ITEM 10 - Action
December 21, 2005

Approval of Final Call for Projects Document for the
2006 Constrained Long Range Plan (CLRP) and
FY 2007-2012 Transportation Improvement Program (TIP)

Staff Recommendation: Approve the final call for projects document and schedule for the air quality conformity assessment for the 2006 CLRP and FY 2007-2012 TIP for distribution to state, regional, and local agencies.

Issues: None

Background: At the November 16 meeting, the Board was briefed on the draft call for projects document, which is an updated version of last year's document, and schedule for the air quality conformity assessment for the 2006 CLRP and FY 2007-2012 TIP. As requested by the Board, the attached draft final version incorporates on pages I-8 and 9 the three priority areas for project submissions that were included in last year's document.

This document was reviewed by the TPB Technical Committee on December 2. The proposed schedule for the air quality conformity determination, the 2006 CLRP, and the FY 2007-2012 TIP is on page viii.

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD (TPB)

Call for Projects

For the 2006 Constrained Long-Range Transportation Plan (CLRP) and Fiscal Year 2007 - 2012 Transportation Improvement Program (TIP)

DRAFT

December 12, 2005

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INTRODUCTION

The National Capital Region Transportation Planning Board (TPB), the designated Metropolitan Planning Organization (MPO) for the Washington region, has responsibilities for both long-term transportation planning covering the next two to three decades (the Plan) and short-term programming of projects covering the next six years (the Transportation Improvement Program or TIP). The planning horizon for the plan is from 2006 to 2030. The plan identifies transportation projects and strategies that can be implemented by 2030, within financial resources "reasonably expected to be available."

Purpose of Document

This document is a broad solicitation for projects and programs to be included in the Plan and TIP (the "2006 CLRP" and the "FY 2007-2012 TIP"). Individual counties, municipalities and state and federal agencies with the fiscal authority to fund transportation projects, as well as public groups and individuals, are invited to submit projects in response to the solicitation. The purpose of this document is to:

1) Describe the policy framework and priorities that should guide project selections;
2) Review federal regulations related to the plan and TIP; and
3) Explain the project submission process for the plan and the TIP.

Overview of the Policy Framework and Federal Requirements

The Plan and TIP must address the policy framework, the TPB Vision, and federal requirements, which together comprise the key criteria for the development of the Plan and TIP, summarized in Figure 1 below. The TPB Vision can be found on page 1-2 and includes eight policy goals regarding sustainability of the region's infrastructure, environment, air quality, economic development, and quality of life.

The Plan and TIP must meet federal requirements involving financial constraint, air quality conformity, public participation, Title VI and environmental justice, and other requirements including a Congestion Management System (CMS). A financial plan must show how the updated long-range plan can be implemented with expected revenues. The plan and TIP need to demonstrate conformity with national air quality standards.

The 2006 CLRP is a major plan update, which means that a financial plan of revenues expected to be available for the long-range plan will be developed (anticipated to be complete in February 2006), and public involvement activities will be enhanced.

Planning Provisions in SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: Legacy for Users)

In August 2005, SAFETEA-LU became the new federal surface transportation law. Until a final rule is established on the metropolitan planning provisions, the TPB will rely on the interim

guidance released by FHWA and FTA in September 2005 to guide the planning process[1]. FHWA and FTA are expected to initiative a comprehensive rulemaking in the spring of 2006. Plans and TIPs adopted after July 1, 2007 must meet all SAFETEA-LU planning requirements.

Below are a few changes from SAFETEA-LU that implementing agencies should be aware of as project submissions are developed:

- Project eligibility for the Congestion Mitigation and Air Quality Improvement program (CMAQ) has been expanded to include diesel retrofit technologies. SATETEA-LU established two priorities for the program: diesel retrofit technologies and "cost-effective congestion mitigation activities".

- The TPB's next major Plan update with a new financial plan will occur in 2010 (instead of 2009) because SAFETEA-LU requires that the Plan and TIP are updated every 4 years, instead of 3 and 2 respectively.

- SAFETEA-LU includes eight planning factors to consider during Plan and TIP development (instead of seven). The TPB Vision incorporates the eight planning factors. The factors now stress:
    - Safety;
    - Security; and
    - Consistency between transportation improvements and state and local planned growth and economic development patterns.

SAFETEA-LU changes that will impact the next Plan and TIP in calendar year 2007:

- Implementing agencies will be asked to identify on the project description forms "types of potential mitigation activities" for major projects and how those actions or activities will be funded.

- In 2007, all projects and programs funded with the following three programs must be derived from a TPB Human Service Transportation Coordination Plan (to be developed in 2006):

    1) Formula Program for Elderly Persons and Persons with Disabilities (Section 5310);
    2) Job Access and Reverse Commute (JARC, Section 5316); and
    3) New Freedom Program[2] (Section 5317)

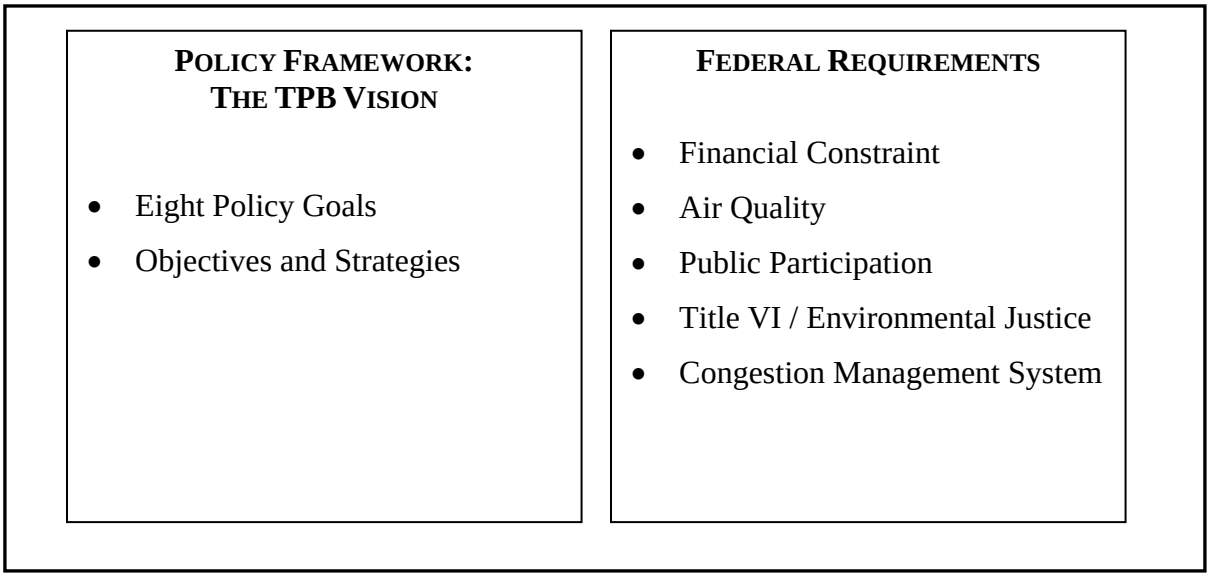
- Furthermore, SAFETEA-LU states that "the plan and TIP shall consider the design and delivery of non-emergency transportation services".

[1] Interim Guidance for Implementing Key SAFETEA-LU Provisions on Planning, Environment and Air Quality for Joint FHWA/FTA Authorities. September 2, 2005.

[2]The New Freedom Program provides capital and operating funding for transportation services above and beyond what is required by the Americans with Disabilities Act (ADA).

- During the development of the long-range plan, the TPB and state implementing agencies will have to consult with agencies responsible for land use management, natural resources, environmental protection, conservation, historic preservation, airport operations and freight movements on projects in the Plan. Consultation may involve comparison of a map of transportation improvements to conservation plans or maps and natural or historic resources inventories.

Figure 1:
Key Criteria for Developing the Plan and Transportation Improvement Program (TIP)



Relationship between the Plan and TIP

Every year the TPB prepares a program for implementing the plan using federal, state, and local funds. This document, known as the TIP, provides detailed information showing what projects are eligible for funding and implementation over a six-year period. Like the Plan, the TIP needs to address the TPB Vision and federal requirements. The TIP includes portions, or phases, of projects selected for implementation from the Plan. While the entire project is described in the Plan, in many instances only a portion of the project is included in the six-year TIP. The Plan is reviewed every year and under federal requirements must be updated at least every four years. The TIP must be updated every four years as well.

Key Dates for Updating the Plan and TIP

The proposed schedule for updating the Plan and TIP is shown on page viii. Below is an overview of key activities.

February 2006

- Implementing agencies must submit all project information by February 3, 2006.
- The TPB releases the project submissions for a 30-day public comment period at the February Citizen Advisory Committee meeting.
- The Financial Plan for the long-range plan is finalized.

March 2006

- The TPB reviews the comments and is asked to approve the project submissions for inclusion in the air quality conformity analysis of the Plan and TIP.
- Public outreach forums are held.

April to August 2006

- The Plan and TIP are analyzed for air quality conformity, including conformity with fine particulate matter (PM2.5) standards.
- Public-friendly materials on the draft Plan and TIP are developed to facilitate public comment.

September 2006

- The TPB releases the Plan, TIP, and Air Quality Conformity Determination for another 30-day public comment period in September.

October 2006

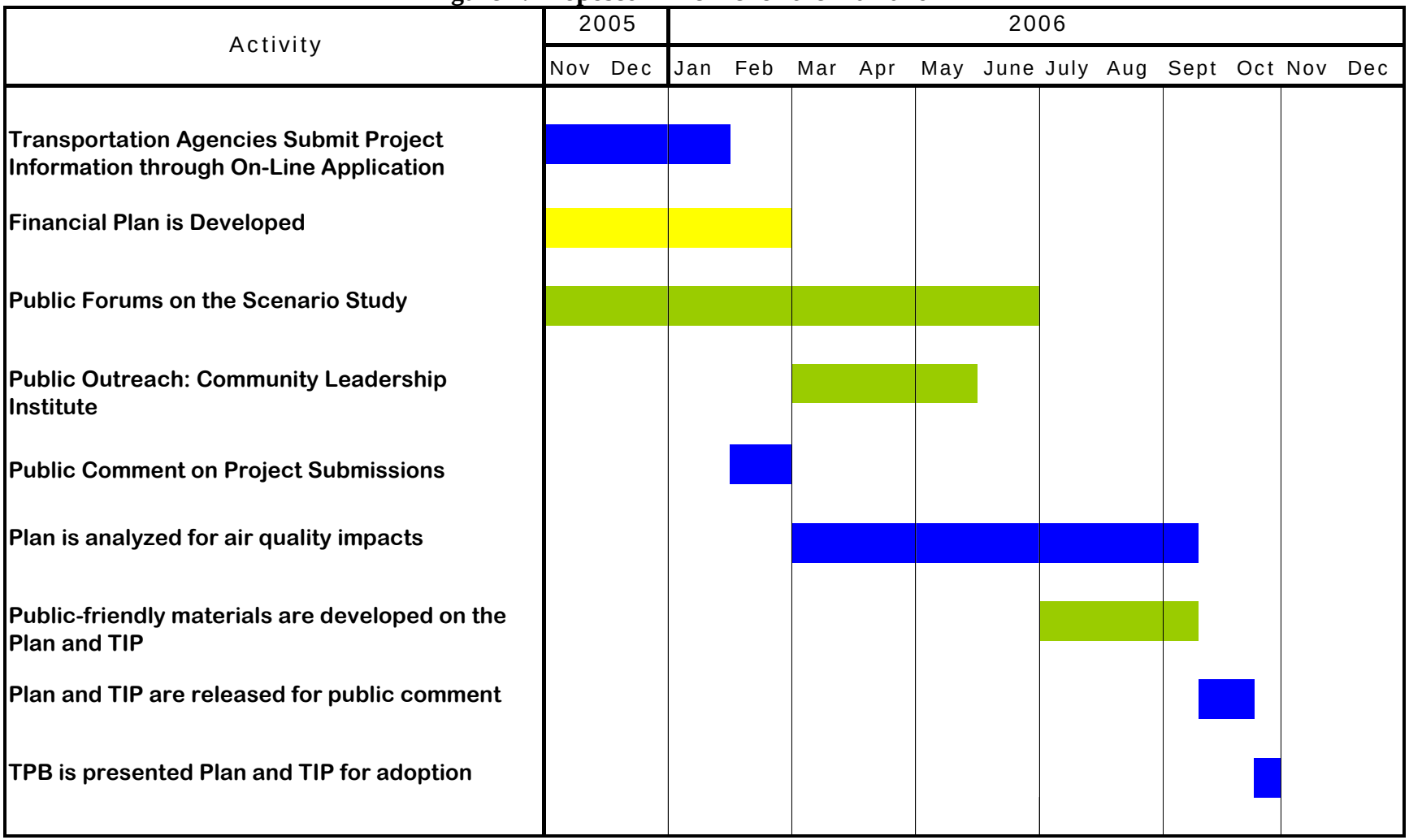
- The TPB reviews public comments and is asked to adopt the Air Quality Conformity Determination, the Plan, and TIP.

Proposed Schedule
For the 2006 Constrained Long-Range Transportation Plan (CLRP) and
FY 2007 – 2012 Transportation Improvement Program (TIP)

*November 16, 2005	TPB Reviews Draft Call For Projects (formerly called the "Solicitation Document")
*December 21, 2005	TPB Releases Final Call For Projects
December 21, 2005	Transportation Agencies Begin Submitting Project Information through Database Application
February 3, 2006	DEADLINE: Transportation Agencies Complete On-Line Project Submissions
February 9, 2006	Plan and TIP Project Submissions Released for Public Comment
*February 15, 2006	TPB Briefed on Project Submissions
March 12, 2006	Public Comment Period Ends
*March 15, 2006	TPB Reviews Public Comments and is asked to Approve Project Submissions for Inclusion in the Air Quality Conformity Analysis
*July 19, 2006	TPB Receives Status Report on the Draft Plan and TIP
September 14, 2006	Draft Plan and TIP Released for Public Comment (Public-friendly materials on the draft Plan and TIP are provided to facilitate public comment)
*September 20, 2006	TPB Briefed on the Plan and TIP
October 14, 2006	Public Comment Period Ends
*October 18, 2006	TPB Reviews Public Comments and Responses to Comments, and is Presented the Draft Plan and TIP for Adoption

*TPB Meeting

Figure 2: Proposed Timeline for the Plan and TIP



SECTION 1:
POLICY FRAMEWORK

THE TPB VISION

To guide the planning and implementation of transportation strategies, actions, and projects for the National Capital Region the TPB adopted a Vision in October 1998 that is a comprehensive set of policy goals, objectives, and strategies. SAFETEA-LU established eight factors for Plan and TIP development. These factors are included in the TPB Vision.

The TPB Vision will be used to review and assess the strategies and projects under consideration for inclusion in the Plan and TIP. **In developing proposed projects and strategies in the Plan or TIP, each agency must consider their contributions to meeting the Vision's policy goals and objectives set by the TPB.** In this way, the TPB will be able to ensure and document that consideration of the required planning factors has taken place. Consideration of regional goals and objectives may also prove useful to agencies in selecting among proposed projects or actions when the desired level of investment exceeds the projected available revenues. Especially important are projects and strategies that contribute to meeting the required emission reductions and achieving air quality conformity.

The Vision policy goals, objectives, and strategies are provided in the following pages.

Vision Statement

In the 21st Century, the Washington metropolitan region remains a vibrant world capital, with a transportation system that provides efficient movement of people and goods. This system promotes the region's economy and environmental quality, and operates in an attractive and safe setting—it is a system that serves everyone. The system is fiscally sustainable, promotes areas of concentrated growth, manages both demand and capacity, employs the best technology, and joins rail, roadway, bus, air, water, pedestrian and bicycle facilities into a fully interconnected network.

Policy Goals, Objectives, and Strategies

Policy Goal 1: The Washington metropolitan region's transportation system will provide reasonable access at reasonable cost to everyone in the region.

Objectives:

1. A comprehensive range of choices for users of the region's transportation system.

2. Accurate, up-to-date and understandable transportation system information which is available to everyone in real time, and is user-friendly for first-time visitor and residents, regardless of mode of travel or language of the traveler.

3. Fair and reasonable opportunities for access and mobility for persons with special accessibility needs.

4. Convenient bicycle and pedestrian access.

Strategies:

1. Plan, implement, and maintain a truly integrated, multi-modal regional transportation system.

2. Plan and implement a tourist-friendly system that encourages the use of transit and provides international signage and information.

3. Make the region's transportation facilities safer, more accessible, and less intimidating for pedestrians, bicyclists, and persons with special needs.

4. Plan and implement a uniform fare system for transit and commuter rail.

5. Adopt a regional transit planning process and plan, with priority to uniformity, connectivity, equity, cost effectiveness and reasonable fares.

Policy Goal 2: The Washington metropolitan region will develop, implement, and maintain an interconnected transportation system that enhances quality of life and promotes a strong and growing economy throughout the entire region, including a healthy regional core and dynamic regional activity centers with a mix of jobs, housing and services in a walkable environment.

Objectives:

1. Economically strong regional core.

2. Economically strong regional activity centers with a mix of jobs, housing, services, and recreation in a walkable environment.

3. A web of multi-modal transportation connections which provide convenient access (including improved mobility with reduced reliance on the automobile) between the regional core and regional activity centers, reinforcing existing transportation connections and creating new connections where appropriate.

4. Improved internal mobility with reduced reliance on the automobile within the regional core and within regional activity centers.

5. Efficient and safe movement of people, goods, and information, with minimal adverse impacts on residents and the environment.

Strategies:

1. Define and identify existing and proposed regional activity centers, taking full advantage of existing infrastructure, for the growth and prosperity of each jurisdiction in the region.

2. Encourage local jurisdictions to provide incentives for concentrations of residential and commercial development along transportation/transit corridors within and near the regional core and regional activity centers, such as zoning, financial incentives, transfer of development rights, priority infrastructure financing, and other measures.

3. Encourage the federal government to locate employment in the regional core and in existing and/or planned regional activity centers.

4. Give high priority to regional planning and funding for transportation facilities that serve the regional core and regional activity centers, including expanded rail service and transit centers where passengers can switch easily from one transportation mode to another.

5. Identify and develop additional highway and transit circumferential facilities and capacity, including Potomac River crossings where necessary and appropriate, that improve mobility and accessibility between and among regional activity centers and the regional core.

6. Intercept automotive traffic at key locations, encouraging "park once," and provide excellent alternatives to driving in the regional core and in regional activity centers.

7. Develop a system of water taxis serving key points along the Potomac and Anacostia Rivers.

Policy Goal 3: The Washington metropolitan region's transportation system will give priority to management, performance, maintenance, and safety of all modes and facilities.

Objectives:

1. Adequate maintenance, preservation, rehabilitation, and replacement of existing infrastructure.

2. Enhanced system safety through effective enforcement of all traffic laws and motor carrier safety regulations, achievement of national targets for seatbelt use, and appropriate safety features in facility design.

Strategies:

1. Factor life-cycle costs into the transportation system planning and decision process.

2. Identify and secure reliable sources of funding to ensure adequate maintenance, preservation, and rehabilitation of the region's transportation system.

3. Support the implementation of effective safety measures, including red light camera enforcement, skid-resistant pavements, elimination of roadside hazards, and better intersection controls.

Policy Goal 4: The Washington metropolitan region will use the best available technology to maximize system effectiveness.

Objectives:

1. Deploy technologically advanced systems to monitor and manage traffic, and to control and coordinate traffic control devices, such as traffic signals, including providing priority to transit vehicles where appropriate.

2. Improve incident management capabilities in the region through enhanced detection technologies and improved incident response.

3. Improve highway lighting, lane markings, and other roadway delineation through the use of advanced and emerging technologies.

1. Reduction in regional congestion and congestion-related incidents.

2. A user-friendly, seamless system with on-demand, timely travel information to users, and a simplified method of payment.

3. Improved management of weather emergencies and major incidents.

4. Improved reliability and predictability of operating conditions on the region's transportation facilities.

5. Full utilization of future advancements in transportation technology.

Strategies:

4. Establish a unified, technology-based method of payment for all transit fares, public parking fees, and toll roads in the region.

5. Utilize public/private partnerships to provide travelers with comprehensive, timely, and accurate information on traffic and transit conditions and available alternatives.

6. Use technology to manage and coordinate snow plowing, road salting operations, and other responses to extreme weather conditions, and to share with the public assessments of road

conditions and how much time it will take to clear roadways.

7. Use advanced communications and real-time scheduling methods to improve time transfers between transit services.

8. Develop operating strategies and supporting systems to smooth the flow of traffic and transit vehicles, reduce variances in traffic speed, and balance capacity and demand.

9. Maintain international leadership in taking advantage of new technologies for transportation, such as automated highway systems and personal rapid transit.

Policy Goal 5: The Washington metropolitan region will plan and develop a transportation system that enhances and protects the region's natural environmental quality, cultural and historic resources, and communities.

Objectives:

1. The Washington region becomes a model for protection and enhancement of natural, cultural, and historical resources.

2. Reduction in reliance on the single-occupant vehicle (SOV) by offering attractive, efficient and affordable alternatives.

3. Increased transit, ridesharing, bicycling and walking mode shares.

4. Compliance with federal clean air, clean water and energy conservation requirements, including reductions in 1999 levels of mobile source pollutants.

5. Reduction of per capita vehicle miles traveled (VMT).

6. Protection of sensitive environmental, cultural, historical and neighborhood locations from negative traffic and developmental impacts through focusing of development in selected areas consistent with adopted jurisdictional plans.

Strategies:

1. Implement a regional congestion management program, including coordinated regional bus service, traffic operations improvements, transit, ridesharing, and telecommuting incentives, and pricing strategies.

2. Develop a transportation system supportive of multiple use and higher density (commercial and residential) in the regional core and regional activity centers as a means of preserving land; natural, cultural and historic resources; and existing communities.

3. Support regional, state and federal programs which promote a cost-effective combination of technological improvements and transportation strategies to reduce air pollution, including promoting use of

transit options, financial incentives, and voluntary emissions reduction measures.

4. Develop a regional tourism initiative to encourage air and train arrival in the region, and additional transit access and automobile parking at the termini of Metrorail/rail services.

5. Provide equivalent employer subsidies to employees with the intent of "leveling the playing field" between automobile and transit/ridesharing.

6. Plan and implement transportation and related facilities that are aesthetically pleasing.

7. Implement a regional bicycle/trail/pedestrian plan and include bicycle and pedestrian facilities in new transportation projects and improvements.

8. Reduce energy consumption per unit of travel, taking maximum advantage of technology options.

Policy Goal 6: The Washington metropolitan region will achieve better inter-jurisdictional coordination of transportation and land use planning.

Objectives:

1. A composite general land use and transportation map of the region that identifies the key elements needed for regional transportation planning--regional activity centers, principal transportation corridors and facilities, and designated "green space."

2. Region-wide coordination of land use and transportation planning in accordance with the recommendations of the Partnership for Regional Excellence report approved by the COG Board of Directors in 1993.

Strategies:

1. Develop a regional process to notify local governments formally of regional growth and transportation policy issues, and encourage local governments to specifically address such issues in their comprehensive plans.

2. Identify an agreed-upon set of definitions and assumptions to facilitate regional cooperation.

3. Ensure that major corridor studies include options that serve the regional core and regional activity centers shown on the regional map.

4. Develop, in cooperation with local governments, model zoning and land use guidelines that encourage multiple use development patterns and reduce non-work automobile dependency.

5. Plan for development to be located where it can be served by existing or planned infrastructure.

Policy Goal 7: The Washington metropolitan region will achieve an

enhanced funding mechanism(s) for regional and local transportation system priorities that cannot be implemented with current and forecasted federal, state, and local funding.

Objectives:

1. Consensus on a set of critical transportation projects and a funding mechanism(s) to address the region's growing mobility and accessibility needs.

2. A fiscally sustainable transportation system.

3. Users of all modes pay an equitable share of costs.

Strategies:

1. Conduct outreach and education activities to promote public participation.

2. Develop public support and approval for a specific set of regional and local transportation priorities and a funding mechanism(s) to supplement (and not supplant) priorities to be implemented with current and forecasted federal, state, and local funding.

Policy Goal 8: The Washington metropolitan region will support options for international and inter-regional travel and commerce.

Objectives:

1. The Washington region will be among the most accessible in the nation for international and inter-regional passenger and goods movements.

2. Continued growth in passenger and goods movements between the Washington region and other nearby regions in the mid-Atlantic area.

3. Connectivity to and between Washington Dulles International, National, and Baltimore-Washington International airports.

Strategies:

1. Maintain convenient access to all of the region's major airports for both people and goods.

2. Support efficient, fast, cost-effective operation of inter-regional passenger and freight rail services.

3. Support the development of a seamless regional transportation system.

4. Support coordinated ticketing and scheduling among Amtrak, MARC, VRE, WMATA, local bus and inter-city bus service.

5. Develop a regional plan for freight movement

PRIORITY AREAS FOR PROJECT SUBMISSIONS

The TPB chose to highlight three specific priority areas related to the TPB Vision for consideration by the implementing agencies when submitting projects, proposals and strategies to be included in the Plan and TIP. Information on how the 2005 CLRP responded to these priority areas is available at the TPB website.[3] This call for projects seeks proposals that respond to following priority areas.

1. **Further improve safe, effective, and optimized use of traffic signals and other traffic control devices, and provide annual reports on transportation operations improvement programs,** as stated as part of Goal 3, Strategy 3 in the TPB Vision: *"Support the implementation of effective safety measures, including red light camera enforcement, skid-resistant pavements, elimination of roadside hazards, and better intersection controls"*, and Goal 4, Strategy 1: *"Deploy technologically advanced systems to monitor and manage traffic, and to control and coordinate traffic control devices, such as traffic signals, including providing priority to transit vehicles where appropriate"*.

From 2002 to 2005, the transportation agencies of the region participated in a traffic signal timing "optimization" program undertaken as a TPB-adopted Transportation Emissions Reduction Measure (TERM). During this program, the percentage of the region's traffic signals that were optimized rose from 45% to 68%. The TPB recognizes the efforts of the region's transportation agencies in management, operations, and technology development, and calls for proposals to address maintaining and increasing this level of effort through traffic signal timing optimization, systems maintenance, and exploration of new technologies. Proposals should encourage congestion management, emissions reduction, and the safe and efficient use of the region's existing transportation system by drivers, transit riders, pedestrians, bicyclists, and all members of the public. Additionally, the TPB calls for an annual report from each transportation agency describing their implementation of transportation operations improvement programs, and the impacts of those programs. This will address the public's high level of interest in this critical topic.

2. **Further improve interagency coordination for incident management**, as stated in Goal 4, Objective 3:"*Improved management of weather emergencies and major incidences*" and Goal 4, Strategy 2: *"Improve incident management capabilities in the region through enhanced detection technologies and improved incident response"*.

On October 19, 2005, the TPB added an initial multi-year Regional Transportation Coordination Program to the CLRP and Transportation Improvement Program. The program, a partnership of the region's major transportation agencies, is to coordinate and support regional sharing of transportation systems condition and management information during incidents through integration of systems technologies, improved procedures and planning, and improved accuracy and timeliness of transportation information provided the public. Although individual agencies continue to be the responders to incidents, the regional transportation coordination program aims to keep transportation, police and other agencies across the region in the information loop so that they may make quick decisions to manage sudden transportation system surges or other effects from regional incidents. The TPB calls for maintenance and expansion of this coordination program and related activities to benefit transportation management, safety, and security.

[3] Go to TPB past documents, under October 19, 2005, see Item 10a and the Item 10 hand-out http://www.mwcog.org/transportation/committee/committee/archives.asp?COMMITTEE_ID=15,

3. **Identify how projects or proposals support the regional core and regional activity centers,** as stated in Goal 2, Strategy 4 of the Vision: *"Give high priority to regional planning and funding for transportation facilities that serve the regional core and regional activity centers, including expanded rail service and transit centers where passengers can switch easily from one transportation mode to another"*.

   In 2005, an analysis of how the CLRP supported the regional activity centers and clusters was conducted and presented to the TPB. The analysis was conducted for clusters because the centers do not line up with transportation analysis zone boundaries. The analysis showed that between 2005 and 2030, the number of activity clusters with rail stations increases. The balance between households and jobs in the clusters improves, as households become more concentrated in clusters. The share of auto commute trips to activity clusters decreases and transit use is high in activity clusters, especially in clusters within the regional core. The TPB and the Metropolitan Development Policy Committee (MDPC) will be revising the regional activity centers and clusters with Round 7.0.

SECTION 2:
FEDERAL REQUIREMENTS

AIR QUALITY CONFORMITY REQUIREMENTS

The Clean Air Act Amendments (CAAA) of 1990 require that the transportation actions and projects in the CLRP and TIP support the attainment of the federal health standards. The Washington area is currently in a nonattainment status for the 8-hour ozone standard and for fine particles standards (PM2.5, or particulate matter less than or equal to 2.5 micrometers in diameter). The CLRP and the TIP have to meet air quality conformity requirements as specified in the amended Environmental Protection Agency (EPA) regulations issued in July 2004 and in supplemental guidance issued thereafter.

Background

Ozone

Since EPA designated the Washington area as nonattainment for the 1-hour ozone standard in the 1990 CAAA, the Metropolitan Washington Air Quality Committee (MWAQC) and the state air management agencies have developed state air quality implementation plans (SIP)s to achieve EPA's emissions reduction requirements and demonstrate attainment. These work efforts included the development and submittal to EPA of a final 'severe' area ozone attainment SIP in 2004, which, following EPA's approval in May 2005, established revised mobile source emissions budgets for volatile organic compounds (VOC) and nitrogen oxides (NOx). On April 15, 2004 EPA designated the Washington, DC – MD – VA area as 'moderate' nonattainment for the 8-hour ozone standard, which replaced the 1-hour ozone standard. SIP planning efforts are now underway to address these additional requirements.

For air quality conformity purposes, per EPA guidance, emissions budgets associated with the 1-hour standard are being used on an interim basis until new 8-hour ozone standard budgets are established to assess conformity of transportation plans and programs. The current CLRP and TIP adhere to those existing mobile emissions budget levels.

Fine Particles Standards (PM2.5)

On December 17, 2004 EPA designated the DC – MD – VA area (consisting of the Washington MSA, excluding Stafford County, VA, and Calvert County, MD) as nonattainment for PM2.5. While the attainment date for the area is 2010, air quality conformity requirements include a 1 year grace period, which started on April 5, 2005, in which to demonstrate conformity of transportation plans and programs to the new standards. If a plan and TIP which conform to the new standards are not in place (including both TPB and federal approvals) by April 6, 2006, the conformity status lapses.

Current Status

As part of the conformity assessment of the 2006 CLRP and FY2007 – 12 TIP, projected emissions for the actions and projects expected to be completed in the 2010, 2020 and 2030 analysis years will need to be estimated. If the analysis of mobile source emissions for any of these years shows an increase in NOx or VOC above what is allowed in the emissions budgets, or if PM2.5 issues arise, it

will be necessary for the TPB to define and program transportation emission reduction measures (TERMs) to mitigate the excess emissions, as has been done in the past. The TPB Technical Committee's Travel Management Subcommittee is developing a schedule for submittal and analysis of candidate TERM proposals for potential inclusion in the 2006 CLRP and FY 2007-12 TIP for the purpose of NOx, VOC, or PM2.5 emissions mitigation. Should emissions analysis for any forecast year estimate excess emissions which cannot be mitigated, TPB's programming actions would become limited to those projects which are exempt from conformity.

FINANCIAL CONSTRAINT

Updating the Plan

The following financial requirements for the Plan are provided in the federal planning regulations.

> The long-range Plan "must include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenues. The plan shall compare the estimated revenue from existing and proposed funding sources that can reasonably be expected to be available for transportation use, and the estimated costs of constructing, maintaining and operating the total (existing plus planned) transportation system over the period of the plan.
>
> The estimated revenue by existing revenue source (local, State, and Federal and private) available for transportation projects shall be determined and any shortfalls shall be identified. Proposed new revenue and/or revenue sources to cover shortfalls shall be identified, including strategies for ensuring their availability for proposed investments. Existing and proposed revenues shall cover all forecasted capital, operating, and maintenance costs."

In June 2005, FHWA and FTA issued “Fiscal Constraint Guidance” which provides planning guidance and a set of questions and answers on financial plans and fiscal constraint for Plans and TIPs. The guidance recognizes that transportation planning varies across the county, the difficulty in predicting project costs and revenues, and that flexibility is needed in demonstrating fiscal constraint. The guidance is available at the FHWA website: http://www.fhwa.dot.gov/hep/index.htm.

The 2006 financial analysis for the new Plan and TIP is currently under development and is expected to be finalized in February 2006. This financial analysis is expected to produce the same financial “big picture” as in the 2003 analysis. The vast majority of currently anticipated future transportation revenues will continue to be devoted to the maintenance and operation of the current transit and highway systems. Because no significant sources of new revenues are anticipated, all new expansion projects to be considered for inclusion in the CLRP will require a project specific funding plan with identified revenue sources.

Agencies should review the timing, costs and funding for the actions and projects in the Plan, ensuring that they are consistent with the "already available and projected sources of revenues." Significant changes to the projects or actions in the current plan should be identified. New projects and strategies, specifically addressing regional air quality conformity needs also should be identified. If new funding sources are to be utilized for a project or action, agencies should describe the strategies for ensuring that the funding will be available.

If new funding sources are to be utilized for a project or action, agencies should describe the strategies for ensuring that the funding will be available. Other projects or actions above and beyond those for which funds are available or committed may be submitted to the Plan under illustrative status. A change in project status from illustrative to full status would require a Plan amendment. Illustrative projects will not be assumed in the air quality conformity determination of the Plan.

Developing Inputs for the TIP

The following financial requirements for the TIP are provided in the federal planning regulations.

> "The TIP shall be financially constrained by year and include a financial plan that demonstrates which projects can be implemented using current revenue sources and which projects are to be implemented using proposed revenue sources (while the existing transportation system is being adequately operated and maintained).
>
> The financial plan shall be developed by the MPO in cooperation with the State and the transit operator. The State and transit operator must provide MPOs with estimates of available Federal and State funds which the MPOs shall utilize in developing financial plans. It is expected that the State would develop this information as part of the STIP development process and that the estimates would be refined through this process.
>
> Only projects for which construction and operating funds can reasonably be expected to be available may be included under full status in the plan. In the case of new funding sources, strategies for ensuring their availability shall be identified. In developing the financial analysis, the MPO shall take into account all projects and strategies funded under Title 23, USC and the Federal Transit Act, other Federal funds, local sources, state assistance, and private participation.
>
> In non-attainment areas, projects included for the first two years of the current TIP shall be limited to those for which funds are available or committed."

To develop a financially constrained TIP, agencies should begin with the projects and actions committed in the previous TIP After reviewing the estimates of available state and federal funds for the period, agencies can identify the actions and projects as inputs for the TIP, ensuring that projects for the first two years are "limited to those for which funds are available or committed."

TITLE VI AND ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations, dated February 11, 1994, requires Federal agencies to identify and address disproportionately high and adverse human health and environmental effects, including interrelated social and economic effects of their programs, policies, and activities on minority and low-income populations.

In December of 1998 the US Department of Transportation/Federal Highway Administration released Order 6640.23 "FHWA Actions to Address Environmental Justice In Minority and Low-Income Populations." Order 6640.23 "establishes policies and procedures for the Federal Highway Administration (FHWA) to use in complying with Executive Order 12898". The document states that Executive Order 12898 is "primarily a reaffirmation of the principles of Title VI of the Civil Rights Act of 1964 (Title VI) and related statutes, the National Environmental Policy Act (NEPA), 23 U.S.C. 109(h), and other Federal environmental laws, emphasizing the incorporation of those provisions with the environmental and transportation decision-making processes."

Furthermore, "these requirements will be administered to identify the risk of discrimination, early in the development of FHWA's programs, policies, and activities so that positive corrective action can be taken. In implementing these requirements, the following information should be obtained where relevant, appropriate, and practical:

(1) population served and/or affected by race, or national origin, and income level;
(2) proposed steps to guard against disproportionately high and adverse effects on persons on the basis of race, or national origin; and,
(3) present and proposed membership by race, or national origin, in any planning or advisory body that is part of the program."

The TPB addresses these requirements in several ways. First, to ensure on-going input from transportation disadvantaged population groups, the TPB established the Access for All Advisory Committee to advise on issues, projects and programs important to low-income communities, minority communities and persons with disabilities. Second, each time the Plan is updated, the AFA committee reviews maps of proposed major projects and locations of transportation disadvantaged populations from the Census. Third, an analysis of travel characteristics and accessibility to jobs is conducted to ensure that disadvantaged groups are not disproportionately impacted by the long-range plan. The latest analysis and AFA report can be found at the TPB website: http://www.mwcog.org/transportation/.

CONGESTION MANAGEMENT DOCUMENTATION

A Congestion Management System (CMS) is an integral part of the transportation planning process of the Washington metropolitan area, and is a component of the metropolitan area's long-range transportation plan. The CMS component of the Plan provides information on transportation system performance, usage, and efficiency, and provides information on the potential impact of proposed strategies to alleviate congestion. The CMS component of the Plan will document that serious consideration has been given to strategies that provide the most efficient and effective use of existing and future transportation facilities, including alternatives to highway capacity increases for single-occupant-vehicles (SOVs).

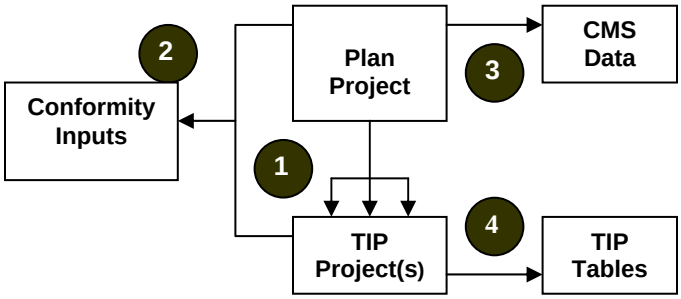
CMS requirements are addressed in both TEA-21 and SAFETEA-LU; federal regulations published in the *Federal Register* on December 19, 1996 are in effect. Federal regulations require consideration of congestion management strategies in cases where single-occupant-vehicle capacity is proposed. Thus **the congestion management documentation form needs to be filled out for any project to be included in the Plan or TIP that significantly increases the single occupant vehicle carrying capacity of a highway**. Non-highway projects do not need a form. Certain highway projects may also be exempt from needing a form. It is recommended to complete a form in association with all submitted, non-exempt projects to ensure compliance with federal regulations and with regional goals.

SECTION 3:
PROJECT SUBMISSION INSTRUCTIONS

INTRODUCTION

This section describes the process to be used by transportation implementing agencies when updating project information for the region's Plan, Conformity and TIP and Congestion Management System documents where necessary. The project description forms are designed to elicit information to enable policy makers, citizens and other interested parties and segments of the community affected by projects in the plan to understand and review them. Description forms must be completed for all projects to be included in the Plan and the TIP. All regionally significant projects, *regardless of funding source*, must be included in the Plan for Air Quality Conformity information purposes. A Congestion Management Documentation Form must be completed for all projects meeting the requirements described on page 3-3 of these instructions. The relationship between the Plan, TIP, Conformity, and CMS is shown in Figure 3. The remainder of this section describes how to update Plan, TIP and Conformity project information using an online database application The TERM analysis and reporting are not addressed here; see Section 4 for those instructions.

Figure 3: Relationship Between Plan, TIP, CMS, and Conformity Information



1. Plan projects are at the "parent" level. Each Plan record may have one or more "child" projects in the TIP
2. Plan and TIP information are combined to create the project listings for the Air Quality Conformity Table
3. Some projects may require a CMS description form (see page 3-3)
4. Financial data from the TIP description forms is used to produce the TIP Tables

The iPlan Online Database

An online database application called ***iPlan*** will be used to solicit project information from each agency. Staff from implementing agencies will be assigned an account with user names and passwords. Once logged into the application users will have access to the Plan and TIP database that was approved by the TPB. This online arrangement will allow collaborative work on data between related agencies.

A user manual with complete form instructions will be provided to agency staff when the application is complete. TPB staff will also offer multiple training sessions to assist staff with the new format. The remainder of this section will cover the purpose of the forms changes in the new version.

The ***iPlan*** application is currently under construction. The ***eTIP*** application from previous years will be used in the interim to gather information necessary to begin the public comment period and conformity modeling process.

PURPOSE OF PROJECT DESCRIPTION FORMS

Plan Description Forms

Each submission should describe the project in sufficient detail to facilitate review by the TPB and the public. Specific information is needed on the project location and physical characteristics, purpose, projected completion date, total estimated costs, proposed sources of revenues, and other characteristics. Submissions for studies should indicate those cases where the design concept and scope (mode and alignment) have not been fully determined and will require further analysis. TERM projects or actions should be identified. Plan Project Description Forms should be used to describe the full scope of a facility's improvements. Each phase of the project (even if there is only one) should be described under the "Project Phasing". The Air Quality Conformity Analysis is based on the information in these listings, so all projects and sub-projects in the plan need to be included.

TIP Description Form

A TIP Project Description Form should be completed for each project intended for programming in the current TIP. Every TIP project record must have a “parent” record in the Plan table. Any projects that do not have funding associated with them between last fiscal year’s annual element and the out year of the TIP will not be listed in the published TIP Tables. Projects that are noted as having funding included under another project listing are exempt from this.

CMS Documentation Form

A Congestion Management Documentation Form should be completed for each project or action intended for the Plan or the current TIP that involves a significant increase in single-occupant vehicle (SOV) carrying capacity of a highway. Below are the criteria to determine whether a project needs a form. Congestion Management Documentation Forms are also included in the online application.

The following categories of projects **REQUIRE** a congestion management form (mark "YES" on Item 7 of the Plan Project Description Form), except if they fall under one or more of the exemption criteria listed subsequently.

- New limited access or other principal arterial roadways on new rights-of-way
- Additional through lanes on existing limited access or other principal arterial roadways
- Construction of grade-separated interchanges on limited access highways where previously there had not been an interchange.

Iif you indicated that the project does not require CMS documentation then identify the reason(s) why the project is exempt:

- The number of lane-miles added to the highway system by the project totals less than 1 lane-mile
- The project is an intersection reconstruction or other traffic engineering improvements, including replacement of an at-grade intersection with an interchange
- The project will not allow motor vehicles, such as bicycle or pedestrian facilities
- The project consists of preliminary studies or engineering only, and is not funded for construction

- Any project that received NEPA approval on or before April 6, 1992
- Any project that was already under construction on or before September 30, 1997, or for which construction funds were committed in the FY98-03 TIP. Note that funds being committed in the FY99-04 TIP does not exempt a project.
- Any project whose construction cost is less than $5 million.

Brief and complete answers to all questions are recommended. A reference to an external document or an attachment without further explanation on the form itself is not recommended; findings of studies, Major Investment Studies, for example, should be summarized on the form itself. References to other documents can be made if desired *in addition to* the answer provided on the form.

As a rule of thumb, the scale and detail in the responses to the questions should be in proportion to the scale of the project. For example, a relatively minor project needs less information than a major, multi-lane-mile roadway construction project.

The form can summarize the results of EISs or other studies completed in association with the project, and can also summarize the impact or regional studies or programs. It allows the submitting agency to explain the context of the project in the region's already-adopted and implemented programs, such as the Commuter Connections program, and to go on to explain what new and additional strategies were considered for the project or corridor in question.

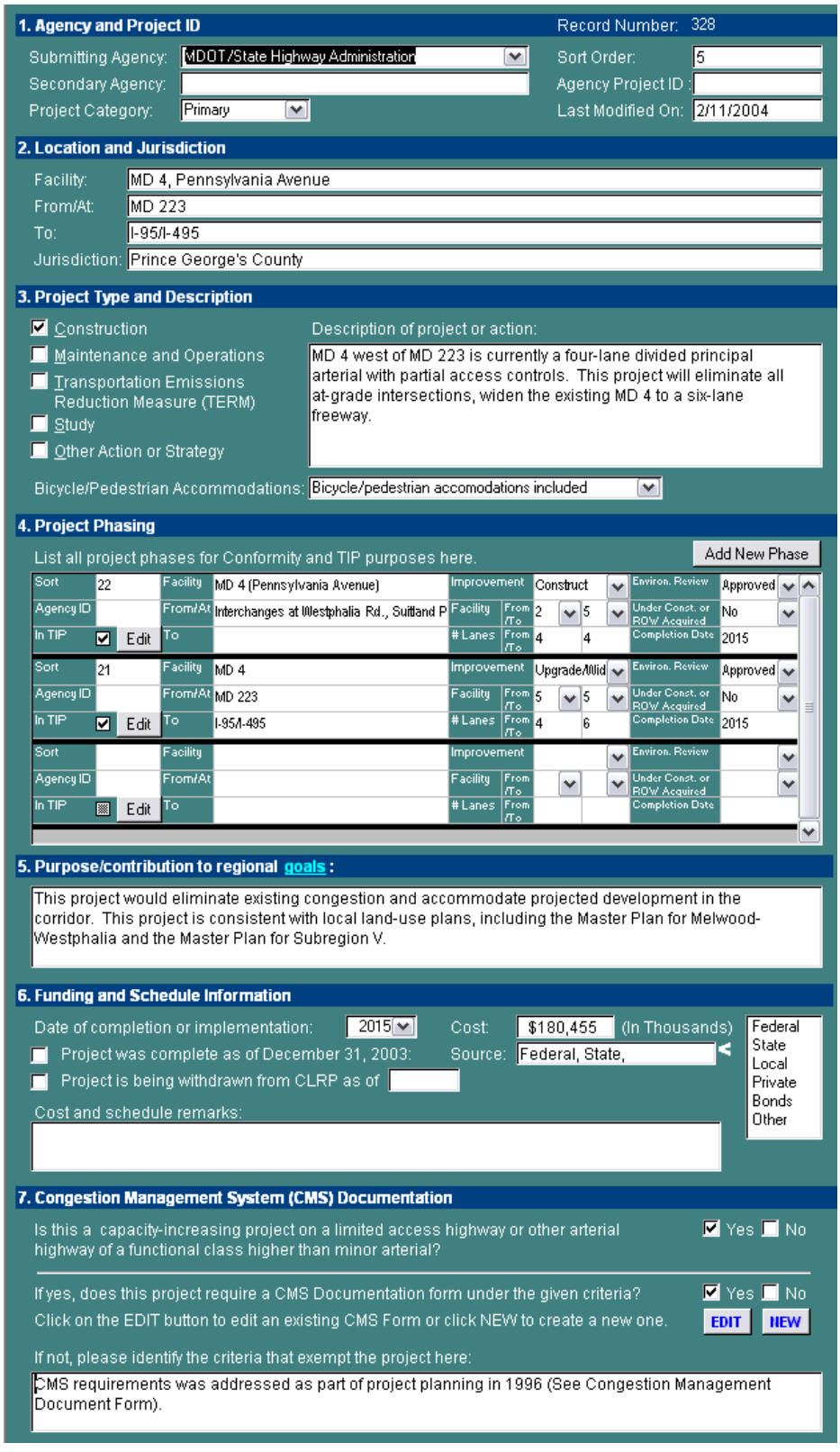
DISTRIBUTION OF ETIP AND ITIP APPLICATION

Until the ***iPlan*** application is ready, the ***eTIP*** will be available to download from the COG website at http://www.mwcog.org/transportation/activities/clrp/online/etip.asp. For assistance or further information, please call Andrew Austin at (202) 962-3353.

SAMPLE FORMS

The following pages are samples for the Plan and TIP Project Description Forms (Figures 4 and 5) from the ***eTIP*** application. These samples were printed using data from previous project submissions and are provided for illustrative purposes only. Following the forms are a list of fields that are expected to be displayed on the ***iPlan*** Project Description Forms. Italicized items are new or altered from previous years.

Figure 4: CLRP Description Form



1. Agency and Project ID — Record Number: 328

Submitting Agency: MDOT/State Highway Administration
Secondary Agency:
Project Category: Primary
Sort Order: 5
Agency Project ID:
Last Modified On: 2/11/2004

2. Location and Jurisdiction

Facility: MD 4, Pennsylvania Avenue
From/At: MD 223
To: I-95/I-495
Jurisdiction: Prince George's County

3. Project Type and Description

- [x] Construction
- [ ] Maintenance and Operations
- [ ] Transportation Emissions Reduction Measure (TERM)
- [ ] Study
- [ ] Other Action or Strategy

Description of project or action:
MD 4 west of MD 223 is currently a four-lane divided principal arterial with partial access controls. This project will eliminate all at-grade intersections, widen the existing MD 4 to a six-lane freeway.

Bicycle/Pedestrian Accommodations: Bicycle/pedestrian accomodations included

4. Project Phasing

List all project phases for Conformity and TIP purposes here. Add New Phase

Sort	22	Facility	MD 4 (Pennsylvania Avenue)	Improvement	Construct			Environ. Review	Approved		
Agency ID		From/At	Interchanges at Westphalia Rd., Suitland P	Facility	From /To	2	5	Under Const. or ROW Acquired	No		
In TIP	☑ Edit	To		# Lanes	From /To	4	4	Completion Date	2015		
Sort	21	Facility	MD 4	Improvement	Upgrade/Mid			Environ. Review	Approved		
Agency ID		From/At	MD 223	Facility	From /To	5	5	Under Const. or ROW Acquired	No		
In TIP	☑ Edit	To	I-95/I-495	# Lanes	From /To	4	6	Completion Date	2015		
Sort		Facility		Improvement				Environ. Review			
Agency ID		From/At		Facility	From /To			Under Const. or ROW Acquired			
In TIP	▨ Edit	To		# Lanes	From /To			Completion Date			

5. Purpose/contribution to regional goals:

This project would eliminate existing congestion and accommodate projected development in the corridor. This project is consistent with local land-use plans, including the Master Plan for Melwood-Westphalia and the Master Plan for Subregion V.

6. Funding and Schedule Information

Date of completion or implementation: 2015
Cost: $180,455 (In Thousands)
Source: Federal, State,
- [ ] Project was complete as of December 31, 2003:
- [ ] Project is being withdrawn from CLRP as of

Federal
State
Local
Private
Bonds
Other

Cost and schedule remarks:

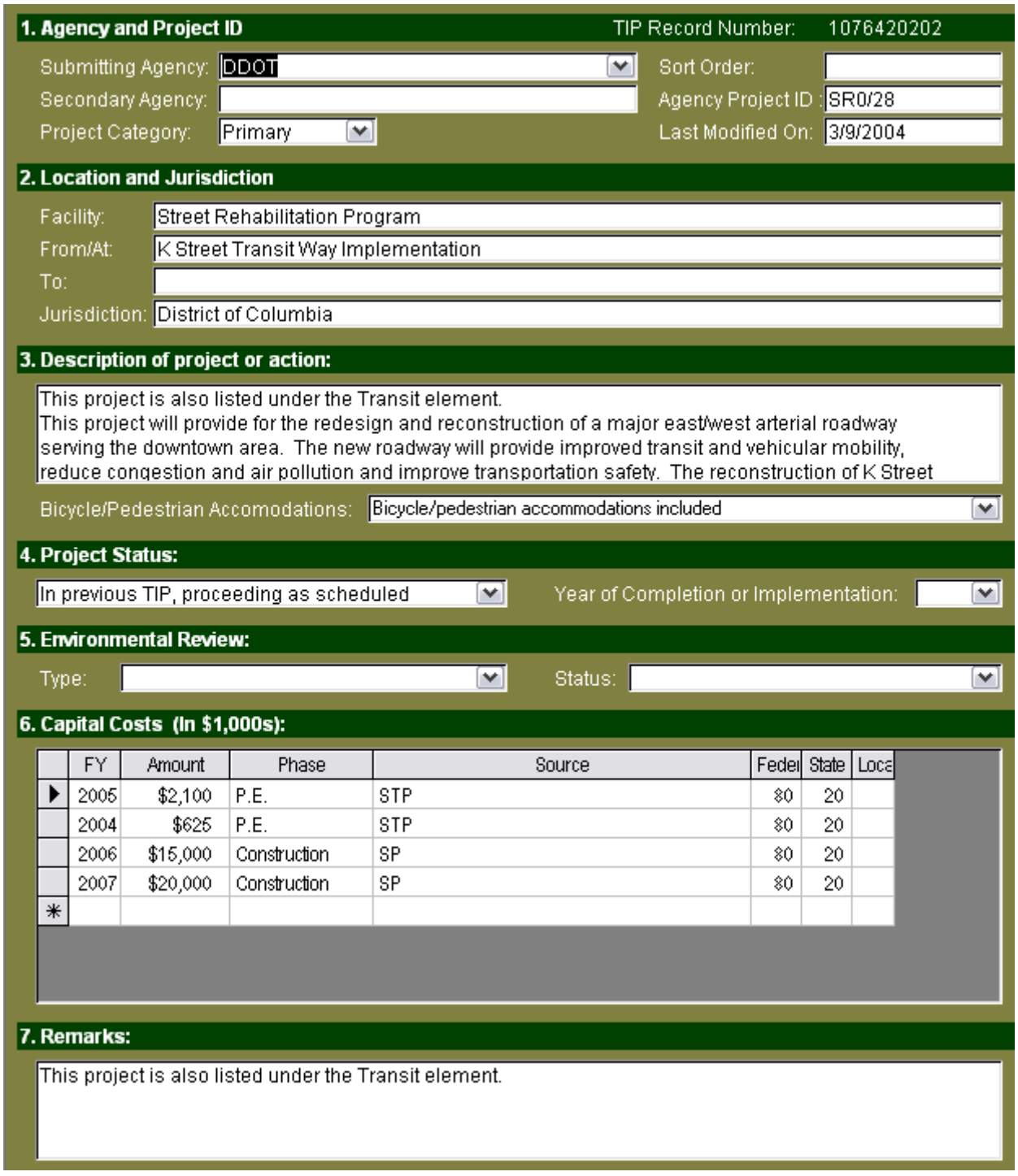
7. Congestion Management System (CMS) Documentation

Is this a capacity-increasing project on a limited access highway or other arterial highway of a functional class higher than minor arterial? ☑ Yes ☐ No

If yes, does this project require a CMS Documentation form under the given criteria? ☑ Yes ☐ No
Click on the EDIT button to edit an existing CMS Form or click NEW to create a new one. EDIT NEW

If not, please identify the criteria that exempt the project here:
CMS requirements was addressed as part of project planning in 1996 (See Congestion Management Document Form).

Figure 5: TIP Description Form



1. Agency and Project ID — TIP Record Number: 1076420202

Submitting Agency: DDOT
Sort Order:
Secondary Agency:
Agency Project ID: SR0/28
Project Category: Primary
Last Modified On: 3/9/2004

2. Location and Jurisdiction

Facility: Street Rehabilitation Program
From/At: K Street Transit Way Implementation
To:
Jurisdiction: District of Columbia

3. Description of project or action:

This project is also listed under the Transit element.
This project will provide for the redesign and reconstruction of a major east/west arterial roadway serving the downtown area. The new roadway will provide improved transit and vehicular mobility, reduce congestion and air pollution and improve transportation safety. The reconstruction of K Street

Bicycle/Pedestrian Accomodations: Bicycle/pedestrian accommodations included

4. Project Status:

In previous TIP, proceeding as scheduled — Year of Completion or Implementation:

5. Environmental Review:

Type: — Status:

6. Capital Costs (In $1,000s):

	FY	Amount	Phase	Source	Feder	State	Loca
▶	2005	$2,100	P.E.	STP	80	20	
	2004	$625	P.E.	STP	80	20	
	2006	$15,000	Construction	SP	80	20	
	2007	$20,000	Construction	SP	80	20	
*							

7. Remarks:

This project is also listed under the Transit element.

Plan Project Description Forms

1. CLRPID ..... Randomly generated ID number for database tracking purposes
2. Agency ..... Primary submitting agency
3. Secondary Agency ..... Any other agencies working in conjunction with primary agency
4. Project Type ..... Functional class or category on which projects will be grouped in reports (e.g. Interstate, Primary, Transit, etc.)
5. *Project Name* ..... Name of projects that are not specific to a single facility
6. Facility Name ..... Name of facility that is being improved or altered
7. *Facility Route Prefix, Number* ..... Interstate or State abbreviation for route type (e.g. I, VA, MD, US) and route number designation
8. From/At Name ..... Beginning project limit or location for spot improvement
9. *From Route Prefix, Number* ..... see Facility Route Prefix, Number above
10. To Name ..... Ending project limit
11. *To Route Prefix, Number* ..... see Facility Route Prefix, Number above
12. Jurisdiction ..... Check box field to identify the jurisdiction(s) the project is located in
13. Agency Project ID ..... Project codes for agency use
14. Construct ..... Project involves construction on a new or existing facility (Yes/No)
15. TERM ..... Project is a Transportation Emission Reduction Measure (Yes/No)
16. Study ..... Project is a study and not funded for construction (Yes/No)
17. Maintenance/Operations ..... Project is Maintenance and/or Operational in nature (Yes/No)
18. Action ..... Project is some other action or strategy not described above (Yes/No)
19. Bicycle/Pedestrian ..... Project is: primarily a bicycle/pedestrian project; includes accommodations for bicycle/pedestrian users; does not include any such accommodations
20. *Short Description* ..... One or two sentence general description of project (e.g. “Widen facility to four lanes.”)
21. Long Description ..... Further detailed information if required
22. Purpose ..... Description of how the project supports regional goals and objectives as outlined in the TPB Vision
23. *Total Estimated Cost* ..... Estimated cost of the project from start to finish
24. Remaining Cost ..... Estimated cost remaining to be spent on project
25. *Programmed Cost* ..... Calculated amount based on programming in any accompanying TIP projects (not editable on CLRP form)
26. Source ..... Indication of federal, state, local or other sources of funding
27. Capacity Increase ..... Project will increase capacity on a facility of functional class above 3
28. CMS Required ..... Project (does not/does) require Congestion Management System documentation based on the criteria listed on page 3-2
29. Exemption ..... Criteria that identify the project as being exempt from CMS documentation
30. Completion/Implementation Date ... Date the project will be completed (open to traffic) or implemented
31. *Project Status* ..... Project is complete, withdrawn, or ongoing (i.e. implemented)
32. *Web Site* ..... URL for further project information from implementing agency
33. *E-mail* ..... E-mail for project manager or point-of-contact for information
34. *Phone Number* ..... Phone number for project manager or point-of-contact for information
35. Last Modified On ..... Automated field that tracks when changes have been made
36. Notes/Remarks ..... General notes for agency/TPB staff to use (will not be public)

TIP Project Description Forms

The following fields are expected to be displayed on the iPlan TIP Project Description Forms. Italicized items are new or altered from previous years.

1. TIPID ..... Randomly generated ID number for database tracking purposes
2. Agency ..... Primary submitting agency
3. Secondary Agency ..... Any other agencies working in conjunction with primary agency
4. Project Type ..... Functional class or category on which projects will be grouped in reports (e.g. Interstate, Primary, Transit, etc.)
5. *Project Name* ..... Name of projects that are not specific to a single facility
6. Facility Name ..... Name of facility that is being improved or altered
7. *Facility Route Prefix, Number* ..... Interstate or State abbreviation for route type (e.g. I, VA, MD, US) and route number designation
8. From/At Name ..... Beginning project limit or location for spot improvement
9. *From Route Prefix, Number* ..... see Facility Route Prefix, Number above
10. To Name ..... Ending project limit
11. *To Route Prefix, Number* ..... see Facility Route Prefix, Number above
12. Jurisdiction ..... Check box field to identify the jurisdiction(s) the project is located in
13. Agency Project ID ..... Project codes for agency use
14. Bicycle/Pedestrian ..... Project is: primarily a bicycle/pedestrian project; includes accommodations for bicycle/pedestrian users; does not include any such accommodations
15. *Short Description* ..... One or two sentence general description of project (e.g. “Widen facility to four lanes.”)
16. Long Description ..... Further detailed information if required
17. *Web Site* ..... URL for further project information from implementing agency
18. *E-mail* ..... E-mail for project manager or point-of-contact for information
19. *Phone Number* ..... Phone number for project manager or point-of-contact for information
20. Environmental Review Type ..... Type of NEPA documentation required, if any
21. Environmental Review Status ..... Current status of any required NEPA documentation
22. Completion/Implementation Date ... Date the project will be completed (open to traffic) or implemented
23. Project Status ..... Project is delayed, reprogrammed, complete, withdrawn, or ongoing
24. Notes/Remarks ..... General notes for agency/TPB staff to use (will not be public)
25. Capital Costs
    a. Fiscal Year ..... Fiscal year in which funds are expected to be obligated
    b. Phase ..... Funds obligated for: a) Planning and Engineering, b) R.O.W. acquisition, c) Construction, d) Studies (non-P.E.), and e) Other (e.g. bus purchases, TERM implementation, etc.)
    c. Source ..... Federally recognized source of funds
    d. Fed/State/Local Share ... Percentage distribution of federal, state and local funds
    e. Amount ..... Funds shown in $1,000s
26. Conformity Information
    a. Improvement ..... Check box field to identify type of improvement being made to the facility (e.g. construct, widen, upgrade, etc.)
    b. Facility Type From ..... Functional class of facility before improvement
    c. Facility Type To ..... Functional class of facility after improvement
    d. Lanes From ..... Number of lanes on facility before improvement
    e. Lanes To ..... Number of lanes on facility after improvement
    f. R.O.W. Acquired ..... Right-of-way has been acquired for the facility
    g. Under Construction ..... Construction has begun on facility

APPENDIX - A

TERM ANALYSIS INSTRUCTIONS

TERM EMISSIONS REDUCTION CALCULATIONS

This section of the solicitation document contains instructions for analyzing transportation emissions reduction measure (TERM) projects. Starting this fiscal year, in addition to estimating the ozone precursor (VOC and NOx) emissions reductions we will estimate fine particulate matter (PM 2.5) emissions reduction benefits. Section I provides information to estimate VOC and NOx, and Section II provides the necessary information to estimate PM 2.5 emissions.

Section I

Table 1 provides an overview of the three emissions components, namely Start-up (Cold Start), Running, and Hot Soak. The methodology that will be used to analyze TERMs for the 2006 CLRP and FY 2007 - 2012 TIP utilizes the latest travel demand results from the Version 2.1D travel demand model and emissions rate data from the Mobile 6.2 emissions model.

The introduction of the Mobile 6 emissions model offered the potential for a more disaggregate emissions reduction analysis of TERMs. Instead of the 8 different vehicle classes used in the Mobile 5b model, the Mobile 6 model utilizes 28 vehicle classes (the current model version is Mobile 6.2). Four categories of TERMs have been developed utilizing the disaggregate nature of the vehicle classes. The four categories are:

- TERMs impacting the traffic stream (all vehicle types), such as the Signal Optimization TERM, will continue to be analyzed using a regional composite vehicle emissions factor. Tables 2, 3 and 4 display emissions factors for analysis years 2010, 2020 and 2030. Weighted average of arterial and freeway emissions factors are shown in the tables; these factors are plotted in the exhibit 1 and 2.

- TERMs impacting commute trips, such as the Employer Outreach and Telework Resources Center TERM (item # 75 and # 90 on the TERM tracking sheet, page 1-2), will be analyzed using an average light duty vehicle emissions factor composed of emissions factors for several classes of light duty vehicles and for motorcycles. Tables 5, 6, and 7 display emissions factors for commuting vehicle trips for analysis years 2010, 2020 and 2030. Weighted average of arterial and freeway emissions factors are shown in the tables; these factors are plotted in the exhibit 3 and 4.

- TERMs impacting all types of heavy duty diesel vehicles, such as a Diesel Fuel Additive TERM, are considered as engine technology (heavy duty diesel vehicles) category.

- TERMs impacting an individual heavy duty vehicle type of a specific weight class, are categorized as a specific vehicle type, such as school buses, transit buses, tractor trailers. Emissions rates for 2010 heavy duty diesel transit and school buses are shown in Table 8; rates for other specific weight classes can be generated as needed.

- TERMs impacting vehicle idling such as roundabouts in place of traffic signals can be analyzed using the individual vehicle type idling emissions factors or the traffic stream idling emissions factors for year 2010, 2020, and 2030 shown in Table 9.

Tables 2 through 7 show Cold Start, Running, Hot Soak emissions factors for VOC and NOx for the analysis years 2010, 2020 and 2030 to be used for analyzing "Traffic Stream" and "Commute" TERMs. Exhibits 1 through 4 show the plots of NOx and VOC running emissions factors for these years. Table 8 shows 2010 emissions factors for school and transit buses (heavy duty diesel vehicles). Since the life span of buses are 12 years, model year 2020 and 2030 emissions factors for buses are not provided. Table 9 shows idling emissions factors for the different vehicle types for all three analysis year. Table 10 shows the 2005 regional average speeds generated by the post-processor which are used to compute hourly speeds for emissions calculations. Since there is little variation through time, the 2005 speeds may be used for any of the analysis years; use specific speeds for each application, where available. Table 11 provides the Mobile 6 vehicle classifications.

The cost effectiveness calculation methodology is explained following the emissions factors tables and is a primary criterion used to select TERMs. The final section provides an example of a commuting vehicle TERM analysis using the emissions factors included in the tables.

For purpose of determining emissions reductions, the start-up, running, and hot soak portions of each trip must be considered. Table 1 shows the procedure to use in the analysis.

Table 1: Mobile Source Emissions Overview

EMISSIONS=TRAVEL X EMISSIONS RATE

Start-up=Trip Origins X Grams/Trip

Running=VMT X Grams/Mile

Hot Soak=Trip Destinations X Grams/Trip

Emissions factors were obtained from the Mobile 6.2 model and are contained herein. NOx emissions do not occur in the hot soak portion of the trip, therefore only VOC factors are shown for this category.

It may be noted that the running emissions factors and cold start/hot soak emissions factors shown in the attached tables were generated using the Mobile 6.2 emissions model with the latest VMT and vehicle registration data as input to the model. These are the factors that were used in the conformity analysis of the 2005 CLRP and FY 2006-2011 TIP. Running emissions factors for speed ranges 1 to 65 mph are shown in the emissions factor tables. If the actual speed for a TERM is known use the appropriate emissions factors, otherwise use emissions factors for average travel speed.

Table 2: 2010 Running, Cold Start, and Hot Soak Average Emissions Factors for "Traffic Stream" TERMs (Mobile6.2)

Emission Type	Speed (mph)	Average 2010 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	3.0895	3.0284	3.0651	1.4539	1.4539	1.4539
Running (g/mi)	2	3.0895	3.0284	3.0651	1.4539	1.4539	1.4539
Running (g/mi)	3	2.4066	2.3701	2.3920	1.3944	1.3944	1.3944
Running (g/mi)	4	1.5527	1.5478	1.5507	1.3203	1.3203	1.3203
Running (g/mi)	5	1.0405	1.0543	1.0460	1.2758	1.2758	1.2758
Running (g/mi)	6	0.8563	0.8645	0.8596	1.1665	1.1665	1.1665
Running (g/mi)	7	0.7250	0.7290	0.7266	1.0884	1.0884	1.0884
Running (g/mi)	8	0.6262	0.6272	0.6266	1.0300	1.0300	1.0300
Running (g/mi)	9	0.5495	0.5483	0.5490	0.9843	0.9843	0.9843
Running (g/mi)	10	0.4880	0.4850	0.4868	0.9483	0.9483	0.9483
Running (g/mi)	11	0.4488	0.4435	0.4467	0.9012	0.9012	0.9012
Running (g/mi)	12	0.4161	0.4086	0.4131	0.8621	0.8621	0.8621
Running (g/mi)	13	0.3887	0.3792	0.3849	0.8290	0.8290	0.8290
Running (g/mi)	14	0.3649	0.3540	0.3605	0.8008	0.8008	0.8008
Running (g/mi)	15	0.3445	0.3323	0.3396	0.7762	0.7762	0.7762
Running (g/mi)	16	0.3248	0.3158	0.3212	0.7678	0.7678	0.7678
Running (g/mi)	17	0.3074	0.3012	0.3049	0.7608	0.7608	0.7608
Running (g/mi)	18	0.2918	0.2880	0.2903	0.7543	0.7543	0.7543
Running (g/mi)	19	0.2779	0.2764	0.2773	0.7487	0.7487	0.7487
Running (g/mi)	20	0.2655	0.2660	0.2657	0.7434	0.7434	0.7434
Running (g/mi)	21	0.2554	0.2575	0.2562	0.7385	0.7385	0.7385
Running (g/mi)	22	0.2462	0.2498	0.2476	0.7339	0.7339	0.7339
Running (g/mi)	23	0.2380	0.2428	0.2399	0.7298	0.7298	0.7298
Running (g/mi)	24	0.2304	0.2362	0.2327	0.7258	0.7258	0.7258
Running (g/mi)	25	0.2234	0.2302	0.2261	0.7225	0.7225	0.7225
Running (g/mi)	26	0.2171	0.2245	0.2201	0.7199	0.7199	0.7199
Running (g/mi)	27	0.2114	0.2192	0.2145	0.7176	0.7176	0.7176
Running (g/mi)	28	0.2059	0.2141	0.2092	0.7155	0.7155	0.7155
Running (g/mi)	29	0.2011	0.2093	0.2044	0.7136	0.7136	0.7136
Running (g/mi)	30	0.1966	0.2053	0.2001	0.7119	0.7119	0.7119
Running (g/mi)	31	0.1920	0.2004	0.1954	0.7110	0.7110	0.7110
Running (g/mi)	32	0.1879	0.1962	0.1912	0.7103	0.7103	0.7103
Running (g/mi)	33	0.1841	0.1922	0.1873	0.7097	0.7097	0.7097
Running (g/mi)	34	0.1803	0.1883	0.1835	0.7089	0.7089	0.7089
Running (g/mi)	35	0.1768	0.1847	0.1800	0.7084	0.7084	0.7084
Running (g/mi)	36	0.1742	0.1819	0.1773	0.7117	0.7117	0.7117
Running (g/mi)	37	0.1717	0.1791	0.1747	0.7146	0.7146	0.7146
Running (g/mi)	38	0.1693	0.1766	0.1722	0.7178	0.7178	0.7178
Running (g/mi)	39	0.1671	0.1740	0.1699	0.7204	0.7204	0.7204
Running (g/mi)	40	0.1649	0.1716	0.1676	0.7232	0.7232	0.7232
Running (g/mi)	41	0.1630	0.1694	0.1656	0.7292	0.7292	0.7292
Running (g/mi)	42	0.1609	0.1670	0.1633	0.7350	0.7350	0.7350
Running (g/mi)	43	0.1591	0.1650	0.1615	0.7408	0.7408	0.7408
Running (g/mi)	44	0.1574	0.1631	0.1597	0.7459	0.7459	0.7459
Running (g/mi)	45	0.1556	0.1611	0.1578	0.7509	0.7509	0.7509
Running (g/mi)	46	0.1589	0.1589	0.1589	0.7599	0.7599	0.7599
Running (g/mi)	47	0.1570	0.1570	0.1570	0.7685	0.7685	0.7685
Running (g/mi)	48	0.1554	0.1554	0.1554	0.7765	0.7765	0.7765
Running (g/mi)	49	0.1537	0.1537	0.1537	0.7843	0.7843	0.7843
Running (g/mi)	50	0.1521	0.1521	0.1521	0.7920	0.7920	0.7920
Running (g/mi)	51	0.1505	0.1505	0.1505	0.8044	0.8044	0.8044
Running (g/mi)	52	0.1489	0.1489	0.1489	0.8164	0.8164	0.8164
Running (g/mi)	53	0.1476	0.1476	0.1476	0.8280	0.8280	0.8280
Running (g/mi)	54	0.1464	0.1464	0.1464	0.8390	0.8390	0.8390
Running (g/mi)	55	0.1450	0.1450	0.1450	0.8498	0.8498	0.8498
Running (g/mi)	56	0.1438	0.1438	0.1438	0.8671	0.8671	0.8671
Running (g/mi)	57	0.1434	0.1434	0.1434	0.8838	0.8838	0.8838
Running (g/mi)	58	0.1427	0.1427	0.1427	0.8999	0.8999	0.8999
Running (g/mi)	59	0.1419	0.1419	0.1419	0.9153	0.9153	0.9153
Running (g/mi)	60	0.1414	0.1414	0.1414	0.9303	0.9303	0.9303
Running (g/mi)	61	0.1408	0.1408	0.1408	0.9543	0.9543	0.9543
Running (g/mi)	62	0.1403	0.1403	0.1403	0.9778	0.9778	0.9778
Running (g/mi)	63	0.1400	0.1400	0.1400	1.0003	1.0003	1.0003
Running (g/mi)	64	0.1397	0.1397	0.1397	1.0219	1.0219	1.0219
Running (g/mi)	65	0.1391	0.1391	0.1391	1.0430	1.0430	1.0430

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.9659	0.5817
Hot Soak Loss (g/trip end)	0.5799	-
Hot Start (g/trip start, Light Duty Only)	0.1648	0.1271

Table 3: 2020 Running, Cold Start, and Hot Soak Average Emissions Factors for "Traffic Stream" TERMs (Mobile6.2)

Emission Type	Speed (mph)	Average 2020 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	1.6166	1.5876	1.6050	0.4846	0.4846	0.4846
Running (g/mi)	2	1.6166	1.5876	1.6050	0.4846	0.4846	0.4846
Running (g/mi)	3	1.2712	1.2562	1.2652	0.4632	0.4632	0.4632
Running (g/mi)	4	0.8396	0.8419	0.8405	0.4362	0.4362	0.4362
Running (g/mi)	5	0.5805	0.5933	0.5856	0.4198	0.4198	0.4198
Running (g/mi)	6	0.4823	0.4912	0.4859	0.3781	0.3781	0.3781
Running (g/mi)	7	0.4123	0.4185	0.4148	0.3483	0.3483	0.3483
Running (g/mi)	8	0.3598	0.3639	0.3614	0.3260	0.3260	0.3260
Running (g/mi)	9	0.3190	0.3215	0.3200	0.3085	0.3085	0.3085
Running (g/mi)	10	0.2862	0.2875	0.2867	0.2947	0.2947	0.2947
Running (g/mi)	11	0.2638	0.2634	0.2636	0.2776	0.2776	0.2776
Running (g/mi)	12	0.2450	0.2432	0.2443	0.2635	0.2635	0.2635
Running (g/mi)	13	0.2293	0.2261	0.2280	0.2513	0.2513	0.2513
Running (g/mi)	14	0.2159	0.2117	0.2142	0.2409	0.2409	0.2409
Running (g/mi)	15	0.2041	0.1990	0.2021	0.2321	0.2321	0.2321
Running (g/mi)	16	0.1921	0.1891	0.1909	0.2305	0.2305	0.2305
Running (g/mi)	17	0.1815	0.1800	0.1809	0.2291	0.2291	0.2291
Running (g/mi)	18	0.1721	0.1720	0.1721	0.2281	0.2281	0.2281
Running (g/mi)	19	0.1638	0.1650	0.1643	0.2270	0.2270	0.2270
Running (g/mi)	20	0.1562	0.1587	0.1572	0.2261	0.2261	0.2261
Running (g/mi)	21	0.1505	0.1538	0.1518	0.2250	0.2250	0.2250
Running (g/mi)	22	0.1454	0.1493	0.1470	0.2243	0.2243	0.2243
Running (g/mi)	23	0.1408	0.1453	0.1426	0.2234	0.2234	0.2234
Running (g/mi)	24	0.1363	0.1415	0.1384	0.2227	0.2227	0.2227
Running (g/mi)	25	0.1323	0.1383	0.1347	0.2219	0.2219	0.2219
Running (g/mi)	26	0.1287	0.1347	0.1311	0.2214	0.2214	0.2214
Running (g/mi)	27	0.1254	0.1316	0.1279	0.2210	0.2210	0.2210
Running (g/mi)	28	0.1218	0.1286	0.1245	0.2205	0.2205	0.2205
Running (g/mi)	29	0.1190	0.1258	0.1217	0.2203	0.2203	0.2203
Running (g/mi)	30	0.1161	0.1231	0.1189	0.2198	0.2198	0.2198
Running (g/mi)	31	0.1138	0.1206	0.1165	0.2195	0.2195	0.2195
Running (g/mi)	32	0.1113	0.1179	0.1139	0.2194	0.2194	0.2194
Running (g/mi)	33	0.1089	0.1158	0.1117	0.2192	0.2192	0.2192
Running (g/mi)	34	0.1070	0.1137	0.1097	0.2190	0.2190	0.2190
Running (g/mi)	35	0.1047	0.1116	0.1075	0.2186	0.2186	0.2186
Running (g/mi)	36	0.1033	0.1098	0.1059	0.2197	0.2197	0.2197
Running (g/mi)	37	0.1021	0.1082	0.1045	0.2206	0.2206	0.2206
Running (g/mi)	38	0.1008	0.1067	0.1032	0.2217	0.2217	0.2217
Running (g/mi)	39	0.0996	0.1054	0.1019	0.2227	0.2227	0.2227
Running (g/mi)	40	0.0984	0.1041	0.1007	0.2235	0.2235	0.2235
Running (g/mi)	41	0.0971	0.1024	0.0992	0.2253	0.2253	0.2253
Running (g/mi)	42	0.0961	0.1012	0.0981	0.2272	0.2272	0.2272
Running (g/mi)	43	0.0951	0.1000	0.0971	0.2287	0.2287	0.2287
Running (g/mi)	44	0.0940	0.0990	0.0960	0.2303	0.2303	0.2303
Running (g/mi)	45	0.0930	0.0978	0.0949	0.2318	0.2318	0.2318
Running (g/mi)	46	0.0968	0.0968	0.0968	0.2343	0.2343	0.2343
Running (g/mi)	47	0.0958	0.0958	0.0958	0.2366	0.2366	0.2366
Running (g/mi)	48	0.0948	0.0948	0.0948	0.2388	0.2388	0.2388
Running (g/mi)	49	0.0940	0.0940	0.0940	0.2409	0.2409	0.2409
Running (g/mi)	50	0.0931	0.0931	0.0931	0.2429	0.2429	0.2429
Running (g/mi)	51	0.0924	0.0924	0.0924	0.2464	0.2464	0.2464
Running (g/mi)	52	0.0917	0.0917	0.0917	0.2496	0.2496	0.2496
Running (g/mi)	53	0.0911	0.0911	0.0911	0.2525	0.2525	0.2525
Running (g/mi)	54	0.0907	0.0907	0.0907	0.2556	0.2556	0.2556
Running (g/mi)	55	0.0902	0.0902	0.0902	0.2584	0.2584	0.2584
Running (g/mi)	56	0.0900	0.0900	0.0900	0.2628	0.2628	0.2628
Running (g/mi)	57	0.0900	0.0900	0.0900	0.2668	0.2668	0.2668
Running (g/mi)	58	0.0899	0.0899	0.0899	0.2711	0.2711	0.2711
Running (g/mi)	59	0.0899	0.0899	0.0899	0.2748	0.2748	0.2748
Running (g/mi)	60	0.0898	0.0898	0.0898	0.2787	0.2787	0.2787
Running (g/mi)	61	0.0900	0.0900	0.0900	0.2846	0.2846	0.2846
Running (g/mi)	62	0.0901	0.0901	0.0901	0.2903	0.2903	0.2903
Running (g/mi)	63	0.0900	0.0900	0.0900	0.2959	0.2959	0.2959
Running (g/mi)	64	0.0903	0.0903	0.0903	0.3012	0.3012	0.3012
Running (g/mi)	65	0.0903	0.0903	0.0903	0.3063	0.3063	0.3063

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.5387	0.2398
Hot Soak Loss (g/trip end)	0.2629	-
Hot Start (g/trip start, Light Duty Only)	0.0959	0.0552

Table 4: 2030 Running, Cold Start, and Hot Soak Average Emissions Factors for "Traffic Stream" TERMs (Mobile6.2)

Emission Type	Speed (mph)	Average 2030 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	1.5309	1.4981	1.5178	0.3598	0.3598	0.3598
Running (g/mi)	2	1.5309	1.4981	1.5178	0.3598	0.3598	0.3598
Running (g/mi)	3	1.2029	1.1847	1.1956	0.3429	0.3429	0.3429
Running (g/mi)	4	0.7928	0.7925	0.7927	0.3217	0.3217	0.3217
Running (g/mi)	5	0.5469	0.5574	0.5511	0.3090	0.3090	0.3090
Running (g/mi)	6	0.4545	0.4618	0.4574	0.2755	0.2755	0.2755
Running (g/mi)	7	0.3881	0.3934	0.3902	0.2514	0.2514	0.2514
Running (g/mi)	8	0.3385	0.3422	0.3400	0.2334	0.2334	0.2334
Running (g/mi)	9	0.2996	0.3022	0.3006	0.2194	0.2194	0.2194
Running (g/mi)	10	0.2689	0.2703	0.2695	0.2083	0.2083	0.2083
Running (g/mi)	11	0.2479	0.2479	0.2479	0.1949	0.1949	0.1949
Running (g/mi)	12	0.2304	0.2290	0.2298	0.1838	0.1838	0.1838
Running (g/mi)	13	0.2156	0.2132	0.2146	0.1743	0.1743	0.1743
Running (g/mi)	14	0.2029	0.1996	0.2016	0.1662	0.1662	0.1662
Running (g/mi)	15	0.1916	0.1875	0.1900	0.1589	0.1589	0.1589
Running (g/mi)	16	0.1806	0.1780	0.1796	0.1587	0.1587	0.1587
Running (g/mi)	17	0.1705	0.1697	0.1702	0.1579	0.1579	0.1579
Running (g/mi)	18	0.1617	0.1622	0.1619	0.1577	0.1577	0.1577
Running (g/mi)	19	0.1538	0.1553	0.1544	0.1574	0.1574	0.1574
Running (g/mi)	20	0.1467	0.1492	0.1477	0.1568	0.1568	0.1568
Running (g/mi)	21	0.1414	0.1447	0.1427	0.1567	0.1567	0.1567
Running (g/mi)	22	0.1365	0.1404	0.1381	0.1564	0.1564	0.1564
Running (g/mi)	23	0.1319	0.1367	0.1338	0.1558	0.1558	0.1558
Running (g/mi)	24	0.1279	0.1330	0.1299	0.1556	0.1556	0.1556
Running (g/mi)	25	0.1243	0.1299	0.1265	0.1554	0.1554	0.1554
Running (g/mi)	26	0.1208	0.1268	0.1232	0.1552	0.1552	0.1552
Running (g/mi)	27	0.1175	0.1238	0.1200	0.1549	0.1549	0.1549
Running (g/mi)	28	0.1147	0.1209	0.1172	0.1547	0.1547	0.1547
Running (g/mi)	29	0.1119	0.1184	0.1145	0.1546	0.1546	0.1546
Running (g/mi)	30	0.1092	0.1158	0.1118	0.1544	0.1544	0.1544
Running (g/mi)	31	0.1066	0.1132	0.1092	0.1542	0.1542	0.1542
Running (g/mi)	32	0.1044	0.1109	0.1070	0.1539	0.1539	0.1539
Running (g/mi)	33	0.1021	0.1088	0.1048	0.1537	0.1537	0.1537
Running (g/mi)	34	0.1001	0.1066	0.1027	0.1536	0.1536	0.1536
Running (g/mi)	35	0.0983	0.1047	0.1009	0.1534	0.1534	0.1534
Running (g/mi)	36	0.0968	0.1029	0.0992	0.1541	0.1541	0.1541
Running (g/mi)	37	0.0955	0.1015	0.0979	0.1548	0.1548	0.1548
Running (g/mi)	38	0.0942	0.1000	0.0965	0.1555	0.1555	0.1555
Running (g/mi)	39	0.0931	0.0986	0.0953	0.1560	0.1560	0.1560
Running (g/mi)	40	0.0920	0.0974	0.0942	0.1567	0.1567	0.1567
Running (g/mi)	41	0.0909	0.0959	0.0929	0.1579	0.1579	0.1579
Running (g/mi)	42	0.0898	0.0948	0.0918	0.1589	0.1589	0.1589
Running (g/mi)	43	0.0888	0.0937	0.0908	0.1600	0.1600	0.1600
Running (g/mi)	44	0.0878	0.0925	0.0897	0.1611	0.1611	0.1611
Running (g/mi)	45	0.0867	0.0914	0.0886	0.1621	0.1621	0.1621
Running (g/mi)	46	0.0905	0.0905	0.0905	0.1637	0.1637	0.1637
Running (g/mi)	47	0.0896	0.0896	0.0896	0.1649	0.1649	0.1649
Running (g/mi)	48	0.0886	0.0886	0.0886	0.1665	0.1665	0.1665
Running (g/mi)	49	0.0878	0.0878	0.0878	0.1678	0.1678	0.1678
Running (g/mi)	50	0.0869	0.0869	0.0869	0.1689	0.1689	0.1689
Running (g/mi)	51	0.0863	0.0863	0.0863	0.1708	0.1708	0.1708
Running (g/mi)	52	0.0857	0.0857	0.0857	0.1728	0.1728	0.1728
Running (g/mi)	53	0.0853	0.0853	0.0853	0.1748	0.1748	0.1748
Running (g/mi)	54	0.0847	0.0847	0.0847	0.1765	0.1765	0.1765
Running (g/mi)	55	0.0844	0.0844	0.0844	0.1781	0.1781	0.1781
Running (g/mi)	56	0.0841	0.0841	0.0841	0.1806	0.1806	0.1806
Running (g/mi)	57	0.0841	0.0841	0.0841	0.1831	0.1831	0.1831
Running (g/mi)	58	0.0842	0.0842	0.0842	0.1853	0.1853	0.1853
Running (g/mi)	59	0.0840	0.0840	0.0840	0.1875	0.1875	0.1875
Running (g/mi)	60	0.0840	0.0840	0.0840	0.1897	0.1897	0.1897
Running (g/mi)	61	0.0841	0.0841	0.0841	0.1930	0.1930	0.1930
Running (g/mi)	62	0.0842	0.0842	0.0842	0.1960	0.1960	0.1960
Running (g/mi)	63	0.0844	0.0844	0.0844	0.1990	0.1990	0.1990
Running (g/mi)	64	0.0845	0.0845	0.0845	0.2019	0.2019	0.2019
Running (g/mi)	65	0.0846	0.0846	0.0846	0.2048	0.2048	0.2048

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.4716	0.172
Hot Soak Loss (g/trip end)	0.2023	-
Hot Start (g/trip start, Light Duty Only)	0.0848	0.0406

Exhibit - 1
VOC MOBILE6.2 RUNNING EMISSION RATES
TRAFFIC STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVEARGE of ARTERIAL & FREEWAY

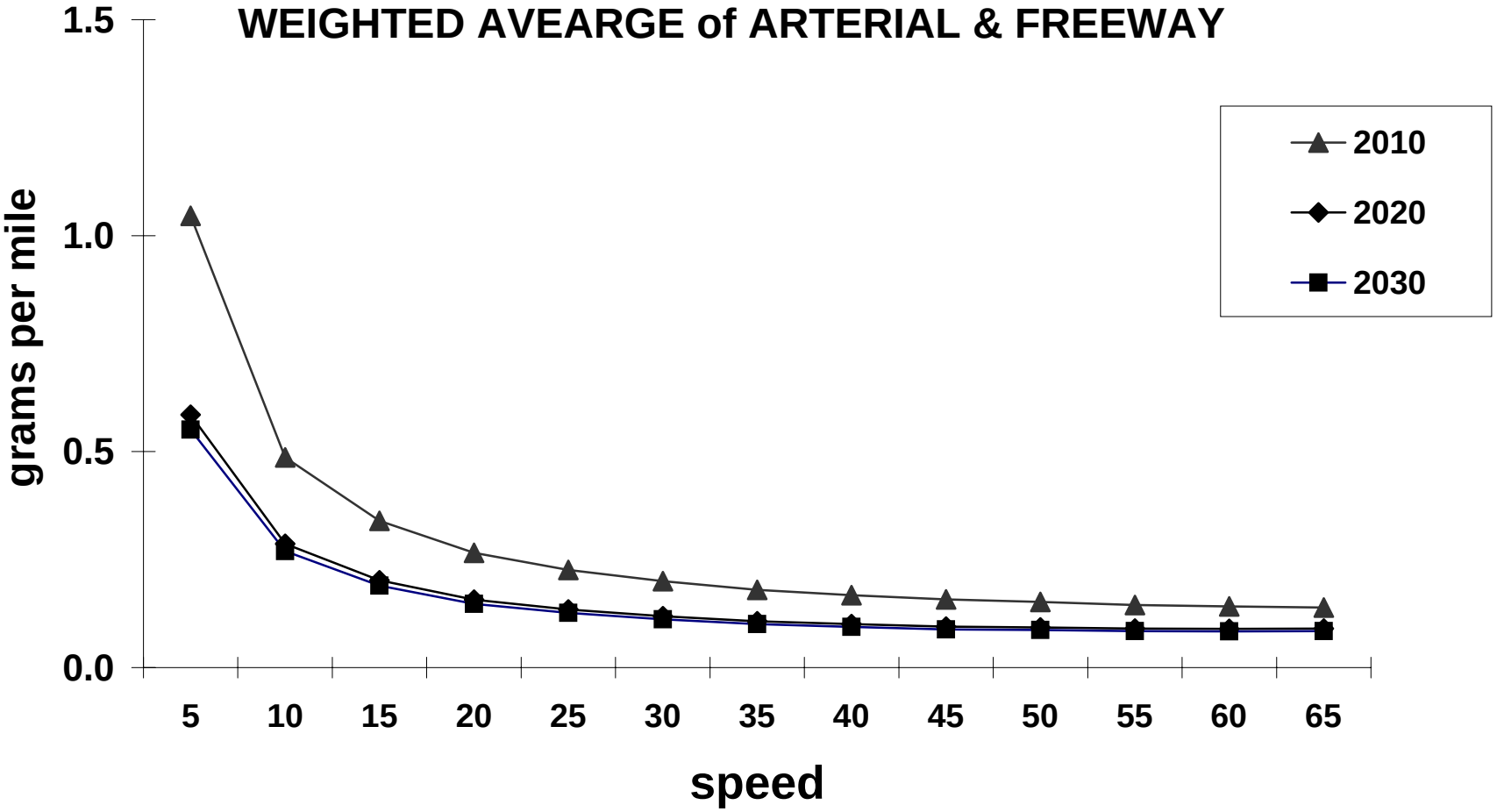


Exhibit - 2
NOx MOBILE6.2 RUNNING EMISSION RATES
TRAFFIC STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVEARGE of ARTERIAL & FREEWAY

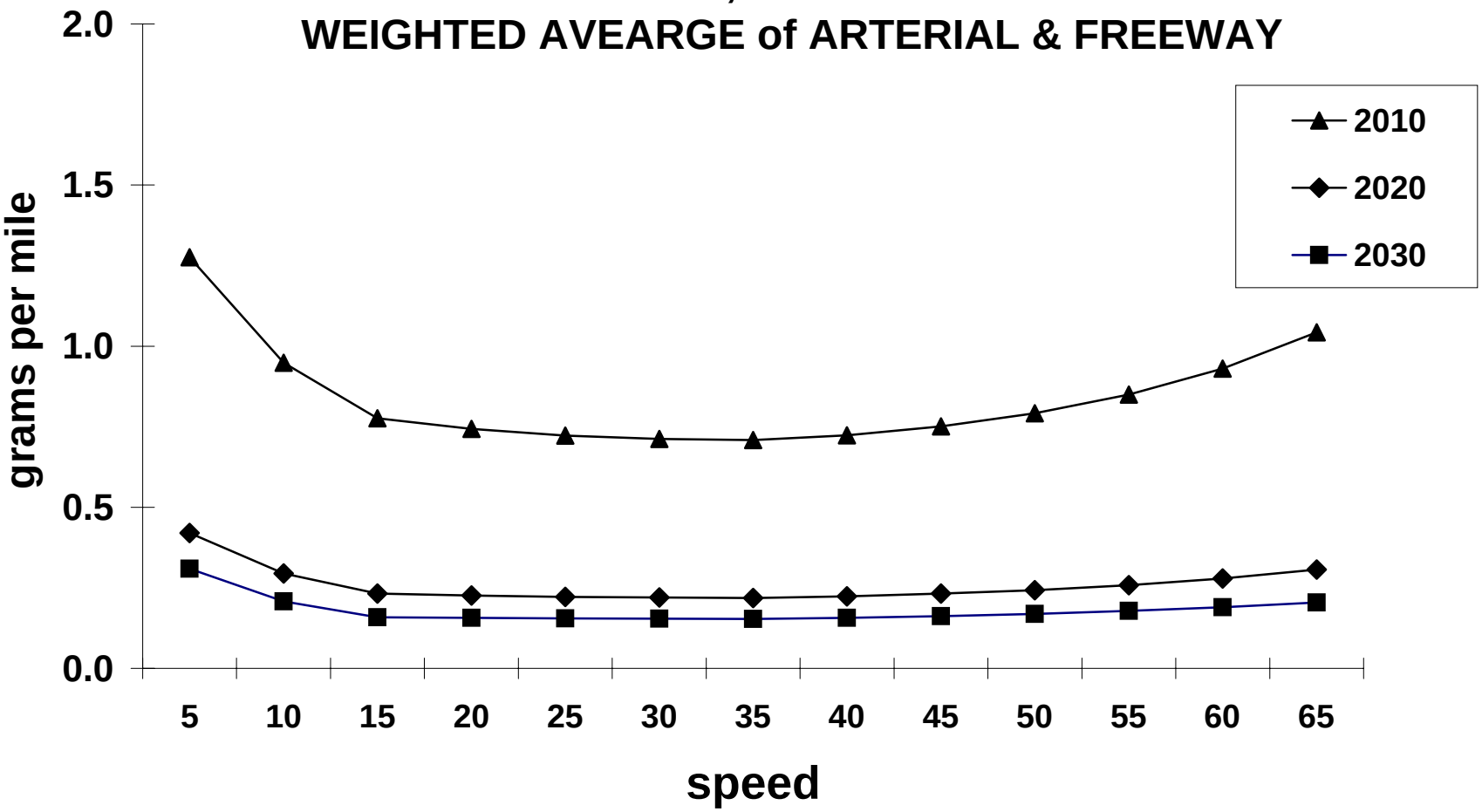


Table 5: 2010 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commute" TERMs
(Mobile 6.2)

Emission Type	Speed (mph)	Average 2010 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	3.1067	3.1066	3.1067	0.9036	0.9036	0.9036
Running (g/mi)	2	3.1067	3.1066	3.1067	0.9036	0.9036	0.9036
Running (g/mi)	3	2.4163	2.4163	2.4163	0.8588	0.8588	0.8588
Running (g/mi)	4	1.5542	1.5541	1.5542	0.8023	0.8023	0.8023
Running (g/mi)	5	1.0367	1.0367	1.0367	0.7688	0.7688	0.7688
Running (g/mi)	6	0.8515	0.8420	0.8477	0.7123	0.6794	0.6991
Running (g/mi)	7	0.7196	0.7032	0.7130	0.6720	0.6157	0.6495
Running (g/mi)	8	0.6201	0.5989	0.6116	0.6417	0.5678	0.6121
Running (g/mi)	9	0.5434	0.5180	0.5332	0.6182	0.5308	0.5832
Running (g/mi)	10	0.4815	0.4533	0.4702	0.5992	0.5010	0.5599
Running (g/mi)	11	0.4427	0.4130	0.4308	0.5708	0.4665	0.5291
Running (g/mi)	12	0.4103	0.3789	0.3977	0.5471	0.4375	0.5033
Running (g/mi)	13	0.3829	0.3504	0.3699	0.5274	0.4132	0.4817
Running (g/mi)	14	0.3596	0.3260	0.3462	0.5102	0.3922	0.4630
Running (g/mi)	15	0.3391	0.3048	0.3254	0.4953	0.3741	0.4468
Running (g/mi)	16	0.3199	0.2898	0.3079	0.4821	0.3752	0.4393
Running (g/mi)	17	0.3024	0.2766	0.2921	0.4704	0.3761	0.4327
Running (g/mi)	18	0.2872	0.2646	0.2782	0.4602	0.3768	0.4268
Running (g/mi)	19	0.2736	0.2542	0.2658	0.4508	0.3777	0.4216
Running (g/mi)	20	0.2613	0.2446	0.2546	0.4422	0.3783	0.4166
Running (g/mi)	21	0.2513	0.2374	0.2457	0.4347	0.3786	0.4123
Running (g/mi)	22	0.2422	0.2307	0.2376	0.4277	0.3788	0.4081
Running (g/mi)	23	0.2344	0.2249	0.2306	0.4212	0.3793	0.4044
Running (g/mi)	24	0.2267	0.2191	0.2237	0.4153	0.3794	0.4009
Running (g/mi)	25	0.2197	0.2140	0.2174	0.4100	0.3798	0.3979
Running (g/mi)	26	0.2139	0.2091	0.2120	0.4048	0.3798	0.3948
Running (g/mi)	27	0.2084	0.2044	0.2068	0.4001	0.3798	0.3920
Running (g/mi)	28	0.2029	0.1999	0.2017	0.3957	0.3799	0.3894
Running (g/mi)	29	0.1983	0.1962	0.1975	0.3919	0.3799	0.3871
Running (g/mi)	30	0.1938	0.1925	0.1933	0.3880	0.3799	0.3848
Running (g/mi)	31	0.1893	0.1883	0.1889	0.3856	0.3793	0.3831
Running (g/mi)	32	0.1852	0.1846	0.1850	0.3833	0.3786	0.3814
Running (g/mi)	33	0.1815	0.1810	0.1813	0.3810	0.3781	0.3798
Running (g/mi)	34	0.1780	0.1776	0.1778	0.3789	0.3775	0.3783
Running (g/mi)	35	0.1745	0.1745	0.1745	0.3771	0.3771	0.3771
Running (g/mi)	36	0.1720	0.1720	0.1720	0.3783	0.3783	0.3783
Running (g/mi)	37	0.1697	0.1697	0.1697	0.3797	0.3797	0.3797
Running (g/mi)	38	0.1673	0.1673	0.1673	0.3809	0.3809	0.3809
Running (g/mi)	39	0.1652	0.1652	0.1652	0.3820	0.3820	0.3820
Running (g/mi)	40	0.1631	0.1631	0.1631	0.3833	0.3833	0.3833
Running (g/mi)	41	0.1613	0.1613	0.1613	0.3852	0.3852	0.3852
Running (g/mi)	42	0.1591	0.1591	0.1591	0.3869	0.3869	0.3869
Running (g/mi)	43	0.1573	0.1573	0.1573	0.3888	0.3888	0.3888
Running (g/mi)	44	0.1556	0.1556	0.1556	0.3904	0.3904	0.3904
Running (g/mi)	45	0.1540	0.1540	0.1540	0.3921	0.3921	0.3921
Running (g/mi)	46	0.1523	0.1523	0.1523	0.3940	0.3940	0.3940
Running (g/mi)	47	0.1504	0.1504	0.1504	0.3959	0.3959	0.3959
Running (g/mi)	48	0.1488	0.1488	0.1488	0.3980	0.3980	0.3980
Running (g/mi)	49	0.1471	0.1471	0.1471	0.3996	0.3996	0.3996
Running (g/mi)	50	0.1457	0.1457	0.1457	0.4013	0.4013	0.4013
Running (g/mi)	51	0.1442	0.1442	0.1442	0.4037	0.4037	0.4037
Running (g/mi)	52	0.1430	0.1430	0.1430	0.4058	0.4058	0.4058
Running (g/mi)	53	0.1417	0.1417	0.1417	0.4078	0.4078	0.4078
Running (g/mi)	54	0.1404	0.1404	0.1404	0.4097	0.4097	0.4097
Running (g/mi)	55	0.1390	0.1390	0.1390	0.4114	0.4114	0.4114
Running (g/mi)	56	0.1383	0.1383	0.1383	0.4138	0.4138	0.4138
Running (g/mi)	57	0.1375	0.1375	0.1375	0.4161	0.4161	0.4161
Running (g/mi)	58	0.1372	0.1372	0.1372	0.4182	0.4182	0.4182
Running (g/mi)	59	0.1363	0.1363	0.1363	0.4200	0.4200	0.4200
Running (g/mi)	60	0.1359	0.1359	0.1359	0.4220	0.4220	0.4220
Running (g/mi)	61	0.1351	0.1351	0.1351	0.4245	0.4245	0.4245
Running (g/mi)	62	0.1347	0.1347	0.1347	0.4267	0.4267	0.4267
Running (g/mi)	63	0.1343	0.1343	0.1343	0.4289	0.4289	0.4289
Running (g/mi)	64	0.1338	0.1338	0.1338	0.4313	0.4313	0.4313
Running (g/mi)	65	0.1336	0.1336	0.1336	0.4333	0.4333	0.4333

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty	0.9659	0.5818
Hot Soak Loss (g/trip end)	0.5705	-
Hot Start (g/trip start, Light Duty	0.1649	0.1271

Table 6: 2020 Running, Cold Start, and Hot Soak Average Emissions Factors for "Commute Vehicle" TERMs
(Mobile 6.2)

Emission Type	Speed (mph)	Average 2020 Running Emission Factor (g/mi)					
		Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60%, Freeway- 40%	NOx		Arterial - 60%, Freeway- 40%
Running (g/mi)	1	1.6246	1.6246	1.6246	0.3849	0.3849	0.3849
Running (g/mi)	2	1.6246	1.6246	1.6246	0.3849	0.3849	0.3849
Running (g/mi)	3	1.2752	1.2752	1.2752	0.3654	0.3653	0.3654
Running (g/mi)	4	0.8390	0.8390	0.8390	0.3413	0.3413	0.3413
Running (g/mi)	5	0.5769	0.5769	0.5769	0.3270	0.3270	0.3270
Running (g/mi)	6	0.4783	0.4725	0.4760	0.3024	0.2878	0.2966
Running (g/mi)	7	0.4079	0.3979	0.4039	0.2847	0.2599	0.2748
Running (g/mi)	8	0.3552	0.3420	0.3499	0.2716	0.2392	0.2586
Running (g/mi)	9	0.3142	0.2986	0.3080	0.2614	0.2227	0.2459
Running (g/mi)	10	0.2814	0.2637	0.2743	0.2532	0.2097	0.2358
Running (g/mi)	11	0.2590	0.2406	0.2516	0.2407	0.1946	0.2223
Running (g/mi)	12	0.2406	0.2212	0.2328	0.2305	0.1821	0.2111
Running (g/mi)	13	0.2249	0.2046	0.2168	0.2219	0.1715	0.2017
Running (g/mi)	14	0.2116	0.1905	0.2032	0.2145	0.1624	0.1937
Running (g/mi)	15	0.2000	0.1785	0.1914	0.2078	0.1544	0.1864
Running (g/mi)	16	0.1882	0.1693	0.1806	0.2021	0.1550	0.1833
Running (g/mi)	17	0.1777	0.1613	0.1711	0.1971	0.1555	0.1805
Running (g/mi)	18	0.1685	0.1541	0.1627	0.1928	0.1559	0.1780
Running (g/mi)	19	0.1602	0.1478	0.1552	0.1886	0.1564	0.1757
Running (g/mi)	20	0.1528	0.1421	0.1485	0.1849	0.1568	0.1737
Running (g/mi)	21	0.1474	0.1380	0.1436	0.1817	0.1570	0.1718
Running (g/mi)	22	0.1424	0.1346	0.1393	0.1787	0.1573	0.1701
Running (g/mi)	23	0.1375	0.1312	0.1350	0.1760	0.1574	0.1686
Running (g/mi)	24	0.1335	0.1281	0.1313	0.1735	0.1574	0.1671
Running (g/mi)	25	0.1296	0.1254	0.1279	0.1711	0.1578	0.1658
Running (g/mi)	26	0.1261	0.1224	0.1246	0.1688	0.1578	0.1644
Running (g/mi)	27	0.1227	0.1200	0.1216	0.1669	0.1578	0.1633
Running (g/mi)	28	0.1194	0.1172	0.1185	0.1651	0.1579	0.1622
Running (g/mi)	29	0.1166	0.1151	0.1160	0.1633	0.1580	0.1612
Running (g/mi)	30	0.1139	0.1127	0.1134	0.1618	0.1580	0.1603
Running (g/mi)	31	0.1116	0.1107	0.1112	0.1606	0.1578	0.1595
Running (g/mi)	32	0.1091	0.1084	0.1088	0.1595	0.1575	0.1587
Running (g/mi)	33	0.1070	0.1066	0.1068	0.1587	0.1573	0.1581
Running (g/mi)	34	0.1048	0.1048	0.1048	0.1577	0.1570	0.1574
Running (g/mi)	35	0.1030	0.1030	0.1030	0.1568	0.1568	0.1568
Running (g/mi)	36	0.1017	0.1017	0.1017	0.1575	0.1575	0.1575
Running (g/mi)	37	0.1004	0.1004	0.1004	0.1582	0.1582	0.1582
Running (g/mi)	38	0.0990	0.0990	0.0990	0.1587	0.1587	0.1587
Running (g/mi)	39	0.0978	0.0978	0.0978	0.1593	0.1593	0.1593
Running (g/mi)	40	0.0968	0.0968	0.0968	0.1598	0.1598	0.1598
Running (g/mi)	41	0.0957	0.0957	0.0957	0.1608	0.1608	0.1608
Running (g/mi)	42	0.0948	0.0948	0.0948	0.1615	0.1615	0.1615
Running (g/mi)	43	0.0935	0.0935	0.0935	0.1623	0.1623	0.1623
Running (g/mi)	44	0.0926	0.0926	0.0926	0.1632	0.1632	0.1632
Running (g/mi)	45	0.0916	0.0916	0.0916	0.1640	0.1640	0.1640
Running (g/mi)	46	0.0908	0.0908	0.0908	0.1650	0.1650	0.1650
Running (g/mi)	47	0.0899	0.0899	0.0899	0.1659	0.1659	0.1659
Running (g/mi)	48	0.0890	0.0890	0.0890	0.1666	0.1666	0.1666
Running (g/mi)	49	0.0883	0.0883	0.0883	0.1674	0.1674	0.1674
Running (g/mi)	50	0.0876	0.0876	0.0876	0.1683	0.1683	0.1683
Running (g/mi)	51	0.0871	0.0871	0.0871	0.1693	0.1693	0.1693
Running (g/mi)	52	0.0866	0.0866	0.0866	0.1704	0.1704	0.1704
Running (g/mi)	53	0.0860	0.0860	0.0860	0.1714	0.1714	0.1714
Running (g/mi)	54	0.0856	0.0856	0.0856	0.1723	0.1723	0.1723
Running (g/mi)	55	0.0851	0.0851	0.0851	0.1731	0.1731	0.1731
Running (g/mi)	56	0.0850	0.0850	0.0850	0.1742	0.1742	0.1742
Running (g/mi)	57	0.0852	0.0852	0.0852	0.1752	0.1752	0.1752
Running (g/mi)	58	0.0851	0.0851	0.0851	0.1762	0.1762	0.1762
Running (g/mi)	59	0.0852	0.0852	0.0852	0.1771	0.1771	0.1771
Running (g/mi)	60	0.0851	0.0851	0.0851	0.1781	0.1781	0.1781
Running (g/mi)	61	0.0852	0.0852	0.0852	0.1791	0.1791	0.1791
Running (g/mi)	62	0.0853	0.0853	0.0853	0.1802	0.1802	0.1802
Running (g/mi)	63	0.0855	0.0855	0.0855	0.1812	0.1812	0.1812
Running (g/mi)	64	0.0855	0.0855	0.0855	0.1822	0.1822	0.1822
Running (g/mi)	65	0.0857	0.0857	0.0857	0.1833	0.1833	0.1833

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.5387	0.2398
Hot Soak Loss (g/trip end)	0.2584	-
Hot Start (g/trip start, Light Duty Only)	0.0959	0.0552

Table 7: 2030 Running, Cold Start, and Hot Soak Average Emissons Factors for "Commute" TERMs (Mobile 6.2)

Average 2030 Emission Factors (gm/mi)							
Emission Type	Speed (mph)	Arterial	Freeway	Weighted Factor VOC	Arterial	Freeway	Weighted Factor NOx
		VOC		Arterial - 60% Freeway 40%	NOx		Arterial - 60% Freeway 40%
Running (g/mi)	1	1.5399	1.5399	1.5399	0.3285	0.3285	0.3285
Running (g/mi)	2	1.5399	1.5399	1.5399	0.3285	0.3285	0.3285
Running (g/mi)	3	1.2078	1.2078	1.2078	0.3119	0.3118	0.3119
Running (g/mi)	4	0.7929	0.7929	0.7929	0.2913	0.2913	0.2913
Running (g/mi)	5	0.5439	0.5438	0.5439	0.2788	0.2788	0.2788
Running (g/mi)	6	0.4509	0.4455	0.4487	0.2575	0.2448	0.2524
Running (g/mi)	7	0.3843	0.3750	0.3806	0.2423	0.2208	0.2337
Running (g/mi)	8	0.3342	0.3223	0.3294	0.2309	0.2028	0.2197
Running (g/mi)	9	0.2954	0.2812	0.2897	0.2219	0.1887	0.2086
Running (g/mi)	10	0.2646	0.2484	0.2581	0.2149	0.1772	0.1998
Running (g/mi)	11	0.2439	0.2265	0.2369	0.2042	0.1643	0.1882
Running (g/mi)	12	0.2263	0.2084	0.2191	0.1953	0.1533	0.1785
Running (g/mi)	13	0.2114	0.1929	0.2040	0.1878	0.1442	0.1704
Running (g/mi)	14	0.1987	0.1797	0.1911	0.1815	0.1363	0.1634
Running (g/mi)	15	0.1878	0.1681	0.1799	0.1758	0.1295	0.1573
Running (g/mi)	16	0.1768	0.1596	0.1699	0.1709	0.1301	0.1546
Running (g/mi)	17	0.1669	0.1521	0.1610	0.1665	0.1305	0.1521
Running (g/mi)	18	0.1583	0.1451	0.1530	0.1626	0.1310	0.1500
Running (g/mi)	19	0.1504	0.1390	0.1458	0.1592	0.1313	0.1480
Running (g/mi)	20	0.1434	0.1336	0.1395	0.1563	0.1316	0.1464
Running (g/mi)	21	0.1383	0.1299	0.1349	0.1533	0.1318	0.1447
Running (g/mi)	22	0.1336	0.1263	0.1307	0.1505	0.1320	0.1431
Running (g/mi)	23	0.1291	0.1231	0.1267	0.1482	0.1321	0.1418
Running (g/mi)	24	0.1253	0.1204	0.1233	0.1460	0.1323	0.1405
Running (g/mi)	25	0.1216	0.1176	0.1200	0.1440	0.1324	0.1394
Running (g/mi)	26	0.1182	0.1149	0.1169	0.1422	0.1324	0.1383
Running (g/mi)	27	0.1151	0.1123	0.1140	0.1405	0.1324	0.1373
Running (g/mi)	28	0.1123	0.1099	0.1113	0.1389	0.1325	0.1363
Running (g/mi)	29	0.1096	0.1080	0.1090	0.1373	0.1326	0.1354
Running (g/mi)	30	0.1070	0.1059	0.1066	0.1360	0.1328	0.1347
Running (g/mi)	31	0.1046	0.1037	0.1042	0.1350	0.1323	0.1339
Running (g/mi)	32	0.1023	0.1017	0.1021	0.1341	0.1323	0.1334
Running (g/mi)	33	0.1003	0.0999	0.1001	0.1333	0.1321	0.1328
Running (g/mi)	34	0.0982	0.0981	0.0982	0.1323	0.1319	0.1321
Running (g/mi)	35	0.0965	0.0965	0.0965	0.1314	0.1314	0.1314
Running (g/mi)	36	0.0950	0.0950	0.0950	0.1323	0.1323	0.1323
Running (g/mi)	37	0.0940	0.0940	0.0940	0.1329	0.1329	0.1329
Running (g/mi)	38	0.0927	0.0927	0.0927	0.1333	0.1333	0.1333
Running (g/mi)	39	0.0916	0.0916	0.0916	0.1339	0.1339	0.1339
Running (g/mi)	40	0.0905	0.0905	0.0905	0.1343	0.1343	0.1343
Running (g/mi)	41	0.0894	0.0894	0.0894	0.1351	0.1351	0.1351
Running (g/mi)	42	0.0883	0.0883	0.0883	0.1358	0.1358	0.1358
Running (g/mi)	43	0.0874	0.0874	0.0874	0.1364	0.1364	0.1364
Running (g/mi)	44	0.0865	0.0865	0.0865	0.1373	0.1373	0.1373
Running (g/mi)	45	0.0854	0.0854	0.0854	0.1379	0.1379	0.1379
Running (g/mi)	46	0.0849	0.0849	0.0849	0.1388	0.1388	0.1388
Running (g/mi)	47	0.0839	0.0839	0.0839	0.1394	0.1394	0.1394
Running (g/mi)	48	0.0832	0.0832	0.0832	0.1403	0.1403	0.1403
Running (g/mi)	49	0.0824	0.0824	0.0824	0.1410	0.1410	0.1410
Running (g/mi)	50	0.0818	0.0818	0.0818	0.1418	0.1418	0.1418
Running (g/mi)	51	0.0812	0.0812	0.0812	0.1428	0.1428	0.1428
Running (g/mi)	52	0.0808	0.0808	0.0808	0.1437	0.1437	0.1437
Running (g/mi)	53	0.0802	0.0802	0.0802	0.1443	0.1443	0.1443
Running (g/mi)	54	0.0798	0.0798	0.0798	0.1452	0.1452	0.1452
Running (g/mi)	55	0.0795	0.0795	0.0795	0.1459	0.1459	0.1459
Running (g/mi)	56	0.0794	0.0794	0.0794	0.1469	0.1469	0.1469
Running (g/mi)	57	0.0794	0.0794	0.0794	0.1478	0.1478	0.1478
Running (g/mi)	58	0.0794	0.0794	0.0794	0.1488	0.1488	0.1488
Running (g/mi)	59	0.0794	0.0794	0.0794	0.1496	0.1496	0.1496
Running (g/mi)	60	0.0794	0.0794	0.0794	0.1503	0.1503	0.1503
Running (g/mi)	61	0.0796	0.0796	0.0796	0.1512	0.1512	0.1512
Running (g/mi)	62	0.0799	0.0799	0.0799	0.1522	0.1522	0.1522
Running (g/mi)	63	0.0800	0.0800	0.0800	0.1531	0.1531	0.1531
Running (g/mi)	64	0.0801	0.0801	0.0801	0.1540	0.1540	0.1540
Running (g/mi)	65	0.0802	0.0802	0.0802	0.1549	0.1549	0.1549

Emission Type	VOC	NOx
Cold Start (g/trip start, Light Duty Only)	0.4717	0.172
Hot Soak Loss (g/trip end)	0.1995	-
Hot Start (g/trip start, Light Duty Only)	0.0849	0.0406

Exhibit - 3
VOC MOBILE6.2 RUNNING EMISSION RATES
COMMUTE STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVEARGE of ARTERIAL & FREEWAY

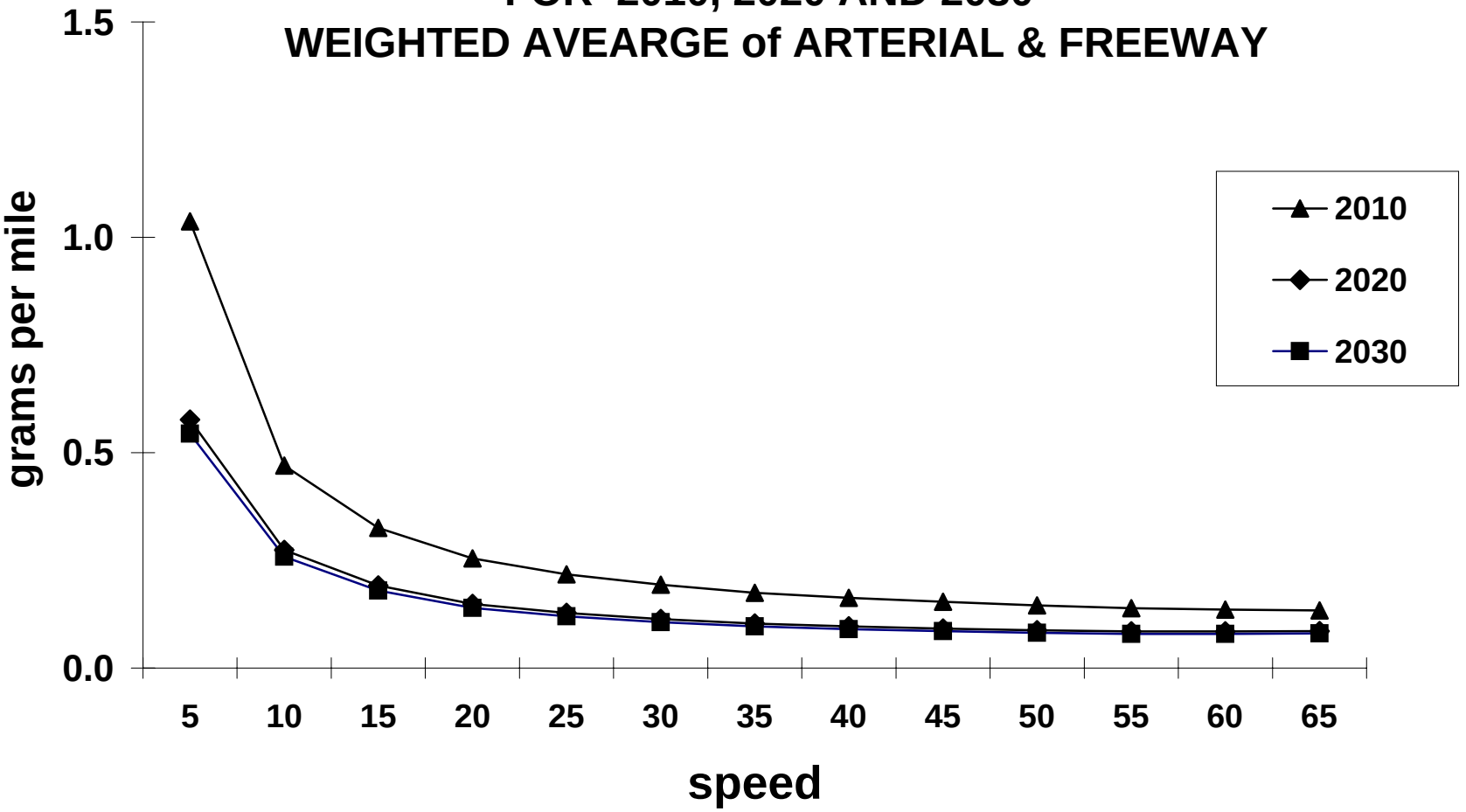


Exhibit - 4
NOx MOBILE6.2 RUNNING EMISSION RATES
COMMUTE STREAM
FOR 2010, 2020 AND 2030
WEIGHTED AVEARGE of ARTERIAL & FREEWAY

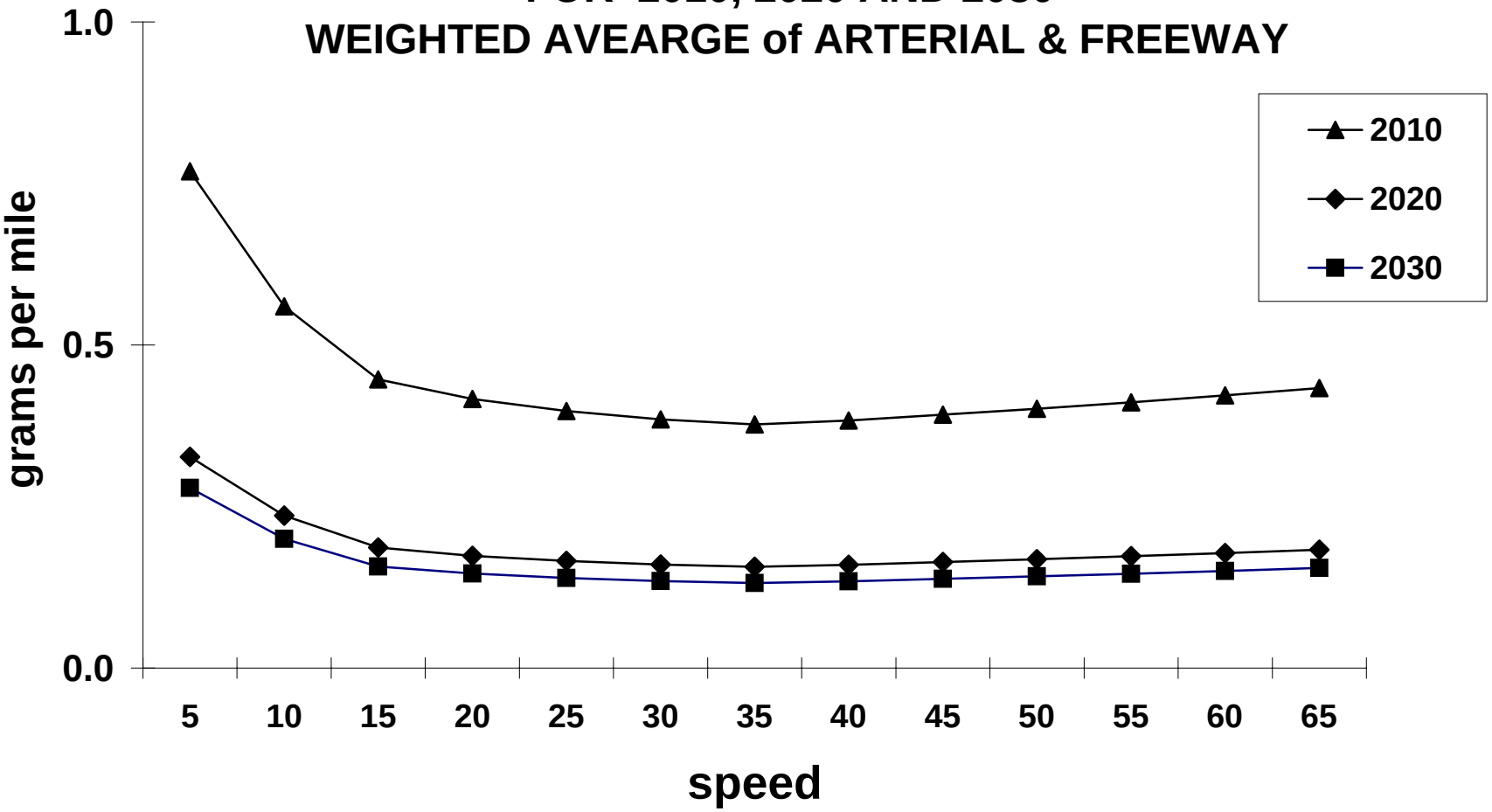


Table - 8 Regional Bus Emissions Factors (Mobile 6.2)

		School Bus - 2010 Emissions Factors					Transit Bus - 2010 Emissions Factors				
Speed	Facility	NOx (Grams/mile)					NOx (Grams/mile)				
		Fall	Spring	Summer	Winter	Average	Fall	Spring	Summer	Winter	Average
1.00	Arterial	11.803	12.748	12.748	13.402	12.675	18.423	19.704	19.704	20.476	19.577
2.00	Arterial	11.803	12.748	12.748	13.402	12.675	18.423	19.704	19.704	20.476	19.577
3.00	Arterial	11.402	12.317	12.317	12.949	12.246	17.796	19.029	19.029	19.775	18.907
4.00	Arterial	10.901	11.778	11.778	12.383	11.710	17.013	18.186	18.186	18.899	18.071
5.00	Arterial	10.601	11.455	11.454	12.043	11.388	16.544	17.68	17.68	18.373	17.569
6.00	Arterial	9.995	10.803	10.803	11.358	10.740	15.596	16.66	16.66	17.312	16.557
7.00	Arterial	9.563	10.338	10.337	10.869	10.277	14.919	15.931	15.931	16.555	15.834
8.00	Arterial	9.238	9.989	9.988	10.502	9.929	14.411	15.384	15.384	15.987	15.292
9.00	Arterial	8.986	9.717	9.717	10.217	9.659	14.016	14.959	14.959	15.545	14.870
10.0	Arterial	8.784	9.5	9.499	9.989	9.443	13.701	14.619	14.619	15.191	14.533
11.0	Arterial	8.446	9.136	9.135	9.606	9.081	13.171	14.048	14.048	14.598	13.966
12.0	Arterial	8.164	8.833	8.832	9.288	8.779	12.729	13.572	13.572	14.104	13.494
12.9	Arterial	8.007	8.663	8.663	9.11	8.611	12.483	13.307	13.307	13.828	13.231
13.0	Arterial	7.925	8.576	8.575	9.018	8.524	12.355	13.17	13.17	13.685	13.095
14.0	Arterial	7.721	8.356	8.356	8.787	8.305	12.035	12.824	12.824	13.327	12.753
15.0	Arterial	7.544	8.165	8.165	8.587	8.115	11.757	12.525	12.525	13.016	12.456
16.0	Arterial	7.337	7.943	7.942	8.353	7.894	11.432	12.175	12.175	12.652	12.109
17.0	Arterial	7.154	7.746	7.746	8.146	7.698	11.145	11.866	11.866	12.331	11.802
18.0	Arterial	6.991	7.571	7.571	7.962	7.524	10.89	11.591	11.591	12.045	11.529
19.0	Arterial	6.846	7.415	7.415	7.798	7.369	10.661	11.346	11.346	11.79	11.286
20.0	Arterial	6.715	7.274	7.274	7.65	7.228	10.456	11.124	11.124	11.56	11.066
21.0	Arterial	6.592	7.142	7.141	7.511	7.097	10.261	10.915	10.915	11.342	10.858
22.0	Arterial	6.479	7.021	7.021	7.384	6.976	10.084	10.724	10.724	11.144	10.669
23.0	Arterial	6.377	6.911	6.91	7.269	6.867	9.923	10.55	10.55	10.963	10.497
24.0	Arterial	6.283	6.81	6.809	7.162	6.766	9.775	10.391	10.391	10.797	10.339
25.0	Arterial	6.196	6.717	6.716	7.065	6.674	9.638	10.244	10.244	10.645	10.193
26.0	Arterial	6.134	6.65	6.65	6.995	6.607	9.54	10.138	10.138	10.534	10.088
27.0	Arterial	6.077	6.589	6.588	6.93	6.546	9.448	10.039	10.039	10.432	9.990
28.0	Arterial	6.023	6.531	6.531	6.87	6.489	9.363	9.948	9.948	10.337	9.899
29.0	Arterial	5.973	6.478	6.478	6.814	6.436	9.284	9.862	9.862	10.248	9.814
30.0	Arterial	5.927	6.428	6.428	6.762	6.386	9.21	9.783	9.783	10.166	9.736
31.0	Arterial	5.916	6.416	6.416	6.749	6.374	9.191	9.762	9.762	10.144	9.715
32.0	Arterial	5.905	6.405	6.405	6.738	6.363	9.173	9.742	9.742	10.124	9.695
33.0	Arterial	5.895	6.395	6.394	6.727	6.353	9.155	9.724	9.724	10.104	9.677
34.0	Arterial	5.886	6.385	6.384	6.716	6.343	9.139	9.706	9.706	10.086	9.659
34.6	Arterial	6.066	6.567	6.567	6.909	6.527	9.265	9.977	9.977	10.369	9.897
35.0	Arterial	5.877	6.376	6.375	6.707	6.334	9.124	9.69	9.69	10.069	9.643
36.0	Arterial	5.913	6.415	6.414	6.748	6.373	9.179	9.749	9.749	10.131	9.702
37.0	Arterial	5.947	6.452	6.452	6.787	6.410	9.231	9.805	9.805	10.189	9.758
38.0	Arterial	5.98	6.487	6.487	6.824	6.445	9.28	9.858	9.858	10.244	9.810
39.0	Arterial	6.011	6.521	6.52	6.859	6.478	9.326	9.908	9.908	10.296	9.860
40.0	Arterial	6.04	6.553	6.552	6.893	6.510	9.371	9.956	9.956	10.345	9.907
41.0	Arterial	6.126	6.646	6.645	6.991	6.602	9.504	10.099	10.099	10.494	10.049
42.0	Arterial	6.208	6.735	6.734	7.084	6.690	9.63	10.235	10.235	10.636	10.184
43.0	Arterial	6.287	6.82	6.819	7.173	6.775	9.751	10.365	10.365	10.771	10.313
44.0	Arterial	6.362	6.9	6.9	7.259	6.855	9.867	10.49	10.49	10.9	10.437
45.0	Arterial	6.433	6.978	6.977	7.34	6.932	9.977	10.608	10.608	11.024	10.554
46.0	Arterial	6.578	7.134	7.134	7.504	7.088	10.202	10.85	10.85	11.275	10.794
47.0	Arterial	6.717	7.284	7.284	7.662	7.237	10.417	11.082	11.082	11.516	11.024
48.0	Arterial	6.851	7.428	7.427	7.813	7.380	10.623	11.304	11.304	11.747	11.245
49.0	Arterial	6.978	7.566	7.565	7.958	7.517	10.821	11.517	11.517	11.968	11.456
50.0	Arterial	7.101	7.698	7.697	8.097	7.648	11.011	11.722	11.722	12.181	11.659
51.0	Arterial	7.321	7.935	7.934	8.346	7.884	11.352	12.09	12.09	12.563	12.024
52.0	Arterial	7.532	8.163	8.163	8.586	8.111	11.681	12.443	12.443	12.931	12.375
53.0	Arterial	7.736	8.383	8.382	8.817	8.330	11.997	12.784	12.784	13.284	12.712
54.0	Arterial	7.932	8.594	8.593	9.039	8.540	12.301	13.112	13.112	13.625	13.038
55.0	Arterial	8.121	8.798	8.797	9.253	8.742	12.595	13.427	13.427	13.953	13.351
56.0	Arterial	8.442	9.144	9.144	9.618	9.087	13.095	13.966	13.966	14.513	13.885
57.0	Arterial	8.753	9.479	9.478	9.969	9.420	13.577	14.486	14.486	15.053	14.401
58.0	Arterial	9.052	9.802	9.801	10.309	9.741	14.044	14.988	14.988	15.575	14.899
59.0	Arterial	9.342	10.114	10.113	10.637	10.052	14.494	15.473	15.473	16.079	15.380
60.0	Arterial	9.622	10.415	10.415	10.954	10.352	14.929	15.941	15.941	16.566	15.844
61.0	Arterial	10.088	10.918	10.917	11.482	10.851	15.655	16.723	16.723	17.379	16.620
62.0	Arterial	10.539	11.404	11.403	11.993	11.335	16.358	17.48	17.48	18.165	17.371
63.0	Arterial	10.976	11.875	11.874	12.488	11.803	17.038	18.213	18.213	18.926	18.098
64.0	Arterial	11.4	12.331	12.33	12.967	12.257	17.697	18.922	18.922	19.664	18.801
65.0	Arterial	11.81	12.773	12.772	13.432	12.697	18.336	19.61	19.61	20.379	19.484

Table - 9 Idling Emissions Factors

(Mobile 6.2)

Vehicle Type	2010		2020		2030	
	VOC	NOx	VOC	NOx	VOC	NOx
	g/hr	g/hr	g/hr	g/hr	g/hr	g/hr
LDGV	9.6651	2.3954	4.3599	0.9148	4.0684	0.7378
LDGTI	6.5328	1.5969	3.4216	0.6695	3.2873	0.5900
LDGT2	6.7310	2.3083	3.6049	0.9356	3.4794	0.8284
LDGT3	11.4874	3.6390	5.0824	1.4696	4.6046	1.1015
LDGT4	11.8429	4.8790	5.2671	2.0739	4.7379	1.5790
HDGV2b	9.4946	3.6206	4.6296	0.6830	4.2228	0.3013
HDGV3	8.6358	3.7389	4.5176	0.7799	4.1096	0.3895
HDGV4	11.6249	3.8614	4.0569	0.6418	3.7393	0.3460
HDGV5	9.8565	4.1175	4.2470	0.7439	3.9029	0.3978
HDGV6	9.7355	4.0719	4.2379	0.7371	3.8946	0.3934
HDGV7	10.9438	4.5546	4.4706	0.8218	4.0914	0.4466
HDGV8a	12.7324	5.0636	4.6026	0.8748	4.2121	0.4728
HDGV8b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LDDV	0.8690	1.4690	0.3303	0.2361	0.2578	0.1111
LDDT12	6.5330	9.5539	0.0000	0.0000	0.0000	0.0000
HDDV2B	1.1451	9.3678	0.8161	1.7991	0.7871	0.8863
HDDV3	1.2406	9.8459	0.9196	1.7421	0.8980	0.9946
HDDV4	1.5478	12.9703	1.1010	2.7450	1.0505	1.2146
HDDV5	1.7014	13.9043	1.2005	2.9804	1.1354	1.3133
HDDV6	2.1443	16.9770	1.4581	3.0949	1.4010	1.5705
HDDV7	2.6385	21.0884	1.8024	3.8310	1.7356	1.9471
HDDV8a	2.7226	23.9020	2.0505	4.0945	1.9868	2.2081
HDDV8b	3.2054	28.3073	2.2950	5.0476	2.1849	2.4613
MC	21.5073	1.5834	21.5073	1.5834	21.5073	1.5834
HDGB	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HDDBT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HDDBS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LDDT34	2.1999	2.8725	0.8290	0.8055	0.5894	0.4901
All vehicles	**8.3116**	**3.7739**	**4.0261**	**1.2155**	**3.7831**	**0.9163**

Also for use in the emissions reduction calculations average weighted speed by time period are shown in Table 10 below. The 24 hour regional average weighted speed is 41 miles per hour and should be used for TERMs affecting the entire traffic stream, where site-specific speed data are not available. Please express reductions of VOC and NOx for all years in both kilograms per day and tons per day using a conversion factor of .0011 (# of kg reduced X .0011 = # of tons reduced).

Table 10: Average Weighted Speeds by Hour

Time	Speed (mph)
12-1	48
1-2	49
2-3	49
3-4	49
4-5	48
5-6	45
6-7	41
7-8	38
8-9	39
9-10	41
10-11	43
11-12	42
12-1 PM	40
1-2 PM	42
2-3 PM	42
3-4 PM	41
4-5 PM	40
5-6 PM	39
6-7 PM	40
7-8 PM	42
8-9 PM	43
9-10 PM	44
10-11 PM	45
11-12 MID	45
24 Hour Avg	41

Table 11: Mobile 6 Vehicle Classifications		
Number	***Abbreviation***	***Description***
1	LDGV	Light-Duty Gasoline Vehicles (Passenger Cars)
2	LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
3	LDGT2	Light-Duty Gasoline Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
4	LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW)
5	LDGT4	Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALVW)
6	HDGV2b	Class 2b Heavy-Duty Gasoline Vehicles (8,501-10,000 lbs. GVWR)
7	HDGV3	Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR)
8	HDGV4	Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR)
9	HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR)
10	HDGV6	Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR)
11	HDGV7	Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR)
12	HDGV8a	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR)
13	HDGV8b	Class 8b Heavy-Duty Gasoline Vehicles (>60,000 lbs. GVWR)
14	LDDV	Light-Duty Diesel Vehicles (Passenger Cars)
15	LDDT12	Light-Duty Diesel Trucks 1and 2 (0-6,000 lbs. GVWR)
16	HDDV2b	Class 2b Heavy-Duty Diesel Vehicles (8,501-10,000 lbs. GVWR)
17	HDDV3	Class 3 Heavy-Duty Diesel Vehicles (10,001-14,000 lbs. GVWR)
18	HDDV4	Class 4 Heavy-Duty Diesel Vehicles (14,001-16,000 lbs. GVWR)
19	HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs. GVWR)
20	HDDV6	Class 6 Heavy-Duty Diesel Vehicles (19,501-26,000 lbs. GVWR)
21	HDDV7	Class 7 Heavy-Duty Diesel Vehicles (26,001-33,000 lbs. GVWR)
22	HDDV8a	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs. GVWR)
23	HDDV8b	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)
24	MC	Motorcycles (Gasoline)
25	HDGB	Gasoline Buses (School, Transit and Urban)
26	HDDBT	Diesel Transit and Urban Buses
27	HDDBS	Diesel School Buses
28	LDDT34	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs. GVWR)

COST EFFECTIVENESS ESTIMATION PROCEDURES

Consistency between programming agencies in assumptions and methodology for effectiveness estimations is critical for meaningful comparison of different projects around the region. Therefore, please use the following guidelines when calculating the cost effectiveness of your TERM projects. When determining the cost effectiveness, capital costs, operating costs, and revenues should be considered. Projects should be expressed in dollars per ton of reduction for both VOC and NOx. Please use the following series of formulas to compute cost effectiveness:

A. Total Project Cost = Capital Costs + Operating Costs - (Revenues + Resale Value, if relevant/significant)

B. Cost Per Day = $\frac{\text{Total Project Cost}}{\text{Benefit Days per Year X Lifespan}}$

C. Cost Per Ton = Cost Per Day / Tons VOC or NOx Reduced Per Day

Where:

Benefit Days per Year = 250 for projects mostly related to work travel (i.e., commuter lots, ridesharing)

365 for projects relating to all travel (e.g. roadway signal systems)

Lifespan[1] = 30 years for park and ride lot (construction)
100 years for park and ride lot land (right-of-way)
20 years for roadways
30 years for bridges
12 years for roadway signal systems
20 years for rail signalization
35 years for structures (i.e., garages)
12 years for buses
35 years for railcars
30 years for locomotives
10 years for sidewalks

Travel demand model assumptions:

Average one-way trip length for commute trips = 15.5 miles
Average vehicle occupancy = 1.12

[1] These lifespan values were provided by various transit and highway agencies and consultants. If lifespan values necessary for the cost/benefit calculation of any TERM projects are not provided, please contact Daivamani Sivasailam at (202) 962-3226.

Section II

The EPA guidance on fine particulate matter (PM 2.5) emissions requires the region to estimate direct PM 2.5 and NOx emissions as a PM2.5 precursor. In addition these emissions estimations are required on an annual basis and not on a daily basis as in the case of ozone precursors. Direct PM2.5 emission rates are constant for all speeds and are expressed in grams/mile. Direct PM 2.5 has no start-up, soak or other evaporative emissions associated with them. However, NOx as a precursor to PM 2.5 is similar to NOx as a precursor to ozone, and has start-up emissions in addition to running emissions.

The recommended methodology to estimate annual direct PM2.5 and NOx emissions as a PM2.5 precursor is to use an average of the four seasonal emission rates (Winter, Spring, Summer, and Fall) and apply these average rates to annual VT and VMT to estimate the annual direct PM2.5 and NOx emissions. Direct PM2.5 emissions rates and average seasonal NOx emissions rates for the analysis years 2010, 2020, & 2030 are shown in Tables 12, 13, 14 & 15.

An example of a commuter TERM analysis with PM2.5 and NOx emissions as a PM2.5 precursor is shown on the following pages.

Table-12

Direct PM2.5 Emissions Factors

	Season	Speed	Facility	Total PM
2010 PM2.5 - Auto Access	WINTER	35.0	Arterial	0.0118
	SPRING	35.0	Arterial	0.0117
	SUMMER	35.0	Arterial	0.0117
	FALL	35.0	Arterial	0.0116
			Average	**0.0117**

2020 PM2.5 - Auto Access	WINTER	35.0	Arterial	0.0113
	SPRING	35.0	Arterial	0.0113
	SUMMER	35.0	Arterial	0.0113
	FALL	35.0	Arterial	0.0113
			Average	**0.0113**

2030 PM2.5 - Auto Access	WINTER	35.0	Arterial	0.0113
	SPRING	35.0	Arterial	0.0113
	SUMMER	35.0	Arterial	0.0113
	FALL	35.0	Arterial	0.0113
			Average	**0.0113**

Table 13: NOx - 2010 Running, Cold Start Average Emissions Factors for Commute TERMs (Mobile 6.2)
(Seasonal Average)

Speed	Weighted Factor Winter NOx (grams/mile)	Weighted Factor Spring NOx (grams/mile)	Weighted Factor Summer NOx (grams/mile)	Weighted Factor Fall NOx (grams/mile)	Average of Seasonal Factors (grams/mile)
1	0.9272	0.7932	0.8232	0.7428	**0.8216**
2	0.9272	0.7932	0.8232	0.7428	**0.8216**
3	0.8873	0.7590	0.7840	0.7107	**0.7852**
4	0.8372	0.7162	0.7347	0.6706	**0.7397**
5	0.8071	0.6904	0.7051	0.6464	**0.7123**
6	0.7383	0.6317	0.6424	0.5911	**0.6509**
7	0.6891	0.5896	0.5976	0.5518	**0.6070**
8	0.6522	0.5581	0.5639	0.5222	**0.5741**
9	0.6236	0.5337	0.5377	0.4992	**0.5486**
10	0.6007	0.5140	0.5169	0.4809	**0.5281**
11	0.5696	0.4875	0.4888	0.4559	**0.5004**
12	0.5434	0.4654	0.4656	0.4351	**0.4774**
13	0.5214	0.4463	0.4458	0.4175	**0.4578**
14	0.5026	0.4305	0.4287	0.4023	**0.4410**
15	0.4864	0.4163	0.4142	0.3892	**0.4265**
16	0.4799	0.4109	0.4077	0.3840	**0.4206**
17	0.4739	0.4058	0.4019	0.3794	**0.4152**
18	0.4688	0.4014	0.3967	0.3752	**0.4105**
19	0.4641	0.3974	0.3920	0.3715	**0.4063**
20	0.4601	0.3940	0.3879	0.3681	**0.4025**
21	0.4563	0.3908	0.3842	0.3652	**0.3991**
22	0.4528	0.3879	0.3805	0.3626	**0.3960**
23	0.4499	0.3851	0.3776	0.3601	**0.3932**
24	0.4471	0.3828	0.3745	0.3578	**0.3905**
25	0.4444	0.3807	0.3718	0.3558	**0.3882**
26	0.4420	0.3786	0.3691	0.3537	**0.3859**
27	0.4399	0.3767	0.3669	0.3519	**0.3838**
28	0.4380	0.3750	0.3648	0.3503	**0.3820**
29	0.4359	0.3733	0.3626	0.3489	**0.3802**
30	0.4341	0.3718	0.3606	0.3474	**0.3785**
31	0.4329	0.3710	0.3593	0.3465	**0.3774**
32	0.4320	0.3701	0.3580	0.3457	**0.3765**
33	0.4311	0.3692	0.3566	0.3450	**0.3755**
34	0.4301	0.3683	0.3555	0.3442	**0.3745**
35	0.4293	0.3676	0.3547	0.3435	**0.3738**
36	0.4316	0.3696	0.3558	0.3454	**0.3756**
37	0.4338	0.3716	0.3574	0.3471	**0.3775**
38	0.4359	0.3733	0.3588	0.3487	**0.3792**
39	0.4380	0.3751	0.3599	0.3503	**0.3808**
40	0.4400	0.3767	0.3614	0.3519	**0.3825**
41	0.4430	0.3792	0.3634	0.3543	**0.3850**
42	0.4459	0.3817	0.3653	0.3564	**0.3873**
43	0.4485	0.3840	0.3672	0.3587	**0.3896**
44	0.4512	0.3863	0.3688	0.3607	**0.3918**
45	0.4536	0.3884	0.3705	0.3627	**0.3938**
46	0.4565	0.3910	0.3725	0.3653	**0.3963**
47	0.4596	0.3934	0.3745	0.3676	**0.3988**
48	0.4624	0.3958	0.3763	0.3699	**0.4011**
49	0.4650	0.3982	0.3783	0.3720	**0.4034**
50	0.4676	0.4002	0.3802	0.3741	**0.4055**
51	0.4709	0.4031	0.3828	0.3766	**0.4084**
52	0.4738	0.4057	0.3848	0.3791	**0.4109**
53	0.4768	0.4083	0.3868	0.3814	**0.4133**
54	0.4797	0.4106	0.3888	0.3838	**0.4157**
55	0.4824	0.4130	0.3908	0.3860	**0.4181**
56	0.4857	0.4158	0.3930	0.3888	**0.4208**
57	0.4889	0.4185	0.3953	0.3911	**0.4235**
58	0.4920	0.4211	0.3974	0.3936	**0.4260**
59	0.4949	0.4238	0.3996	0.3960	**0.4286**
60	0.4978	0.4260	0.4017	0.3984	**0.4310**
61	0.5013	0.4289	0.4040	0.4009	**0.4338**
62	0.5044	0.4317	0.4063	0.4035	**0.4365**
63	0.5074	0.4344	0.4085	0.4060	**0.4391**
64	0.5106	0.4369	0.4109	0.4085	**0.4417**
65	0.5135	0.4396	0.4130	0.4108	**0.4442**

	Winter	Spring	Summer	Fall	Average
Cold Start (g/trip start, Light Duty Only)	0.6841	0.6168	0.5696	0.5823	**0.6132**

Table 14: NOx - 2020 Running, Cold Start Average Emissions Factors for Commute TERMs (Mobile 6.2)
(Seasonal Average)

Speed	Weighted Factor Winter NOx (grams/mile)	Weighted Factor Spring NOx (grams/mile)	Weighted Factor Summer NOx (grams/mile)	Weighted Factor Fall NOx (grams/mile)	Average of Seasonal Factors (grams/mile)
1	0.3609	0.3234	0.3466	0.3119	**0.3357**
2	0.3609	0.3234	0.3466	0.3119	**0.3357**
3	0.3457	0.3098	0.3297	0.2986	**0.3209**
4	0.3266	0.2926	0.3091	0.2821	**0.3026**
5	0.3150	0.2823	0.2965	0.2722	**0.2915**
6	0.2879	0.2580	0.2697	0.2484	**0.2660**
7	0.2685	0.2405	0.2502	0.2316	**0.2477**
8	0.2539	0.2273	0.2359	0.2191	**0.2341**
9	0.2424	0.2174	0.2247	0.2094	**0.2235**
10	0.2335	0.2092	0.2155	0.2015	**0.2149**
11	0.2212	0.1983	0.2035	0.1909	**0.2035**
12	0.2109	0.1891	0.1936	0.1819	**0.1939**
13	0.2023	0.1813	0.1850	0.1744	**0.1857**
14	0.1947	0.1746	0.1778	0.1679	**0.1788**
15	0.1884	0.1688	0.1715	0.1624	**0.1728**
16	0.1857	0.1666	0.1688	0.1601	**0.1703**
17	0.1837	0.1646	0.1663	0.1582	**0.1682**
18	0.1816	0.1627	0.1642	0.1566	**0.1663**
19	0.1799	0.1613	0.1622	0.1551	**0.1646**
20	0.1783	0.1597	0.1605	0.1537	**0.1630**
21	0.1771	0.1586	0.1589	0.1524	**0.1617**
22	0.1756	0.1575	0.1574	0.1513	**0.1605**
23	0.1744	0.1565	0.1561	0.1503	**0.1593**
24	0.1734	0.1554	0.1549	0.1493	**0.1583**
25	0.1724	0.1546	0.1538	0.1485	**0.1573**
26	0.1717	0.1538	0.1528	0.1478	**0.1565**
27	0.1707	0.1532	0.1518	0.1471	**0.1557**
28	0.1700	0.1523	0.1509	0.1464	**0.1549**
29	0.1693	0.1517	0.1501	0.1458	**0.1542**
30	0.1687	0.1512	0.1492	0.1453	**0.1536**
31	0.1683	0.1509	0.1487	0.1448	**0.1532**
32	0.1678	0.1504	0.1480	0.1444	**0.1526**
33	0.1674	0.1501	0.1475	0.1442	**0.1523**
34	0.1672	0.1498	0.1471	0.1439	**0.1520**
35	0.1667	0.1495	0.1464	0.1437	**0.1516**
36	0.1677	0.1503	0.1473	0.1445	**0.1525**
37	0.1687	0.1513	0.1480	0.1451	**0.1533**
38	0.1696	0.1521	0.1485	0.1461	**0.1541**
39	0.1705	0.1530	0.1493	0.1470	**0.1550**
40	0.1713	0.1537	0.1498	0.1477	**0.1556**
41	0.1727	0.1549	0.1505	0.1488	**0.1567**
42	0.1739	0.1559	0.1515	0.1498	**0.1578**
43	0.1751	0.1569	0.1525	0.1508	**0.1588**
44	0.1762	0.1579	0.1534	0.1516	**0.1598**
45	0.1774	0.1589	0.1540	0.1526	**0.1607**
46	0.1785	0.1600	0.1550	0.1537	**0.1618**
47	0.1797	0.1611	0.1558	0.1548	**0.1629**
48	0.1810	0.1622	0.1568	0.1558	**0.1640**
49	0.1824	0.1632	0.1576	0.1568	**0.1650**
50	0.1834	0.1642	0.1585	0.1578	**0.1660**
51	0.1848	0.1656	0.1595	0.1592	**0.1673**
52	0.1861	0.1668	0.1605	0.1604	**0.1685**
53	0.1876	0.1681	0.1617	0.1616	**0.1698**
54	0.1888	0.1692	0.1627	0.1627	**0.1709**
55	0.1899	0.1703	0.1636	0.1637	**0.1719**
56	0.1915	0.1716	0.1648	0.1648	**0.1732**
57	0.1929	0.1728	0.1658	0.1662	**0.1744**
58	0.1943	0.1739	0.1668	0.1673	**0.1756**
59	0.1954	0.1751	0.1678	0.1684	**0.1767**
60	0.1967	0.1761	0.1686	0.1695	**0.1777**
61	0.1982	0.1778	0.1697	0.1707	**0.1791**
62	0.1996	0.1790	0.1708	0.1721	**0.1804**
63	0.2009	0.1800	0.1718	0.1732	**0.1815**
64	0.2023	0.1811	0.1729	0.1742	**0.1826**
65	0.2037	0.1824	0.1740	0.1752	**0.1838**

	Winter	Spring	Summer	Fall	Average
Cold Start (g/trip start, Light Duty Only)	0.274	0.2529	0.2329	0.2422	**0.2505**

Table 15: NOx - 2030 Running, Cold Start Average Emissions Factors for Commute TERMs (Mobile 6.2)
(Seasonal Average)

Speed	Weighted Factor Winter NOx (grams/mile)	Weighted Factor Spring NOx (grams/mile)	Weighted Factor Summer NOx (grams/mile)	Weighted Factor Fall NOx (grams/mile)	Average of Seasonal Factors (grams/mile)
1	0.2967	0.2709	0.2955	0.2684	**0.2829**
2	0.2967	0.2709	0.2955	0.2684	**0.2829**
3	0.2842	0.2596	0.2811	0.2570	**0.2705**
4	0.2686	0.2453	0.2635	0.2427	**0.2550**
5	0.2594	0.2368	0.2527	0.2343	**0.2458**
6	0.2367	0.2162	0.2296	0.2140	**0.2241**
7	0.2205	0.2015	0.2129	0.1994	**0.2086**
8	0.2085	0.1905	0.2003	0.1883	**0.1969**
9	0.1992	0.1820	0.1907	0.1799	**0.1880**
10	0.1916	0.1750	0.1828	0.1731	**0.1806**
11	0.1813	0.1657	0.1724	0.1637	**0.1708**
12	0.1726	0.1580	0.1638	0.1559	**0.1626**
13	0.1654	0.1513	0.1565	0.1494	**0.1557**
14	0.1593	0.1458	0.1503	0.1438	**0.1498**
15	0.1539	0.1409	0.1449	0.1389	**0.1447**
16	0.1519	0.1390	0.1425	0.1371	**0.1426**
17	0.1501	0.1373	0.1404	0.1355	**0.1408**
18	0.1485	0.1359	0.1384	0.1341	**0.1392**
19	0.1469	0.1345	0.1368	0.1327	**0.1377**
20	0.1457	0.1333	0.1354	0.1315	**0.1365**
21	0.1447	0.1324	0.1340	0.1305	**0.1354**
22	0.1435	0.1314	0.1327	0.1295	**0.1343**
23	0.1427	0.1306	0.1317	0.1287	**0.1334**
24	0.1418	0.1297	0.1306	0.1279	**0.1325**
25	0.1411	0.1289	0.1296	0.1272	**0.1317**
26	0.1402	0.1284	0.1286	0.1266	**0.1309**
27	0.1396	0.1278	0.1280	0.1259	**0.1303**
28	0.1390	0.1270	0.1271	0.1253	**0.1296**
29	0.1384	0.1266	0.1264	0.1249	**0.1290**
30	0.1380	0.1260	0.1258	0.1243	**0.1285**
31	0.1376	0.1258	0.1252	0.1239	**0.1281**
32	0.1373	0.1255	0.1247	0.1237	**0.1278**
33	0.1368	0.1253	0.1243	0.1233	**0.1274**
34	0.1366	0.1250	0.1237	0.1231	**0.1271**
35	0.1363	0.1248	0.1232	0.1228	**0.1268**
36	0.1372	0.1256	0.1239	0.1236	**0.1276**
37	0.1381	0.1262	0.1247	0.1244	**0.1284**
38	0.1390	0.1271	0.1252	0.1254	**0.1292**
39	0.1397	0.1279	0.1257	0.1258	**0.1298**
40	0.1404	0.1282	0.1262	0.1265	**0.1303**
41	0.1415	0.1292	0.1271	0.1275	**0.1313**
42	0.1425	0.1302	0.1279	0.1285	**0.1323**
43	0.1435	0.1312	0.1286	0.1294	**0.1332**
44	0.1445	0.1322	0.1291	0.1304	**0.1341**
45	0.1455	0.1330	0.1301	0.1311	**0.1349**
46	0.1466	0.1341	0.1308	0.1321	**0.1359**
47	0.1477	0.1351	0.1316	0.1331	**0.1369**
48	0.1488	0.1360	0.1324	0.1341	**0.1378**
49	0.1498	0.1368	0.1331	0.1350	**0.1387**
50	0.1507	0.1377	0.1341	0.1358	**0.1396**
51	0.1521	0.1388	0.1351	0.1370	**0.1408**
52	0.1532	0.1400	0.1360	0.1380	**0.1418**
53	0.1544	0.1411	0.1366	0.1390	**0.1428**
54	0.1556	0.1421	0.1373	0.1400	**0.1438**
55	0.1566	0.1429	0.1383	0.1410	**0.1447**
56	0.1578	0.1442	0.1393	0.1420	**0.1458**
57	0.1590	0.1454	0.1403	0.1432	**0.1470**
58	0.1605	0.1464	0.1412	0.1442	**0.1481**
59	0.1615	0.1474	0.1422	0.1452	**0.1491**
60	0.1626	0.1484	0.1428	0.1461	**0.1500**
61	0.1637	0.1495	0.1438	0.1476	**0.1512**
62	0.1649	0.1506	0.1448	0.1488	**0.1523**
63	0.1663	0.1517	0.1457	0.1498	**0.1534**
64	0.1674	0.1527	0.1465	0.1508	**0.1544**
65	0.1685	0.1537	0.1473	0.1518	**0.1553**

	Winter	Spring	Summer	Fall	Average
Cold Start (g/trip start, Light Duty Only)	0.1929	0.1818	0.1679	0.179	**0.1804**

EXAMPLE OF A COMMUTING VEHICLE TRIP TERM ANALYSIS

Proposal: Construction of 1300 additional Parking Spaces at a Metro Station

Description: 1,300 parking spaces will be constructed at a Metro station. The garages at Metrorail stations are currently experiencing full utilization of all existing parking capacity on a daily basis.

Analysis Tool: Sketch Planning

Assumptions:

- To build 1,300 additional parking spaces at a Metro station to increase capacity at a station. Cost to construct the garage is assumed to be $2.117 million dollars. Life span: 30 years
- New trips generated due to additional parking spaces will be 2/3 of new spaces.
- Average one-way trip length reduced will be 15.5 miles.
- No cold start benefit, as autos will drive to station.
- NOx & VOC estimation using Mobile 6.2 Emissions factors.

Summary Impacts (2010):

Daily VT Reduction:	-	VT
Daily VMT Reduction:	26,846	VMT
Daily NOx Reductions:	0.0113	tons/day
Daily VOC Reductions:	0.0048	tons/day
PM Reductions (per year):	0.0866	tons/year

Emission Impacts for (2010):

1,300 additional spaces

Trip length: 15.5 mile x 2 = 31 mi round trip

2/3 new trips: 2/3 x 1300 = 866 trips

866 x 31 miles = 26,846 VMT

Daily NOx & VOC emission reductions (2010):

NOx								
Cold Start	0	x	0.5818 grams / 1 trip	x	1 ton / 907,185 grams	=	0.00000	Tons
Running	26,846	x	0.3833 grams / 1 mi	x	1 ton / 907,185	=	0.0113	Tons
					Total NOx		0.0113	Tons
VOC								
Cold Start + Hot Soak	0	x	1.536 grams / 1 trip	x	1 ton / 907,185 grams	=	0.0000	Tons
Running	26,846	x	0.1631 grams / 1 mi	x	1 ton / 907,185	=	0.0048	Tons
					Total VOC		0.0048	Tons

Methodology for PM2.5 emissions estimation:

Direct PM2.5

Direct PM2.5 emissions factors are available for winter, spring, summer and fall seasons. Estimation of direct PM2.5 emissions can be carried out on a seasonal or an annual basis. As PM2.5 seasonal emission factors do not vary significantly, the average of these four seasonal factors is used to estimate annual PM emissions. Please refer Table -12.

The travel demand model and postprocessor use average annual weekday traffic (AAWDT) for analysis. Hence for the analysis of TERMs which are effective 7-days a week, VT and VMT for such TERMs need to be adjusted to reflect average daily traffic (AADT). A factor of 0.95 is used to convert AAWDT volume to AADT volume. For the TERMs that affect only commuter traffic (effective only on weekdays) no adjustment is needed as the VT and VMT reflect average weekday traffic. The formulae for annual direct PM2.5 estimation for these TERMs are shown as below.

For the TERMs effective 365 days:

Direct PM2.5 Emissions = VMT x average of seasonal emissions factors x weekly VMT adjustment factor x days/year.

Running 26,846 x $\frac{0.0117 \text{ grams}}{1 \text{ mi}}$ x $\frac{1 \text{ ton}}{907{,}185 \text{ grams}}$ x 0.95 x 365 days = 0.1201 tons

For the TERMs effective only on weekdays:

Direct PM2.5 Emissions = VMT x average of seasonal emissions factors x days/year.

Running 26,846 x $\frac{0.0117 \text{ grams}}{1 \text{ mi}}$ x $\frac{1 \text{ ton}}{907{,}185 \text{ grams}}$ x 250 days = 0.0866 Tons

NOx Emissions as a PM 2.5 Precursor:

As conformity assessment criteria for the PM2.5 standards include NOx emissions as a PM 2.5 precursor, we are also required to estimate NOx emissions on seasonal/annual basis. For TERM analysis we follow the annual approach similar to the PM2.5 emission estimation as described above. Emission factors corresponding to speed 40 mph are used to estimate cold start and running NOx precursor emissions. Tables 13-15 show the average of the NOx seasonal emissions factors for years 2010, 2020 and 2030.

For the TERMs effective 365 days:

Cold Start	0	x	0.6132 grams / 1 trip	x	1 ton / 907,185 grams	x	365			=	0.0000	Tons
Running	26,846	x	0.3825 grams / 1 mi	x	1 ton / 907,185	x	0.95	x	365	=	3.9249	Tons
					Total						3.9249	Tons

For the TERMs effective only on weekdays:

Cold Start	0	x	0.6132 grams / 1 trip	x	1 ton / 907,185 grams	x	250	=	0.0000	Tons
Running	26,846	x	0.3825 grams / 1 mi	x	1 ton / 907,185	x	250	=	2.8298	Tons
					Total				2.8298	Tons

Cost Effectiveness (2010):

Garage cost (assumed): $2.177 million

$$\text{NOx} = \frac{\$2.177 \text{ million}}{250 \text{ days} \times 30 \text{ yr} \times 0.0113 \text{ t/d}} = \$25{,}700/\text{ ton}$$

$$\text{VOC} = \frac{\$2.177 \text{ million}}{250 \text{ days} \times 30 \text{ yr} \times 0.005 \text{ t/d}} = \$60{,}500/\text{ ton}$$

$$\text{PM2.5} = \frac{\$2.177 \text{ million}}{30 \text{ yr} \times 0.1201 \text{ t/yr}} = \$750{,}000/\text{ ton}$$

APPENDIX - B

TERM REPORTING INSTRUCTIONS

TERM REPORTING

Federal regulations require the timely implementation of TERMs (CMAQ funded, non-CMAQ funded and NOx mitigation measures). If the implementation of programmed TERMs falls behind schedule, the regulations state "that all State and local agencies with influence over approvals of funding for TERMs [should give] maximum priority to approval or funding of TERMs over other projects within their control". To address these requirements, please provide a brief statement describing the status of each TERM programmed in previous TIPs. This applies to those projects not yet fully implemented and reported as such in the TERM tracking sheet developed as part of the CLRP and TIP. Include any changes in the scheduling or implementation of these TERMs. Your submissions will be used to update the "TERM Tracking Sheet" for analysis years 2010, 2020 and 2030. For information purposes, last year's "TERM Tracking Sheet" is attached.

TERM TRACKING SHEET - CURRENT MEASURES

IMPLEMENTATAION: YEAR 2000 AND LATER

Credits are taken in Air Quality Conformity Analysis FY 2005-2010

***** Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/DAY REDUCTION CREDITED						Project Category *
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
9	X	1994-99	MDOT	Park & Ride Lot - MD 210/ MD 373	X				2000	2003	0.0006	0.0014	0.0004	0.0006	0.0004	0.0006	C
19	X	1994-99	PRTC	VRE Woodbridge Parking Expansion (add 500 spaces)	X					2002-2003	n/a	n/a	n/a	n/a	n/a	n/a	-
20	X	1994-99	ALEX	King St. Metrorail access improvements			X			2002, '04, '05	0.0011	0.0014	0.0007	0.0006	0.0008	0.0009	C
38	X	1995-00	MDOT	Signal Systems - MD 85 Executive Way to MD 355	X				1996	Pre 2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
39	X	1995-00	MDOT	Signal Systems - MD 355 ,I-70 ramps to Grove Rd.	X				1996	n/a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
44	X	1995-00	MDOT	Signal Systems - MD 410, 62nd Ave. to Riverdale Rd.	X				1996	2002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TR
48	X	1995-00	MDOT	MARC Replacement Coaches	X				1999	2004	0.0006	0.0014	0.0004	0.0006	0.0012	0.0018	C (TCM)
49	X	1995-00	MDOT	MARC Expansion Coaches	X				1999	2004	0.0052	0.0133	0.0033	0.0055	0.0054	0.0145	C (TCM)
51	X	1995-00	VDOT	Alexandria Telecommuting Pilot Program	X					2000 & 2001	0.0000	0.0000					C
52	X	1995-00	VDOT	Fairfax County Bus Shelter (Fairfax Co. TDM program)			X		2000	2001	0.0000	0.0000					C
54	X	1995-00	VDOT	City of Fairfax Bus Shelters			X		1999	2004	0.0000	0.0005	0.0000	0.0002	0.0000	0.0000	C (TCM)
56	X	1995-00	VDOT	Cherry Hill VRE Access			X			2007	0.0040	0.0114	0.0026	0.0047	0.0023	0.0047	C (TCM)
58	X	1995-00	WMATA	Bus Replacement (172 buses)	X				1998	1998	0.0690	0.2520					SP (TCM)
59	X	1995-00	MCG	Shady Grove West Park and Ride			X		2010		0.0000	0.0000	0.0000	0.0000	0.0000	0.0030	C
60	X	1995-00	MCG	White Oak Park and Ride			X		2010		0.0000	0.0000	0.0000	0.0000	0.0000	0.0059	C
61	X	1995-00	MCG	Bicycle Facilities			X		FY99		0.0017	0.0009	0.0011	0.0004	0.0012	0.0006	C
62	X	1995-00	MCG	Pedestrian Facilities to Metrorail			X				0.0029	0.0038	0.0018	0.0016	0.0015	0.0021	C
63	X	1995-00	MDOT	MARC Replacement Coaches	X				1999	2004	0.0023	0.0057	0.0015	0.0024	0.0031	0.0059	C
64	X	1995-00	MDOT	MARC Expansion Coaches	X				1999	2004	0.0183	0.0493	0.0118	0.0205	0.0283	0.0482	C (TCM)
66	X	1995-00	VDOT	Commuter Lots - District Wide			X		varies	1995, 2000	0.0063	0.0156	0.0040	0.0065	0.0062	0.0157	C
67	X	1995-00	VDOT	I-66 and Stringfellow Rd. Park and Ride	X				2000	2000 end	0.0057	0.0095	0.0037	0.0039	0.0039	0.0059	C
68	X	1995-00	VDOT	Lake Ridge Park and Ride (now called Tacketts Mill lot)	X					1999/2000	0.0000	0.0047	0.0000	0.0020	0.0000	0.0030	C
69	X	1995-00	VDOT	Bicycle Trails and Facilities			X		varies	varies	0.0011	0.0081	0.0007	0.0034	0.0074	0.0053	C
70	X	1995-00	VDOT	Improved Acceess to Metrorail Stations			X		varies	2000-2010	0.0003	0.0005	0.0002	0.0002	0.0004	0.0006	C
71	X	1995-00	VDOT	I-66 HOV access at Monument Dr.	X					1997	0.0057	0.0095	0.0037	0.0039	0.0004	0.0059	C
72	X	1995-00	DC	Bicycle Facilities		X					0.0137	0.0095	0.0088	0.0039	0.0093	0.0065	C
73	X	1995-00	REGION	COG Regional Ridesharing Support	X					on-going	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C

TERM TRACKING SHEET - CURRENT MEASURES

IMPLEMENTATAION: YEAR 2000 AND LATER

Credits are taken in Air Quality Conformity Analysis FY 2005-2010

***** Project Category: TR - Traffic Stream, C - Commute, H - Heavy Duty Vehicles (Engine Technology), SP- Specific Vehicle Type, TCM - Transportation Control Measures

NOs	CREDIT TAKEN	TIP CREDITED	AGENCY	PROJECT	IMPLEMENTATION STATUS				ORIGINAL COMPLETION DATE	ACTUAL COMPLETION DATE	TONS/DAY REDUCTION CREDITED						Project Category *
					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
74	X	1995-00	REGION	M-47 Integrated Ridesharing	X					on-going	0.0264	0.0493	0.0165	0.0206	0.0139	0.0172	C
75	X	1995-00	REGION	M-92 Telecommuting Support	X					on-going	0.2069	0.3951	0.1763	0.2256	0.1889	0.2374	C
77		1996-01	VDOT	Duke Street Pedestrian Bridge					2005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-
79	X	1996-01	VDOT	Fairfax County Bus Shelters (30 shelters with project #85)			X		1999	Summer 2001	0.0011	0.0014	0.0007	0.0006	0.0008	0.0009	C
81	X	1996-01	VDOT	Arlington County Metrocheck Program	X				1997	1997 Onwards	0.0011	0.0014	0.0007	0.0006	0.0004	0.0009	C
82	X	1996-01	VDOT	Old Dominion Drive Bike Trail			X		2000	2004	0.0006	0.0005	0.0004	0.0002	0.0004	0.0003	C
83	X	1996-01	WMATA	Bus Replacement (see line 58, above)	X					1998	Credit taken in line 58, above						SP
85	X	1996-01	VDOT	Fairfax County Bus Shelters (30 shelters with project #79)			X		1999	2001	0.0006	0.0005	0.0004	0.0002	0.0004	0.0009	C
90	X	1996-01	REGION	M-47c Employer Outreach / Guaranteed Ride Home	X					on-going	0.3460	0.5748	0.2209	0.2395	0.1777	0.1989	C
91	X	1996-01	REGION	M-70a Bicycle Parking			X		1999		0.0040	0.0033	0.0026	0.0014	0.0039	0.0030	C
92	X			M-92 Telecommuting Support [1]	Combined with item #75												C
95	X	1997-02	MCG	Germantown Transit Center			X		2004		0.0029	0.0090	0.0018	0.0038	0.0019	0.0053	C (TCM)
102	X	1997-02	PG	Prince George's County Bus Replacement	X				1998	1998	0.0030	0.0090					SP (TCM)
106	X	1997-02	VDOT	PRTC Employer Commuting Outreach Program	X					1977 on-going	0.0011	0.0002	0.0007	0.0001	0.0008	0.0000	C
107	X	1997-02	VDOT	PRTC Multimodal Strategic Marketing Implementation Plan	X					1977 on-going	0.0000	0.0002	0.0000	0.0001	0.0000	0.0003	C
108	X	1997-02	MDOT	M-103 Taxicab Replacement in Maryland [2]		X			1999	On-going	0.0797	0.2675	0.1340	0.1827	0.3120	0.4810	SP
109	X	1997-02	REGION	M-70b Employer Outreach for Bicycles	X				1998	on going	0.0007	0.0007	0.0005	0.0003	0.0003	0.0002	C
110		1997-02	VDOT	M-77b Vanpool Incentive Programs in Virginia			X		1999	delayed	n/a	n/a	n/a	n/a	n/a	n/a	C
111	X	1998-03	WMATA	Bus Replacement (108 buses)	X				1999	1999	0.0450	0.1617					SP
112	X	1998-03	MCG	Montgomery County Bus Replacement	X						0.0080	0.0270					SP
113	X	1998-03	PG	Prince George's County Bus Replacement	X				1998	1998	0.0010	0.0020					SP
114	X	1998-03	FDC	Frederick County Bus Replacement	X						0.0010	0.0000					SP
117	X	1998-03	VDOT	Arlington County Four Mile Run Bike Trail			X		1999	delayed	0.0006	0.0005	0.0004	0.0002	0.0004	0.0003	C
118	X	1998-03	VDOT	Northern Virginia Turn Bays	X				2000	1998	0.0006	0.0008	0.0004	0.0003	0.0008	0.0003	TR
119	X	1998-03	VDOT	Fairfax City Bus Replacement			X		2001	2003	n/a	n/a					SP
121	X	1998-03	WMATA	WMATA Bus Replacement (252 buses)	X				2001	2001	0.1060	0.3860					SP
122	X	97 & 98 TIP	REGION	M-101a Mass Marketing Campagin (Consumer)			X			Underway	0.1479	0.2237	0.0952	0.0973	0.0752	0.0807	C
123	X	1999-04	MDOT	Various Park and Ride Lots(I-270/MD124, 450 & I-170/MD-75, 54 spaces)	X				2001/1999	2001	0.0046	0.0171	0.0029	0.0071	0.0039	0.0136	C

TERM TRACKING SHEET - CURRENT MEASURES

IMPLEMENTATAION: YEAR 2000 AND LATER

Credits are taken in Air Quality Conformity Analysis FY 2005-2010

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					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
124	X	1999-04	MDOT	Signal Systems (197/MD-198, MD-382 TO US-301,US301)	X				2000	2002	0.0070	-0.0017	0.0047	-0.0008	0.0079	-0.0014	TR
125	X	1999-04	VDOT	Transit Center at 7 Corners	X				2002		0.0006	0.0009	0.0004	0.0004	0.0004	0.0006	C
126	X	1999-04	VDOT	Falls Church Clean Diesel Bus Service	X				2000	2003	0.0040	0.0050					SP
127	X	1999-04	VDOT	VA 234 Bike Trail			X		2001	2007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
128	X	1999-04	VDOT	PRTC Ridesharing	X				on-going	2000 ongoing	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	C
130	X	1996-01	VDOT	M-14: I-66 Feeder Bus Fare Buy Down	X					1998 onward	0.0143	0.0261	0.0092	0.0109	0.0081	0.0124	C
131	X	2000-05	MDOT	Various park and Ride Lots	x				2002	2003	0.0040	0.0154	0.0025	0.0064	0.0038	0.0119	C
132	X	2000-05	MDOT	Signal Systems	X				Varies	on-going	0.0017	0.0000	0.1244	0.0000	0.0007	0.0000	TR
133	X	2000-05	VDOT	450 Spaces at Gambrill/Hooes Rds. Park and Ride			X		2002	2004	0.0040	0.0085	0.0026	0.0036	0.0021	0.0041	C
134	X	2000-05	VDOT	300 Spaces at Backlick Rd			X		2003	2006	0.0029	0.0062	0.0018	0.0026	0.0015	0.0030	C
135	X	2000-05	VDOT	Accotink-Gateway Connector Trail			X		2002	2005	0.0040	0.0047	0.0026	0.0020	0.0018	0.0020	C
136	X	2000-05	VDOT	Columbia Pike Trail			X		2000	2001, 2005	0.0034	0.0038	0.0022	0.0016	0.0014	0.0015	C
137	X	2000-05	VDOT	Lee Highway trail			X		2000	2005	0.0017	0.0019	0.0011	0.0008	0.0006	0.0008	C
138	X	2000-05	VDOT	Arlington Bus Shelter Improvements			X		2005	2005	0.0006	0.0005	0.0004	0.0002	0.0002	0.0002	C
139	X	2000-05	VDOT	Pentagon Metrostation Improvements	X					2003	0.0046	0.0081	0.0029	0.0034	0.0022	0.0033	C
140	X	2000-05	MDOT	East/West Intersection Improvements			X		2005	2005	0.0235	0.0119	0.0151	0.0049	0.0859	0.0337	C
141	X	2001-06	Feds	Federal Transit/Ridesharing subsidy	X				on-going		0.0584	0.0905	0.0375	0.0377	0.0286	0.0313	C
142	X	2002-07	WMATA	100 CNG buses	X				2002		0.0000	0.1358					SP (TCM)
143	X	2002-07	WMATA	ULSD with CRT filters			X		on-going		0.2100	0.0000	0.4300	0.0000	0.4300	0.0000	H (TCM)
144	X	2003-08	DC	Replace ~~23~~ 12 Taxicabs with CNG cabs			X		2005	2006	0.0089	0.0157					H
145	X	2003-08	DC	D.C.Incident Response & TrafficManagement System	X				2005	2004	0.0161	0.0414	0.0108	0.0206	0.0100	0.0168	TR
146	X	2003-08	DC	Bicycle Lane in D. C. (35 Mile)			X		2005	2006	0.0095	0.0085	0.0061	0.0035	0.0046	0.0029	C (TCM)
147	X	2003-08	DC	Bicycle Racks in D. C. (500)	X				2005	2004	0.0013	0.0009	0.0008	0.0004	0.0006	0.0003	C (TCM)
148	X	2003-08	DC	External Bicycle Racks on WMATA Buses in D. C. (600)	X				2005	2003	0.0020	0.0031	0.0013	0.0013	0.0010	0.0011	C (TCM)
149		2003-08	DC	CNG Rental Cars (18)				X	2005	Removed	0.0000	0.0002					SP
150	X	2003-08	DC	Sidewalks in D.C. ($ 5 million)	X				2005	2004	0.0358	0.0555	0.0230	0.0231	0.0182	0.0192	C
151	X	2003-08	DC	CNG Refuse Haulers (2)	X				2005	2004	0.0001	0.0020					H (TCM)
152	X	2003-08	DC	Circulator /Feeder Bus Routes	X				2005	2003	0.0131	0.0200	0.0084	0.0083	0.0066	0.0069	C

TERM TRACKING SHEET - CURRENT MEASURES

IMPLEMENTATAION: YEAR 2000 AND LATER

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					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
153	X	2003-08	MDOT	Commuter Tax Credit			X		2005	n/a	0.0782	0.1223	0.0502	0.0509	0.0398	0.0422	C
155		2003-08	MDOT	Employer Vanpool Program (WWB)				X	2005	Removed	0.0018	0.0041					C
156	X	2003-08	MDOT	Green Line Link			X		2005	n/a	0.0026	0.0047	0.0016	0.0019	0.0013	0.0016	C
157	X	2003-08	MDOT	Park & Ride Lots - Southern Maryland			X		2005	2003/2005	0.0050	0.0109	0.0032	0.0045	0.0026	0.0038	C
158	X	2003-08	MDOT	Prince George's County- Bus Exp			X		2005	n/a	0.0359	0.0657	0.0230	0.0273	0.0186	0.0228	C
159	X	2003-08	MDOT	MTA - Bus Service Expansion			X		2005	n/a	0.0081	0.0157	0.0052	0.0065	0.0042	0.0054	C
160	X	2003-08	MDOT	Ride- On - Super Discount			X		2005	n/a	0.0009	0.0014	0.0006	0.0006	0.0005	0.0005	C
161	X	2003-08	Regional	Regional Traveler Information Systems			X		2005		0.1012	0.5401	0.0682	0.2686	0.0686	0.2195	TR
162	X	2003-08	MDOT	Universal Transportation Access (MD + WMATA)			X		2005	n/a	0.0161	0.0249	0.0103	0.0104	0.0082	0.0086	C
163	X	2003-08	MCG	Construction of 1300 additional Parking Spaces at Grosvenor Metro Garage	X				2004		0.0046	0.0104	0.0029	0.0044	0.0025	0.0036	C (TCM)
164	X	2003-08	MCG	Bethesda Shuttle Bus Services	X				2004		0.0031	0.0048	0.0020	0.0020	0.0016	0.0016	C
165	X	2003-08	MCG	External Bicycle Racks on Ride-On Buses in Montgomery County	X				2004		0.0006	0.0010	0.0004	0.0004	0.0003	0.0003	C
166	X	2003-08	MCG	New CNG Powered Light Duty Vehicle fleet in the County	X				2004		0.0000	0.0001					SP
167	X	2003-08	MCG	Free Bus Service on Selected Routes on I-270	X				2004		0.0011	0.0017	0.0007	0.0007	0.0005	0.0006	C
168	X	2003-08	MCG	Annual Sidewalk Program	X				2004		0.0171	0.0264	0.0110	0.0110	0.0087	0.0091	C
169	X	2003-08	MDOT	Bethesda Breeze/International Express Metrobus			X		2005	n/a	0.0037	0.0053	0.0024	0.0022	0.0019	0.0018	C
170	X	2003-08	MDOT	Bethesda-8, Silver Spring Downtown Dasher and Prince Georges Co. Shuttles at 3 PNR lot			X		2005	n/a	0.0088	0.0104	0.0057	0.0043	0.0043	0.0036	C
171		2003-08	MDOT	Proposed Transportation Management District in Montgomery County (Rockville and Gaithersburg)				X	2005	Removed	0.0057	0.0078	0.0037	0.0033	0.0029	0.0027	C
172	X	2003-08	MDOT	Sidewalks (Bikes/Pedestrian) at / near Rail Stations	X				2005	2002	0.0093	0.0147	0.0060	0.0061	0.0047	0.0051	C
173	X	2003-08	MDOT	Neighborhood Sidewalks Improvements (Bike/Pedestrian)	X				2005	2004	0.0032	0.0017	0.0021	0.0007	0.0015	0.0005	C
174	X	2003-08	MDOT	Neighborhood Conservation Program - Neighborhood Sidewalks Improvements (Bikes/Pedestrian)		X			2005	n/a	0.0028	0.0014	0.0018	0.0006	0.0013	0.0005	C
175	X	2003-08	MDOT	Maryland bus Transit Service Expansion	X				2005	2004	0.0141	0.0323	0.0091	0.0134	0.0076	0.0112	C
176	X	2003-08	VDOT	Universal Transportation Access Program			X		2005	2005	0.0012	0.0019	0.0008	0.0008	0.0006	0.0006	C
177	X	2003-08	VDOT	Interactive Rideshare & Kiosk Initiative			X		2005		0.0004	0.0007	0.0002	0.0003	0.0002	0.0002	C
178	X	2003-08	VDOT	Mobile Commuter Stores			X		2005		0.0021	0.0039	0.0014	0.0016	0.0011	0.0014	C
179	X	2003-08	VDOT	Telework Incentive Program (Telework VA)[1]	X				2005	2001	0.0007	0.0012	0.0005	0.0005	0.0004	0.0004	C
180	X	2003-08	VDOT	Commuter Choice			X		2005		0.0010	0.0014	0.0006	0.0006	0.0005	0.0005	C
181	X	2003-08	VDOT	Employer Shuttle Services			X		2005		0.0114	0.0166	0.0073	0.0069	0.0057	0.0057	C

TERM TRACKING SHEET - CURRENT MEASURES

IMPLEMENTATAION: YEAR 2000 AND LATER

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					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOX	VOC	NOX	VOC	NOX	
184	X	2003-08	VDOT	Van Start / Van Save			X		2005	till 2006	0.0014	0.0026					C
185	X	2003-08	VDOT	Metro Shuttle Bus			X		2005	1999-2005	0.0012	0.0026	0.0008	0.0011	0.0006	0.0009	C
187	X	2003-08	VDOT	VRE Mid-Day Train Service	X				2005	2002	0.0016	0.0029	0.0010	0.0012	0.0008	0.0010	C
190	X	2003-08	VDOT	Employer Vanpool Program (Bridge deck)			X		2005	2004 - 2008	0.0009	0.0019					C
191	X	2003-08	VDOT	Town of Leesburg P&R Lot			X		2005	2004	0.0019	0.0039	0.0012	0.0016	0.0010	0.0014	C
192	X	2003-08	VDOT	District-wide P&R Lots	X		X		2005	2001-2005	0.0113	0.0224	0.0072	0.0093	0.0059	0.0078	C
193	X	2003-08	VDOT	Additional Parking at 4 Metro stations			X		2005	2001, 2005	0.0145	0.0333	0.0093	0.0139	0.0078	0.0116	C
196	X	2003-08	WMATA	64 CNG Buses (Purchased in 2001)	X				2005	2004	0.0021	0.0870					SP (TCM)
197	X	2003-08	WMATA	250 CNG Buses (175 buses by Dec. 2004; 75 buses by mid 2006)			X		2005	2004-2006	0.0083	0.3400					SP
198	X	2003-08	WMATA	60 Engine Replacement (MY 1992 & 1993 MY buses)	X				2004	2004	0.0138	0.0755					SP
199	X	2003-08	WMATA	Car Sharing Program	X				2005	2004	0.0008	0.0018	0.0005	0.0008	0.0004	0.0006	C
200	X	2003-08	WMATA	Bikes Racks on WMATA Buses in VA (372 Bike Racks)	X				2005	2004	0.0012	0.0019	0.0008	0.0008	0.0006	0.0007	C (TCM)
202		2003-08	MDOT	Fleet Replacement (state auto fleet, gas to hybrid, 250 vehicles)				X	2005	Removed	0.0055	0.0133	0.0022	0.0031			SP
203	X	2003-08	MDOT	Replace 55 Montgomery County 10 yr. old buses w/ new CNG buses			X		2005	n/a	0.0000	0.2861	0.0000	0.0657			SP
204		2003-08	MDOT	Neighborhood Bus Shuttle (5 circulator routes)				X	2005	Removed	0.0075	0.0122	0.0048	0.0051	0.0038	0.0042	C
205	X	2003-08	MDOT	New Surface Parking at Transit Centers (500 spaces)			X		2005	n/a	0.0026	0.0060	0.0017	0.0025	0.0014	0.0021	C
206		2003-08	MDOT	Additional Bike Lockers at Metro-Stations				X	2005	Removed	0.0132	0.0209	0.0085	0.0087	0.0067	0.0072	C
207	X	2003-08	MDOT	Bike Facilities at PnR Lots or other similar location			X		2005	n/a	0.0093	0.0166	0.0060	0.0069	0.0048	0.0057	C
208		2003-08	MDOT	CNG Fueling Stations				X	2005	Removed	0.1270	0.1170					SP
209		2003-08	MDOT	Gas cap replacements (ROP Credit)				X	2005	Removed	N/A	N/A	N/A	N/A	N/A	N/A	SP
210		2003-08	MDOT	Gas can turnover (ROP Credit)				X	2005	Removed	N/A	N/A	N/A	N/A	N/A	N/A	SP
211	X	2003-08	MDOT	External Bicycle Racks on WMATA Buses (486 MD buses)	X				2005	2002	0.0014	0.0022	0.0009	0.0009	0.0007	0.0008	C (TCM)
212	X	2003-08	MDOT	Bike \ Pedestrian Trail - Anacostia River Walk			X		2005	n/a	0.0006	0.0005	0.0004	0.0002	0.0003	0.0002	C
213		2003-08	MDOT	Transit Prioritization - Queue Jumps				X	2005	Removed	0.0031	0.0037	0.0020	0.0016	0.0015	0.0013	C
214	X	2003-08	MDOT	Commuter Choice Benefit/Tax Credit - Marketing Expansion			X		2005	n/a	0.0546	0.0859	0.0351	0.0358	0.0278	0.0297	C
215	X	2003-08	MDOT	Improvements to Pedestrian Access in TOD areas (4 locations)			X		2005	n/a	0.0060	0.0087	0.0038	0.0036	0.0030	0.0030	C
216	X	2003-08	MDOT	Telecommuting Expansion[1]	X				2005	n/a	0.0645	0.1208	0.0414	0.0503	0.0336	0.0419	C
217		2003-08	MDOT	Replace older Diesel Engine in Public Sector vehicles				X	2005	Removed	0.0237	0.1300					H
218	X	2003-08	VDOT	MV-92 Telecommuting Program - Expanded[1]	X				2005	2003	0.0689	0.1291	0.0442	0.0537	0.0359	0.0447	C
219	X	2003-08	VDOT	MV-123 Employer Outreach for Public Sector Employees [2]	X				2005	2003	0.0153	0.0237	0.0098	0.0099	0.0078	0.0082	C
220	X	2003-08	REGION	Signal System Optimization			X		2005	2005	0.4272	0.1510	0.2879	0.0751	0.2896	0.0613	TR
										Available Emissions Credits	**2.467**	**5.072**	**1.826**	**1.436**	**1.689**	**1.319**	

TRANSPORTATION EMISSION REDUCTION MEASURES (CLRP Projects Only)

Credited in Air Quality Conformity Analyses (calendar years 1993-2004)
(TRACKING SHEET)

Project Category: TR - Traffic Stream, C - Commute, H - Engine Technology (Heavy Dudy Vehicles), SP- Specific Vehicle Type

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					FULL	SCALED-BACK	UNDER-WAY	REM			2010		2020		2030		
											VOC	NOx	VOC	NOx	VOC	NOx	
221	X	1995-00 TIP	REGION	M-24 Speed Limit Adherence					2010		-0.0146	0.5364	-0.0042	0.2365	0.0010	0.0739	TR
222		1996-01 TIP	MGC	Rock Spring Park Pedestrian Amenities				X			0.0010	0.0040	0.0000	0.0000	0.0000	0.0000	-
223	X	1996-01 TIP	MGC	Olney Transit Center Park and Ride					2015		0.0020	0.0080	0.0009	0.0030	0.0003	0.0007	C
224	X	1996-01 TIP	MGC	Damascus Park and Ride						2003	0.0010	0.0040	0.0004	0.0015	0.0001	0.0003	C
225	X	1996-01 TIP	DC	M-103 Taxicab Replacement (DC)					2015		0.0000	0.0000	0.1745	0.3000	0.3490	0.6000	H
226	X	STADIUM ANALYSIS		M-103 Taxicab Replacement (MD)		X			2008		0.0000	0.0000	0.1560	0.2400	0.1560	0.2400	H
227	X	1997-02 TIP	MDOT	Shady Grove West Transit Center Park and Ride							0.0000	0.0100	0.0000	0.0038	0.0000	0.0009	C
228	X	1997-02 TIP	MGC	Olney Transit Center Park and Ride							0.0000	0.0000	0.0004	0.0012	0.0003	0.0007	C
229	X	1997-02 TIP	MGC	White Oak Park and Ride							0.0000	0.0200	0.0000	0.0076	0.0000	0.0017	C
230	X	1997-02 TIP	MGC	Damascus Park and Ride						2003	0.0000	0.0000	0.0002	0.0005	0.0001	0.0003	C
231	X	1997-02 TIP	MGC	Four Corners Transit Center					2015		0.0000	0.0010	0.0000	0.0004	0.0000	0.0001	C
232		1997-02 TIP	MGC	Burtonsville Transit Center				X			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
233	X	1997-02 TIP	MGC	Silver Spring Transit Access							0.0000	0.0010	0.0000	0.0003	0.0000	0.0002	C
234	X	1997-02 TIP	MGC	Shady Grove Parking Construction						2003	0.0050	0.0190	0.0021	0.0072	0.0007	0.0017	C
PLAN TOTAL											-0.0066	0.5994	0.1743	0.5621	0.3516	0.6804	
GRAND TOTAL (Current Measures + CLRP plan)											2.460	5.671	2.000	1.998	2.041	1.999	

DEFINITIONS:

CREDIT TAKEN (X means emissions reduction credits taken):

TIP - Emissions credits are taken for projects being implemented, according to the progress reporting schedules provided by the implementing agencies (contained in Appendix J of Conformity Document). No credit has been taken for projects in which only some components of the measure have been implemented.

CLRP - Credit is taken for each of these elements of the CLRP according to the schedule provided by the implementing agency.

IMPLEMENTATION STATUS:

FULL = project is completed as planned at the time of analysis.

SCALED BACK = project is completed, but at a different level than assumed at the time of analysis (i.e., purchased 50 buses instead of 100)

UNDERWAY = project is not complete, but is close enough that credit may be taken (i.e., under construction, NOT just out for bid)

REMOVED = project no longer expected to be implemented or constructed

COMPLETION DATE:

PROJECTED = project completion date originally expected (i.e., at time of emissions analysis)

ACTUAL = actual year project was open for use, or expected to be open for use if under construction

REMOVED projects

Emissions credits are not counted in toal available emissions credits

1 Line items 218, 216, 179, 92 are all credited as part of M-92 Regional Telecommute Support TERM, line item # 75

2 Line item 108 & 219 credits are taken only for year 2010