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# MEMORANDUM

**To:** **Project Selection Committee**

**From:** CMAP Staff

**Date:** June 2014

**Re:** Documentation on methods used for proposed CMAQ scoring process

This spring, CMAP staff made an **initial proposal** for a new project ranking system to use in the Congestion Mitigation and Air Quality Improvement (CMAQ) program that is meant to enhance decision-making with project evaluation that integrates information on a wider range of benefits. In summary, the proposed approach ranks each project using a score from 0 to 100. Of the total, 30 percent of the score comes from "transportation impact criteria" that are specific to the type of project, while 10 percent is based on achieving certain regional priorities outlined in GO TO 2040. The lion's share of the score, 60 percent, is based on the cost-effectiveness of the air emissions reduction associated with the project. Please note that a high or low ranking does not necessarily imply a project will be selected for funding since other considerations, such as project readiness or sponsor capacity, influence actual project selection.

**Comment [JE1]:** As agreed in the CMAQ Programming and Management Policies approved October 2014, air quality cost-effectiveness will be the primary consideration and will be presented side by side with transportation impact and regional priority scores, which will be given secondary consideration. In the program documents, projects will be shown ranked within their eligibility categories.

This memo provides documentation on the proposed scoring process for committee and stakeholder feedback. A spreadsheet is also available on the PSC website that shows how projects considered in the FY14-18 CMAQ cycle would have scored using the new procedure.

## Transportation Impact Criteria

The currently proposed transportation impact criteria and their weights are as follows:

**Comment [JE2]:** County comment -- A "yes/no" or "low/medium/ high" rating should be used to increase flexibility in project selection.

CMAP response – It some ways it would be more challenging and less informative to develop rules for what constitutes a low, medium, or high score. Regardless, the PSC retains the flexibility to select lower-scoring projects over higher-scoring projects.

| **Project type** | **Criteria and Weights** | | |
|---|---|---|---|
| Highway | Reliability<br>15 | Safety<br>10 | On CMP network<br>5 |
| Transit | Ridership<br>15 | Reliability (transit service) or asset condition (transit facilities)<br>15 | |
| Bicycle | Safety & attractiveness<br>10 | Transit accessibility<br>10 | Facility connectivity<br>10 |
| Direct Emissions Reduction | Benefits sensitive population<br>20 | Annual health benefits<br>5 | Improves public fleets<br>5 |

## Highway Projects

### *Travel time reliability score*

This is composed of a quantitative and a qualitative evaluation. The quantitative portion is based on the planning time index (95th percentile travel time divided by free flow travel time) and takes a maximum of **10**. The Planning Time Index is calculated for the project footprint based on speed probe data for 2012 provided by the vendor Midwest Software Solutions (MS2) through an agreement with IDOT. (These data will be updated going forward and will likely be for 2012 and 2013 together in the FY16-20 program evaluation.) The score was calculated based on the percentile shown in the middle column in the table below. Points were assigned for each project as follows:

| Maximum Approach PTI* | Percentile (weighted by distance) | Score |
|---|---|---|
| <= 1.40 | 0 - 50th | 2 |
| 1.41 to 1.81 | 51st to 75th | 4 |
| 1.82 to 2.55 | 76th to 90th | 6 |
| 2.56 to 3.35 | 91st to 95th | 8 |
| 3.36 and greater | >95th | 10 |

* Maximum corridor PTI for signal interconnects and for bottleneck eliminations; maximum intersection leg PTI for intersection improvements.

The qualitative dimension of the score has a maximum of **5** and is developed by determining whether the project has any of the following characteristics or helps implement any of the following as part of a larger program:

| *Systematic Improvements* | Score |
|---|---|
| Integrated Corridor Management | 5 |
| Workzone management (traveler information improvements) | 5 |
| Truck travel information systems | 4 |
| Strategies to improve transit on-time performance | 4 |
| Ramp metering | 4 |
| Road weather management systems | 2 |
| Special event management | 3 |
| Traffic signal interconnect | 4 |
| Adaptive signal control | 5 |
| | |
| *Spot improvements:* | |
| Highway-rail grade separation with more than 10K AADT and more than 10K annual minutes of delay lasting > 10 minutes | 5 |
| Implementation of effective crash reduction strategy (e.g., access management) as part of highway improvement | 3 |
| Highway-rail grade separation in ICC top 20 delay list | 3 |
| Highway-rail grade separation with more than 5K AADT and >5K | 2 |

| | |
|---|---|
| annual minutes of delays lasting > 10 minutes | |
| Other highway-rail grade separation | 1 |
| | |
| *Incident Detection:* | |
| Traffic Management Center (TMC) to TMC Communications | 4 |
| Computer-aided dispatch (911 call center) to (TMC) communications | 4 |
| Extension or improvement of real-time traffic surveillance on regional expressways and tollways, including video and detectors | 3 |
| Integration of real-time probe data into incident detection procedures | 3 |
| Establishment of detector health program | 3 |
| | |
| *Incident Response:* | |
| Expansion of response operations capabilities (e.g., minutemen) | 5 |
| Dispatch improvements, including center-to-operator and supervisor-to-operator communications (including supervisor-bus communications) | 4 |
| Response equipment (e.g., minuteman vehicles) | 4 |
| | |
| *Incident Recovery:* | |
| Expediting coroner's/medical examiner's accident investigation process | 5 |
| Dynamic message signs (DMS, multiple, including arterial DMS) | 3 |
| Incident-responsive ramp meters | 3 |
| Speed Management Systems | 2 |
| On-scene communication, coordination, and cooperation | 2 |
| Development and improvement of highway closure detour routes | 2 |

### *Safety*

Although CMAQ is not a safety program, the project development process will wind up addressing safety deficiencies if they exist. Other things being equal, then, it is more important to fund a project where safety problems are more severe. At its March 2014 meeting, RTOC suggested using the IDOT 5% report locations to score safety. At the time, these data had not been made available, but since then CMAP has acquired them. Thus, the score is simply **10** if the project addresses a 5% location and **0** if it does not.

### *Congestion Management Process highway system.*

The regional Congestion Management Process (CMP) has identified a set of roadways on which it is particularly critical to minimize congestion. The CMP highway network consists of the National Highway System and the **Strategic Regional Arterial** system. The score is **5** if the project is on the CMP and **0** if not.

**Comment [DF3]:** County comment -- Average daily traffic (ADT) should be used to prioritize highways for funding in addition to the CMP network.

CMAP response -- One purpose of the National Highway System and the Strategic Regional Arterial system (the components of the CMP) is to identify priority roadways. If the CMP network does not perform as intended, then an update to the CMP should be considered rather than diluting the priorities it does establish. Lastly, note that the point value (5 points) assigned to the CMP is quite small.

## Direct Emissions Reduction Projects

### *Improving the condition of public fleets*

Given the funding challenges of public agencies and the condition of public fleets, as a matter of policy a project improving public sector vehicles should be a higher priority than one benefitting the private sector. The score is **5** if the project improves publicly owned fleets and **0** if it does not.

### *Annual health benefits*

Annual health benefits are calculated by US EPA's **Diesel Emissions Quantifier** at the county level and divided by annualized project costs. No points are given for a benefit/cost ratio less than $1.00. One point is given for a cost/benefit ratio of $1.00 and one point for each $0.50 above that, with a maximum of **5** points.

### *Benefits to sensitive populations*

Impacts from fine particulate matter emissions may be more pronounced in children and older adults, who are especially susceptible to illnesses caused or exacerbated by exposure to fine particulate matter. Minority and poverty status likely influence susceptibility as well. The sensitive population index shows the relative proportions of persons in a census tract who are over 65, under 5, minority, and low-income. For each of these categories, a tract was given a value from 0 – 4 based on the quintiles of that category in the region (e.g., a tract in the second quintile for population over 65 would receive a value of 2, while one in the fifth quintile would receive a value of 4). For income, a value of 4 was given if the tract median income was below half of the regional median income ($31,140) and 0 if above that level. The data are from the 2010 decennial census.

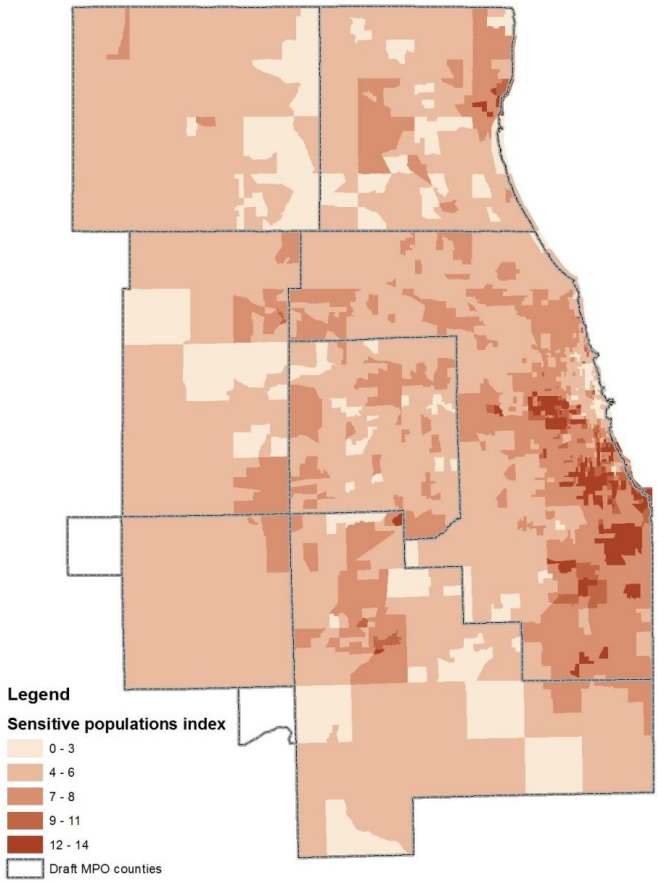
The index is shown in Figure 1. The breakpoints for the census tracts are shown in the table immediately below. Theoretically the maximum value this index could take is 16. However, the highest value actually observed in a census tract is 14.

| **Index value** | **0** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| Percent age over 65 | 0% | 8% | 12% | 18% | 26% |
| Percent age under 5 | 0% | 4% | 6% | 7% | 9% |
| Percent minority | 0% | 12% | 23% | 40% | 66% |
| Income | 4 if median tract income <$31,140; otherwise 0 | | | | |

To score a project, the sensitive population index is then multiplied by an estimate of the population benefiting from the project, the magnitude of the emissions reduction, and the time of exposure. For localized projects, the population within 0.5 miles of the project was used. For transit projects, the service population was used, as it was assumed that the service population would be the most affected by emissions reductions benefits, along with the population within 0.5 miles of the project. Service board customer demographics were compared to the breakpoints in the sensitive population index to derive an index for the transit agencies.

The final project score is assigned on a scale of 0 to **20**. Any project where sensitive population index × population benefitting × magnitude of emissions reduction per operating hour × time of exposure ÷ exposure buffer area is greater than 250 kg per square mile receives one point, with one point for each 250 beyond that, up to a maximum of 20. This planning-level approach provides a simple, reasonable assessment of the level of benefit of a project for sensitive populations in the region.

**Figure 1. Sensitive populations index (2010)**




## Bicycle Facilities

### *Safety and attractiveness rating*

The Bicycle and Pedestrian Task Force has developed a "**safety and attractiveness rating**" that scores the improvement in conditions for walking and biking that result from building a facility. A guide for scoring is shown in the table below. A project score is calculated as (safety and attractiveness rating after project – rating before project) × weight. In this case the weight is 2 so

that the maximum score is **10**. For example, building a protected bike lane along an arterial street with no accommodation currently would take the safety/attractiveness rating from 1 to 5 and earn a score of (5 – 1) × 2 = 8. Ratings and their narrative descriptions are in the table below:

| Narrative description | Rating |
|---|---|
| Impassable barrier for walking and bicycling | 0 |
| Arterial road with no bike/ped accommodation | 1 |
| Arterial road with some bike/ped accommodation, including marked shared lanes, and collector streets with no accommodation; | 2 |
| Low-speed, local streets with no bike/ped accommodation | 3 |
| Unprotected bike lane; local and collector streets with full accommodation | 4 |
| Trail or arterial sidepath, cycletrack, protected bike lane, buffered bike lane | 5 |

### *Connectivity*

At its March 2014 meeting, the Bicycle and Pedestrian Task Force suggested that a measure of connectivity be included in the bikeway project evaluations, and that this measure include either street network connectivity or connectivity to the bikeway system itself. The measure is the greater of either (a) the project's street network connectivity rating, measured with the Pedestrian Environment Factor, or (b) the connectivity of bikeways resulting from the project. This includes all bikeways, not just Regional Greenways and Trails Plan projects. This maximum is then partially weighted by the CMAP land use diversity index, which helps emphasize locations likely to generate short trips between nearby land uses conducive to cycling, to arrive at a final score. The measure is designed to recognize project proposals with substantial connectivity benefits along the full spectrum of rural to urban locations. The score has a maximum value of **10**. The following table shows the assignment of points related to improving bikeway connectivity:

| Project's Bikeway Connectivity Characteristics | Value Assigned |
|---|---|
| Project fills a gap between existing bikeways | 10 |
| Project intersects an existing bikeway | 6 |
| Project extends an existing bikeway | 3 |
| Project is a new isolated bikeway segment. | 0 |

The procedures for calculating the Pedestrian Environment Factor and the Index of Land Use Diversity in the Chicago Region are described in documents linked to the CMAP **Performance Measurement** web pages. Below are samples of how this measure plays out under various scenarios:

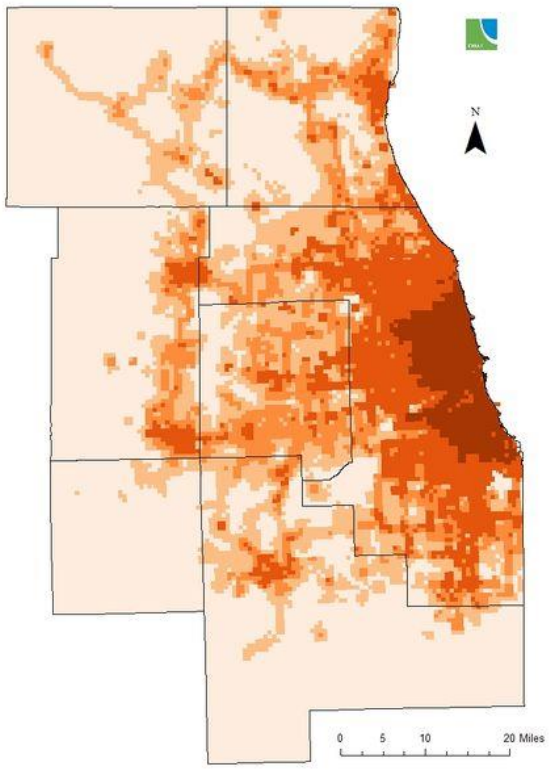
| Column | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Description | Bikeway Connect-ivity | PEF | Greater of PEF or Bikeway Connectivity | Half of Column C | Avg. Land Use Diversity | Score = D × (E + 1) |
| Urban, Isolated Facility | 0 | 9.67 | 9.67 | 4.84 | 0.58 | 7.64 |

| Column | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Urban, Connected Facility | 6 | 7.41 | 7.41 | 3.70 | 0.61 | 5.99 |
| Suburban or Rural, Isolated Facility | 0 | 2.25 | 2.25 | 1.12 | 0.44 | 1.62 |
| Suburban or Rural, Connected Facility | 10 | 1.61 | 10 | 5 | 0.57 | 7.86 |

### *Transit accessibility index*

Measuring transit accessibility helps ensure that a bicycle facility provides a realistic alternative to auto use by evaluating the potential to link bicycling with transit for longer trips. The measure was developed by CMAP for the GO TO 2040 update to provide a uniform measure of transit level of service available across the region during an average week (see map in Figure 2). The maximum score on this measure is **10**. Since the transit accessibility index ranges from 1 – 5, the index is weighted by 2 to produce the score. Accessibility in all the subzones the project intersects is averaged to score the project. A full description of the calculation of the transit accessibility index will be posted in the GO TO 2040 Update Appendices.

**Figure 2. Transit accessibility index (2010).**




**Comment [DF4]:** RTA comment – noted concern with "Awarding points for projects in locations with a high transit accessibility index (which penalizes projects that are intended to improve transit accessibility)."

CMAP response – The transit accessibility index is proposed to be used only to score bicycle projects.

RTA comment – "For anything related to transit accessibility index (whether for a transit or bike project), I would recommend a similar nuanced approach (like the travel time reliability score) where you consider both the existing condition and the ability of a project to improve the index."

CMAP response – A bike project cannot change the transit accessibility index (as currently conceived) and the index is not proposed for use in scoring transit projects. But we agree with that, outside of CMAQ scoring, it would be good to be able to show how a given project would change the transit accessibility index. We hope to develop a technique to do that in the near future.

| Color Code | Index Value | Subzone count | Share of Regional Population | Share of Regional Employment | Transit Access Level |
|---|---|---|---|---|---|
| | 1 | 8,850 | 7.3% | 5.4% | Low |
| | 2 | 3,242 | 20.1% | 16.2% | Moderately Low |
| | 3 | 1,874 | 16.3% | 20.2% | Moderate |
| | 4 | 1,851 | 29.7% | 30.3% | Moderately High |
| | 5 | 626 | 26.6% | 28.0% | High |

## Transit Projects

### *Ridership increase*

First-year ridership estimates from the FY10-14, FY12-16, and FY14-18 programs that were provided by applicants or calculated by staff were combined into one dataset. The quintiles were calculated and used to define the scoring system with a maximum score of **15**.

| Ridership | Percentile | Score |
|---|---|---|
| <254 | 0 – 20th | 3 |
| 255 - 436 | 21 - 40th | 6 |
| 437 - 1,002 | 41 – 60th | 9 |
| 1,002 - 1,829 | 61 – 80th | 12 |
| >1,830 | >80th | 15 |

### *Travel time reliability score*

The travel time reliability score is composed of a quantitative measure of on-time performance (OTP) on the particular route with a qualitative evaluation of the project's impact on reliability. The travel time reliability criterion only applies to transit service and equipment. It takes a maximum of **15**, with 7.5 points coming from the quantitative measure. Only Pace has supplied system-wide on-time performance data so far. Staff anticipates asking for the route-level OTP on the CMAQ application form.

| On-time performance | Score |
|---|---|
| < 60% | 7.5 |
| 60% - 70% | 6.0 |
| 70% - 80% | 4.5 |
| 80% - 90% | 3.0 |
| >90% | 0 |

The qualitative element of the score is based on the presence of the reliability-enhancing features in the table below. Projects can receive up to 7.5 points in this area. As with highway scoring, this qualitative method should be replaced as better technical tools for estimating changes to OTP are developed.

**Comment [DF5]:** Pace comment – "Evaluation criteria is not supportive of Transportation Demand Management strategies including vanpool and rideshare programs which have proven air quality and congestion reduction benefits."

CMAP response – Vanpool and rideshare would be scored solely on their air quality benefits (as "other" projects). Ideally, other transportation impact criteria should eventually be developed for TDM projects.

**Comment [DF6]:** Pace suggested that ridership is not as good a measure as passenger miles traveled (PMT). CMAP compared the transit projects submitted in the last three CMAQ cycles and found that the 10th, 20th, 30th… 95th percentile values are closely correlated for both ridership and PMT. Since the ridership points are assigned based on percentiles, it does not appear that using PMT would alter project priorities.

**Comment [DF7]:** Pace comment – "With travel time reliability, the proposal should consider not only current on-time performance (OTP) but the optimal speed if improvements were made. For example, additional operating time has been added to many transit schedules to improve on-time performance reflecting the actual travel time vs desired optimal time if delays are reduced. The schedule may 'accommodate' delays for customer satisfaction and reliability, shows an improved OTP yet is actually slower."

CMAP response -- A simple way of measuring travel time reliability and reliability improvements is needed. To date we have not heard an alternative recommendation from PSC members. Transit speed improvement might also be an appropriate measure, but it is not clear that proper estimates will be available at the time the applications are received.

| *Rail* | **Score** |
|---|---|
| New Vehicles | 1.25 |
| Upgraded Switches | 1.25 |
| Upgraded Power Supply | 1.25 |
| Positive Train Control | 1.25 |
| Station Consolidation | 1.25 |
| Track Improvements | 2.50 |
| Reduction of Freight/Vehicle/Pedestrian Interference | 3.75 |
| | |
| *Bus* | |
| New Vehicles | 1.25 |
| Queue Jump/Bypass Lanes | 1.25 |
| Off-board Fare Collection | 1.25 |
| Reduced Stops/Express Service | 1.50 |
| New Dispatching/Decision Support Systems | 1.25 |
| Passenger Vehicle Movement Restrictions | 1.25 |
| Transit signal priority | 3.00 |
| Multi-Door Boarding with Off-board Fare Collection | 2.50 |
| Bus-on-Shoulders | 4.00 |
| Managed Lanes | 5.00 |
| Dedicated Bus Way | 7.50 |
| Far-side Stops | 1.25 |
| Bus Stop Upgrades | 1.25 |
| Near Level Boarding | 3.00 |

For new service, an upgrade to conventional fixed route service will take a score based on the OTP of the local service on the route plus a qualitative score based on the reliability-enhancing features of the project. For example, a "basic" arterial rapid transit project along a route where the local service is 65% on-time would get a score of 6.0 based on OTP + 1.25 for reduced stops + 2.5 for transit signal priority = 9.75. New vehicle purchases for service anywhere in the system would receive a quantitative score based on the system average.

### *Existing asset condition*

Other things being equal, it is more important to fund a transit facility or purchase new equipment where these assets are in worse condition. The Regional Transportation Authority's data will be used to define asset condition. Condition is rated based on a 1 – 5 scale, and project sponsors will be asked to provide that rating on the CMAQ application. This criterion would only apply to transit facilities. Entirely new facilities will receive a score of **0**. *For the purpose of rescoring the FY14-18 program, asset condition was rated based on staff judgment since the RTA asset condition data were not available.*

| **Narrative description** | **Rating** |
|---|---|
| Excellent/Does not currently exist | 0 |
| Good | 3.75 |



**Comment [DF8]:** Pace recommendation

**Deleted:** 2

**Comment [DF9]:** Pace recommendation

**Deleted:** 2.50

**Comment [DF10]:** Pace recommendation

**Comment [DF11]:** Pace comment – "How is this calculated? Does it factor different vehicle types, markets served?"

CMAP response – The systemwide average on-time performance would be provided by the sponsor, and this would be for all fixed routes. It does not factor in the type of market served.

**Comment [DF12]:** Pace comment – "The recommendation does not support new improvements in areas where prior investment was not deemed a priority or reflective of changing travel patterns, market conditions and new congestion thus maintaining the status quo. As proposed all 'new' projects receive a 0 rating. The proposed method works against new or modernized facilities/improvements such as transit facilities, Bus on Shoulders, Bus Rapid Transit projects especially in new/under invested market areas and will continue to worsen without intervention. Propose ranking new facilities/improvements same number of points as assets in poor condition (15 rather than zero points)."

CMAP response: Although there is a perceived risk that new service and facilities will be at a disadvantage in the proposed system, note that new facilities tend to score better on air quality cost-effectiveness than projects that modernize existing facilities. Over the last three CMAQ cycles, new transit facilities had an average cost-effectiveness of $1,858/kg, while projects modernizing existing facilities had an average cost-effectiveness of $5,365/kg. Thus, the use of asset condition actually tends to offset somewhat the advantage that new facilities have. Furthermore, asset condition is only used to score transit facilities. Projects like BRT/ART would be processed as transit service.

RTA comment: "Alternatively, you could develop a more nuanced approach like you did for the travel time reliability score – where you consider both the existing reliability and the ability of the proposed project to improve the reliability."

CMAP response -- This would be attractive, however for asset condition the improvement is expected to always be to a new or "excellent" condition, so the analogy with the way reliability was handled may not hold.

| Narrative description | Rating |
|---|---|
| Adequate | 7.50 |
| Marginal | 11.25 |
| Poor | 15 |

### Other Projects

Some projects may not fit neatly into any of the categories above, and the CMAQ program at CMAP has an "Other Projects" submission form to accommodate these funding requests. For these projects, no transportation impact criteria would be used. Instead, the cost-effectiveness of emissions reduction would count for 90 points rather than 60. Project sponsors will be encouraged to discuss their proposals with CMAP staff before submission to ensure that they are best handled as "Other Projects."

## Air Quality Cost-Effectiveness

Air quality cost-effectiveness is measured as either the cost per kilogram of volatile organic compounds (VOC) reduced or the cost per kilogram of fine particulate matter (PM2.5) reduced. In order to compare the opportunity costs of projects that have unequal lifespans, cost-effectiveness values were annualized according to the formula:

$$\text{Cost-effectiveness} = \frac{\text{Project cost} \times \frac{i}{1-(1+i)^{-n}}}{\text{Annual emissions reduction}}$$

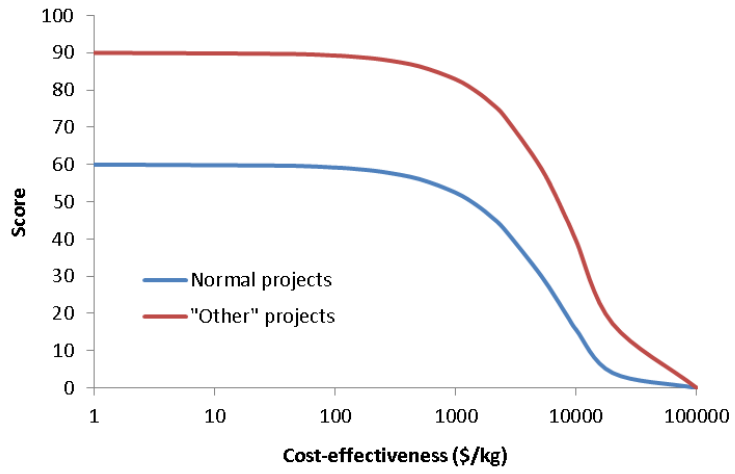
The last term in the numerator is the capital recovery factor, where $i$ = discount rate and $n$ = the useful life of the project in years as reported by project sponsors. A discount rate of 3% was used, in line with typical U.S. Environmental Protection Agency practice.

After annualizing, cost-effectiveness was converted to a point value between 0 and 60 (except for projects classified as "other," for which the range was 0 to 90 points). Because projects submitted for funding under CMAQ show a very wide range in cost-effectiveness values, the distribution of project cost-effectiveness is skewed well to the right. In the FY14-18 program, the median cost-effectiveness was $5,150 per kilogram VOC reduced while the average was $43,500. Cost-effectiveness ranged from $40 to over $1 million per kilogram VOC eliminated. Projects in the upper part of this range cannot realistically be considered to have air quality benefits. Given this skew and the need to have better separation between projects in the lower part of the range, it would not be appropriate to rescale the cost-effectiveness range linearly. Instead, a simple non-linear approach to rescaling was used in which:

$$\text{Project score} = \text{Maximum score} \times \exp(-k \times \text{cost-effectiveness})$$

The maximum score is 60 for most projects and 90 for "other" projects. The parameter $k$ was set so that the middle score of 30 corresponds to the median cost-effectiveness in the FY 14-18 program. This scoring approach preserves variation in cost-effectiveness values while reflecting professional judgment about what constitutes a cost-effective project. It can be seen in the graph

below that the score is most sensitive to changes in cost-effectiveness between about $1,000 and $10,000 /kg, which is in fact the range demarcating projects that perform reasonably well on cost and those that do not. Lastly, the same approach was used for direct emissions projects, only using the cost-effectiveness of PM2.5 removal.




## Regional Priorities

### *Components of GO TO 2040 major capital projects*

Projects that implement elements of GO TO 2040 major capital projects are given **10** points. In the FY 14 – 18 program, the following projects were eligible:

| | | |
|---|---|---|
| Intersection Improvement | II03143988 | Elmhurst Rd and Touhy Av/IL 72 |
| Intersection Improvement | II08143971 | ElginO'Hare Expy/Thorndale Av and Park Blv Interchange, incl. Arlington Hts. Rd Interchange |
| Bottleneck Elimination | BE03143991 | Touhy Av and UPRR |
| Transit Service and Equipment | TI13143920 | I90 Corridor Transit Access Improvement Project |
| Transit Facility Improvement | TI01143897 | Union Station Transportation Center |
| Intersection Improvement | II08143970 | ElginO'Hare/Thorndale Av and I290 Interchange |
| Intersection Improvement | II08143977 | ElginO'Hare/Thorndale Av and IL 83 Interchange |
| Intersection Improvement | II08143976 | ElginO'Hare/Thorndale Av and Wood Dale Rd Interchange |

**Comment [DF13]:** Pace comment – "It is unlikely several project classifications such as the Direct Emissions Reduction Projects, new vehicles and transit facilities can achieve this category. Very few transit projects are in the major capital or parking management/pricing. What is the merit of a category if projects are not eligible? This issue was discussed in several working group meetings earlier this year with suggestions to increase the air quality percentages and reduce or eliminate the regional priority percentage amount."

CMAP response – It is true that relatively few projects can qualify as regional priorities, but this is intended to support very specific projects under GO TO 2040. A number projects were eligible under GO TO 2040 priorities in the last CMAQ cycle. Also, the recommended weighting has already been adjusted from 50% air quality and 20% regional priority to 60% air quality and 10% regional priority.

### *Parking management, including parking pricing*

Sponsors would submit this project via the "Other Projects" form. CMAQ projects that implement parking management strategies would be given **10** points. No projects were submitted in the FY 14-18 cycle that would fit this category.

### *Geographic targeting of funds*

GO TO 2040 recommends establishing a geographically-targeted infrastructure funding source. CMAP is currently researching options for geographic targeting of infrastructure investment. This approach will not be ready in time for the upcoming FY 16 – 20 CMAQ cycle, and this category was not scored in the FY 14-18 reevaluation.

### *Transit-supportive land use*

The viability of transit is closely connected to land use and neighborhood design, and so a major priority of GO TO 2040 is to encourage land use patterns that support transit. While the CMAQ program can fund a variety of transit improvements, not all potential work types have a particular nexus to land use. For example, transit vehicle improvements, signal priority systems, queue jumps, traveler information systems, and marketing initiatives are unlikely to have much impact on development, or vice versa. These are valuable enhancements that will increase ridership through improved speed and reliability of service, but have little bearing on land use.

Rather, the proposed scoring for transit-supportive land use is applicable to other GO TO 2040 priorities such as bus rapid transit (BRT) station improvements and rail station improvements; these work types hold the highest potential for supporting transit-oriented development. Major master-planned redevelopment projects conducted in tandem with transit improvements (past examples include Prairie Crossing in Grayslake and The Glen in Glenview) could also be considered regional priorities, although these projects should be evaluated on a case-by-case basis.

GO TO 2040 offers numerous recommendations to encourage local governments to better link transit, land use, and housing. As CMAP promotes the implementation of GO TO 2040, it is important to underscore the *adoption* of preferred policies. This scoring proposal is designed to reflect current zoning codes, serving as an incentive for local communities to implement transit-supportive land use policies and regulations. As such, it will require project sponsors to provide additional supporting information on adopted zoning codes in the project area.

The scoring system has three main components for transit-supportive land use, as identified in academic research:[1]

- *Density* – Denser development in the vicinity of a transit stop supports higher ridership.

**Comment [DF14]:** Pace comment – "Transit supportive land use may assist with BRT/ART and corridor projects however the scoring methodology is focused on existing higher density (primarily rail) not those that can develop or shape the future development and land use. We are penalizing projects that are intended to improve accessibility, regional mobility and transit supportive land use at a time we should be encouraging such concepts in the region as outlined in GOTO 2040. By not supporting projects which can shape the future access, mobility land use and improvements in air quality and reduced congestion, we are only propelling these issues into the future when it will most likely be cost prohibitive if even possible to correct."

CMAP response -- The scoring methodology focuses on permitted density, as read from zoning codes, rather than existing density. We are trying to encourage transit-supportive land use. By using permitted density the measure will encourage projects in communities that allow for increased densities in existing or proposed transit corridors. This can support BRT as well as rail.

[1] Robert Cervero and Kara Kockelman, 1997. Travel demand and the 3Ds: Density, diversity, and design. *Transportation Research Part D* 2 (3), 199-219.

- *Diversity* – A mix of land allows transit to serve a larger variety of trip types across more periods of the day.
- *Design* – Stations and surrounding development should be integrated to allow convenient access to transit.

In addition, much research has highlighted the importance of distance to the transit station on ridership.[2] The proposed scoring system looks at measures of density, design, and diversity within one-half mile of transit, consistent with planning practices at the Regional Transportation Authority.

Scoring is as follows:

<table>
<tr><th></th><th>Max Score</th><th>Criteria</th></tr>
<tr><td>Density</td><td>5</td><td>Up to 3 points will be awarded based on the permitted density for residential and non-residential land uses within one-half mile of the transit station. If more than one residential or non-residential classification is zoned within the station area, points will be assigned to the classification with the highest permitted density.<br><br>Points will be assessed based on both residential and non-residential densities. If the two categories yield different point totals, the average of the two point totals will be awarded.<br><br>Permitted Densities:
<table>
<tr><th>Residential (DU/buildable acre)</th><th>Non-Residential (FAR)</th><th>Points</th></tr>
<tr><td>< 6</td><td>≤ 1.0</td><td>0</td></tr>
<tr><td>> 6 and ≤ 10</td><td>> 1.0 and ≤ 2.0</td><td>0.5</td></tr>
<tr><td>> 10 and ≤ 16</td><td>> 2.0 and ≤ 3.0</td><td>1.0</td></tr>
<tr><td>> 16 and ≤ 24</td><td>> 3.0 and ≤ 4.0</td><td>2.0</td></tr>
<tr><td>> 24</td><td>> 4.0</td><td>3.0</td></tr>
</table>
AND<br><br>Up to 2 points will be awarded based on innovative parking requirements, which supports denser development by increasing space available for other uses (one point for each strategy implemented):<br><br>• Reduced minimum parking requirements<br>• Enacted maximum parking requirements<br>• Shared parking permitted<br>• In-lieu parking fees permitted<br>• Enacted bicycle parking requirements</td></tr>
</table>

[2] Reid Ewing and Robert Cervero, 2010. Travel and the Built Environment: A Meta-Analysis. *Journal of the American Planning Association* 76 (3), 265-294.

| | | |
|---|---|---|
| | | • Off-street parking is required behind or underneath buildings<br>• Off-street parking is permitted off-site |
| Diversity | 2.5 | Up to 5 points will be awarded for the **presence of mixed-use zoning** within one-half mile of transit project (2.5 points for each strategy implemented):<br><br>• Zoning allows vertical mixing of uses (e.g., residential units above ground-level retail or office).<br>• Zoning allows pedestrian-friendly diverse land uses (e.g., drugstores, groceries, dry cleaning, banks, restaurants, gyms, hardware stores, libraries, etc.).<br>• Zoning excludes car-dependent land uses (e.g., drive-through stores, strip malls, etc.).<br><br>Communities that have implemented form-based codes may require additional qualitative analysis from CMAP staff to ensure their zoning meets the above standards. |
| Design | 2.5 | Up to 2.5 points will be awarded based on pedestrian-friendly designs currently implemented within one-half mile of transit station (one point for each strategy implemented):<br><br>• Continuous sidewalks on both sides of street<br>• Short block lengths/high intersection density<br>• Marked pedestrian crosswalks<br>• ADA accessibility features (curb ramps, truncated dome mats, accessible pedestrian signals, etc.)<br>• Enhanced pedestrian crossing strategies (in-road "Stop for Pedestrians" signs, pedestrian refuges, signals and timers, etc.)<br>• Traffic calming strategies (bump-outs, road diets, speed bumps, neighborhood traffic circles, chicanes, etc.)<br>• Lighting, street furniture, and streetscape beautification<br>• Zoning requires building facades to be located close to sidewalks |

In the rescored FY 14-18 program, the following transit facility projects receive points under this criterion:

| | Density | | | | |
|---|---|---|---|---|---|
| Description | Permitted Densities | Parking | Diversity | Design | Total |
| Monroe Station Reconstruction CTA Red Line | 3.5 | 1.5 | 2.5 | 2.5 | *10* |
| State/Lake Reconstruction - CTA Loop Elevated | 3.5 | 1.5 | 2.5 | 2.5 | *10* |
| Union Station Transportation Center* | N/A | N/A | N/A | N/A | N/A |
| Washington/Wabash Station on Loop Elevated to replace Randolph/Wabah and Madison/Wabash | 3.5 | 1.5 | 2.5 | 2.5 | *10* |
| Maywood Train Station Facility | 1.5 | 0.5 | 1.0 | 1.5 | *5* |

| | | | | | |
|---|---|---|---|---|---|
| Randall Rd Transit Infrastructure Improvements | 0.5 | 0 | 0 | 0.5 | *1* |
| Regionwide Transit Access Improvements | 1.0 | 0.5 | 0.5 | 1.0 | *3* |
| Pedestrian Infrastructure Improvements: Pace Bus Routes 350, 352, 364, 572, 529, 381, 395, 877, 888** | N/A | N/A | N/A | N/A | N/A |

* Received priority as a component of a GO TO 2040 major capital project. ** Challenging to score because of multiple routes and jurisdictions; also unlikely to have major land use impacts.