

Arterial Management Plan Methodology

August 21, 2015

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INTRODUCTION

The Commonwealth Transportation Board (CTB) approved a process for developing Corridor Master Plans on the Corridors of Statewide Significance (CoSS). The CTB resolution stated that Corridor Master Plans are critical to preserving the capacity and safety and controlling congestion on the CoSS. Additionally, these plans will help ensure the ability of the CoSS to function into the future, as facilities for long distance travel, movement of goods and economic development. In light of the CTB’s responsibilities under § 33.1-12.8(f) and § 33.1-23.03, it is essential that similar plans be developed to preserve the capacity and safety on the regional network. Since most of the regional networks are functionally classified as arterials, the focus of Arterial Management Plans (AMP) is on the regional arterial network.

The Commonwealth’s arterial network is the result of major investments in public funds and, given the unclear outlook for financing new transportation improvements, it is critical to develop plans and procedures to better preserve the Commonwealth’s existing transportation investments. Therefore, the purpose of an Arterial Management Plan is to develop a holistic approach that identifies ways to ensure the safety and preserve the capacity of the Commonwealth’s arterial highway network without wide scale roadway widenings.

In the future, there will continue to be a need to accommodate new land development along the arterial network, but the access to new sites must be strategically planned in advance to minimize the congestion and safety impacts that frequently accompany “strip development”. The Arterial Management Plan will help guide localities and the development community in their decision making process that will ultimately lead to maximizing capacity, minimizing congestion, reducing safety impacts, as well as planning and designing the appropriate access for the future development in the corridor.

The steps below represent the methodology to conduct a “maximum effort” Arterial Management Plan. The labor and cost to complete this methodology is extensive and an amount that VDOT would not necessarily want to spend for each corridor where an Arterial Management Plan is desired. Therefore, a table is provided at the end of the methodology that lists each of the steps below and provides some “general” guidance relative to the level of effort for arterials where a “moderate effort” or “minimal effort” Arterial Management Plan is more appropriate. Both the “moderate effort” and “minimal effort” would provide VDOT with a means to reduce the cost of completing Arterial Management Plans statewide.

Initial Tasks completed by VDOT prior to start of an Arterial Management Plan

Task A. Establish Corridor Study Area (by VDOT)

Once an appropriate corridor has been selected for completing an AMP, the limits of the corridor and study area need to be defined in order to scope the level of effort required to complete the AMP. The study area should cover the length of the corridor where intense development or redevelopment is expected to occur. The limits on each end should extend beyond intersections at least 500 feet to cover any operational, access, or safety problems associated with the study intersection. The width of the corridor should be at least a ¼ mile on each side of the corridor centerline; but may extend outward to fully incorporate complete parcels or include adjacent parcels also prime for development. The study

area may also include a second connecting corridor that is a primary or critical link in the transportation network, between the study area and another major facility (i.e. interstate). The primary consideration for inclusion should be if the second corridor is directly impacted operationally by the development, and creating an AMP can influence or invoke changes to the second corridor.

Task B. Establish AMP Goals for the Corridor (by VDOT)

Initial draft goals for the Arterial Management Plan should be established by VDOT for the study corridor and should be a part of selecting the candidate corridor. Example goals are listed below.

- Maintain and protect the efficiency of the corridor – manage the number of access points and signals, minimize unnecessary cross-overs, encourage inter-parcel connections, a parallel road system, and turn lanes, review access management standards and revise to make it unique to this corridor.
- Improve the safety of the corridor by utilizing the above and other means.
- Protect and preserve natural and cultural resources (wetlands, streams, Resource Protection Area, battlefields, open space and buffers, etc.).
- Preserve and/or enhance the comprehensive plan for the area.
- Support the development of residential, neighborhood commercial and other land uses that address local needs resulting in less vehicular traffic travelling on or through the corridor.
- Initiate and/or support programs to reduce traffic demand such as Travel Demand Management, transit, multimodal use, etc.
- Preserve quality of life within the corridor.
- Facilitate local economic development goals for the corridor.

Tasks to be completed as part of an Arterial Management Plan

Task 1. Establish a Project Steering Committee

Purpose

A successful Arterial Management Plan depends on both the local jurisdiction and VDOT having ownership of the plan. Therefore, it is important that the correct staff lead the project from the beginning, including the scoping phase, and ensure that all stakeholder and representative agencies' input is considered. Identifying key local agency decision makers is important as these individuals will ultimately be responsible for ensuring that the plan is adopted and implemented.

Steps to Complete the Task

Step 1: Select a Project Steering Committee

Work with VDOT District Planner to identify appropriate staff from the local jurisdiction and VDOT. Strong consideration of the following staff should include:

- Local Jurisdiction Planning Staff
- Local Jurisdiction Public Works Staff
- Local Jurisdiction Economic Development Staff
- VDOT District Planner (Project Manager)
- VDOT District TED Staff
- VDOT District L&D Staff
- VDOT Central Office TMPD Staff
- VDOT Resident Engineer
- Additional agency representatives such as National Park Service, Transit Agencies, MPO or PDC staff and other relevant stakeholders.

Step 2: Arrange a Meeting Schedule with Project Steering Committee

Steering Committee should meet multiple times to discuss key topics at the various stages of project development. Six separate meetings are likely, unless some topics can be combined and adequately addressed in one meeting (i.e. unmanaged and managed conditions). Typical meetings would include the following milestones:

- Meeting 1 – Kickoff meeting to discuss scope, schedule, identify stakeholders, etc. Identify data requirements from the local agencies and VDOT. Use of current available data will reduce costs and save time. Corridor goals and objectives should also be reviewed and finalized.
- Meeting 2 - Review existing conditions
- Meeting 3 - Review future land use and trip generation assumptions
- Meeting 4 - Review unmanaged conditions
- Meeting 5 - Review managed plan conditions
- Meeting 6 - Review recommendations and draft Arterial Management Plan

Additional meetings may be required to address any issues that arise during the study or to prepare for Board of Supervisor, City Council, Town Council or public meetings. As most Arterial Management Plans should be able to be completed in approximately 12 months, project schedules should adhere to a one year timeframe for completion.

Task 2. Collect Traffic Data

Purpose

Corridor-wide traffic data is required to evaluate existing operating conditions, establish a base line for forecasting traffic and calculate historic traffic growth rates. Traffic data used in traffic operations needs to meet the guidelines contained in the VDOT *Traffic Operations Analysis Tool Guidebook*. Link: http://www.virginiadot.org/business/resources/traffic_engineering/VDOT_Traffic_Operations_Analysis_Tool_GuidebookV1.1-August2013.pdf

Steps to Complete the Task

Step 1: Compile Historic Traffic Data

The local jurisdiction and/or VDOT can provide historical intersection and average daily traffic counts for the study area intersections and roadway segments.

- Traffic volumes and count data can be obtained from traffic impact studies completed for proposed developments along the corridor. Traffic impact studies can be obtained from the local jurisdiction and VDOT. VDOT's Landtrack system should also be reviewed to identify available traffic impact studies. Link: <http://landtrx.vdot.virginia.gov/>
- Recent traffic studies performed for public projects, such as roadway improvements, STARS, HSIP safety studies, etc. can also be a source of documented traffic data.
- Another source of data is historic link counts from VDOT Traffic Engineering Division. Link: <http://www.virginiadot.org/info/ct-trafficcounts.asp>
- INRIX data may be available for the study corridor from VDOT. This data provides average travel speeds that can be used to identify congestion areas and calibrate simulation models.
- Collect crash data for the study area from DMV and VDOT. The data shall consist of at the latest three (3) years of available crash data. http://www.dmvnow.com/safety/#crash_data/index.html
https://public.tableau.com/profile/tien.simmons#!/vizhome/Crashtools8_2/Main

Step 2: Collect Corridor Traffic Data

More recent or supplemental traffic data may be required. The VDOT *Traffic Operations Analysis Tool Guidebook* states that traffic data should have been collected within the past two years.

- Select the key intersections in the study area with input from the Project Steering Committee.
- Collect turning movement count (TMC) data at each of the key intersections during the AM peak period and the PM peak period on a Tuesday, Wednesday, or Thursday during a normal/representative work week. Each peak period should be 2 to 3 hours based on the travel/commute patterns of the study area. Full day counts of 12 hours or more may be required

for locations with a heavy mid-day peak hour. If historical traffic data suggests that Saturday peak periods volumes exceed the weekday PM peak period volumes then consider collecting Saturday peak period traffic data.

- To supplement the turning movement count (TMC) data, collect four (4) day bi-directional average daily traffic (ADT) counts from Wednesday to Saturday for at least two locations along the corridor. The ADTs should include traffic counts, classification and speed.

Task 3. Conduct Site Field Review

Purpose

The purpose of the site field review is to assess existing conditions of the corridor, verify intersection configurations and land uses that may not be up to date on aerial photography and identify both physical deficiencies such as inadequate sight distance, as well as operational deficiencies.

Steps to Complete the Task

Step 1: Document Corridor Characteristics

- Video the corridor in both directions.
- Collect digital photographs of all roadway approaches to each intersection and median breaks.
- Collect digital photographs of operational and geometric deficiencies, as well as safety issues.
- Verify intersection and access configurations.
- Document unique roadway features.
- Document pedestrian and bicycle accommodations.
- Document traffic control devices consisting of traffic signals, signing and pavement markings.
- Document existing rumble strips, clear zones, sight distance issues and shoulders.
- Document posted speed limits.

Step 2: Review Safety Issues/Concerns

- Review the corridor, intersections, interchanges, driveways, and median crossovers using professional engineering judgment to identify and document areas of safety concern. If the crash analysis has been completed then areas of concern can also be reviewed in the field and documented.
- If possible review the corridor with the local police, county sheriff and/or Virginia State Police to identify any additional areas in the study area that pose a safety concern to pedestrian, bicycle and/or vehicular traffic.

Step 3: Identify Land Use and Review Access

- Document existing land uses along the corridor by parcel. Note business names and subdivision and office park names for stakeholder and public involvement purposes, if necessary.
- Evaluate access including development access, driveway types, spacing, and location using professional engineering judgment. Identify access that is minimally spaced, has steep grades, has non-standard sight distance, or causes potential safety issues.

Step 4: Conduct Geometric Review

- Review and identify existing geometric characteristics along the study corridor for issues with vertical and horizontal roadway alignment, weaving, merging, and diverging movements, and sight distance based on professional engineering judgment.
- Note observed non-standard features.
- A review of “As-built” drawings could be conducted if deemed necessary to verify geometric deficiencies.

Step 5: Observe Existing Traffic Operations

- Review and identify areas along the corridors where traffic operations influence the movement of through vehicles.
- Note other observations of operational concerns that may include delays, queues, signal progression, unusual driver behavior patterns, etc.
- Informally interview local businesses along the corridor to obtain a better understanding of travel patterns and local concerns.
- Observe traffic operations including vehicles, pedestrians and bicycles.

Task 4. Conduct Stakeholder Interviews

Purpose

Stakeholder interviews with major landowners, civic league representatives, transportation providers, and other transportation advocacy groups (at the discretion of the local jurisdiction and VDOT) provide an understanding of their interests and plans that might influence the outcome of the Arterial Management Planning process. The Project Steering Committee shall identify the stakeholders, with the understanding that a representative number (between 5 and 15 stakeholders) need to be interviewed. Further, not all land owners will be interviewed, but will have an opportunity to provide input during the public involvement process. The interviews provide an opportunity to educate the stakeholders about arterial management process.

Steps to Complete the Task

Step 1: Identify Stakeholders

- Consult the Project Steering Committee to identify stakeholders to participate in the interviews.
- Examine land records to identify major landowners in the corridor that should be contacted to determine their development plans.

Step 2: Develop a Strategy to Engage Stakeholders

- Determine how stakeholders are to be contacted and informed of the project.
- Decide on an outreach strategy to engage stakeholders. Appropriate strategies include, but are not limited to a charrette, one-on-one interviews, focus group, or public meeting.
- For the selected outreach strategy, develop appropriate questions, visual aids, or presentations that are vetted with the Project Steering Committee prior to meeting stakeholders.
- Stakeholders shall be informed of the project purpose, scope, goals, objectives, expectations and schedule.

A sample questionnaire is included in the Appendix A.

Task 5. Analyze Existing Conditions

Purpose

The purpose of the existing conditions analysis is to establish the present or baseline conditions of the corridor. This includes the existing operational, geometric and safety characteristics to be addressed by the plan. Analyzing existing conditions can also verify or dismiss perceived issues along the corridor.

Steps to Complete the Task

Step 1: Review of Existing Studies, Plans, Policies, and Guidelines

- Review existing studies, plans, policies and guidelines relative to the study area. Reviewing these documents provides a greater understanding of the context of the project, unmet transportation needs relevant to the corridor, and any planned improvements. The documents relevant for review are:
 - Comprehensive plans;
 - Capital improvement programs;
 - Major thoroughfare plans;
 - Local access ordinances;
 - Zoning and subdivision ordinance
 - Other local ordinances that impact transportation infrastructure;
 - VDOT Six Year Improvement Program, link: <http://www.virginiadot.org/projects/syp-default.asp>;
 - VDOT *Access Management Design Standards for Entrances and Intersections*, Appendix F of the VDOT Road Design Manual, link: http://www.virginiadot.org/info/access_management_regulations_and_standards.asp
 - Any regional documents pertaining to transportation infrastructure. The regional entity could either be a planning district commission or a metropolitan planning organization based on the location of the study area.

Step 2: Identify Existing Land Use

- Obtain the most recently available GIS data containing parcels. This is usually obtained from the local jurisdiction where the study area is located. Zoning data is often contained within these files. If the jurisdiction does not have GIS parcel data, zoning information is available through the jurisdiction's planning department and the comprehensive plan.
- Categorize the land use into broad land use categories. While there is no minimum number of categories, the categories chosen should encompass all the land uses in the study area. Existing land use zoning categories may not match future Comprehensive Plan categories. Land Use categories documented should be the same for existing and future land use to help users of the plan to understand changes in future land use. Often future land uses are broader and thus may work better at keeping the land use assumptions and discussions at the proper level for developing the AMP. The land use forecast will examine future conditions 20-30 years out, thus

broad flexible categories should be considered. Existing land use should be documented by parcel on graphics. Please reference Appendix B for an example of land use graphics.

Step 3: Conduct Crash Analysis

- Conduct a crash analysis for the study area corridor using the latest three years of crash data. The data summary from the FR-300 report should include weather conditions, lighting conditions, type of collision, severity of crash, and other pertinent crash factors as necessary to aid in identifying crash patterns. Data should be summarized by corridor sections and by key intersections. Crash totals at intersections should include crashes within 500 feet of the intersection.
- Crash rates along the corridor should be calculated and compared to similar facilities statewide. Average statewide rates can be obtained from VDOT Traffic Engineering Division.
- Crash Frequency and location can be represented by scatter plots of crashes by type created along the corridor.
- Crash data, such as type of collision, severity, lighting conditions, weather, should be summarized using tables and graphical representations (i.e bar charts, pie charts, etc.) Please see Appendix C for examples.

Step 4: Evaluate Access Conformance with VDOT Regulations

- Existing driveways, intersections (signalized and unsignalized), and crossovers/median openings should be included in GIS mapping. Separation distances between these access points should be shown on report graphics. Please see Appendix D for examples.
- Compare the existing crossover/median opening locations and driveway entrances to VDOT *Access Management Design Standards for Entrances and Intersections*, Appendix F of the VDOT *Road Design Manual* to determine which ones are non-compliant.
- Non-compliant crossovers and driveways should be documented in the GIS mapping. Please see Appendix D for examples.

Step 5: Analyze Existing Traffic Operations

- Determine measures of levels of effectiveness through coordination with the Project Steering Committee. These are likely to include intersection delay, level of service and queuing, and average speed and travel time to traverse the corridor. The study periods should also be determined in collaboration with the Project Steering Committee, which should consider weekday AM, Noon, PM and Saturday peak periods for analysis. Analysis of existing interchanges should analyze ramp merge and diverge maneuvers.
- Utilizing the traffic data collected, conduct the capacity analyses of the corridor for the agreed upon peak periods.
- Create Synchro or HCS Streets models of the corridor following the VDOT *Traffic Operations Analysis Tool Guidebook* guidance. Conduct peak hour capacity analysis of the corridor for the peak periods for which traffic data was collected.

- Document agreed upon measures of effectiveness in tables and graphics. Please see Appendix E for examples.

Task 6. Develop Traffic Volume Forecasts

Purpose

The recommended Arterial Management Plan examines existing conditions but more importantly plans for future development. The AMP establishes recommendations to address future development and its associated traffic, with the intent to maximize the flow of traffic while minimizing investment in the transportation infrastructure. Future traffic projections are critical to understanding the future operations and required subsequent proposed future improvements.

Steps to Complete the Task

Development of future traffic can be approached in a multitude of ways of which some are simplistic while others are complicated. Identification of the best approach shall be vetted and determined during the scoping process with the Project Steering Committee. The most straight forward and simplistic approach is to use the regional traffic model or an agreed upon growth rate from historical traffic data. A more intense and detailed approach is to examine and determine specific land uses and determine their future land use and associated traffic, coupled with determining the background traffic growth as well. The following describes a general approach in determining future traffic volumes.

Step 1: Identify Future Land Use and Developable Land

Collaboration between the Project Steering Committee, stakeholders and local planning staff, is required to determine future land use. The following items will assist in the future land use determination.

- As a starting point and for base reference, if a GIS parcel file is available from the local jurisdiction, review it to determine if it contains the future land use for each parcel. If the file does not contain the future land use, refer to the jurisdiction's comprehensive plan.
- Apply the same general categories as applied to the existing land use. As with the existing land use, the categories should encompass all land uses in the corridor.
- Decide on the density of development in the study area. Sources for this are the jurisdiction's zoning code, existing developments, and local planning staff.
- Meet with the local planning staff and other key stakeholders to review the proposed zoning, planned land use, and potential land use allowed in the Comprehensive Plan.
- Calculate the percentage of developable land. The following constraints are recommended, but may change depending on the study area:
 - *Slope*: Eliminate slopes greater than 15%. It is assumed that land with a slope above 15% were unsuitable for development or would be expensive to develop. Therefore, slopes that were greater than 15% in elevations should be eliminated from the total developable land. This can be accomplished using GIS.
 - *Wetlands*: Eliminate any wetlands and land within 100 feet of a wetland. These areas are undevelopable land due to environmental regulations, preservation, and unsuitability for construction.

- *Historic Properties:* While federal law does not necessarily protect historically designated properties, it is assumed that properties owned by preservation organizations or are part of federal or state historic parks will not be developed in the future. This information is available from jurisdiction property records.

Undevelopable land should be shown on land use graphics. See Appendix F for example graphics.

- Upon consideration of the several aspects that will influence future land use and development, create a draft future land use scenario. The draft scenario shall be vetted with the Project Steering Committee, for review and comment. Upon the Project Steering Committee's input, finalize the future land use scenario.

Step 2: Calculate Trip Generation Rates

- There are several approaches to calculating trip generation rates. The appropriateness of trip generation is based on the study area.
- For large corridors that require a high level of analysis, blended rates may be an appropriate strategy. Blended rates are an average trip generation rate for a category of land use. An example of this would be an average trip generation rate for high density residential would be derived from separate generation rates for an apartment building and a townhouse development. Please see the most recent version of ITE Trip Generation Manual as a source for trip generation rates.
- For smaller study areas with fewer parcels and land use types, trip generation rates that are not blended may be appropriate.
- Develop trip generation rates for daily, and peak hour periods. Ingress and Egress percentages are also needed.
- For approved developments (planned and pending) use the projected traffic volumes from the approved traffic studies.

Step 3: Determine Level of Analysis

- Determine a level of analysis based on the size of the study area. If the study area is small, parcel level analysis of land use may be appropriate. If the study area is large, it may be appropriate to categorize the parcels in the study area into zones. For an example of zones, please refer to Appendix F.

Step 4: Calculate Potential Number of Future Trips

- Calculate the total amount of future development. This would include the total number of dwelling units for residential land use and the total number square feet for commercial, office and industrial uses.
- Multiply the total number of future units by the appropriate trip generation rate. Daily and peak hour trip totals should be generated.
- Decide on an appropriate internal capture rate for mixed use land uses or commercial trips within a zone. Reduce the number of total trips by the internal capture trips.

Step 5: Check Assumptions

- Use the existing land use documented in Task 5 to calculate the number of existing trips. Follow the same trip generation calculations listed previously in this task.
- Compare the number of existing trips with existing counts. It is highly unlikely that the number of trips will be identical to the counts; however, it should be within a reasonable range of the counts.

Step 6: Identify Background Growth

There are several methods that can be used to identify the background growth of traffic for the corridor. Coordinate with VDOT to determine the most effective method for the study corridor.

- Determine with the Project Steering Committee the future forecast year for the AMP. It should be 10 to 20 years into the future depending on how close to buildout the corridor currently is developed.
- Option 1: Use historic growth rates from VDOT's Statewide Planning System or other sources of historical average daily traffic.
 - Apply the historic growth rates to existing through volumes to develop background forecasts.
- Option 2: Use the latest regional travel demand model.
 - Run the model for the base year and the model horizon year. Daily and peak hour growth rates from the model will be compared to historic growth rates.
 - Apply the model growth rates to existing through volumes to develop background forecasts.

Step 7: Distribute Site Generated Traffic

Add the site generated traffic generated in Step 4 to the background future traffic in Step 6. Distributions should either follow existing travel patterns shown in existing counts or be obtained from the travel demand model.

- Balance volumes between intersections as necessary.
- Replace calculated volumes with forecasts from existing traffic analysis studies for individual entrances as available.

Task 7. Define Future Traffic “Minimally Managed” Conditions

Purpose

The purpose of this task is to develop a future scenario for the corridor to compare to potential optimal access management solutions. The “Minimally Managed” condition represents a scenario that could occur if an arterial management plan is not implemented and minimum standards were applied.

Steps to Complete the Task

Step 1: Develop Potential “Minimally Managed” Access Layout

- To understand the potential minimally managed access layout, use the parcels analyzed in Task 5, determine the maximum amount of access allowed under the VDOT *Access Management Guidelines*, and determine the most likely access locations based on existing crossovers and the constraints identified in Task 5.
- This scenario is considered the “Minimally Managed” access layout.

Step 2: Analyze Future “Minimally Managed” Conditions

- The trips generated in Task 6 will be added to the future background traffic at the access locations identified in the “Minimally Managed” access plan.
- Conduct a peak hour signal warrant analysis on each crossover to determine if traffic signals are warranted.
- Modify the Synchro files developed in Task 5 to reflect the new access points and traffic signal locations for the same peak periods analyzed under existing conditions.
- Conduct peak hour capacity analysis of the corridor for the peak periods for which traffic data was collected.
- Document the numbers of allowable access points, including full intersections, driveways, median openings and crossovers.
- Document agreed upon measures of effectiveness in tables and graphics. Please see Appendix B for examples. Measures of effectiveness could include:
 - Projected crash rate
 - Delay
 - Travel Time
 - Queuing
 - Level of Service

Task 8. Define Future Traffic “Optimally Managed” Conditions

Purpose

The purpose of this task is to develop an “Optimally Managed” access management plan that eliminates and/or minimizes the operational or safety problems identified as part of the “Minimally Managed” access plan.

Steps to Complete the Task

Step 1: Develop Potential “Optimally Managed” Access Layout

- Use access management techniques provided in the “Toolbox of Alternatives”, located in Appendix G, to mitigate operational and safety problems identified with the “Minimally Managed” access plan. Examples of these strategies include but are not limited to:
 - access management standards pertaining median openings;
 - spacing and consolidation of access points;
 - modifying or restricting ingress/egress at access points (geometrics of access point, right-in/right-out, etc);
 - traffic signalizations or signal modifications;
 - reverse frontage roads, interparcel connections;
 - alternative median opening configurations;
 - turn lane requirements/modifications/restrictions;
 - alternative intersection design;
 - capacity improvements (understanding that this is only for rare situations)
 - policy (zoning and ordinance practices consistent with arterial management); or TDM strategies such as telecommuting hubs (these strategies would reduce the travel demand along the corridor and forecast traffic volumes should be reduced).
- Combining the techniques along the corridor into a single access management concept is considered the “Optimally Managed” access layout.

Step 2: Analyze Future “Optimally Managed” Conditions

- The future peak hour traffic volumes from the “Minimally Managed” scenario will be adjusted to the proposed access locations identified in the “Optimally Managed” access plan.
- Conduct a peak hour signal warrant analysis on each crossover to determine if traffic signals are warranted.
- Modify the Synchro files developed in Task 7 to reflect the changes in access points and traffic signal locations from the “Minimally Managed” scenario for the same peak periods used.
- Conduct peak hour capacity analysis of the corridor for the peak periods for which traffic data was collected.
- Document the numbers of allowable access points, including full intersections, driveways, median openings and crossovers.

- Document agreed upon measures of effectiveness in tables and graphics. Please see Appendix B for examples.

Task 9. Identify Recommendations

Purpose

The purpose is to identify the recommendations that will be included in the AMP and provide a strategy to implement the plan.

Steps to Complete the Task

Step 1: Identify Recommendations

- In consultation with the Project Steering Committee and based on the results of the “Optimally Managed” performance measures select the arterial management tools and/or strategies from the Toolbox of Alternatives to apply to the corridor to address geometric, operational, safety and access deficiencies. Strategies could include, but are not limited to, access management, connectivity, traffic signal operations, travel demand management, and zoning/land use policy recommendations. VDOT has developed a “Toolbox of Alternatives” that provides alternative arterial management strategies to choose recommendations to be applied to the corridor.
- Identify the implementation timeframe and responsible party for each recommendation.
- Establish thresholds or “triggers” that would warrant the improvement for recommendations expected to be required in the future but are not appropriate at the time of the study.

Step 2: Identify Opinions of Probable Construction Costs

- Develop opinions of probable cost (OPC) estimates for the preliminary alternatives identified. Base costs on the most current edition of VDOT Transportation and Mobility Planning Division’s “Statewide Planning Level Cost Estimates”.
- Inflate/adjust costs as necessary and agreed upon to project current day (e.g., 2014 cost estimates). Include a planning level contingency cost that is appropriate for the study area.
- Estimate right-of-way (ROW) costs on an agreed upon percentage of the overall construction costs. The cost estimates should not include estimates for utility costs or utility relocations.

Task 10. Public Meetings

Purpose

The purpose of developing a public meeting schedule is to inform stakeholders about the project, receive feedback and building consent.

Steps to Complete the Task

Step 1: Decide on a Public Meeting Schedule

- Consult the Project Steering Committee to establish a schedule to hold public meetings.
- Decide the number of public meetings that are appropriate. The minimum number of meetings is two, after the existing and future conditions are documented and once the arterial management strategies have been drafted.

Step 2: Prepare for Public Meeting (VDOT)

- VDOT or the local jurisdiction will be responsible for meeting logistics and costs including, finding and arranging a site, signage at the meeting, official public comments, refreshments, and advertisements and notifications.

Step 3: Develop Public Meeting Materials

- In collaboration with the Project Steering Committee determine the public meeting style and agenda. The possible meeting materials include project boards, PowerPoint presentations, project information sheets, and comment sheets.

Step 4: Hold Public Meeting

- Provide an open house with staffed boards.
- Consider providing a presentation and allowing follow up questions from the audience.
- Encourage local VDOT or local jurisdiction staff to participate in any discussion.
- Consider adding interaction activities with citizens. Activities could include:
 - Identify problem areas on a map
 - Ranking of issues or ideas
 - Drawing solutions on a map
 - Scenario planning exercises
- Encourage citizens to fill out comment sheets.

Step 5: Compile Comment Sheets

- Document comments from citizens and note any common themes
- Report comments back to Project Steering Committee

Task 11. Local Government Official Briefings

Purpose

The purpose of this task is to continuously brief local government officials on the Arterial Management Plan progress and then the AMP's recommendations. The ultimate goal is to get the local government board or council to adopt the AMP into the Comprehensive Plan or Master Plan and any local ordinances required to implement the AMP.

Steps to Complete the Task

Step 1: Coordinate with Local Government Staff

- In consultation with local government staff, determine the most effective way to brief local government officials. This could be at Board/Council meetings, workshops or transportation subcommittee meetings (if they exist).

Step 2: Educational Briefing

- Brief local government officials on the Arterial Management Plan purpose, goals, process, and benefits.
- Special effort should be made to ensure they understand that VDOT is not attempting to dictate land use decisions as part of the Arterial Management Plan but rather preserve the safety, mobility and current investment in the Commonwealth's mobility corridors.

Step 2: Recommendations Briefing

- Brief local government officials on the recommendations in the Arterial Management Plan.
- VDOT should request that the Board/Council adopt the AMP into the Comprehensive Plan or Master Plan and any local ordinances required to implement the AMP.

Task 12. Arterial Management Plan Report

Purpose

The purpose of this task is to develop a user-friendly report that VDOT and the local government can use to help implement the Arterial Management Plan. The plan should be shared with local developers prior to developing plan submittals and should show the recommendations for the corridor, particularly access management.

Steps to Complete the Task

Step 1: Develop a Draft Report

- The report will document pertinent information relative to the project purpose and need, planning and analysis process, summary of the plan methodology, summary of the alternatives and recommendations, and opinion of probable cost of the alternatives and recommendations.
- The report will be developed in 11"x17" format with graphics and concise as possible. Background data and analysis should be provided in an appendix instead of within the main body of the report.
- The report should contain an executive summary that is predominately a set of maps that shows the recommendations for the corridor. This section can be used to negotiate and inform developers of the local government's and VDOT's expectations for the corridor.

Step 2: Finalize Report

- The report should be updated based on VDOT and Project Steering Committee comments.
- Final report should be provided to VDOT through electronic submission. The electronic submission will include digital copies of the document, associated mapping (including GIS shape files and AutoCAD files) and pertinent graphics, figures, photos, and support material.

Guidelines for Completing an Arterial Management Plan

The following table provides guidance on how to reduce the effort for developing an Arterial Management Plan that will also reduce the cost. The known needs of the corridor and the stakeholders interested in the corridor can drive the decision on which effort level is most appropriate for a given corridor. Consultation with the local jurisdiction should occur during the decision process.

Methodology Step	“Maximum Effort”	“Moderate Effort”	“Minimal Effort”
Task A. Establish Corridor Study Area (by VDOT)	Establish the study corridor as described in the steps under Task A.	Consider a smaller corridor length where development is most likely to occur.	Consider including only the most critical sections of the corridor being studied.
Task B. Establish AMP Goals for the Corridor (by VDOT)	Establish goals as described in the steps under Task B.	Same as “Maximum Effort”	Same as “Maximum Effort”
Task 1. Establish a Project Steering Committee	Establish Project Steering Committee as described in the steps under Task 1. Up to Six Meetings	Reduce number of meetings to 4 meetings.	Consider a smaller Steering Committee. If a Steering Committee is created, then limit the number of meetings to two meetings. One to discuss existing conditions and another to review alternatives and make recommendations.
Task 2. Collect Traffic Data	Collect new traffic data as described in the steps under Task 2.	Use available data from VDOT, local government and corridor traffic impact analyses and supplement counts as necessary.	Use available data from VDOT, local government and corridor traffic impact analyses. Eliminate collecting crash data.
Task 3. Conduct Site Field Review	Conduct a site field review as described in the steps under Task 3.	Same as “Maximum Effort”	The level of effort will range from driving the corridor and recording notes to the same level of effort as “Moderate Effort”
Task 4. Conduct Stakeholder Interviews	Conduct stakeholder interviews using the guidance provided in the steps under Task 4.	Eliminate stakeholder interviews and allow input from stakeholders to occur at public meeting(s).	Eliminate stakeholder interviews

Methodology Step	“Maximum Effort”	“Moderate Effort”	“Minimal Effort”
Task 5. Analyze Existing Conditions	Analyze existing conditions as described in the steps under Task 5.	Same as “Maximum Effort”	Eliminate crash analysis. Only analyze traffic operations for weekday AM and PM peak hours.
Task 6. Develop Traffic Volume Forecasts	A multitude of resources and methodologies may be used and examined (separately or in combination) to determine growth rates, consisting of: use of the regional model (with some adjustments potentially applied), independent development of a growth rate using future land use scenarios, use of historical traffic data, use of traffic studies for pending and/or approved development, etc.	If available use the regional traffic demand model to get growth rates for the corridor and apply those rates to existing counts. Otherwise following the “Minimal Effort” process.	Apply historic growth rates to the existing counts to get future traffic volumes for the corridor. Also use volumes from traffic impact studies for planned development parcels.
Task 7. Define Future Traffic “Minimally Managed” Conditions	Develop and evaluate the “minimally managed” condition following the steps outlined under Task 7.	Same as “Maximum Effort”	This task could be eliminated if there is no need to compare the build condition to a “no-build” or “minimally managed” condition.
Task 8. Define Future Traffic “Optimally Managed” Conditions	Develop and evaluate the “optimally managed” condition following the steps outlined under Task 7.	Same as “Maximum Effort”	Same as “Maximum Effort”
Task 9. Identify Recommendations	Identify recommendations following the guidance provided in Task 9.	Same as “Maximum Effort”	Same as “Maximum Effort”

Methodology Step	“Maximum Effort”	“Moderate Effort”	“Minimal Effort”
Task 10. Public Meetings	Hold up to two public meetings following the guidance provided in Task 10.	Hold a single public meeting to discuss the project following the guidance provided in Task 10.	“Same as Moderate Effort”
Task 11. Local Government Official Briefings	Follow the guidance under Task 11 in briefing and seeking local government officials’ approval.	Share responsibility between VDOT and local jurisdiction staff in briefing and seeking local government officials’ approval.	Allow the local jurisdiction staff to brief local officials and seek their approval
Task 12. Arterial Management Plan Report	Prepare an Arterial Management Plan Report as described in the steps under Task 12.	Same as “Maximum Effort”	Same as “Maximum Effort”
Typical Cost Range	\$225,000 - \$275,000	\$125,000 - \$175,000	\$75,000 - \$100,000