COORDINATING AND PRIORITIZING MULTIMODAL TRANSPORTATION PROJECTS

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ABSTRACT

The goal of this effort is to aid the VTrans2025 Technical Committee in coordinating and prioritizing multimodal transportation projects. This project delineated the process through which a multimodal transportation project is developed and implemented for the Commonwealth of Virginia. Specifically, the project also developed and tested the application process for multimodal transportation projects. That application process includes developing various forms of reports, scoring the project based on criteria developed from the goals of VTrans2025, ranking multiple projects based on various sets of weights given to the criteria, and finally prioritizing the implementation and funding of those projects. Finally, a web-based interface is developed to help manage the entire multimodal project development and prioritization process. State officials working with VTrans2025 will use these prototypes, in finalized forms, to aid them in the development and prioritization of multimodal transportation projects in the future.

1 INTRODUCTION

There is the need for analytical methods to improve systems integration among the various modal transportation agencies of the Commonwealth of Virginia. Our effort was in collaboration with the VTrans2025 Technical Committee which is comprised of agency representatives of road, port, aviation, transit, and rail.

The VTrans2025 Technical Committee developed two broad objectives for improving Virginia’s transportation system. One objective is to achieve coordination and integration of various systems among the state and local transportation agencies. The second objective is to encourage the state and local agencies to develop transportation projects that involve more than one mode and meet the six VTrans2025 goals: 1) providing a safe and secure transportation system, 2) preserving and managing the existing transportation system, 3) facilitating the efficient movement of people and goods, 4) improving Virginia’s economic vitality and providing access to economic opportunities for all Virginian’s, 5) improving the quality of life, and 6) improving program delivery.

The VTrans2025 Committee seeks to develop and demonstrate a priority-setting methodology using forms of performance evaluation. This project developed Multimodal Investment Network (MIN) concept and the process for multimodal planning, multi-objective decision making, and prioritization. Three materials were identified and developed to facilitate the planning process: 1) MIN Application, 2) Rating and Prioritization Workbook, and 3) MIN Development Website.

The remainder of this paper is organized as follows: Multimodal Investment Network Concept, defines and outlines multimodal investment networks; Process for MIN Implementation, description of the process for multimodal planning and prioritization; MIN Application, describes the MIN Summary, MIN Report, and Criteria Notes; Rating and Prioritization Workbook, discusses the scoring and rating system; MIN Development Website, describes the three-page web-based interface.

2 MULTIMODAL INVESTMENT NETWORK CONCEPT

A Multimodal Investment Network (MIN) is a group of interdependent and interrelated transportation projects that reflect statewide goals and objectives involving more than one mode of transportation. The purpose of developing a MIN, as opposed to individual projects from different
modes, is to support coordination and communication between the different statewide and local transportation agencies. Bundling projects into a MIN forces the transportation agencies to take a multimodal perspective by considering not only at their mode but at all other modes that relate to their project. The current working list of MINs is as follows:

1. Dulles Airport Access Corridor
2. Hampton Roads Multimodal Access
3. Richmond to Hampton Roads Passenger Mobility
4. Interstate 64 Corridor
5. Interstate 95 Passenger and Goods Movement
6. I-81 Corridor Passenger and Goods Movement
7. Interstate 73 Corridor/ Franklin County Airport Access
8. Coalfields Access
9. Route 29 Corridor
10. Northern Virginia Connections
11. Port Accessibility and Mobility
12. Virginia Bicycling and Pedestrian System
13. Emergency Transportation

3 PROCESS FOR MIN IMPLEMENTATION

This project developed the process for multimodal transportation planning and prioritization. The process is also known as the MIN Lifecycle since it is the step-by-step process for MIN implementation. The eleven-step process is as follows:

Step 1. Various stakeholders submit MIN letters of intent (approx. two months). Metropolitan Planning Organizations (MPOs), Planning District Commissions (PDCs), and other local authorities are able to submit letters recommending transportation projects that should be prioritized as a MIN. The potential MIN could be an idea, or a project that is in the planning or implementation stages.

Step 2. Technical Committee identifies candidate MINs (approx. 2 months). The Technical committee will review the MIN letters of intent and identify MINs they want researched.

Step 3. Technical Committee designates MIN sponsors (approx. 1 month). The Technical Committee designates a MIN Sponsor for each of the identified MINs. A sponsor can be any of the four transportation agencies, or any MPO or PDC. Most likely the committee will choose the agency that has the biggest project or the most number of projects in the MIN. For example, for the Dulles Airport Access Corridor MIN the sponsor would be the Virginia Department of Rail and Public Transit.

Step 4. Sponsors coordinate among agencies, MPO/PDCs, and others (approx. four months). MIN Sponsors will coordinate among other involved agencies and MPO/PDCs, to research and provide the information necessary to complete the MIN Application. The sponsor must make sure that the projects from different modes fit together to improve the transportation system.

Step 5. Sponsors submit applications (approx. one month). The sponsor must submit an application that will be reviewed by the VTrans2025 technical committee. The MIN Application includes a one-page summary, a ten-page report, and criteria notes.

Figure 1. One-page cover page for the MIN application, called the “MIN Summary”. It outlines what the MIN is, why the MIN is needed, and how the MIN will be implemented.

Step 6. Technical Committee scores MINs (approx. two months). The VTrans2025 Technical Committee will score the submitted MINs using the Rating and Prioritization Workbook on how they meet the VTrans2025 goals.

Step 7. Technical Committee provides sensitivity analysis to scores (approx. one month). The VTrans2025 Technical Committee weights the goals in five different ways so
as to see how the MINs rank using different weighted criteria. The different weighted scores are averaged and compared to the other MINs. This analysis is done to make sure the MIN is insensitive to a change in weight of one particular goal. The best MINs will be ones that have high ratings for all of the five weighting types. The MINs will be ranked based on their averaged weighted score.

Step 8. Technical Committee reports results to the Multimodal Policy Committee (approx. one month). The Technical Committee will submit the ranking of the MINs to the Secretary of Transportation and the Multimodal Policy Committee.

Step 9. The Secretary of Transportation and the Multimodal Policy Committee prioritize MINs for implementation (approx. one month). Based on the ranking of the MINs the Secretary of Transportation and the Multimodal Policy Committee will decide which MINs to implement and the priority of each MIN. They will notify the transportation agencies and the MPO/PDCs of the MINs that should be implemented.

Step 10. Agencies incorporate MINs into modal planning, prioritization, and programming (continuing). The agencies and MPO/PDCs must make the projects in the MIN that are part of their mode or region a high priority in their planning decisions. The projects will get priority over projects that are not incorporated into a MIN.

Step 11. Sponsors monitor the progress of MINs and report to the Technical Committee (continuing). In order to make sure the projects in a MIN are being implemented it is important for the sponsor of each MIN to monitor its progress of the MIN and report the status to the Technical Committee. The monitoring will ensure the MIN is being implemented promptly and appropriately.

4 MIN APPLICATION

In order for a MIN to be considered for implementation by the Secretary of Transportation and Multimodal Policy Committee, the MIN Application must first be completed. A MIN Application is comprised of: the MIN Report (ten-page), MIN Summary (one-page), and Criteria Notes.

The MIN Summary is a one-page cover page for the MIN Application. The MIN Summary allows the VTrans2025 committee members to get a quick briefing on what the MIN is, why the MIN is needed, how the MIN will solve the problem, and who the MIN sponsor is. The MIN Summary template asks the applicant to provide a brief overview, give the need and rationale, outline the implementation plan, and note who the sponsors are. An example of the Dulles Airport Access Corridor MIN Summary is shown in Figure 1.

The MIN Report describes the MIN in detail. It has four sections: introduction, need and purpose, rationale for selected alternative, and system integration and implementation plan. The MIN report was based on current major impact studies (MIS) and the environmental impact statements (EIS), following their design so that the applicant did not have to learn a new format or new types of questions. Applicants can easily compare a MIN with other projects. An example of the first page of the Dulles Airport Access Corridor MIN Report is shown in Figure 2.

Figure 2. This is the first page of the MIN Report. The rest of the MIN Report describes the MIN in detail with the sections Introduction, Need and Purpose, Rationale for Selected Alternative, and System Integration and Implementation Plan.

The Criteria Notes help the VTrans2025 Technical Committee score the MIN. The form is set up in the same fashion as the score sheet that the Technical Committee uses and allows the MIN Sponsor to comment on how the MIN should be rated. By knowing exactly what criteria and goals the MIN should meet, the sponsor can design a MIN that meets these goals. It aids the Technical Committee by providing direct answers to questions. An example of the Dulles Airport Access Corridor MIN Criteria Notes form is shown in Figure 3.
5 RATING AND PRIORITIZATION WORKBOOK

The MIN prioritization workbook was created to help the VTrans2025 Technical Committee score and rank many MINs. The workbook was designed to convert up to thirty raw MIN scores into understandable priority rankings. The scorer types in the scores for each MIN and the workbook automatically ranks the MINs.

The first page of the workbook is the MIN scoring sheet template. The VTrans2025 Technical Committee developed a set of performance factors, objectives, and measures for each of the VTrans2025 goals. Figure 4 shows goal 1: To provide a safe, secure, and integrated transportation system that reflects different needs of the Commonwealth. This goal, also called a criteria, is then divided into two performance factors: 1.1 safety and 1.2 security. For each factor there are one to two objectives for the performance measure.

The performance measure puts the objective in the form of a measure that can be answered with yes, no, or neither. A scoring system was chosen consisting of –1 (MIN has a negative impact and therefore had a response of no to the performance measure), 0 (MIN did not affect the performance measure, did not apply, or there was not enough information to answer either way), or 1 (MIN has a positive impact and therefore had a response of yes to the performance measure). This scoring system was designed to prevent any subjectivity or ambiguity from entering the scoring process.
It also encourages the MIN sponsor to pursue the performance objectives. The Dulles Airport Access Corridor is scored in Figure 4 along with three other MINs.

The second sheet is the MIN policy page which applies five different policy options to the raw scores to help gain consensus on the ranking and subsequent prioritization of the MINs. The policy options give varying weight to the different objective measures or criteria goals. The concept behind weighting the criterion is the idea that though the six criteria are all important to statewide goals, they are not necessarily equal in statewide significance. Five different policy options are shown in Figure 5.

The MIN analysis worksheet shows the MIN’s weighted score and the ranking within each policy. Figure 6 and Figure 7 show the weighted scores and rankings of the Dulles Airport Access Corridor as compared to three other MINs.

Figure 6. MIN Analysis Score Table shows the resultant scores of the various policy options. The scores are used to rank the MIN.

Figure 7. MIN Analysis Ranking Table shows the rank of the MIN within each policy option.

These weighted scores and rankings, with a suggested MIN priority list, are given to the Secretary of Transportation and Multimodal Policy Committee.

6 MIN DEVELOPMENT WEBSITE

An interface to retrieve, submit, and store information and documents related to the MIN process was created. The interface, designed for the web, smoothly links the agencies and the VTrans2025 Technical Committee. A web-based interface saves time, strengthens communication, and improves organization. Three-page design prototype was developed. All three pages were designed with the background and color-coding of the VTrans2025 homepage.

MIN Sponsor can download and submit an application form. VTrans2025 Technical Committee can submit a MIN application materials. MIN Sponsor can download and submit an application form. VTrans2025 Technical Committee can submit a MIN application materials.

Figure 8. MIN Development Homepage outlines the full process for MIN development and implementation.

The first page is the MIN homepage shown in Figure 8. It gives information about the MIN concept and process as well as gives instructions to the sponsors and VTrans2025 Technical Committee on where to go for their part of the interface. The webpage is designed to link to the VTrans2025 homepage and to the other two pages of the MIN interface.
Figure 9. MIN Development Sponsor Page is used by the MIN sponsor to submit the MIN Report, MIN Summary, and MIN Criteria Notes to the VTrans2025 Technical Committee.

With the MIN sponsor page, shown in Figure 9, the sponsor can download the three parts of the MIN application, download samples to use as a guideline for completion of their MIN, and submit the completed application. The page begins with instructions for the sponsor so that he or she knows the steps that must be followed for their MIN to be reviewed.

The VTrans2025 Technical Committee page links to the database of submitted MINs Figure 10. The scoring workbook can also be downloaded at this site. The site is meant to be password protected so that unauthorized people or agencies can not access the submitted MINs.

7 CONCLUSION

The work of this project has contributed significantly to the sustainability of the VTrans2025 effort by automating a process that was previously non-existent. This work put a spotlight on both the existing and future structure in place to develop and prioritize multimodal projects so that the VTrans2025 Technical Committee can better understand the current situation and what it needs to move toward.

Additionally, this work focused on the Commonwealth of Virginia utilizing its current resources as efficiently as possible to help create the most effective and modern transportation network.

Figure 10. MIN Development Committee Page is used by the Technical Committee to download the MIN Prioritization Workbook and view the updated list of MIN Applications submitted via the website.

Moving forward, the VTrans2025 Technical Committee and the Multimodal Policy Committee will finalize the prioritization system and, ultimately, the entire VTrans2025 plan. The Commonwealth needs to find ways to address larger issues that exist among local, regional, and state rights regarding land use as well as mismanagement of transportation and land use funding at both the local and state levels. Another area in which the Commonwealth needs to make significant strides is facilitating a much higher level of communication, collaboration, and synergy regarding local, regional, and state long-term transportation and land use plans. The Commonwealth of Virginia taking major steps towards improving intermodal communication, collaboration, and implementation through VTrans2025 will be extremely beneficial to its citizens, but the Commonwealth needs to make similar efforts towards
solving these other transportation issues of equal, if not greater, magnitude in order to do its absolute best to serve all Virginians.

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