

Project Selection for the Congestion Mitigation and Air Quality Improvement (CMAQ) Program in the Chicago Region

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This is a shortened form of the author's Master's project.
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1. Introduction

The federal Congestion Mitigation and Air Quality Improvement (CMAQ) program provides funds to states and regions for transportation projects that will improve air quality and reduce traffic congestion. In northeastern Illinois, CMAQ projects are selected by the Chicago Metropolitan Agency for Planning (CMAP), the region's transportation and land use planning body. CMAQ is a valuable source of funds for small- to medium-sized transportation projects and as the "finishing piece" for large projects in the Chicago region. At this time, however, the program is struggling to achieve its benefits because local project sponsors are not utilizing the funds in a timely fashion. To address this, CMAP has recently implemented a number of "active program management" strategies to encourage project implementation.

CMAQ has broader importance for CMAP because it is currently the one of the only discretionary sources of funds that CMAP controls. As CMAP prepares to adopt a new regional long-range plan, there is an opportunity to reassess the region's needs and how the CMAQ program can help to address those, as well as to reinforce the active program management strategies. The current project selection process was developed in the early 1990s with the participation of a number of regional stakeholders and has continued to evolve with lessons learned over the years. The regional governance structure has since changed, however, and there is now a window of opportunity to reorient the program to more directly support the regional plan.

1.1 Objective

This paper will recommend a revised process for the Chicago Metropolitan Agency for Planning (CMAP) to prioritize and program transportation projects under the Congestion Mitigation and Air Quality Improvement (CMAQ) program. This revised process will focus on:

1. how CMAQ funds can be used to help the Chicago region implement its *GO TO 2040* regional comprehensive plan (and future regional plans),
2. supporting CMAP's new active program management policies for the CMAQ program, and
3. providing greater clarity about what considerations influence project selection.

This paper focuses on the institutional context and the process of project selection, not on the actual quantification of project benefits, particularly with regard to air quality. It does recommend changes in evaluation criteria, but does not address the technical details of such criteria. Some policy-level factors and project preferences based on stated regional priorities are suggested, but it is recognized that any program changes will be need to be in line with the priorities of the committees at CMAP that govern the CMAQ process. This program proposal is therefore meant as a well-developed starting point for future staff and committee discussions.

2. Background and Context

2.1. National CMAQ Program

The purpose of the CMAQ program, as identified in the current federal program guidance, is to "fund transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards (NAAQS) for ozone, carbon monoxide (CO), and particulate matter (PM)."¹ It is the "first and [one of the] only federally funded transportation program[s] explicitly targeting air quality improvement;" the program also devolves programming to the states

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and regions, allowing local entities to direct the funds as they see best fit.² As such, the program is an important, and appreciated, source of funds for many nonattainment regions. Nonetheless, CMAQ is not a large program: its funds account for less than two percent of the total transportation budget in many regions.³

Projects funded by CMAQ typically reduce motor vehicle emissions by reducing vehicle travel, by improving traffic flow to reduce idling and stop-and-go driving, and by implementing technologies that reduce vehicle emissions.⁴ Program guidance under SAFETEA-LU directs states and metropolitan planning organizations (MPO), like CMAP, to give priority to diesel retrofits and “cost-effective congestion mitigation activities that provide air quality benefits”, as well as to Transportation Control Measures (TCMs) included in regional and state air quality plans.⁵ A 2008 assessment of the FHWA’s CMAQ project database shows that from 2000 to 2005, the majority of projects funded – in terms both of number of projects and of dollars spent – are transit and traffic flow projects.

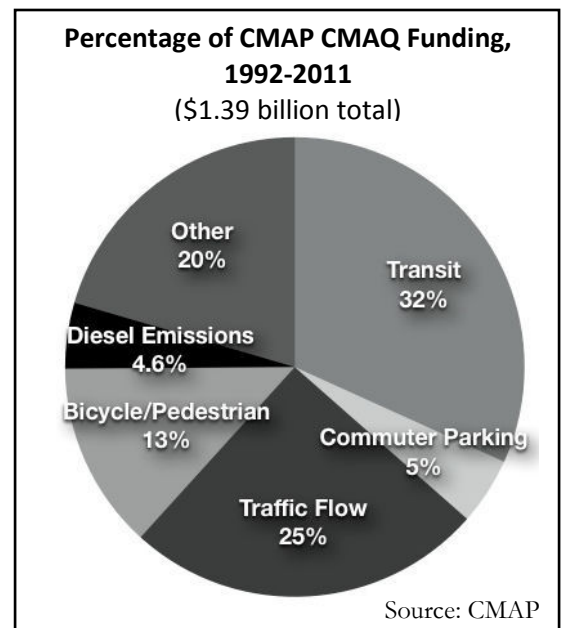
2.2. CMAQ in the Chicago Metropolitan Region

The Chicago region is currently classified as a moderate nonattainment area for the 1997 8-hour ozone standard and is a nonattainment area for annual fine particulate matter (PM_{2.5}). As of 2006, there were over 10 million people estimated to be living in the 10 nonattainment counties of the Chicago-Gary-Lake County nonattainment area, covering the southern end of Lake Michigan in Illinois and Indiana. Of those, 8.4 million people are within the Illinois portion, accounting for the vast majority (over 90%) of the state’s population in such counties, and two-thirds of the state’s entire population.⁶ The Chicago region receives approximately 95% of the state’s CMAQ funds, averaging around \$90 million a year under SAFETEA-LU. Since 1992, the Chicago region has received over \$1.3 billion in CMAQ funds.

To address the region’s primary air quality issues, CMAP focuses its CMAQ funds on projects that will reduce ozone precursors – volatile organic compounds (VOC) and nitrogen oxides (NO_x) – and PM_{2.5}. Though almost any project with emission benefits is eligible, CMAP identifies seven general project types eligible for funding. They are:

- Transit improvements (transit system start-up, transit transfer facilities, transit facility improvements, transit service and equipment)
- Commuter parking facilities
- Traffic flow improvement projects (intersection improvements and bottleneck elimination, signal interconnects)
- Bicycle and pedestrian facility projects
- Bicycle parking and bicycle encouragement projects
- Diesel emission reduction projects
- Other projects, including cold start reduction projects⁷

The chart at right shows the percentage of funding going to these categories over the life of the program. Similar to the national totals, CMAQ in the Chicago region has been largely focused on transit and traffic flow improvement projects.



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The CMAP CMAQ program largely follows the format laid out by the federal CMAQ guidelines. All projects must be either proposed by a unit of government or have a local government as sponsor. Eligible sponsors include the Illinois Department of Transportation (IDOT), which suballocates funds to the region and then can apply to receive some of those funds for projects within the region. Project sponsors are required to provide a twenty percent match for the federal funds, except in the case of certain transit projects (for which no match is required) and diesel retrofit projects with private railroad companies (for which a higher match is required).⁸ That funding is referred to as the “local match” but can actually come from a variety of funding sources, including state funds.

2.2.1. Current Project Selection

Project selection is currently a year-long process, which begins with the annual call for CMAQ projects. After applications are received, staff calculates project air quality impacts based on the information provided by the applicants and develops an initial program suggestion. Next, the CMAP CMAQ Project Selection Committee, composed of regional representatives,⁹ develops a program of CMAQ projects, often building off the staff suggestions. This program is passed up the organizational structure to the Transportation Committee, which then puts the proposed program out for public comment. After making any changes as appropriate, the program is given to the MPO Policy Committee and the CMAP Board, the two policy-level committees that govern the agency’s actions, for final approval.¹⁰

In the current project selection process, after the project applications are compiled and project air quality benefits calculated, a list of proposed projects by project type is generated. That list is sorted (“ranked”) based on cost-effectiveness ratios of dollars per kilogram VOC eliminated (or PM_{2.5} eliminated, in the case of diesel emission reduction projects). Decisions are guided in part by the list sorting, but a number of other considerations enter into the discussion. The program booklet that accompanies the annual call for projects identifies a number of criteria that are used to select projects, both as screening criteria and as selection criteria. Other documents produced as part of the project selection process give a further set criteria. The table on the next page describes these criteria.

The total set of considerations (stated and informal) potentially informing project selection is quite substantial, but it is difficult to know how many of these criteria are actually factored in to project selection currently. Published lists of projects currently include cost-effectiveness ratios (VOC or PM_{2.5}) and the project costs (total and CMAQ portion). Staff and committee working lists incorporate more factors –cost-effectiveness ratios for all pollutants considered, project costs in more detail, prior project funding through CMAQ, bus routes benefited, project mix, and sponsors with unobligated funds. The other criteria are generally only incorporated via staff and committee discussions.

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CMAQ CMAQ Project Selection Criteria

Threshold (Screening) Criteria¹¹

- Public sponsor is submitting the project
- Local match funds are committed
- Project provides emissions and/or congestion benefit
- Implementation considerations: projects must
 - Be constructed to federal standards
 - Conform to national and regional intelligent transportation systems (ITS) architecture, where applicable
- Application is complete (agreements, scoping documents, reviewed at sub-regional level)

Stated Criteria in Project Application Booklet¹²

- Cost-effectiveness ratios: (over the life of the project)
 - Dollars per kilogram volatile organic compounds (VOC) eliminated (primary ranking)
 - Dollars per kilogram nitrogen oxides (NOx) eliminated
 - Dollars per kilogram particulate matter (PM_{2.5}) eliminated (primary ranking for diesel emission reduction projects)
 - Dollars per 1,000 trips eliminated
 - Dollars per 1,000 vehicle miles traveled (VMT) eliminated
- Preference is given to:
 - Transportation Control Measures
 - Fully-funded projects
 - Ready-to-go projects
- Project Selection Committee reserves judgment, and often considers:
 - Regional equity
 - Project readiness
 - Project mix

Identified in Other Program Documentation¹³

- Daily VOC eliminated (kilograms) – not as a cost-effectiveness ratio
- Project cost considerations
 - Project has prior CMAQ funding
 - Local match is greater than normal CMAQ share (generally more than 20%)
 - Uncommitted costs are above 10% of total project costs
 - Cost effectiveness is more than \$2,000 per kg VOC eliminated (projects flagged)
- Sponsor has unobligated funds from previous projects
- Bus routes benefit from traffic flow improvements (signal interconnects) or pedestrian improvements (sidewalks)
- Mix of projects programmed, by:
 - Project type
 - Geography
 - Sponsoring agency
 - Mode

(continued on next page)

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Other Considerations Not in Program Documentation¹⁴

- Regional priorities
- Funding considerations
 - Leveraging of other funds (for the required local funding match)
 - 'Final piece of the funding puzzle' for projects that need one last source of funds to be fully funded
 - Demonstrated ability to obligate – the staff and committee do not want to give more money to those who have not spent down their previous balances.
- Sponsor capacity to implement
- Sponsor capacity to make the required local match, particularly if the funding stream is variable
- Large sponsor preferences: larger sponsors (like IDOT, CTA, City of Chicago) tend to submit many projects but in the intervening time between submittal and selection, the project situation can change (e.g. found local funds to use instead, a major impediment or an opportunity came up). CMAP asks these sponsors to identify their priority projects closer to project selection to address this issue.

Finally, some project types also have special considerations that can come into play. For example, in the development of the staff recommendation for the FY2010 program, staff noted that they chose not to fund bicycle facilities that were overly oriented towards recreation (CMAQ is not used to fund recreation paths) or replaced an old facility where the need was not as great. This was done partly in response to recommendations made by the Bicycle and Pedestrian Task Force, and a recommendation after the FY2009 selection process to review bicycle project proposals for duplicative facilities.¹⁵ At the same time, they chose to fund projects that could take advantage of the opportunity for right-of-way acquisition. In the case of parking decks, staff passed over proposals that failed to incorporate mixed-use development. A supplementary form for parking structures did request information on transit-oriented development uses that would be included in projects, and it has been suggested that the committee consider formalizing that requirement in the next call for projects.¹⁶

2.2.2. Current Program Issues

Despite the fact that CMAQ projects are almost entirely paid for by federal funds, the region has consistently had issues with projects not being implemented, or being completed behind schedule and/or over budget. As of January 2010, there were \$284 million in unobligated (i.e. unspent) funds in the program – a full quarter of the funds the region has received since 1992 – some for projects dating back several years. Looking at annual obligation rates, the implementation issues appear to be getting worse, with just a 24% obligation rate in 2008 and a mere 16% in 2009 (as of January 2010), but expenditures for multi-year projects are all counted towards the year the project was initially programmed, so these rates should improve as projects move forward and use more of their out-year funding.¹⁷ The rate will also improve as projects that are behind schedule are completed or withdrawn. Regardless, the ratios are still distressingly low.

This failure to implement projects raises two concerns. First and foremost, these unspent funds represent a missed opportunity to improve the region's air quality and mitigate congestion. Secondly,

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funds that remain unspent four years after they are appropriated* can 'lapse' and be returned to the Highway Trust Fund. Unobligated balances are also threatened by rescissions – Congressional budget changes that take back unobligated funds.¹⁸ Over the life of the program, CMAP has had over \$177 million in contract authority rescinded by the federal government, which has “saved” the program from having funds lapse when they remain unused for too long. Lapsing and rescissions have the same impact, however, as both reduce the funding available for needed projects. A final concern around unobligated balances is that such numbers do not cast a positive light on local discretionary transportation funding at a time when Congress is preparing to debate the next major transportation bill.¹⁹

Project implementation is recognized as the biggest challenge currently facing the program. CMAP staff are working to implement new “Active Program Management” policies that will, it is hoped, encourage project sponsors to complete their projects in a timely fashion. Those policies:

- require more accurate project applications, including review by a regional planning liaison²⁰
- change programming practices to reflect more realistic project timelines
- more aggressively pull funding from projects that do not meet their deadlines
- build more tracking mechanisms into the program to allow for better, faster enforcement
- require project status updates every 6 months for projects that are programmed in the current fiscal year
- create a secondary list of projects which can be moved into the annual program as funds become available from other projects that have had schedule adjustments or their funds withdrawn, or come in under budget.

Beyond the large unused balance of CMAQ fund, a broader policy issue is the disconnect between the CMAQ program and the regional transportation planning process. The most recent federal review of the region’s transportation planning process (summer 2009) called out the need for the region to act upon the priorities defined in its regional planning processes and to ensure that capital improvement programs – including CMAQ – are working in concert and “advancing agreed upon priorities.”²¹ CMAQ is only a small part of the region’s transportation funding, but it is the primary piece controlled by CMAP. The program tends to be used to fund many small and medium-sized projects around the region, which could encourage local implementation of regional objectives while still focusing on improving air quality.

Finally, there are questions of clarity, and potentially of transparency, raised by the documentation of the criteria that are being used to inform project selection. The program application booklet only lists a subset of the criteria actually being used to judge projects; some of the criteria can be inferred from the spreadsheet of projects used by staff and the Project Selection Committee used during selection (not released until after projects are submitted), while there is a set of issues informing discussions that may only be documented after the fact, if at all. Better clarity as to what types of projects the committee is seeking could help attract better projects. Clarifying the weight given to these different criteria would improve program transparency.

* ‘Appropriation’ is the annual distribution of funds under SAFETEA-LU, by which the actual funds (budget authority) that can be spent each year are made available for CMAQ and other programs. Appropriated funds are then allocated (or apportioned) to the State DOTs. FHWA, *Financing Federal-aid Highways*, 9.

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Given the program issues outlined above, there has been and is a need to change the way the CMAQ program is run at CMAP. Based on the program's issues, the following three objectives should guide future program designs:

1. Improve project implementation
2. Link CMAQ more directly to regional planning efforts
3. Clarify criteria, considerations, and weighting used for project selection

3. Project Selection Process Research

3.1. Methods

This paper's recommendations for changing the CMAQ project selection process are largely drawn from case studies of CMAQ project selection processes in other regions and observations of the current process in the Chicago region. These case studies are meant to draw out best practices for criteria and project selection processes. Case studies are used because there is minimal existing literature that more broadly analyzes 'good' CMAQ (or similar) program design. The difficulty with using case studies is, however, that there is substantial local variation in CMAQ programs, thanks to the program's discretionary nature and the different policy contexts in each region.

An effort was made to look beyond CMAQ for project selection processes, but proved unfruitful. The CMAQ program structure creates a particular set of constraints not found in other programs, namely that projects are not necessarily being selected by the implementing agency (as they would be in many private sector situations), and that CMAP does not know with much specificity the types of projects it will receive each funding round. There are a few examples of non-CMAQ programs with similar structures, but focusing on CMAQ programs also allows for a better sense of the range of approaches possible within current program structure.

The case studies cited in this paper are drawn from previous assessments of the CMAQ program. Three of the regions in those assessments were selected for a more in-depth study (including interviews) to gain more specific insight into how their selection processes work. The in-depth case study regions were selected first because project were being selected by the MPO (alone or in conjunction with other regional entities, like counties) and on the basis of their descriptions in the existing literature. The three case study regions are Pittsburgh, Pennsylvania, selected because the regional government recently redesigned their selection process; Denver, Colorado, selected for the region's well-specified project scoring process; and the San Francisco Bay Area in California, selected for the region's innovative use of CMAQ funds through their Transportation for Livable Communities program. The case study project selection processes are evaluated on the basis of CMAP's program needs, as identified above: successful project implementation, linkages to regional planning efforts, and the types and format of the criteria, considerations, and weights used in project selection.

Research into the project selection process in the Chicago region, described above, relies on program documentation, the author's personal observations of the project selection committee deliberations, and the author's participation in the staff program formulation in the summer of 2009. Further conversations with CMAP staff throughout the winter and spring of 2009-2010 augmented and clarified the author's personal observations and the materials available online.

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3.2. Literature Review

3.2.1. Federal Guidance on Project Selection Processes

Before turning to the literature assessing the CMAQ program, it is useful to first outline what the federal CMAQ guidance requires in a project selection process.

- An assessment of “expected emission reduction benefits” prepared to “better inform the selection of CMAQ projects.”²²
- Projects selected by State DOTs or MPOs “in accordance with metropolitan and/or statewide planning processes.”
- Involvement of state and/or local air quality agencies in the project selection process.
- Project selection process that is “transparent, in writing, and publicly available.”²³
- A process that
 - identifies which groups or agencies are involved in rating projects, and which group or committee makes the final recommendation to the MPO board;
 - “clarif[ies] how projects are rated;” and
 - “clearly identif[ies] the basis for rating projects,” including: emissions benefits, cost effectiveness, which should be a primary consideration, and ancillary factors, such as “congestion relief, greenhouse gas reductions, safety, system preservation, access to opportunity, sustainable development and freight, reduced [single occupant vehicle] reliance, multi-modal benefits”²⁴

3.2.2. Previous National Assessments of CMAQ

There have been two major, national studies of the CMAQ program, prompted by Congressional requests. The first was conducted in 2002 and assessed the first ten years of the program; the second was just completed in 2008 and 2009 as part of SAFETEA-LU.²⁵ In both cases, Congress was largely interested in an assessment of program effectiveness and air quality benefits, but both studies include a discussion of program implementation. Due to the wide variety of approaches to implementing the CMAQ program, those reports rely on a case study approach. In addition to their general findings, those reports furnish case studies that complement (and prompted) the case studies conducted for this paper.

The ten year assessment of CMAQ in 2002 largely focused on evaluating the overall effectiveness of the CMAQ program; identifying effective project selection practices was not a primary objective of that study. The authors do recommend greater regional context specificity, namely that “the agency responsible for CMAQ program selection in each nonattainment area should develop a process by which projects can be identified, selected, and evaluated in the context of the specific air quality and congestion problems of that region.”²⁶

The more recent CMAQ program evaluation focuses more on effective program practices. The Phase I Final Report of the CMAQ Evaluation and Assessment conducted as part of SAFETEA-LU primarily evaluates the congestion and mobility benefits associated with common CMAQ projects. That report also identifies good practices for project analysis and programming and the authors identify three characteristics of effective CMAQ programs:

- “Transparent project solicitation, prioritization, and selection process.
- Standardized approaches to project evaluation and ranking.
- Adaptability in response to evaluations and changing conditions.”²⁷

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The Phase II Final Report, which focuses on effective implementation practices, used these three characteristics as the basis for selecting case studies for further evaluation. The Phase II report authors discuss each characteristic in more detail, drawing on examples from the case studies. Their observations can form the basis of a sort of checklist for good program design.

Transparent project solicitation, prioritization, and selection process

The authors find that transparent selection processes derive in large part from clear statements of program goals and project selection processes that are well documented in forms accessible to the public. In good programs, decision-making processes are “transparent and reliable” so that sponsors and observers can understand why and how projects are selected.²⁸

Standardized approaches to project evaluation and ranking

While project evaluation and ranking approaches were different in each case study, the authors note that the local standardized methodologies shared several common characteristics.

- Quantitative and qualitative measures employed. Common quantitative measures are emissions reductions, trip reductions, changes in vehicle miles traveled (VMT), and cost-effectiveness.²⁹ Qualitative measures are generally less standardized, but often focus on desired project types, certain geographic areas, multimodal system connectivity, and encouraging new project partners.³⁰
- Project evaluation generally incorporates estimates of air quality or congestion benefits, and then uses those estimates to generate a measure of cost-effectiveness. It appears to be fairly common practice to generate cost-effectiveness using total project cost and the kilograms of air pollutant reduced.³¹
- Project selection uses the quantitative and qualitative measures to rank projects, including bonus points for certain types of preferred projects. The preferred project types may evolve over time, in response to local needs.³²

Adaptability in response to evaluations and changing conditions

Agencies have had to adjust their CMAQ programs in response to changing federal priorities in each transportation authorization bill, but many agencies are also conducting their own program assessments to periodically realign their program with regional needs and objectives. Some MPOs (including CMAP) are also conducting, or having project sponsors conduct, post-project evaluations to demonstrate that project benefits are being achieved.³³

3.3. Case Studies

The literature on CMAQ emphasizes the local specificity of each CMAQ program. Thus, while the general program characteristics and common good practices are important to note, it is also informative to look in more detail at how programs are operating in other regions. This section outlines characteristics of the three program case studies conducted for this study. As noted above, these case studies were selected from the existing literature based on their program characteristics. They are evaluated on their effectiveness at addressing the three areas with which CMAP currently has issues. In each of these case studies, the different dynamics of the region heavily influences the design of the program and this unfortunately complicates any direct borrowing of ideas.

3.3.1. Pittsburgh, Pennsylvania

The Southwestern Planning Council (SPC), the MPO for the Pittsburgh region, operates a stand-alone CMAQ program, linked to the biennial Transportation Improvement Program (TIP) update.

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Various portions of this region of 2.4 million people are nonattainment or maintenance areas for different air quality standards, including maintenance for carbon monoxide, moderate nonattainment for the 8-hour ozone standard, and nonattainment for fine particulates (PM_{2.5}).³⁴ Under SAFETEA-LU SPC generally has around \$25 million annually to program (\$100 million over the life of the TIP). Like CMAP, SPC also deals with a number of federal funding sources in its TIP but CMAQ is the only program it directly programs.

SPC developed a new selection process in 2007 for their CMAQ program. As a threshold criterion for CMAQ funding, SPC will only consider projects that are consistent with SAFETEA-LU, the 2035 regional transportation plan, and at least one other local or state planning document. After prescreening projects, the core of the selection process is a weighted project scoring system. Half the score is determined by air quality and cost-benefit factors, similar to the factors considered by CMAP. The other half of the score is determined based on a scorecard filled out by committee members. The scorecard awards points based on priority project types (diesel retrofits, traffic signal improvements, transportation demand management, and commuter bicycle/pedestrian improvements) and nine ancillary factors that focus on

- consistency with and effectiveness at achieving regional planning objectives
- project impacts on congestion, safety, and economic development
- funding levels and sources of funds for the local match
- coordination with other projects (including non-CMAQ funded projects)
- public awareness and outreach
- project readiness

For the ancillary factors, committee members score projects as being “high,” “medium,” or “low,” which correspond to a value of 3, 2, and 1. The program booklet describes general guidelines for high/medium/low scores for each factor. For example, for coordination, “projects that are part of a coordinated package of transportation improvements will be scored as High. Projects with lesser documentation of relation to other projects will be scored as Medium or Low.”³⁵ The scores are multiplied by the weights assigned to each factor (between 5 and 10) and a total score is calculated. The maximum score possible for a project that is also a priority project type (worth an extra 30 points) is 192 points.

Evaluation

- Project implementation. Like CMAP, SPC has struggled with implementation. Policies regarding project delays appear to have had more impact on obligation than the selection process employed. Project deliverability is a selection criterion, though its utility (or the committee’s ability to evaluate it) is unclear.
- Linkages to regional planning processes. SPC explicitly uses CMAQ funds to advance their regional transportation plan. Consistency with the regional plan is a requirement for CMAQ funding and project scoring considers a project’s relative contribution (high, medium, or low) to plan implementation.
- Criteria, considerations, and weighting. SPC has a clearly identified and weighted set of criteria, though the method of determining project performance on each criterion is left somewhat to individual discretion. To address this, projects are scored by multiple committee members and the scores are averaged. Air quality is a significant factor in project scoring,

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accounting for half of the score. SPC staff indicated, however, that while the scores inform project selection, they are not the sole, or necessarily the primary, determinants of project funding. This leaves open the question of how much value the scores actually provide and whether projects are being selected on an objective basis.

3.3.2. Denver, Colorado

The Denver Regional Council of Governments (DRCOG), the Denver region's MPO, receives approximately \$18 million in CMAQ funds annually for 7 nonattainment or maintenance counties with nearly 2.6 million people.³⁶ The Denver region is a maintenance area for carbon monoxide and particulate matter (PM₁₀), and marginal nonattainment for the 8-hour ozone standard.³⁷ The agency selects CMAQ projects as part of the TIP update cycle, along with Surface Transportation Program (STP) and Transportation Enhancement (TE) program funds, which DRCOG also controls. Before conducting general project selection for the TIP, DRCOG first sets aside the funds needed for carryover projects, prior commitments for the regional rail development plan (\$7.5 million per year) and a travel behavior survey, and for four specific congestion management "pools" or programs (\$7 million per year).³⁸ These set-asides account for approximately two-thirds of the CMAQ funds in the TIP. Projects that are eligible for funding under one of the 'off-the-top' funding set-aside programs are not eligible for selection as part of the general TIP project selection process.

For general TIP project selection, DRCOG programs by project category. The general project selection is heavily dependent on a point-based system for ranking projects. Different criteria are applied to each category in order to capture the differing priorities between categories, but scores are generally based on some combination of the following factors and category-specific concerns:

- Current facility usage or current congestion
- Air quality benefit (direct or indirect via vehicle travel reduction)
- Multi-modal connectivity
- Cost-effectiveness
- Local overmatch
- Support for or implementation of the regional transportation plan

The last two criteria are included for all projects; nearly a quarter of the total points are awarded based on a project's ability to advance the regional transportation plan. Scoring is done on an entirely quantitative basis, even for more qualitative factors, and is highly standardized. Projects must score a certain minimum number of points to be considered for funding during project selection.³⁹

Once project scores are calculated, project selection is done in two phases. Up to 75% of all available funding goes to the highest scoring projects in each project category. Funding targets are set for project categories by funding source. CMAQ is used for three categories: air quality improvement projects that do not fall into other categories (priority to diesel retrofits), station area planning activities, and new bus service. The remaining quarter of the funds are programmed by the DRCOG board by balancing the scores with other qualitative considerations, including geographic equity at the county level, as well as the inclusion of projects for very small communities; projects that can be merged to reduce costs; projects located in a strategic corridor; and project readiness. CMAQ funds are used for the same three project categories listed above but with no funding targets, as well as for rail transit projects not included in the regional rail plan funded off-the-top.

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Evaluation

- Project implementation. Based on the communications with agency staff, policies regarding project delays appear to have had more impact on obligation than the selection process employed. The Denver region's program has, like the Chicago region, had problems in the past with obligation rates. Over the last year balances have begun to be drawn down and the agency has recently incorporated more stringent requirements about project delays.⁴⁰
- Linkages to regional planning processes. DRCOG explicitly uses CMAQ and its other funds to directly advance their regional plan. DRCOG incorporates plan implementation into the scores for all project types. Two of the CMAQ-funded categories consider inclusion in the regional transportation plan as a requirement for eligibility.
- Criteria, considerations, and weighting. DRCOG has a very detailed set of criteria that they consider for each project. Project selection is heavily dependent on the scores assigned to each project, most notably in the general project selection portion of the TIP development. Weights are developed at the category level and, except for the same points being given for regional plan-related factors, the weights (points) vary between projects. This program provides an example of how to generate a standardized quantitative score for projects based on both quantitative and qualitative criteria. The level of specificity in the weighting and selection process, however, does raise questions about how much subjectivity might be masked by these numbers.

3.3.3. San Francisco Bay Area, California

The Metropolitan Transportation Commission (MTC), the San Francisco Bay Area's MPO, pools its CMAQ and Surface Transportation Program (STP) funds and uses them for "a comprehensive and multi-modal program," made up of a number of sub-programs.⁴¹ San Francisco has 6.4 million people living in 8 counties that are maintenance for carbon monoxide, and marginal nonattainment for the 8-hour ozone standard.⁴² In FY2010, MTC will program \$155 million for both CMAQ and STP. CMAQ funds are used primarily for the Transportation for Livable Communities (TLC) Program, which helps advance smart growth; the Regional Bicycle and Pedestrian Program; and several regional activities implemented by MTC such as the 511 traveler information system, freeway incident management strategies, and a regional universal fare card. MTC's approach overall appears to give the region relatively more flexibility to align its funding with the regional planning objectives set out in the Regional Transportation Plan.

The TLC program is particularly notable for its innovative use of CMAQ funds to specifically support transit-oriented and infill development that reduces reliance on personal automobiles. The TLC program was originally created in 1998 in response to a 1996 policy calling for better coordination of transportation and land use planning.⁴³ The program has evolved over the years to include planning grants and funding for bicycle, pedestrian, and transit access improvements to support smart growth. There is also a local version of the program that passes CMAQ funds to the counties for programming in accordance with the overall TLC program.⁴⁴ The TLC program also seeks to fund activities, such as a sewer upgrade, that would not normally be eligible for CMAQ funding through a process of fund exchanges in which project sponsors trade other regional or local funds that can be used for those activities for CMAQ funds for use in other areas.⁴⁵

The most recent call for capital projects was released in February 2010. There is \$40 million total in available funding, with a \$6 million maximum for each grant application. While no minimum grant is

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outlined for the TLC program, agency policy suggests a \$500,000 grant for large counties with a population over one million and \$250,000 for small counties. Eligible projects include streetscape improvements, transportation demand management projects, other infrastructure improvements (not transportation) and density incentives.⁴⁶ New to this round of funding, projects must be in a “Priority Development Area” as identified by MTC and its partner regional agencies. These agencies recognize the need to focus the region’s resources in order to make a significant impact in the region. Accompanying this, there has been an effort to reduce considerations of geographic equity in the TLC program. Threshold criteria also require at least a 20% local match (federal requirement) and that any new townhouses built near to transit be accessible to persons with disabilities. Criteria include:

- Project impact, in terms of affordable housing and transportation
- Project readiness
- Innovative parking management strategies
- Greenhouse gas emission reductions
- Accessibility for elderly and disabled users, both for streets and housing
- Local overmatch
- Community engagement and support

MTC has also been extremely effective at ensuring implementation. The agency develops its annual program with the expectation that it will be able to capture a larger share of the state’s CMAQ or STP funds, and as a result, MTC may end up with more projects programmed than it can actually fund in a given year.⁴⁷ Projects that meet program deadlines are given priority to be moved into the Transportation Improvement Program (TIP) and receive funds. This process forces projects to compete for funds by demonstrating progress. Projects not funded in the first round may still get funding that year if there are cost-savings in other projects, or if MTC is able to capture funding from other regions in California who do not obligate in time and have portions of their funds redistributed.⁴⁸ To ensure that projects are completed on schedule, MTC strictly enforces project deadlines, does not allow cost increases, and pulls project funding when projects fail to perform.⁴⁹

Evaluation

- Project implementation. Project implementation has been far less of an issue at MTC than at CMAP or the other case studies. As the other case studies suggested, this appears to be more of a result of policies regarding project implementation than the actual programming criteria. The programming process also appears to play a role, as the agency’s decision to fund up to the expected maximum amount available creates competition for funding and the criteria do factor in project readiness and community engagement and support.
- Linkages to regional planning processes. MTC uses CMAQ to support the programs it develops to implement the regional plan. The projects funded through TLC are meant to support the region’s identified “priority development areas,” which are linked to the regional planning process.
- Criteria, considerations, and weighting. MTC has a clear set of criteria and weights for its TLC program. Some criteria have clear breakdowns into sub-criteria with weights associated, but more have only the general point value for the category and a series of questions that address that criterion. The exact means of allocating points within a category is not clearly stated, making MTC the least explicit of the three cases studies on this point. The evaluations are

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performed by a team assembled for the purpose of evaluation, which the agency feels adds a level of impartiality.

4. Proposed Program Redesign

In light of the current CMAQ program issues and the different approaches highlighted in the case studies, this section outlines possibilities for redesigning the CMAQ selection process in the Chicago region.

The proposed project selection process will have a clearer statement of the criteria and their weights, with some simplification in overall structure. As part of this redesign, CMAP needs to clarify what other objectives it has for the CMAQ program. The modal and other committees/task forces can provide valuable input when determining how best to judge projects within their area of expertise.

There are several structural changes to be made to the program.

1. The call for projects should shift to every two years. This was done in the most recent funding cycle (FY 2010 and 2011) and should be continued if it is successful in freeing up more time for staff to manage the program. As in the latest funding round, project selection should include a list of alternate projects that can be moved into the program as funding becomes available from selected projects.
2. CMAP has already begun to address the failure of project sponsors to complete their projects on time, but the agency may want to consider publishing a list of 'repeat offenders' who fail to spend their CMAQ funds and require stricter guarantees from these sponsors. New sponsors could also be subject to these requirements. The shift to a two-year programming cycle would also allow staff to focus on project implementation.
3. Some committee members have raised concerns about certain categories of projects getting too much funding. To address these, CMAP could institute a maximum percentage of funding that can go to any one project type. This would be a cap, not a guaranteed range of funding. CMAP may also wish to institute a minimum and maximum level of funding for projects, to ensure that the program can fund a variety of projects but still efficiently meet the program's administrative requirements.
4. To more directly implement certain regional objectives, CMAP may consider issuing a 'call for sponsors' to complete certain projects or to advance certain plans, as opposed to the typical call for projects. For example, the Bicycle and Pedestrian Task Force has already recommended that project selection for bicycle and pedestrian projects consider the Regional Greenways and Trails Plan. This plan could be the basis for a future call for CMAP-designated projects. A 'call for sponsors' would only use a portion of the funds, perhaps one to five percent over several years. This reform should start as a pilot project, with enough funds set aside for one or two projects and a short list of possible projects in the first few years.
5. The selection process should be more explicitly revisited on a more regular basis, preferably after each funding round.

Below are a list of the new criteria, how they will be scored, and a sample scorecard. Most of the existing criteria are incorporated into the proposed selection process, but with criteria grouped so as to make it easier to compare projects on the basis of multiple criteria.

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- Screening criteria (pre-scoring)
 - Sponsor obligation rate over the past 4 years (new sponsors exempted): project sponsors with an obligation rate below a certain level (to be determined) would be ineligible for more funding until they spend down their previous balances.
 - Project is of a type that will provide air quality benefit (federal requirement)
 - Resolution guaranteeing commitment of local match should project be selected, or timely withdrawal if funds cannot be committed
 - Current requirements for project sponsors and implementation considerations (e.g. build to federal-aid highway standards)

Scoring: required before scoring occurs

- Air Quality: 50%
 - Cost-effectiveness, for all applicable benefit measures (VOCs, NO_x, PM_{2.5}, daily trips, VMT eliminated)
 - Add greenhouse gas emission reductions, depending on CMAP policy and modeling capacity.

Scoring: For each expected air quality benefit, points would be awarded based on set ranges of cost-effectiveness. For most project types, this would be for some combination (often all) of VOCs, NO_x, trips, and VMT eliminated; diesel emission reduction projects are the only ones for which the PM_{2.5} benefit is calculated. Points would be totaled and then scaled so that the maximum possible value equals 50.

Example calculations of air quality benefit

Project A: bicycle facility project – 4 air quality benefit measures calculated

Project B: diesel emission reduction project – 3 air quality benefit measures calculated

| Measure: \$ per eliminated | Project A: Bicycle Facility | | | Project B: Diesel emission reduction | | | | |
|--------------------------------|-----------------------------|---------------------|----------------------|--------------------------------------|--------------------|---------------------|----------------------|-----------------|
| | Cost-effectiveness | Points ^a | Scaling ^b | Weighted points | Cost-effectiveness | Points ^a | Scaling ^b | Weighted points |
| Kilogram VOC | \$1,133 | 2 | | | \$176 | 3 | | |
| 1000 Trips | \$399 | 3 | | | - | - | | |
| 1000 VMT | \$258 | 3 | | | - | - | | |
| Kilogram NO_x | \$1,453 | 2 | | | \$13 | 3 | | |
| Kilogram PM | - | - | | | \$477 | 3 | | |
| TOTAL | | 10 | (50/12) | 41.7 | | 9 | (50/9) | 50 |

^a Points based on cost-effectiveness: for purposes of illustration, the following ranges are used. Actual recommendation is to use quartiles or another less arbitrary system

\$/measure < \$1,000: 3 points

\$/measure = \$1,000-\$2,000: 2 points

\$/measure > \$2,000: 1 point

^b Scaling factor determined by dividing 50 (grouping total points) by the maximum points available for that project type (12 in the case of a bicycle facility project because it has four measures calculated for it, each worth up to 3 points – 3*4 = 12).

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- Funding: 10%
 - Overmatch by sponsor (CMAQ funds less than 80% of total project cost)
 - *Unscored, but stated in program booklet*
 - Leveraging of other funds (projects are using non-local or non-traditional matching funds, and how many sources are being used to fund the project)
 - For projects with multiple funding sources, whether CMAQ funding would bring a project to full funding, and if all other funds are committed

The committee will need to discuss how favorably to view these other funds, because more outside funds coming into a project reduces the amount of funding that the sponsor needs to commit to the project. Sponsor funds can be seen as a measure of sponsor commitment to the project, but a sponsor actively seeking outside funding also requires commitment.

Scoring: Points awarded based on funding overmatch level. Sample approach:

- ◇ Minimum required local match (generally 20%): 0 points
- ◇ Local match from minimum up to 50%: 5 points
- ◇ Local match over 50%: 10 points

- Program Management: 15%
 - Project is in or consistent with local comprehensive plan(s) and other plans
 - Project readiness – in letter, and verified by appropriate party (planning liaison, Chicago DOT, transit service board)
 - Grouped projects that serve multiple communities; multi-agency and multi-jurisdictional projects given priority (foster regional cooperation)

Scoring: High/Medium/Low score assigned by committee and staff, points scaled appropriately. The determination of which score is appropriate will need to come out of committee discussions and any factors used in this decision should be documented and used to inform future calls for projects and selection discussions

- Regional Plan Implementation: 25%
 - Priority areas or corridors, including supporting existing centers and brownfield/infill/transit-oriented development
 - Connect and support existing networks and infrastructure, as is emphasized in the *Preferred Regional Scenario*⁵⁰
 - Implement regional and sub-regional plans, e.g. *Regional Greenways and Trails Plan* or *Water 2050*⁵¹
 - Impact on non-air quality indicators tracked for *GO TO 2040*, e.g. energy consumption; transit oriented development; land use indicators relating to infill, brownfields, density, and mixed-uses; greenhouse gas emissions (if these emissions are not included in the air quality section)⁵²
 - Incorporate project evaluation and/or outcome monitoring into project. One way to do this is to request ‘before’ and ‘after’ photos of projects (where possible) and then use those to highlight program successes.

Scoring: High/Medium/Low score assigned by committee and staff, points scaled appropriately. Scoring for this category should be carried out in the same fashion as the program management category, because these criteria are similarly qualitative

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Sample project scoring sheet

| Criteria | Score | Instructions |
|---|---|--|
| Air Quality Benefit (50%) | | |
| <ul style="list-style-type: none"> • \$/kg VOC : ____ • \$/kg NOx : ____ • \$/1,000 trips : ____ • \$/1,000 VMT : ____ • \$/kg PM_{2.5} : ____ (all are for amount eliminated) | (1, 2, or 3) (1, 2, or 3) (1, 2, or 3) (1, 2, or 3) +(1, 2, or 3) TOTAL * (50/max score) | Cost-effectiveness ratio: Ratio < \$1,000 : 3 points, Ratio \$1,000 - \$2,000 : 2 points Ratio > \$2,000 : 1 point. |
| Funding (10%) | | |
| Local funding match: ____% of total project cost | (0, 5, or 10 points) | -Minimum required local match: 0 points -Local match up to 50%: 5 points -Local match over 50%: 10 points |
| Program Management (15%) | | |
| -Project is in or consistent with local comprehensive plan(s) and other plans? -Project readiness – in letter, and verified by appropriate party? -Grouped project that serves multiple communities? | (5, 10, or 15 points) | Achievement of category objectives High: 15 points Medium: 10 points Low: 5 points |
| Regional Plan Implementation (25%) | | |
| -Project is in a priority area or corridor? Project supports existing centers and brownfield/ infill/ transit-oriented development? -Connects and supports existing networks and infrastructure? -Implements regional and sub-regional plans? -Impacts non-air quality indicators tracked for GO TO 2040? -Incorporates project evaluation and/or outcome monitoring? | (8, 17, or 25 points) | Achievement of category objectives High: 25 points Medium: 17 points Low: 8 points |
| TOTAL | (maximum = 100) | Total category scores |

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In reporting project rankings, a table that only lists the projects and their scores would not communicate the complexity of factors influencing project evaluation. A more informational format could list the project score and also indicate how well a project meets the four categories. Projects lists could be ranked based on the total score but additional columns would show a high/medium/low score for each category to indicate how well that project does at meeting the category criteria. This reporting form would also hopefully help sponsors and other program observers understand what contributes to a successful CMAQ project. The box below shows an example of how projects could be reported.

| Project Score Reporting | | | | | | | | |
|---|-------------------|---|-------------------------|-------------------------|--------------------------------|---------|--------------------|---------------|
| Current Reporting ^a : | | | | | | | | |
| Project ID | Sponsor | Facility to be Improved | Total Project Cost | Federal Funds Requested | \$ per Kilogram VOC Eliminated | | | |
| BP03103345 | Arlington Heights | Pedestrian Facility - Methodist Park Perimeter Sidewalk | \$145,000 | \$108,000 | \$884 | | | |
| | | | | Unusual CMAQ Share: | 74.5% | | | |
| Proposed Reporting: | | | | | | | | |
| Project ID | Sponsor | Facility to be Improved | Federal Funds Requested | Total Score | Air Quality Benefit | Funding | Program Management | Regional Plan |
| BP03-103345 | Arlington Heights | Pedestrian Facility | \$108,000 | 70 | H | M | M | L |
| ^a CMAP (2009), <i>CMAQ Proposal Ranking by Cost per Kilogram of Volatile Organic Compounds Eliminated, Final - FY 2010</i> , July 9. | | | | | | | | |

5. Conclusion

The Congestion Mitigation and Air Quality Improvement program at the Chicago Metropolitan Agency for Planning is a valuable program that is not currently achieving its full potential. Project implementation is often behind schedule, over budget, or simply does not occur. This hinders the improvement of regional air quality, threatens the agency with the loss of funds, and does not encourage Congress to approve other regional discretionary programs. Moreover, CMAQ programming is not connected to CMAP's regional planning work, despite the fact that CMAQ is CMAP's major discretionary source of funds for capital projects. This is a missed opportunity to advance the regional plan, particularly as the region prepares to adopt a new plan. Finally, the full range of considerations that enter into project selection discussions is only partially documented, making it difficult for projects to be consistently evaluated and for program observers to understand how projects are being selected.

To begin to address these issues, this study recommends a redesign of the CMAQ project selection process in the Chicago region. Based on the program's issues, the following three objectives guide the redesign:

1. Improve project implementation
2. Link CMAQ more directly to regional planning efforts
3. Clarify criteria, considerations, and weighting used for project selection

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The program redesign draws on observations of the current project selection process, national studies of the CMAQ program, and three case studies of other regions' CMAQ programs.

The proposals in this paper are meant as a starting point for CMAP staff, CMAQ Project Selection Committee, and other CMAP committee discussions about future directions for the CMAQ program. The agency and its stakeholders need to come to a consensus about how best to approach the CMAQ program, especially whether it can be used to more directly implement the regional plan once it is adopted this fall. There are also aspects of the program that this proposal has not addressed, particularly how to handle project cost increases, which are fairly common in the Chicago region, and several others noted in the text; the agency will also need to consider these in any program reforms. Those discussions, which this paper will hopefully help prompt, can provide the basis for a final redesign proposal.

Endnotes

¹ Federal Highway Administration (2008), *CMAQ Final Program Guidance*, 3.

² Transportation Research Board (2002), *Special Report 264: The CMAQ Program: Assessing 10 Years of Experience*, 1. At the time of the TRB report, CMAQ was the only program of this type, the 2005 Diesel Emission Reduction Act also targets mobile sector emissions.

³ Grant, et al, 2.

⁴ Ibid, ii.

⁵ State air quality plans refers to the State Implementation Plan (SIP). Federal Highway Administration (2008), *CMAQ Final Program Guidance*, 8.

⁶ Nonattainment counties are Cook, DuPage, Lake, Will, Kane, McHenry, and portions of Kendall and Grundy. FHWA (2005), *CMAQ Weighted Populations by State, Nonattainment or Maintenance Area, and County FY05 and FY06*. As of the 2006 American Community Survey, the population of Illinois was approximate 12.8 million. U.S. Census Bureau (2010), "Illinois Factsheet: 2006 American Community Survey" *American Factfinder*.

⁷ CMAP (2008), *Congestion Mitigation and Air Quality Improvement Program (CMAQ) Fiscal Year 2010 Project Application Information Booklet*, 4-6.

⁸ This is a federal requirement for the CMAQ program. See Federal Highway Administration (2008), *CMAQ Final Program Guidance*, 10.

⁹ The committee is composed of a representative from the counties, the Council of Mayors, the Chicago Department of Transportation, the Illinois Department of Transportation, the Regional Transportation Authority, and the Illinois Environmental Protection Agency

¹⁰ CMAP (2009), *Congestion Mitigation and Air Quality Improvement Program (CMAQ) website*.

¹¹ CMAP (2008), *Congestion Mitigation and Air Quality Improvement Program (CMAQ), Fiscal Year 2010 Project Application Booklet*, 7-12.

¹² Ibid, 1, 2, 4, 12.

¹³ CMAP (2009), *CMAQ Proposal Ranking by Cost per Kilogram of Volatile Organic Compounds Eliminated, Final - FY 2010*, July 9; CMAP (2010) *CMAQ Multi-Year Program for Northeastern Illinois- FY2010, 2011: Approved Program*, January 27; Patronsky (2009) *Memorandum to CMAQ Project Selection Committee regarding Staff Recommendation for FY2 2010 CMAQ Program*, CMAP, Chicago, IL, July 16.

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¹⁴ This list was developed through observation of the CMAQ selection process for FY 2010-2011 during the summer of 2009, and through conversations with CMAP staff.

¹⁵ Tom Murtha (2009) *Memorandum to CMAQ Project Selection Committee regarding CMAQ Bicycle and Pedestrian Programming*, CMAP, Chicago, IL, February 20; Doug Ferguson and Ross Patronsky (2008) *Memorandum to CMAQ Project Selection Committee regarding Recommendations for FY2010 CMAQ Application Cycle*, CMAP, Chicago, IL, October 29.

¹⁶ Ross Patronsky (2009) *Memorandum to CMAQ Project Selection Committee regarding Staff Recommendation for FY 2010 CMAQ Program*, CMAP, Chicago, IL, July 16: 1-2.

¹⁷ CMAP (2010), *Obligation Summary by Fiscal Year*, Internal Document, May 11.

¹⁸ CMAP (2009) *Active Program Management of CMAQ Funds*, Internal Document, July 6.

¹⁹ John Donovan of the Federal Highway Administration speaking at the CMAQ Project Selection Committee, March 25, 2010. See CMAP CMAQ Project Selection Committee (2010), *Draft Meeting Minutes*, March 25, item 5.2 Certification Review.

²⁰ Each of the 11 subregional council of governments in the Chicago region has a Planning Liaison who serves as a link between local governments and CMAP and IDOT.

²¹ Federal Highway Administration and Federal Transit Administration (2010), *Certification Review of the Metropolitan Transportation Planning Process for the Chicago, IL Transportation Management Area*, 30.

²² Federal Highway Administration (2008), *CMAQ Final Program Guidance*, 28.

²³ *Ibid*, 29.

²⁴ *Ibid*.

²⁵ The three reports are:

Transportation Research Board (2002), *Special Report 264: The CMAQ Program: Assessing 10 Years of Experience* (Washington, D.C.: National Academy Press).

Michael Grant, et al (2008), *SAFETEA-LU 1808: CMAQ Evaluation and Assessment, Phase I Final Report* (Washington, D.C.: Federal Highway Administration).

Terrance Regan, Elizabeth Murphy, and Mary Beth Hines (2009) *SAFETEA-LU 1808: CMAQ Evaluation and Assessment, Phase II Final Report* (Washington, D.C.: Federal Highway Administration).

²⁶ TRB, 164.

²⁷ Regan, Murphy, and Hines, 5.

²⁸ *Ibid*, 6.

²⁹ *Ibid*, 8.

³⁰ *Ibid*, 9.

³¹ *Ibid*, 10.

³² *Ibid*, 10.

³³ *Ibid*, 13.

³⁴ Regan, Murphy, and Hines, 52; Attainment Status Designations, *Code of Federal Regulations*, title 40, part 81 (Designation of Areas for Air Quality Planning Purposes), subpart C, section 107 (2010); FHWA (2005), *CMAQ Weighted Populations by State, Nonattainment or Maintenance Area, and County FY05 and FY06*.

³⁵ Southwestern Pennsylvania Commission (SPC), (2009), *Application Instructions: Congestion Mitigation Air Quality Program (CMAQ) for the 2011-2014 Transportation Improvement Program*, 5.

³⁶ FHWA (2005), *CMAQ Weighted Populations by State, Nonattainment or Maintenance Area, and County FY05 and FY06*

³⁷ Regan, Murphy, and Hines, 44; Attainment Status Designations, *Code of Federal Regulations*, title 40, part 81 (Designation of Areas for Air Quality Planning Purposes), subpart C, section 107 (2010).

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³⁸ Regan, Murphy, and Hines, 44-46; Denver Regional Council of Governments (DRCOG) (2008), *Evolution of CMAQ in the Denver Region*, 6-11; DRCOG (2007), *Policy on Transportation Improvement Program (TIP) Preparation: Procedures for preparing the 2008-2013 TIP*, 17-18.

³⁹ DRCOG, *Policy on Transportation Improvement Program (TIP) Preparation: Procedures for preparing the 2008-2013 TIP*, 18.

⁴⁰ Todd Cottrell (Senior Transportation Planner, DRCOG) personal communications with author, April 2010.

⁴¹ MTC (2008), *A Guide to the 2009 Transportation Improvement Program (TIP) for the Nine-County San Francisco Bay Area*, MTC Resolution No. 3875, 26.

⁴² FHWA (2005), *CMAQ Weighted Populations by State, Nonattainment or Maintenance Area, and County FY05 and FY06; Attainment Status Designations, Code of Federal Regulations*, title 40, part 81 (Designation of Areas for Air Quality Planning Purposes), subpart C, section 107 (2010).

⁴³ MTC (2004), *Transportation for Livable Communities Works In Progress*, 4.

⁴⁴ MTC (2008), *Ten Years of TLC: An Evaluation of MTC's Transportation for Livable Communities Program*, 3-5.

⁴⁵ Doug Johnson (Senior Planner, MTC), personal communications with author, November 2009, May 2010.

⁴⁶ The latter two activities require the funding exchanges explained in the earlier paragraph. FOCUS (2010), *Transportation for Livable Communities 2010 Capital Program Regional Call for Projects Application Guidelines*, 2.

⁴⁷ MTC (2008), *Regional Project Funding Delivery Policy for STP and CMAQ Funding*, MTC Resolution No. 3606 (Oakland, Calif: MTC).

⁴⁸ Doug Johnson (Senior Planner, MTC), personal communications with author, November 2009, May 2010.

⁴⁹ Karen Frick (former planner, MTC), interview with author, April 2010.

⁵⁰ CMAP (2010) *Preferred Regional Scenario* (Chicago: CMAP).

⁵¹ CMAP (2009), *Northeastern Illinois Regional Greenways and Trails Plan*; CMAP (2010), *Water 2050: Northeastern Illinois Regional Water Supply/Demand Plan*.

⁵² CMAP (2009), Preliminary Tracking Indicators List, October 14.

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