, the visual impact assessment requires us to understand the typical station area designs. This work, which will be completed as a part of Task 9, will be important in completing the visual impact assessment and will be needed to determine the potential for adverse effects to historic buildings.
- **Property Owner Notifications.** In accordance with the Code of Virginia (33.1-94), we will assist DRPT by notifying property owners where we will need to enter their land to conduct the required surveys (i.e., cultural resources surveys, noise monitoring). The required notices must be sent to the property owners listed in the tax records by certified mail, return receipt requested not less than 15 days prior to the first date of the proposed entry. We plan to initiate this process shortly following notice to proceed so that we can begin work on the field investigations.
- **Scoping and Agency Coordination.** While one of the planned public meetings can easily be tailored to meet the requirements of NEPA, additional efforts will be undertaken to initiate scoping with Federal, state, and local agencies. Some of these agencies will be members of the TAC and PAC, however, the environmental resources agencies fall outside of these groups. As a follow-on to the Scoping activities, we will prepare a Scoping Process Report to formally document the process and comments received. Additional agency coordination will be conducted following scoping to collect data, evaluate the potential for impacts, and determine appropriate mitigation measures as needed. With the exception of the DHR, the Parsons Team assumes that the need for coordination will be minimal and primarily related to data collection. Cultural Resources and coordination with DHR is described further below.
- **Section 106/Cultural Resources Investigations.** Dovetail Cultural Resource Group (Dovetail), an SBE/SWAM, will conduct the cultural resource investigations and lead the coordination with DHR. This includes coordination of the area of potential effect (APE) and project results with the DHR, as well as coordination of the overall project effect on historic properties. Dovetail will conduct both Phase I

and Phase II level architectural field studies within the project's APE. Phase I level work will be conducted on all architectural resources within the projects APE meeting the age criteria established by the NRHP. It is estimated that a total of 377 properties will require evaluation. (As the AA work proceeds and more information is known about the alternatives under study, it may be possible to make the APE smaller). Any architectural resources determined potentially eligible for listing on the NRHP by DHR will then be subject to a Phase II-level evaluation to conclusively determine its eligibility for listing on the NRHP (Dovetail estimate is 17 total properties for a Phase II evaluation, although this number is dependent upon Phase I results). At the completion of each phase of fieldwork, Dovetail will prepare DHR Data Sharing System (DSS) packets and reports meeting DHR standards on the investigations. Draft copies of the reports will be submitted to Parsons and DRPT for review and comment. Once this has been accomplished, all edits and comments will be addressed. The agreed upon number of final copies of the report will then be submitted in both hard copies and an electronic format for submittal to the DHR for formal review.

- **Coordination with Travel Demand Forecasting Team.** Additional coordination will be required to determine if the methods being used to satisfy FTA will allow them to output VMT for the region and corridor. VMT is typically used to quantify the environmental benefits of a transit project in terms of air quality and energy usage.
- **Affected Environment/Impact Assessment/Mitigation Measures.** Data collection will be coordinated within the project team to eliminate redundant work. GIS will be used as much as possible to facilitate our analysis and produce high quality and accurate illustrations. The affected environment/impact assessment will address the following topics:
  - Land Use and Socioeconomics
  - Neighborhoods and Community Resources
  - Environmental Justice
  - Parks and Recreation Areas/Section 4(f)
  - Cultural Resources
  - Visual/Aesthetic Resources
  - Air Quality and Energy
  - Noise and Vibration
  - Geology and Soils
  - Habitat and Biota
  - Wetlands and Water Resources
  - Hazardous and Contaminated Materials

- Safety and Security
- Traffic/Transportation
- **EA Document/Technical Memoranda.** The EA document will be developed based on the tasks described above. It is assumed that DRPT will receive a draft and final draft of the EA for review/approval prior to FTA receiving the document for comment. FTA's comments will be addressed prior to circulation of the document. Key assumptions for the EA include:
  - Impacts to rare, threatened or endangered species will not occur. If effects are predicted, then biological assessments will need to be conducted.
  - A Phase I Environmental Site Assessment will not be completed for the Hazardous and Contaminated Materials investigation. Rather, database searches will be conducted using a third party (such as EDR, Inc.) and coordination with the Virginia Department of Environmental Quality (DEQ) will be completed to assess the nature of such sites in the corridor and determine effects.
  - For the Section 4(f) Statement, we have assumed the project will meet the criteria for a *de minimis* impact.
  - Mapping of water resources and wetlands will be sufficient as no direct impacts are anticipated. It is assumed that delineation of wetlands and a jurisdictional determination by the U.S. Army Corps of Engineers is not needed.
- **EA Circulation/Public Meeting.** Early coordination with the public and resource agencies is advisable in an AA or a merged AA/EA process. The public involvement program described further in Task 13 below, more than meets the requirements under NEPA. Circulation of the EA is typically accomplished by advertising its availability along with a public meeting; making the document available at public libraries and on the internet (DRPT's website); and mailing the document (or CD) to the environmental resource agencies.
- **Decision Documentation.** For the purposes of this scope of work and budget, we assume that that the EA will result in a Finding of No Significant Impact. The Parsons Team will assist DRPT in drafting this document on behalf of FTA.

The environmental specialists on the Parsons Team are integral members of the project team and will work to ensure that the selected LPA minimizes environmental impacts while balancing mobility and ridership benefits. The GIS mapping that the Parsons Team already has in-house has allowed us to very quickly identify any potential environmental issues and fatal flaws, avoiding impacts from the earliest stages of project.

A hallmark of the Parsons Team is a core group of professionals that have completed both feasibility and environmental impact studies for key projects throughout Virginia

and for FTA. Our approach is to integrate environmental considerations with the alternatives development to maximize the avoidance of any type of environmental impact, thereby streamlining the environmental impact analysis that follows and avoiding any re-work of alternatives at the NEPA stage. Further, our proposed Deputy Project Manager, Anne Darnall, was the Environmental Manager for the Dulles Corridor Rapid Transit Project. Since that time, she has continued to conduct NEPA studies and alternatives analyses for a variety of states and transit authorities. This work has included two Small Start EAs, one of which is being conducted in conjunction with an Alternatives Analysis.

***Task Item #13 Public Relations and Participation***

A comprehensive public relations and participation program will be developed for this project, including not only public workshops, but also innovative involvement methods to enhance participation. The first step will be to develop a public relations / participation program for the project that will identify stakeholders, demographics in the corridor (including identification of the need for translation services or other minority outreach programs) and tools to be used. The Consultant will plan for and assist DRPT in conducting three sets of formal public meetings and/or hearings – including taking care of all details in advance and preparing all materials and meeting summaries. It is envisioned that there would be two meetings per set, one to engage stakeholders in Henrico County and one to engage stakeholders in the City of Richmond. In addition, the Consultant will make our local team available for smaller scale meetings and presentations, which are a critical component in developing trust and support for a project at a much smaller scale than formal public workshops and hearings.

The Parsons Team will include a variety of collaborative exercises at meetings, including conducting station area planning sessions with stakeholders and jurisdictions. Breakout groups can be used at these meetings to focus on proposed station areas and potential improvements to urban form and community quality, specifically related to the four D's: to effectively plan for transit, we must combine appropriate Density, Diversity, Design, and Destination characteristics of the land use pattern, and we must clearly distinguish the type of transit that is best supported by the regional development framework.

Ideal locations to consider for posting information and/or conducting focus group meetings or workshops would be areas of high concentration of diverse populations along the corridor. For example, it may be possible to hold workshops in larger halls at VCU, and recruit students in the urban planning and design schools to assist with facilitation. Along the Broad Street corridor information centers such as kiosk and displays could be located at various public buildings and retail establishments. Parsons will develop a comprehensive outreach process to identify stakeholders, citizens, and other interested parties to receive both electronic and written materials and invitations to meetings. Our staff will develop information to post on DRPT and local websites and recommends the use of social media as part of the outreach process. The meetings will meet all regulatory requirements for notifications and be

conducted along the corridor at convenient locations. All activities will be documented for use in the decision making process.

### Schedule

Our schedule is presented below. Please note that this is a draft at this time and is a deliverable for Task 2 of the scope of work. As such, it should be revised based on input from DRPT – we often use concurrent task management to expedite corridor studies and can do so on this study. Also, this schedule assumes that inputs from the microsimulation and travel demand model are available in this timeframe. It is Parsons’ experience that the travel demand modeling and traffic analyses are usually the critical path in the maintenance of schedules.

| TASKS                                      | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 Data Collection                          | █   | █   | █   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2 Project Work Program                     | █   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3 Problem Statement                        |     | █   | █   | █   | █   |     |     |     |     |     |     |     |     |     |     |     |
| 4 Alternatives Development                 |     | █   | █   | █   | █   | █   | █   | █   | █   | █   |     |     |     |     |     |     |
| 5 Capital and Operating Costs Estimates    |     | █   |     |     | █   | █   | █   | █   | █   | █   | █   |     |     |     |     |     |
| 6 Preliminary Financial Plans              |     |     |     | █   | █   | █   | █   | █   | █   | █   | █   |     |     |     |     |     |
| 7 Alternatives Evaluation                  |     |     |     |     | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   |     |     |
| 8 Traffic Impact Assessment                |     |     |     |     | █   | █   | █   | █   | █   | █   |     |     |     |     |     |     |
| 9 Station Area Identification              |     | █   | █   | █   | █   | █   | █   | █   | █   |     |     |     |     |     |     |     |
| 10 Corridor & Station Area Land Use Assmt. |     |     |     |     |     |     | █   | █   | █   | █   | █   | █   |     |     |     |     |
| 11 Travel Demand Forecasting Coordination  |     | █   | █   | █   | █   | █   | █   | █   | █   | █   |     |     |     |     |     |     |
| 12 NEPA Evaluation and Determination       |     |     |     |     | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   |
| 13 Public Relations and Participation      | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   | █   |