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MEMORANDUM

To: Transportation Committee

Date: October 16, 2009

From: Joy Schaad, PE

Re: Financial Plan for *GO TO 2040 (*Transportation Expenditures*)*

For *GO TO 2040*, CMAP will estimate the cost of the transportation program associated with the preferred scenario. The projected costs will be organized into three categories:

1. Major capital project expansions and additions
2. Systematic enhancements/improvements
3. Maintenance and operations of the transportation system (further broken down between maintaining the system at a level that is safe and adequate vs. bringing it to a state of good repair)

The total of transportation expenditures in these three categories must be constrained by the predicted amount of future funding (core revenue and "reasonably expected" revenue) as the CMAP staff memo of September 10, 2009 on forecasting transportation revenue explained. Also, as federal planning regulations require, the estimates of the cost will be inflated to the "year of expenditure", rather than shown in constant dollars.

The focus of this memo is on maintenance and operations; the regional costs of the other two funding categories will be developed in the coming months. The purpose of this document is to provide preliminary data on maintenance costs and operating costs to provide a sense of the scale of costs relative to initial estimates of core revenues. The data cited has not been fully vetted by the affected agencies and is subject to change. Better transit data will be forthcoming in the coming weeks and months as the RTA is scheduled to release a draft 10-year business plan in November as well as preliminary findings from their "*Asset Condition Assessment*" at the end of the year.

Levels of Maintenance (safe and adequate vs. state of good repair)

Because maintenance can be performed on a more aggressive or less aggressive basis, we have made the distinction between maintaining our region's transportation system at the "safe and adequate" (S&A) level and to a "state of good repair" (SGR) level. Safe and adequate is characterized as performing sufficient maintenance to assure the safety of the system's users and

the general public, but will result in a backlog of facilities that are in fair or poor condition at any given time. In this application, it was assumed that the region's transportation network would remain in roughly the same condition in 2040 as it is today.

Performing maintenance at levels necessary to assure a "state of good repair" would mean that the facilities and equipment that are not in good or better condition would be brought up to that level and from there on out maintenance would be scheduled and performed on the recommended timing or triggering criteria – so that no significant backlog would arise. No capacity additions are assumed in either of the maintenance categories.

Approach to estimating highway maintenance and operations costs

The region is estimated to have 3,233 lane miles of expressway, 18,719 lane miles of arterial and collector roads (6,955 centerline miles); 17,781 miles of local roads, 311 interchanges, 3,281 bridges, and 7,732 signalized intersections. Basic maintenance such as resurfacing, bridge deck overlays and signal modernization is required to maintain a safe and adequate system for all users. Many facilities will require major reconstruction, rehabilitation or replacement at some point over the next thirty years. For highway costs CMAP staff has consulted with various agencies such as IDOT, the Toll Highway Authority, and county and municipal governments to collect typical costs, i.e. "unit costs" and useful life/maintenance cycles for these types of activities. CMAP has compiled information on*:*

- Resurfacing and reconstruction of expressways, arterial and collector roads, and local and unclassified roads.
- Bridge deck overlays, deck replacements, and major bridge rehabilitation or replacement.
- Traffic signal retiming and signal modernization.
- Associated engineering studies for the above

Based upon these estimates, CMAP staff has constructed an estimate of the maintenance cost category for the 30-year planning cycle. To calculate maintenance cost we multiplied costs of these typical work types by the magnitude of work involved. The magnitude of work consists of factors for both the size of the given system and the frequency requirement that each work type must be performed. The period or frequency of each work type varies for the type of facility. The resultant 30-year costs were broken out into even 1 year increments and then factors for construction cost increases were applied to each year in order to provide "year of expenditure" estimates, as required by federal planning regulations, and then combined into 5-year increments for ease in review.

The cost of administration and operations for the various agencies and levels of government that are responsible for roadway maintenance was also estimated, based on extrapolation of expenditures from recent years. Also, please note that maintenance of bicycle and pedestrian facilities within the right-of-way of roadways is included within these cost estimates.

Initial findings on highway maintenance and operations costs

The resultant 30-year "year of expenditure" costs are $208.0 billion for maintaining the northeast Illinois region's roadway system to a safe and adequate level (basically the same level as today) and would cost $232.3 billion to maintain at a state of good repair. The difference represents the cost of improving the residual roadways that are estimated to be left in the fair or poor condition (10% of total mileage) in the safe and adequate model and the bridges that are estimated to have surface conditions left in fair to poor condition (7% of total bridge surface area) and then continuing to maintain all the region's roadways and bridges in a good to excellent condition. In other words, this eliminates the "backlog" of facilities that are not currently in good or excellent condition. Further, the state of good repair costs for traffic signals included timing "optimization" rather than routine timing adjustments and signal modernization on a more frequent basis.

The preliminary estimate for the operations of the agencies that are responsible for maintaining and operating the region's roadways is predicted at a 30-year total of $56.8 billion. The chart on the last page of this memo shows the costs in 5-year increments and provides the September 2009 core revenue estimates for reference.

Approach to estimating transit maintenance and operations costs

The region is estimated to have nearly 1,500 miles of passenger rail track, over 6,000 transit and rail vehicles (rolling stock), and 332 passenger stations. Much of the system is old and will require significant reconstruction or rehabilitation work at some point during the *GO TO 2040* planning period. For transit costs, CMAP staff has consulted with the RTA and the transit service boards to collect unit costs and maintenance cycles for these types of activities. CMAP collected information on*:*

- Replacing and rehabilitating rolling stock.
- Maintenance of transit passenger facilities.
- Maintaining transit signals, electrical, and communications.
- Maintaining track and bridges.
- Maintenance of equipment maintenance garages and storage facilities.

However, in further consultation with the RTA and the service boards it was determined that in the case of the transit system, the actual condition of the equipment and facilities is critical to the making planning level estimates and that using an assumption of average condition would be misleading. The RTA is currently working with the three service boards to undertake a major project to determine the volume, age and condition of the region's transit assets. Within the RTA's *Asset Condition Assessment* study, the costs to bring the system into a "state of good repair" and to then keep the system at that level will be developed. That information is scheduled to be available by the end of the year and it is hoped that some preliminary information will be available in November.

Also the RTA, working with the service boards, is undertaking development of a 10-year business plan to estimate the costs of the operating and maintaining the region's transit system for the years 2010 through 2019. That information is expected to be out for review shortly and is

anticipated to be refined and approved by the service boards in November. This will provide important information to assess the costs to operate and maintain the transit system at the safe and adequate level.

For the current preliminary estimate of cost, we used the 2006 published "*Moving Beyond Congestion*" strategic plan where the RTA identified 30-year costs for three categories: Maintenance, Enhancement and Expansion of the system. The transit agencies have asked that we wait until the 10-year business plan is available to make the 30-year estimate of operations costs.

Initial findings on transit maintenance and operations costs

Based on *Moving Beyond Congestion* estimates of maintenance, with a conversion to year of expenditure, the 30-year cost is approximately $57.0 billion. The chart on the last page of this memo shows the costs in 5-year increments and provides the September 2009 core revenue estimates for reference. The cost of transit operations will be included in the next iteration of this memo.

Further discussion of trends and issues

Historical construction cost trends

The American Road and Transportation Builders Association (ARTBA) publishes "Highway Construction Producer Prices" and Engineering News Record (ENR) magazine publishes the Annual Consumer Construction Index for Chicago and the U.S. ARTBA's US trends from January 2002 to January 2009, show as steady rise until a peak in 2008 and ENR's US and Chicago trends December 1990 to May of 2009 show a similar pattern, but also include the drop off from summer 2008 to summer 2009.

It is believed at the positive national and worldwide economic conditions experienced in 2002 through 2008 and resultant building boom drove up both labor and material costs for the construction industry. For instance, steel used for reinforcement in concrete pavements peaked in the first half of 2008 and rose from a cost of approximately $600/ton to $1,100/ton. Concrete and to a lesser degree, asphalt were also affected by the national trends and global demand. The cost of most of the materials used in roadway construction, as well as the fuel used at plants and in the heavy equipment on site rises with the rise in petroleum costs which peaked in summer 2008 at over double the average cost in 2007 and 2009. Further analysis of historical construction cost trends nationally was contained in the July 24, 2009 staff memo on the approach to transportation expenditures within the financial plan.

Chicago construction costs are believed to have spiked further due to a steady influx of greater than normal roadway construction volume locally, due to the Tollway Authority's multi- billion dollar "*Open Roads for a Better Tomorrow*" program which put work out to bid on the order of $320 m, $880 m, $830 m, $860 m, and $850 m for the years 2004 through 2008, respectively. Construction bids tend to come in low when there is a dearth of construction activity and rise

when there is an abundance of work. For 2009 the amount of new Tollway work has dropped to $100 million.

Chicago has experienced a significantly higher rate of cost increases since 1990 than the US in general, which is likely due in part to market conditions and labor costs here. Whether this trend will continue is difficult to predict, but we assume that cost increases over time will begin to more closely reflect national trends.

Future construction cost trends

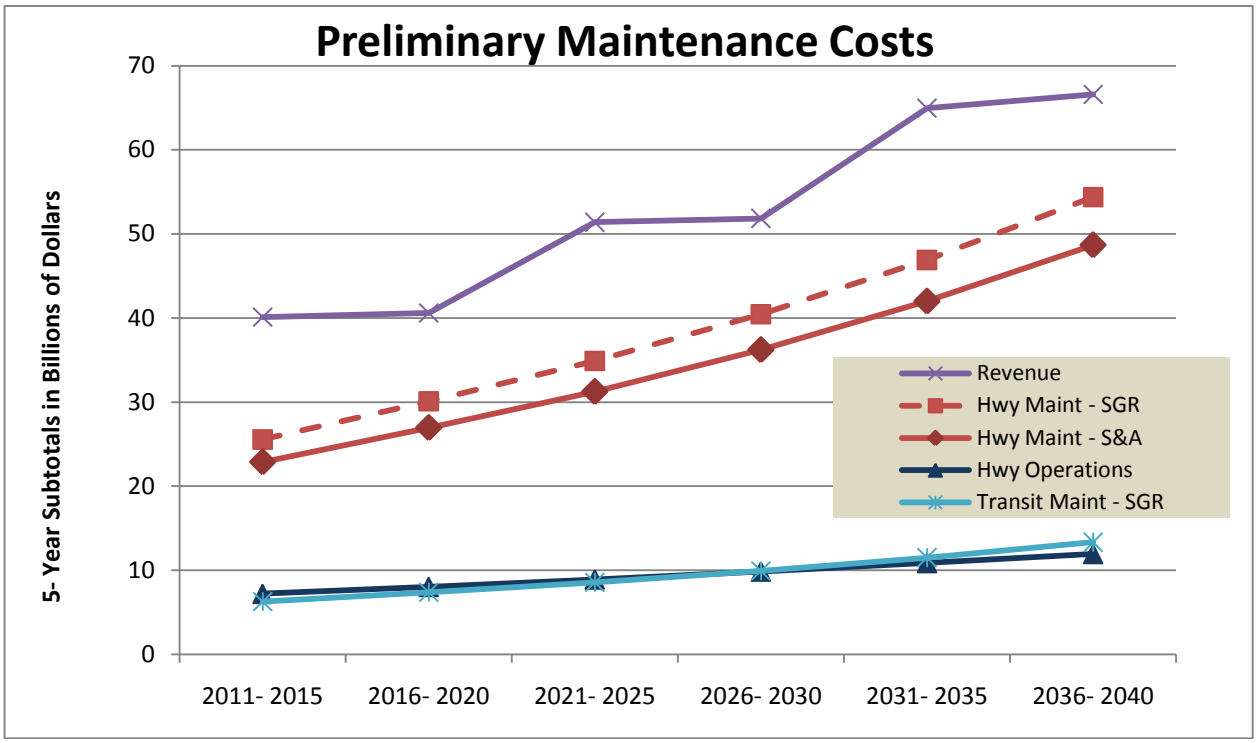
Estimates of future construction cost trends are by nature very speculative. Our estimates assume construction cost increases of approximately 6% per year until 2013, mostly reflecting continued increases in material costs. This is significantly faster than increases in the overall consumer price index (CPI), which generally average 3% per year. The faster increase in construction costs than other costs has been a reality since around 2002.

However, before 2002, construction costs and CPI increases were very similar. In the long term, we assume a return to this historical pattern, as advances in construction practices or new sources for construction materials will be able to curb the dramatic increases in construction costs. Therefore, after 2013, we assume that construction costs will rise at a rate equal to the CPI, or 3% per year. Staff is interested in further discussion of these assumptions by committee members.

Maintenance and operation costs as a share of available revenues

The table on the following page displays the 5-year costs for roadway maintenance (at both the safe and adequate level and the state of good repair level); roadway operations; and transit maintenance (state of good repair). Please note that transit operations costs have not yet been added, so these costs are incomplete. The September 10, 2009 estimate of the region's expected core revenue is displayed for reference.

Total costs are not yet shown on the table, because full information about transit costs is not yet available. But even from the incomplete information provided, it is clear that our core revenues will be barely adequate, and during some periods possibly not even adequate, to fund the basic maintenance and operations of our transportation system. At the same time, the region needs systematic improvements and major capital investments to sustain our place in the national and global economy and to assure a good quality of life for our inhabitants. Therefore, it is necessary address the question what additional revenues can reasonably be expected during the planning period, as well as face the difficult discussion of prioritization among our many transportation needs.



5 year Cost and Core Revenue estimates. Preliminary, subject to change. 10-9-2009
Source CMAP

ACTION REQUESTED: Discussion of approach to estimating expenditures and preliminary maintenance costs compared to core revenue.

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Appendix A - Assumptions
To be Developed

Information on the detailed assumptions used in will be provided in the next iteration of this memo. Email jschaad@cmap.illinois.gov for provisional information, if needed sooner.