

CONGESTION MITIGATION AND AIR  
QUALITY IMPROVEMENT PROGRAM  
(CMAQ)

*CMAQ*  
*PROJECT*  
*DEVELOPMENT*  
*WORKBOOK*  
*FY 2018-2021 Local Program*

*DECEMBER 2016*



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## ***I. New Project Application Process***

Project sponsors interested in proposing projects for consideration under the Congestion Mitigation and Air Quality Improvement Program (CMAQ) program should do so by completing and submitting a CMAQ application by **Thursday, March 2, 2017, 4:00 p.m.** The CMAQ new project online application form<sup>1</sup> can be accessed at: <http://www.ewgateway.org/tiponlineapp/2017/cmaq2017.pdf>

The application is completed on the East-West Gateway (EWG) website<sup>2</sup>. This file stores vital project information that is used to evaluate the projects. It's important that the data entered into our online application matches the completed project application delivered to EWG.

Project sponsors wanting feedback on applications may submit a preliminary copy by January 26, 2017. Simply mark preliminary on the application by that date if you desire comments. Due to volume of applications, each sponsor may receive no more than three preliminary application reviews (for all funding categories). East-West Gateway staff will review the applications submitted and comment by e-mail. Staff will return comments by February 9, 2017. If submitting a preliminary application for feedback, a final application must be still be submitted by March 2, 2017.

An application fee is required for each project that is submitted for consideration. The application fee is ½ of 1% of the federal funds being requested. For example, a sponsor requesting \$800,000 in federal funding would be required to pay a \$4,000 application fee. If the project is not recommended for funding, the application fee will be refunded following the approval of the FY 2018-2021 Transportation Improvement Program (TIP). Counties and states make annual contributions to EWG and as such a credit equal to their annual contribution is applied against their application fees.

Sponsors are encouraged to read the guidelines included in this workbook regarding project eligibility, the selection process, and the Policy on Reasonable Progress. Evaluation of individual projects, including air quality conformity, will utilize information provided in all areas of the application. Please provide all information as completely as possible. Additional relevant project data may be attached and is encouraged. If any of the information requested is unclear, incomplete, or missing, or if there are questions of applicability, contact Jason Lange in MO: (314) 421-4220 or IL: (618) 274-2750. Staff will provide assistance upon request.

**A completed project application<sup>3</sup> consists of one (1) printed original application, signatures, and supplemental information and one (1) electronic copy in Adobe Acrobat (.pdf) format containing the project application/signatures/supplemental information.** Do not send or include multiple files, send one .pdf. The CMAQ data spreadsheet is also a requirement. Failure to include the required data in this spreadsheet for type of project will result in the rejection of the project application.

The printed original application must be postmarked by March 2, 2017. Hand delivered originals and the electronic copy must be submitted by 4:00 p.m on March 2, 2017. Electronic copies may be emailed, burned on a CD/DVD, or stored on a removable disk drive. Applications received after the deadline will not be accepted. Early submissions are appreciated. When submitting the printed project application/signatures/supplemental information, sponsors may divide sections using tabs. Please make sure printed applications are **NOT** bound or stapled.

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<sup>1</sup> Best application performance is by using Microsoft Internet Explorer

<sup>2</sup> TIP application information page on EWG website: <http://www.ewgateway.org/TIPAppInfo/tipappinfo.htm>

Project applications should be addressed to:

East-West Gateway Council of Governments  
Attn: Transportation Planning Dept. - CMAQ  
Gateway Tower  
One Memorial Drive, Suite 1600  
St. Louis, MO 63102

Electronic submissions should be addressed to: [jason.lange@ewgateway.org](mailto:jason.lange@ewgateway.org). The subject should read: <Your City> - <Project Title> Application. For example: Subject: Big City - Main Street Intersection Application.

While sponsors are encouraged to provide as much additional relevant background information as they deem necessary, no project will be evaluated unless the application submitted by March 2, 2017 includes:

- Completed CMAQ Project Application - Marked 'final'  
Please note that the application form for new project submittals (*CMAQ New Project Applicationform*) is only available on line:  
<http://www.ewgateway.org/tiponlineapp/2017/cmaq2017.pdf>
- Project application fee (½ percent of federal funds requested)
- Project application checklist (with signature)
- Location map
- Letter of permission from owner of facility (required if sponsor does not own roadway)
- Data required for calculations of emission reductions. A traffic engineering analysis<sup>4</sup> is required for road projects. (**Complete CMAQdata.xls spreadsheet. The spreadsheet is available on the EWG TIP Application page.**)
- Estimate of Project costs – use Project Estimate.xls – found on EWG TIP application page
- ITS project consistency statement (if necessary) – found on EWG TIP application page
- Letter of project support from third party providing financial support (if necessary)
- Project Schedule
- Signatures including: Financial Certification of Matching Funds, Title VI, and Person of Responsible Charge
- Reasonable Progress and Right-of-Way Certification signatures (Missouri projects only)
- Operations and Maintenance Form (one per sponsor)

## ***II. FY 2018-2021 TIP Development Guidelines***

### ***A. Introduction***

The Fixing America's Surface Transportation (FAST) Act as enacted by Congress and signed by the President on December 4, 2015 includes regulations for categorical funding programs for highway projects and provides flexibility in the funding of all transportation projects. Opportunities are provided to fund roadway, transit, and other transportation projects from a number of funding categories.

Under the FAST Act, a Metropolitan Planning Organization (MPO) is required to develop fiscally constrained long-range transportation plans and TIP. EWG, as the MPO for the St. Louis region, selects projects in accordance with

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<sup>4</sup> Traffic engineering analysis must be performed for road projects. Data calculations based on estimates are not allowed.

principles and framework identified in the long-range transportation plan for the region, *Connected2045*. These projects must be consistent with the region's goals, objectives, and priorities in consultation with the states. The development of the FY 2018-2021 TIP<sup>5</sup> is guided by metropolitan transportation planning, FAST Act, Section 1201.

#### B. *Geographic Scope*

As in the previous TIP, the entire eight-county metropolitan area will be included in the FY 2018-2021 TIP. The area includes Madison, Monroe, and St. Clair counties in Illinois; the City of St. Louis; and Franklin, Jefferson, St. Charles, and St. Louis counties in Missouri.

#### C. *General Policies*

General policies established in FAST are followed in the programming of local transportation projects submitted for the FY 2018-2021 TIP.

- Project funding in the FY 2018-2021 TIP shall not exceed the anticipated available funds.
- The TIP will be limited to a single four-year period and be fiscally constrained.
- Procedures for the evaluation, selection, and programming of new projects in the FY 2018-2021 TIP will be based on policies and criteria approved by the EWG Board of Directors and will be consistent with the provisions, regulatory guidance, and intent of FAST.
- Projects will be programmed in specific federal funding categories. The funding category included in this workbook is the CMAQ Program for Illinois and Missouri.
- Illinois - CMAQ funds are available for three phases of work: preliminary engineering, right of way acquisition, and construction (including construction engineering) in FY 2018 and FY 2019.
- Missouri - CMAQ funds are available in FY 2018<sup>6</sup>, FY 2019, and FY 2020 for three phases of work: preliminary engineering, right of way acquisition, and construction (including construction engineering).

#### D. Project Sponsorship

Projects must have an appropriate government sponsor. Sponsors include but are not limited to states, counties, municipalities, and transportation related government entities. Not-for-profits must seek an appropriate government sponsor to act as sponsor for their project. Sponsors are encouraged to coordinate planning efforts and improvements with other governmental entities, agencies, and organizations. Missouri project sponsorship is defined in the Local Public Agency (LPA) Manual<sup>7</sup> (136.1.2.2). A State transportation department, or other eligible project sponsor may enter into an agreement with a private entity to cooperatively implement any project

#### E. Project Requirements

Responsibilities associated with project sponsorship through the project development and implementation process include:

- Providing an application fee of ½ of one percent of the total federal funds requested for each project, in compliance with a policy of the EWG Board of Directors. For example, if a sponsor is requesting federal funds in the amount of \$800,000 for a particular project, then the application fee for that project would be \$4,000. The application fee will be refunded if the project is not selected for inclusion in the FY 2018-2021 TIP. The refund occurs after approval of the FY 2018-2021 TIP.

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<sup>5</sup> FY 2018-2021: October 1, 2017-September 30, 2021

<sup>6</sup> Construction may be programmed in FY 2018, but may not exceed \$2 million. Larger projects must be programmed in a later fiscal year.

<sup>7</sup> MoDOT LPA Manual: <http://www.modot.org/business/lpa/lpamanual.htm>

- Ensuring the proper documentation is submitted with the formal proposal. This includes all supporting data needed to determine emission reductions to be realized by implementing the proposed project or program. The data must be included in the **CMAQdata.xls** spreadsheet.
- Securing at least 20% local matching funds and providing operations and maintenance information
- Reporting and maintaining all records and receipts as required by the procedures established by the Federal Highway Administration, Federal Transit Administration, and appropriate state transportation agency.
- Post-implementation studies as required by the MPO to determine whether the project actually resulted in the projected air quality benefits.
- Sponsor is compliant with laws and regulations including, but not limited to FAST Act, Title VI of the Civil Rights Act of 1964, Americans with Disabilities Act of 1990, and The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- Sponsors must document a 'Person of Responsible Charge'. Missouri sponsors must have at least one staff person that has completed LPA Basic Training<sup>8</sup>.
- Sponsor of selected project required to attend one public open house meeting (MO sponsors)

It is the policy of EWGCOG to encourage involvement by the public sector and citizens in the transportation decision making process for the St. Louis region. The same project application is used for Missouri and Illinois projects.

### **III. CMAQ Program**

#### **A. CMAQ Program Summary**

The FAST Act authorized funding through the CMAQ program for projects in areas not meeting national air quality standards. The CMAQ program pays for transportation projects or programs that will contribute to attainment of national ambient air quality standards (NAAQS), with a focus on reducing the precursors of ozone formation (hydrocarbons and oxides of nitrogen), carbon monoxide (CO), and particulate matter (PM 2.5).

The St. Louis MPO is in non-attainment for the 8-hour ozone standard and PM 2.5. The FAST Act includes provisions for States with PM 2.5 (fine particulate matter) nonattainment and maintenance areas (such as the St. Louis area) to use at least 25% of its CMAQ funds for projects that reduce PM 2.5 in such areas

The CMAQ program supports two important goals of the U.S. Department of Transportation: improving air quality and relieving congestion. CMAQ funding is directed toward transportation projects or services having air quality benefits. The program encompasses projects and programs dealing with the supply and demand for transportation. Certain highway, transit, demand management, vehicle emission inspection/maintenance, and bicycle programs are eligible for funding. More information on the CMAQ program can be found in the interim CMAQ guidance<sup>9</sup>.

#### **B. CMAQ Project Eligibility**

CMAQ funds may be invested in all ozone, CO, and PM nonattainment and maintenance areas. The St. Louis area includes Madison, Monroe, and St. Clair counties in Illinois; the City of St. Louis; and Franklin, Jefferson, St. Charles, and St. Louis counties in Missouri. Each CMAQ project must meet three basic criteria: it must be a transportation or transportation related project, it must generate an emissions reduction, and it must be located in or benefit a nonattainment or maintenance area.

<sup>8</sup> LPA Basic Training - [http://www.modot.org/business/lpa/cert\\_train.htm](http://www.modot.org/business/lpa/cert_train.htm)

<sup>9</sup> CMAQ interim guidance - <http://bit.ly/interimcmaqguidance>



Projects must comply with the Regional ITS Standards as set forth in the document titled St. Louis Regional ITS Architecture, July 2015<sup>10</sup> as well as the Congestion Management Process<sup>11</sup> (CMP). The CMP is an objectives-driven and performance based approach to defining and managing congestion that makes the transportation system performance and congestion management a core activity, as opposed to an isolated standalone process and function. The project application should identify what CMP goals/objectives and how they will be achieved.

Bicycle and pedestrian facilities are listed as a standalone category, however, the project sponsor should incorporate or upgrade these facilities, where feasible, as part of a traffic flow project (intersection, traffic signal, roundabout, etc.). Alternative fuel school bus purchases may not exceed 2.5% of the amount of federal funds available for each funding round. The selection of alternative fuel school bus projects is not guaranteed. **Appendix A** lists eligible project activities.

Generally the improvements fall into one of nine general categories, although other related activities may also be eligible. The nine categories are listed below:

- Acquisition of diesel retrofits, including tailpipe emissions control devices, and the provision of diesel-related outreach activities.
- Intermodal equipment and facility projects that target diesel freight emissions through direct exhaust control from vehicles or indirect emissions reductions through improvements in freight network logistics.
- Alternative fuel projects including participation in vehicle acquisitions, engine conversions, and refueling facilities. Only publicly owned vehicles providing a dominant transportation function can be fully funded. When non-transit vehicles are purchased through Public-Private Partnerships, only the cost difference between the alternative fuel vehicles and comparable conventional fuel vehicles is eligible. Establishing publicly owned fueling facilities and other infrastructure needed to fuel alternative-fuel vehicles is an eligible expense, unless privately-owned fueling stations are in place and reasonably accessible.
- Establishment or operation of a traffic monitoring, management, and control facility, including the installation of advanced truck stop electrification systems.
- Projects that improve traffic flow, including efforts to provide signal systemization, construct HOV lanes, streamline intersections, add turning lanes, improve transportation systems management and operations that mitigate congestion and improve air quality, and implement ITS and other CMAQ-eligible projects, including efforts to improve incident and emergency response or improve mobility, such as through real time traffic, transit and multimodal traveler information.
- Projects or programs that shift travel demand to nonpeak hours or other transportation modes, increase vehicle occupancy rates, or otherwise reduce demand through initiatives, such as teleworking, ridesharing, pricing, and others.
- Transit investments, including transit vehicle acquisitions and construction of new facilities or

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<sup>10</sup> St. Louis Regional ITS Architecture, July 2015 - <http://bit.ly/EWGITSARCH>

<sup>11</sup> Congestion Management Process - <http://bit.ly/EWGCMPP>

improvements to facilities that increase transit capacity. Operating assistance is also permitted to help start up viable new transportation services.

- Non-recreational bicycle transportation and pedestrian improvements that provide a reduction in single-occupant vehicle travel.
- Vehicle inspection and maintenance programs.

**Projects not eligible for CMAQ funding include, but not limited to:**

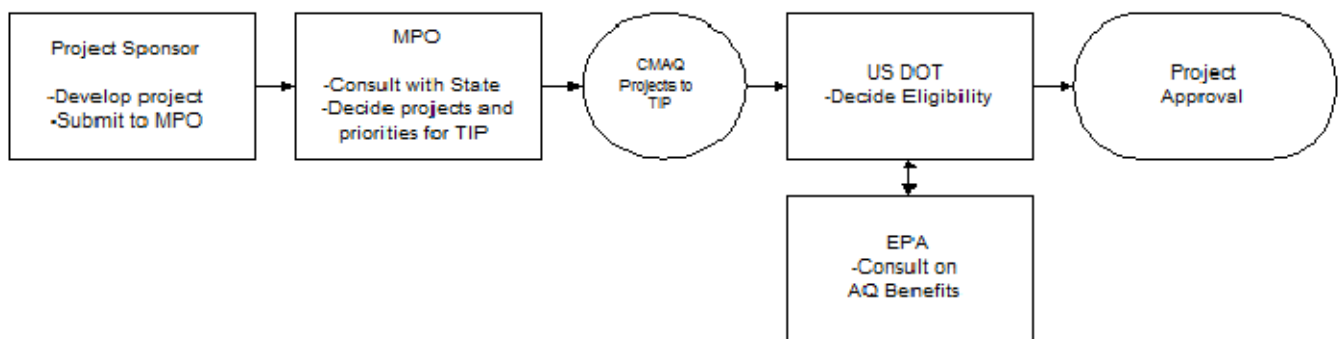
- Roadway projects that add new capacity for single occupant vehicles
- Projects that do not meet the specific eligibility requirements of titles 23 and 49 U.S.C. are ineligible for CMAQ funds. Including routine maintenance and rehabilitation projects such as reconstruction of bridges, repaving or repairing roads. Other funding sources are available for these activities.
- Administrative costs of the CMAQ program may not be defrayed with program funds
- Projects that do not meet the specific eligibility requirements of Titles 23 and 49, United States Code, are ineligible for CMAQ funds.

**IV. CMAQ Project Development and Selection Process**

**A. Project Identification and Development**

The development, selection, and implementation of CMAQ projects is a process involving agencies at the local, state, and federal levels. Interaction, coordination, and consultation is required for a project to go from development to implementation. **Figure 1** illustrates the process projects must go through and the agencies involved in funding a project through the CMAQ program.

**Figure 1  
The CMAQ Project Selection Process**



Project sponsors are responsible for developing the potential CMAQ projects and submitting the projects to the East-West Gateway Council of Governments for review and evaluation. Project submissions should be completed according to the guidelines described in this workbook.

Once EWG staff, in consultation with the states and citizens of the region, has reviewed, evaluated, and ranked the CMAQ candidate projects, selected projects are included in the TIP. The selected projects are reviewed by the Federal Highway Administration and the Federal Transit Administration in consultation with the Environmental Protection Agency to determine project eligibility under the CMAQ program. After the approval of the TIP by these federal agencies, projects included therein are eligible to receive federal funds. Project sponsors then work directly with the state department of transportation or federal agency to arrange for reimbursement of project expenses.

#### *B. Emission Reduction Estimates*

All CMAQ funded projects and programs require assessment and documentation of air quality benefits. The emission reduction estimates are generated using EPA's Motor Vehicle Emission Simulator (MOVES) model. With respect to air quality analysis, every effort will be made to ensure that determinations of air quality benefits are credible and based on a consistent and logical analytical procedure that will yield quantitative estimates of emission reductions. The MOVES model generates precursor of ozone formation (hydrocarbons, oxides of nitrogen), and PM 2.5.

Although quantitative analysis of air quality impacts is required whenever possible, some projects may not lend themselves to such analysis because of the size or scope of the project or because practical experience is lacking to adequately analyze the project. In these cases, a qualitative assessment based on a reasoned and logical examination of how the project or program will decrease emissions and contribute to attainment of NAAQS will be used.

Specific data inputs have been identified which are needed to evaluate estimated emission benefits for the project categories eligible under the CMAQ program. The data needs/inputs for projects being submitted for consideration under the CMAQ program are indicated on the **CMAQdata.xls** spreadsheet. A traffic engineering analysis is required for all roadway projects. Additional data may be requested of the project sponsors to estimate emission reductions. The spreadsheet is available for various projects such as: traffic flow improvement, bike/ped, shared ride, demand management, park & ride, intersection, ITS, alternative fuel vehicles, engine replacements, and transit vehicle acquisitions. Questions on which spreadsheet applies to the project type should be made to Jason Lange at 314-421-4220. Contact EWG at least two weeks prior to the final application due date<sup>12</sup> if the spreadsheet doesn't apply to your project type. **Completion of the CMAQdata.xls spreadsheet is required for project evaluation.** This spreadsheet is available on the TIP Application page ([bit.ly/Tipapphomepage](http://bit.ly/Tipapphomepage)) under the CMAQ section.

Emission reduction is calculated based on the present conditions (before) and conditions following construction (after). The after data should reflect conditions no more than five years following the anticipated completion year. For example, if a project is expected to be built and open to the public in 2019 then the after data should be no later than 2023.

#### *C. Project Evaluation*

Working together through the MPO and in consultation with the states, committees of local government representatives are responsible for selecting projects in the local CMAQ program.

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<sup>12</sup> Contact EWG by February 16, 2017 if spreadsheet not available for project type

For both the Illinois and Missouri portions of the region, EWG staff evaluates local projects relative to how effectively they would reduce emissions. In addition, each project is evaluated based on cost effectiveness and need. Then projects are ranked based on these criteria.

In Illinois, locally sponsored projects receive significant review from committees of elected officials established in each of the three counties. These committees in turn make recommendations to the Illinois Transportation Planning Committee (TPC), which then ranks projects using the established project evaluation criteria as a tool. The Missouri TPC follows a similar process in reviewing the project rankings developed by the EWG staff.

The evaluation of CMAQ projects is essentially a screening of the projects to ensure they meet the minimum eligibility requirements of the CMAQ program. The evaluation process first considers four tests:

- Project and sponsor eligibility
- Emission reductions
- Available local matching funds and realistic financial plan
- Financial need

If a project does not meet all four of the tests, it will not be selected for funding.

The first step in project evaluation is determining the eligibility of the project and sponsor. The project must address the issues of congestion and/or air quality to be considered eligible. Additionally, projects must have an appropriate government sponsor. Private sector involvement in project development/sponsoring is encouraged, but the principal sponsor must be a unit of government. Both requirements must be met for project evaluation to continue.

Next, each project is subject to an analysis of emission reductions. If there is no demonstrated reduction in emissions or the project contributes to the higher emissions, the project will not be considered further.

The third step relates to funding of the project. The federal share for most CMAQ projects is 80 percent. For those projects eligible for 80 percent funding, there is a minimum 20 percent local match required. Those matching funds must be identified in the project application along with the source of those funds. If matching funds are not identified or secured, the project will not be selected for funding. Certain projects like carpool/vanpool programs are eligible up to 100% federal.

The fourth measure, financial need, addresses the availability of financial resources other than CMAQ funds. Preference will be given to those projects which would not be accomplished but for CMAQ funding. Shifting project funding to the CMAQ program simply to make other monies available for other projects which might contribute to air pollution is strongly discouraged. The priority of the CMAQ program is to target the unique opportunities that could not be carried out without the use of CMAQ funds.

Finally, cost effectiveness for each project is measured relative to air quality benefits and other associated benefits. This is a measure developed by comparing the estimated emission reductions and other benefits of the project to construction and operating cost.

#### *D. Project Selection*

The project selection process involves setting the priority list of projects for funding through the CMAQ program. Priorities for eligible CMAQ projects are established locally and are based in large part on the project's consistency with the region's 20-year transportation plan, *Connected2045* and the CMP. Decisions regarding project selection are accomplished through the regional transportation planning process involving the East-West Gateway Council of

Governments, the Missouri Department of Transportation, the Illinois Department of Transportation, local transit providers, and the citizens of the region.

Establishing project priorities and selecting projects for funding in the CMAQ program is a direct result of:

- A project's cost effectiveness
- Consistency with program/project priority in *Connected2045* and CMP
- The availability of local, federal, and other funding

Cost effectiveness is used in the project selection process as a primary measure to establish priority. Projects that are highly cost effective have a higher priority than ones with a low cost effectiveness. This measure is used as a means of comparing various types of projects in a common way: cost per unit of benefit (e.g., metric tons of hydrocarbons and oxides of nitrogen reduced).

Projects recommended for inclusion in the TIP through the CMAQ project selection process are presented to the TPC, the Interagency Consultation Group (IACG), the Executive Advisory Committee (EAC), and the Board of Directors of the EWG. Additionally, public participation requirements will apply to the projects recommended for inclusion in the TIP.

#### *E. Policy on Reasonable Progress (Missouri projects)*

There has been increased concern in recent years regarding the implementation of projects programmed in the TIP. For various reasons, some projects have not progressed toward implementation several years after being programmed. The policy on Reasonable Progress has helped increase the number of programmed projects that are implemented in a timely manner. The implementation status of projects in this and previous TIPs is accounted for and reported through the Project Monitoring and Tracking Process.

For projects or programs included in the TIP, "reasonable progress" will have been made if the project has advanced to the point of obligating all federal funds programmed for that project in the current fiscal year, regardless of the phase of work (i.e., Preliminary Engineering (PE), Right of Way Acquisition (ROW), or Plans Specifications and Estimates (PSE)/Construction). If a project fails to obligate the programmed federal funds by September 30 of the current year, the funding for that year will be forfeited and returned to the regional funding pot. Actual progress toward implementation is measured against the schedule submitted by the project sponsor in the project application.

#### **Reasonable Progress Policy Enforcement**

Projects that do not obligate all federal funds for use by the September 30 suspense date will be removed from the TIP, and the federal funds associated with those projects will be returned to the regional funding pool for redistribution. The removal of projects from the TIP will require no further Board action and the sponsor would have to repay any federal funds already spent if the funding is forfeited.

If a project is realizing delays that will put the federal funding at risk of forfeiture (i.e., not meet a September 30 deadline), the project sponsor will have the opportunity to ask for consideration of a "one-time extension" in their project schedule. The one-time extension can only be requested for the implementation/construction phase of the project. The extension request will only be considered once a year, and has to be made before June 1 of the current fiscal year of the TIP.

To be considered for this extension the sponsor has to demonstrate on all counts: a.) The delay is beyond their

control and the sponsor has done diligence in progressing the project; b.) Federal funds have already been obligated on the project or in cases that no federal funds are used for PE and/or ROW acquisition, there has been significant progress toward final plan preparation; c.) There is a realistic strategy in place to obligate all funds. One-time extensions of up to three (3) months may be granted by East-West Gateway staff and one-time extensions greater than three (3) months, but not more than nine (9) months, will go to the Board of Directors for their consideration and approval. Projects requesting schedule advancements will be handled on a case-by-case basis (subject to available funding) and are subject to the Board adopted rules for TIP modifications.

### **Reasonable Progress Project Monitoring**

An extensive monitoring program has been developed to help track programmed projects and ensure that funding commitments and plans are met. Monthly tracking reports are developed and posted on the East-West Gateway website, utilizing project information provided by the project sponsor, IDOT and MoDOT District offices. Additionally, project sponsors are contacted, at least every six months, by EWGCOG staff for project status interviews.

## APPENDIX A

### CMAQ Eligible Activities

The following list details example CMAQ projects for the nine general categories. Final project eligibility and amount of federal participation is determined by the Federal Highway Administration. The Interim CMAQ Guidance can be found at: <http://bit.ly/interimcmaqguidance>

Eligible CMAQ projects are not limited to the projects examples listed below:

- Acquisition of diesel retrofits, including tailpipe emissions control devices, and the provision of diesel-related outreach activities.
  - Diesel engine or full vehicle replacement
  - Full engine rebuilding or reconditioning
  - Purchase and installation of after-treatment hardware including particulate matter traps and oxidation catalysts
  
- Intermodal equipment and facility projects that target diesel freight emissions through direct exhaust control from vehicles or indirect emissions reductions through improvements in freight network logistics.
  
- Alternative fuel projects including participation in vehicle acquisitions, engine conversions, and refueling facilities.
  - Transit vehicles
  - Paratransit vehicles
  - Diesel engine replacement
  
- Establishment or operation of a traffic monitoring, management, and control facility, including the installation of advanced truck stop electrification systems.
  
- Projects that improve traffic flow, including efforts to provide signal systemization, construct HOV lanes, streamline intersections, add turning lanes, improve transportation systems management and operations that mitigate congestion and improve air quality, and implement ITS and other CMAQ-eligible projects, including efforts to improve incident and emergency response or improve mobility, such as through real time traffic, transit and multimodal traveler information.
  - a. Intersection improvements
    - Turn lanes
    - Traffic signal at intersection
    - Roundabout
  - b. Corridor improvements
    - Traffic signal interconnection
    - Traffic signal optimization plans
    - Ramp metering
    - ITS improvements (cameras, dynamic messaging signs, speed detection, including efforts to improve incident and emergency response or improve mobility, such as through real time traffic, transit and multimodal traveler information.etc.)
    - Multiple signal improvements (flashing yellow arrow, detection, upgrade of deficient equipment to modern standards, software upgrades)

- Projects or programs that shift travel demand to nonpeak hours or other transportation modes, increase vehicle occupancy rates, or otherwise reduce demand through initiatives, such as teleworking, ridesharing, pricing, and others.
  - Ridefinders
  - Bikesharing
  - Park and ride lots
  - Trip reduction programs
  - Travel management plans
  
- Transit investments, including transit vehicle acquisitions and construction of new facilities or improvements to facilities that increase transit capacity. Operating assistance is also permitted to help start up viable new transportation services.
  - Vehicle replacement
    - Operating assistance (see [bit.ly/oaguidance](http://bit.ly/oaguidance) for more info)
    - Vehicle acquisition
    - Transit facilities (lines, stations, terminals, transfer facilities)
  
- Non-recreational bicycle transportation and pedestrian improvements that provide a reduction in single-occupant vehicle travel.
  - Constructing bicycle and pedestrian facilities (paths, bike racks, support facilities, sidewalks, bike lanes, cycle tracks, bike lockers, etc) that can demonstrate a reduction of vehicle trips
  - Non-construction outreach related to safe bicycle use
  
- Vehicle inspection and maintenance programs.



**APPENDIX B**  
**Detailed Cost Estimate**

Estimate of Project Costs				
Project Sponsor: <input type="text"/>				
Project Title: <input type="text"/>				
Date: 2/22/2016				
Specific Roadway Items				
Item	Quantity	Unit	Unit Price	Amount
Clearing and Grubbing	1	L.S.	\$10,000.00	\$10,000.00
Tree Removal	300	EACH	\$32.00	\$9,600.00
Removal of Improvements	1	L.S.	\$15,000.00	\$15,000.00
Removal of Rigid Pavement	563	S.Y.	\$48.00	\$27,024.00
Class A Excavation	2,179	C.Y.	\$25.00	\$54,487.35
Land Disturbance Permit	1	L.S.	\$1,000.00	\$1,000.00
Water Quality Construction	1	L.S.	\$90,020.00	\$90,020.00
Type 5 Aggregate Base (4")	5,377	S.Y.	\$5.50	\$29,575.94
Superpave SP-125 (PG 70-22) DLP	497	TON	\$76.00	\$37,738.69
Type C Bituminous Concrete (Pavement)	264	TON	\$112.00	\$29,544.98
Tack Emulsified Asphalt (SS-1H)	313	GAL	\$4.00	\$1,251.56
Pavement Surfacing and Texturing (0"-2")	7,854	S.Y.	\$5.00	\$39,269.44
Concrete Pavement (7") Non-reinforced	282	S.Y.	\$60.00	\$16,920.00
Concrete Base (8") Non-reinforced	3,129	S.Y.	\$75.00	\$234,666.67
Relocate House Water Service Lead	200	L.F.	\$80.00	\$16,000.00
Adjust Water Service Valve Box to Grade	5	EACH	\$720.00	\$3,600.00
Adjust Water Service Meter Box to Grade	5	EACH	\$900.00	\$4,500.00
Water Service Appurtenance Install (2" or Greater)	3	EACH	\$5,400.00	\$16,200.00
Irrigation System Modification	1	L.S.	\$20,000.00	\$20,000.00
Single Curb Inlet, Untrapped	2	EACH	\$3,000.00	\$6,000.00
Double Curb Inlet, Untrapped	6	EACH	\$3,700.00	\$22,200.00
Manhole, Lock Type Cover	5	EACH	\$2,000.00	\$10,000.00
Adjusting Basin or Inlet	4	EACH	\$1,000.00	\$4,000.00
Adjusting Grate Inlet to Grade	3	EACH	\$1,000.00	\$3,000.00
Adjusting Manhole to Grade	3	EACH	\$900.00	\$2,700.00
Pipe Collar, Type "A" (Concrete)	1	EACH	\$1,100.00	\$1,100.00
Paved Approach (7")	281	S.Y.	\$65.00	\$18,265.00
Curb and Gutter, vertical	6,068	L.F.	\$27.00	\$163,836.00
Integral Curb (6")	300	L.F.	\$25.00	\$7,500.00
Standard Traffic Control Devices	1	L.S.	\$20,000.00	\$20,000.00
Arrow Panel, Type B Noiseless, Rental	3	EACH	\$750.00	\$2,250.00
Mobilization	1	EACH	\$100,000.00	\$100,000.00
Removal Pavement Striping, Paint	300	L.F.	\$1.75	\$525.00
Removal of Pavement Markings, Paint	80	S.F.	\$3.75	\$300.00
24" Class III Reinforced Concrete Pipe (Gasket)	1,500	L.F.	\$100.00	\$150,000.00
Precast Concrete Manhole (42")	5	EACH	\$2,000.00	\$10,000.00
24" Flared End Section	1	EACH	\$1,200.00	\$1,200.00
Sodding	5,000	S.Y.	\$7.00	\$35,000.00
Storm Water Pollution Prevention Program	1	L.S.	\$10,000.00	\$10,000.00
Monument Reconstruction & Landscaping	1	L.S.	\$80,000.00	\$80,000.00
Modification of Roadway Lighting System	16	EACH	\$10,000.00	\$160,000.00
			<b>SUBTOTAL</b>	<b>\$1,464,274.63</b>

**APPENDIX B**  
**Detailed Cost Estimate**

Specific Bicycle Items				
Item	Quantity	Unit	Unit Price	Amount
None				\$0.00
<b>SUBTOTAL</b>				<b>\$0.00</b>

Specific Pedestrian Items				
Item	Quantity	Unit	Unit Price	Amount
Clearing Vegetation from the Pedestrian Access Route	1	L.S.	\$1,200.00	\$1,200.00
Joint Sealant for Concrete Sidewalks	1,550	L.F.	\$3.00	\$4,650.00
Concrete Sidewalk (4")	4,237	S.Y.	\$37.00	\$156,756.67
<b>SUBTOTAL</b>				<b>\$162,606.67</b>

Specific Transit Items				
Item	Quantity	Unit	Unit Price	Amount
None				\$0.00
<b>SUBTOTAL</b>				<b>\$0.00</b>

Miscellaneous Other Items				
Item	Quantity	Unit	Unit Price	Amount
<b>Structural Items</b>				
Aluminum Handrail (Structural)	645	L.F.	\$75.00	\$48,375.00
Modular Block Wall (h>4')	5,228	S.F.	\$27.00	\$141,150.60
Modular Block Wall (h<4')	1,856	S.F.	\$27.00	\$50,118.75
<b>Traffic Signal Items</b>				
Signal Head, Type 3T	1	Each	\$1,100.00	\$1,100.00
Signal Head, Type 4T	1	Each	\$1,300.00	\$1,300.00
Signal Head, Type 3S	3	Each	\$1,200.00	\$3,600.00
Signal Head, Type 4S	2	Each	\$1,500.00	\$3,000.00
Signal Head, Type 5S	3	Each	\$1,800.00	\$5,400.00
Signal Head, Type 34S	2	Each	\$2,800.00	\$5,600.00
Signal Head, Type 45S	1	Each	\$3,200.00	\$3,200.00
Signal Head, Type 3B, Terminal Compartment, and Astro Bracket Mounting	16	Each	\$1,300.00	\$20,800.00
Signal Head, Type 4B, Terminal Compartment, and Astro Bracket Mounting	6	Each	\$1,500.00	\$9,000.00
Signal Head, Type 5B Cluster Assembly, Terminal Compartment, and Astro Bracket Mounting	4	Each	\$1,800.00	\$7,200.00
Signal Head, Type 1S, Pedestrian	24	Each	\$1,000.00	\$24,000.00
Post, Signal, w/Sq. Pedestal Base, 15' Total Height, Aluminum	2	Each	\$975.00	\$1,950.00
Post, Signal, w/Sq. Pedestal Base and Post Cap, 7' Maximum Total Height, Aluminum	10	Each	\$800.00	\$8,000.00
19' Pole, w/12' Mast Arm, Steel	2	Each	\$3,500.00	\$7,000.00
19' Pole, w/18' Mast Arm, Steel	1	Each	\$3,500.00	\$3,500.00
19' Pole, w/20' Mast Arm, Steel	1	Each	\$4,000.00	\$4,000.00
19' Pole, w/32' Mast Arm, Steel	1	Each	\$4,500.00	\$4,500.00
19' Pole, w/34' Mast Arm, Steel	3	Each	\$4,500.00	\$13,500.00
19' Pole, w/36' Mast Arm, Steel	3	Each	\$4,500.00	\$13,500.00
19' Pole, w/40' Mast Arm, Steel	1	Each	\$5,000.00	\$5,000.00

**APPENDIX B**  
**Detailed Cost Estimate**

Relocation of Existing Traffic Signal Controller Cabinet	1	Each	\$1,000.00	\$1,000.00
Relocation of Existing Mast Arm	1	Each	\$700.00	\$700.00
Relocation of Existing Interconnect Cable	4,910	L.F.	\$0.20	\$982.00
Relocation of Existing Signal Cables	890	L.F.	\$0.75	\$667.50
Fiber-Optic Termination	4	Each	\$60.00	\$240.00
Fiber-Optic Fusion Splices	4	Each	\$50.00	\$200.00
Modification of Controller Phasing (Intersection)	1	Each	\$800.00	\$800.00
<b>Miscellaneous Items</b>				
Utility Relocations	1	L.S.	\$25,000.00	\$25,000.00
Office for Engineer	18	MO.	\$1,500.00	\$27,000.00
			<b>SUBTOTAL</b>	<b>\$721,305.35</b>

<b>Construction Cost Total</b>	<b>\$2,348,186.64</b>
<b>Contingency</b>	<b>\$117,813.36</b>
<b>Inflation</b>	<b>\$228,700.00</b>
<b>Preliminary Engineering</b>	<b>\$254,000.00</b>
<b>Right-of-Way</b>	<b>\$398,900.00</b>
<b>Construction Engineering/Inspection</b>	<b>\$215,500.00</b>
<b>Project Total *</b>	<b>\$3,563,100.00</b>

\* The project total cost should match the total cost reported in the project application.  
 Add lines as needed.

## *APPENDIX C*

### *Glossary of Terms*

**Adjustment Factor**— A multiplicative factor that adjusts a capacity or service flow rate from one representing an ideal or base condition to one representing a prevailing condition.

**Annual Average Daily Traffic** – The total volume passing a point or segment of a highway facility in both directions for one year divided by the number of days in the year.

**Approach** – A set of lanes accommodating all left-turn, through, and right-turn movements arriving at an intersection from a given direction.

**Arterial** – Signalized streets that serve primarily through traffic and provide access to abutting properties as a secondary function, having signal spacings of 2 mi. or less and turn movements at intersections that usually do not exceed 20 percent of total traffic.

**Auto Access Trip Length** – the mean distance for users of the proposed facility from their initial origin to the proposed facility.

**Auto Trips/Rate Eliminated** – the actual number (or rate per unit) of auto trips which are eliminated entirely from using the auto mode—i.e., a MetroLink park & ride patron using a bike or feeder bus mode.

**Auto Trips/Rate Diverted** – the actual number (or rate per unit) of auto trips diverted from making the major portion of their trip using auto—i.e., a former auto trip to the CBD diverted to a MetroLink station.

**Average Total Delay** – The total additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures and interaction with other users of the facility divided by the volume departing from the corresponding cross section of the facility.

**Average Travel Speed** – The average speed of a traffic stream computed as the length of a highway segment divided by the average travel time of vehicles traversing the segment, in miles per hour.

**Average Travel Time** – The average time spent by vehicles traversing a highway segment of given length, including all stopped-time delay, in seconds per vehicle or minutes per vehicle.

**Berth** – A position for a bus to pick up and discharge passengers, including curb bus stops and other types of boarding and discharge facilities.

**Bike Lane** – A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicycles.

**Bike Path** – A bikeway physically separated from motorized traffic by an open space or barrier, either within the highway right-of-way or within an independent right-of-way.

**Bikeway** – Any road, path, or way that in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicyclists or are to be shared with other vehicles.

**Bus** – A heavy vehicle involved in the transport of passengers on a for-hire, charter, or franchised transit basis.

**Bus Lane** – A lane restricted to bus usage by special regulations and markings.

**Busway** – A right-of-way restricted to bus usage by physical separation from other traffic lanes.

**Capacity** – The maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions, usually expressed as vehicles per hour or persons per hour.

**CMAQ** – The Congestion Mitigation and Air Quality Improvement Program (CMAQ) is a funding program established by federal transportation law to assist areas with substandard air quality meet the requirements of the 1990 Clean Air Act Amendments.

**CO** – Carbon monoxide (CO) is a chemical compound containing carbon and oxygen. The CAAA requires non-attainment areas to reduce their output of CO.

**Collector Street** – Surface street providing land access and traffic circulation within residential, commercial, and industrial areas.

**Conflicting Approach** – The approach at approximately 90 degrees to the subject approach at an all-way STOP-Controlled (AWSC) intersection.

**Conflicting Traffic Volume** – The volume of traffic that conflicts with a specific movement at an unsignalized intersection.

**Congestion Management Process (CMP)**: Replaced the Congestion Management System (CMS) concept. FAST requires that each Transportation Management Area (see definition of TMA) address congestion management through a *process* that provides for effective management and operation of new and existing transportation facilities through the use of travel demand reduction and operational management strategies. Unless they are part of a CMP, future highway projects that significantly increase capacity for single occupant vehicles (SOVs) generally are ineligible for federal funds.

**Current and Future ADT** – the average daily traffic. For facilities covering more than one measurable highway segment, a distance based weighted average should be used, with the exception that intersection of improvements report current and future ADT for all legs of the intersection.

**Crosswalk** – The marked crossing area for pedestrians crossing the street at an intersection or designated midblock location.

**Cycle** – Any complete sequence of signal indications.

**Cycle Length** – The total time for a signal to complete one cycle.

**Delay** – Additional travel time experienced by a driver, passenger, or pedestrian beyond what would reasonably be desired for a given trip.

**Density** – The number of vehicles occupying a given length of lane or roadway averaged over time, usually expressed as vehicles per mile or vehicles per mile per lane.

**Downstream** – The direction toward which traffic is flowing.

**Dwell Time** – The time that a transit vehicle is stopped in a berth for the purposes of boarding or discharging passengers.

**Effective Green Time** – The time allocated for a given traffic movement (green plus yellow) at a signalized intersection less the start-up and clearance lost times for the movement.

**Effective Red Time** – The time during which a given traffic movement or set of movements is directed to stop; cycle length minus effective green time.

**Fixing America’s Surface Transportation (FAST)** - On December 4, 2015, President Obama signed the [Fixing America’s Surface Transportation \(FAST\) Act](#) (Pub. L. No. 114-94) into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes \$305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs.

**FHWA** – Federal Highway Administration

**Free-flow Speed** – (a) The theoretical speed of traffic when density is zero, that is, when no vehicles are present; (b) the average speed of vehicles over an arterial segment not close to signalized intersections under conditions of low volume.

**Freeway** – A multilane divided highway having a minimum of two lanes for exclusive use of traffic in each direction and full control of access and egress.

**FTA** – Federal Transit Administration

**Fully Actuated Control** – Signal control of an intersection in which the occurrence and length of every phase are controlled by actuations of vehicle detectors placed on each approach to the intersection.

**FY and Total Cost** – The amount requested for the fiscal year for which the project is submitted, along with the total cost of the project if it is a multi-year project.

**HC** – Hydrocarbons (HCs) are chemical compounds containing the elements of carbon and hydrogen.

**High-Occupancy Vehicle Lane** – A lane of a freeway reserved for the use of vehicles with more than a preset number of occupants; such vehicles often include buses, taxis, and carpools.

**I/M Programs** -The purpose of inspection and maintenance (I/M) programs are to reduce emissions by installing control devices on motor vehicles.

**Ideal Conditions** – Characteristics for a given type of facility that are assumed to be the best possible from the point of view of capacity, that is, characteristics that if further improved would not result in increased capacity.

**Interrupted Flow** – A category of traffic facilities having traffic signals, STOP signs, or other fixed causes of periodic delay or interruption to the traffic stream; examples include intersections and arterials.

**Intelligent Transportation Systems (ITS):** Uses state of the art technology to improve travel on a region's major roadways

**Interval** – A period of time in a signal cycle during which all signal indications remain constant.

**Lane 1** – The highway lane adjacent to the shoulder.

**Level of Service** – A qualitative measure describing operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

**Line-Haul Trip Length** – The length of the portion of the trip served by the proposed facility.

**Load Factor** – The number of passengers occupying a transit vehicle divided by the number of seats on the vehicle.

**Maximum Load Point** – The section of a transit line that has the highest passenger demand during a specified time interval.

**Motor Vehicle Emission Simulator (MOVES)**: This new emission modeling system estimates emissions for mobile sources covering a broad range of pollutants and allows multiple scale analysis. MOVES currently estimates emissions from cars, trucks & motorcycles.

**NO<sub>x</sub>** – Nitrous oxide is a chemical compound composed of nitrogen and oxygen. Reductions in NO<sub>x</sub> are required by the CAAA for areas to meet attainment.

**Ozone (O<sub>3</sub>)** – A highly reactive bluish-colored haze formed in the atmosphere by a series of photochemical reactions. Ozone is made up of three atoms of oxygen.

**Particulate Matter (PM)** – PM is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. Particle pollution includes: PM 10 and PM 2.5.

**Peak-Hour Factor** – The hourly volume during the maximum volume hour of the day divided by the peak 15-min rate of flow within the peak hour; a measure of traffic demand fluctuation within the peak hour.

**Pedestrian Flow Rate** – The number of persons passing a point per unit time, usually expressed as pedestrians per 15 min or pedestrians per minute.

**Person Capacity** – The maximum number of persons who can be carried past a given point on a highway or transit right-of-way during a given time period under specified operating conditions without unreasonable delay, hazard, or restriction, in persons per hour.

**Person Level of Service** – The quality of service offered the passenger within a transit vehicle, as determined by the available space per passenger.

**Phase** – The part of the signal cycle allocated to any combination of traffic movements receiving the right-of-way simultaneously during one or more intervals.

**Project Length/Number** – The length of the project or the number of units (parking spaces, buses, etc.) of the project. This would include all legs and approaches for intersection improvements.

**Queue** – A line of vehicles or persons waiting to be served by the system in which the rate of flow from the front of the queue determines the average speed within the queue. Slowly moving vehicles or people joining the rear of the queue are usually considered a part of the queue. The internal queue dynamics may involve a series of starts and stops. A faster-moving line of vehicles is often referred to as a moving queue or a platoon.

**Roadway Conditions** – Geometric characteristics of a street or highway, including the type of facility, number and width of lanes (by direction), shoulder widths and lateral clearances, design speed, and horizontal and vertical alignments.

**Seat Capacity** – The number of seats on a transit vehicle.

**Service Flow Rate** – The maximum hourly rate at which persons or vehicles can be reasonably expected to traverse a point of uniform section of a lane or roadway during a given time period (usually 15 min) under prevailing roadway, traffic, and control conditions while maintaining a designated level of service, expressed as vehicles per hour or vehicles per hour per lane.

**SIP** - The State Implementation Plan is a required planning document submitted by a non-attainment area which establishes an emissions budget and shows how milestones and actual attainment will be reached.

**SOV** - Single Occupant Vehicle

**Speed** – A rate of motion expressed as distance per unit time.

**Speed (Present)** – The mean speed of auto vehicles which will be diverted due to the facility or the mean speed of auto vehicles using the present location of the proposed improvement.

**Speed (After)** – The mean speed of auto vehicles using the improved facility.

**Standees** – The number of passengers standing in a transit vehicle.

**TDMs** - Transportation Demand Measures focus on shifting the demand on the transportation system.

**TMA** – Transportation Management Association is a public/private partnership created to address site or corridor specific transportation related problems and issues.

**TIP** – The Transportation Improvement Program is an official list of projects that are programmed for implementation over the next four years.

**Transit Trips Diverted** – The number of feeder bus trips which will be removed from transit modes due to the implementation of the project.

**Trip Diversion** – The estimate of traffic volumes (highest peak hour) diverted from parallel freeways, arterials, and local streets. This factor is based on travel time differentials.

**Turnout** – A short section of a lane added to a two-lane, two-way highway for the purpose of allowing slow-moving vehicles to leave the main roadway and stop to allow faster vehicles to pass.

**V/C Ratio** – The ratio of demand flow rate to capacity for a traffic facility.

**Volume** – The number of persons or vehicles passing a point on a lane, roadway, or other trafficway during some time interval, often taken to be 1 hr, expressed in vehicles.

**Walkway** – A facility provided for pedestrian movement and segregated from vehicular traffic by a curb or provided on a separate right-of-way.

**Weaving Area** – A length of highway over which traffic streams cross each other's path without the aid of traffic signals over a length of highway, doing so through lane-changing maneuvers; formed between merge and diverge points, as well as between on-ramps and off-ramps on limited access facilities.