



MEMORANDUM

To: CMAP Freight Committee

From: CMAP Staff

Date: March 16, 2015

Re: Technical analysis supporting the freight policy framework

CMAP staff is currently laying the groundwork for a regional freight plan, to be included as a component of the next comprehensive regional plan due in 2018. **The emphasis at this point in the planning process is technical:** identifying categories of capital projects and operational programs for study, and then identifying data sources and research methodologies for each type of project or program. A better understanding of the technical issues will help establish what can or cannot be reasonably studied as part of the freight planning and policy development process.

Over the past several meetings, CMAP staff has worked with the Freight Committee to identify a list of potential projects and programs that may be studied as part of the upcoming planning process. The emphasis now is on identifying specific data sources and research methodologies for each strategy.

Projects and programs for study

CMAP staff reviewed a variety of existing documents to identify potential project types and programs for discussion. These documents include [GO TO 2040](#), the [Freight Cluster Drill Down](#) report, the [Regional Freight Leadership Task Force](#) report, and the [Freight System Planning Recommendations](#). In general, these strategies fall into three categories: capital projects, operational improvements, and regulatory reform.

Table 1 lists the projects and programs identified to date. Previous versions of Table 1 were presented to the Freight Committee at its November 2014 and January 2015 meetings. The Committee's comments from the November meeting have been incorporated into the table, and additional edits from the January meetings are shown in Table 1 as **highlighted** text). Final comments on the list of projects and programs in Table 1 are requested from the Freight Committee.

Table 1. List of potential projects and programs for study

	Strategy	Description
Operational programs	Off-peak deliveries	Incentives to encourage receivers to accept overnight deliveries, reducing congestion during peak periods.
	Consolidated deliveries	Incentives to encourage consolidated deliveries in targeted areas (e.g., campus environments or dense business districts), reducing the number of required trips.
	Centralized delivery/pickup facilities	Incentives or direct support to develop centralized delivery facilities, allowing consolidated deliveries/pickups for consumers.
	Congestion pricing	Use pricing to manage travel demand on congested facilities. Could be applied to non-commercial vehicles and/or commercial vehicles.
	Intelligent transportation systems (ITS)	ITS applications seek to improve the efficiency of the transportation system and commercial vehicle operations (e.g., freight administration, electronic clearance, administrative processes, weigh in motion, electronic support of roadside safety inspections)
	Emerging technologies	Emerging technologies may allow new types of firms to access intermodal facilities, better management of shipping containers on smaller parcels, and cleaner and quieter freight vehicles.
Regulatory reforms	Truck routing improvements	Coordination of various jurisdictions' truck routes, improved dissemination of routing preferences and restrictions (e.g., online portals, signage).
	Truck permitting clearinghouse	Coordination of various jurisdictions' permitting functions to reduce regulatory burden.
	Address delivery time restrictions	Remove or loosen delivery time restrictions in appropriate locations, reducing congestion during peak periods.
	Address truck parking restrictions	Remove or loosen truck parking restrictions in appropriate locations, reducing congestion during peak periods.
	Supportive land use and zoning	Preserve industrial and logistics land uses in appropriate sites near supporting infrastructure. Address access management issues to preserve effective highway operations.
	Right-of-way easements strategies	Transportation agencies face difficulties acquiring the necessary right-of-way to implement capital projects. Various strategies could be pursued to better plan for right-of-way requirements.
Capital projects	Highway-rail grade separations	Reduce congestion and improve safety by separating highway and rail infrastructure at key crossings
	Rail-rail grade separations	Reduce congestion and improve reliability by separating rail facilities at key crossings. May consider the relationship between passenger rail and freight rail.
	Pavement improvements	Improve asset condition by focusing highway reconstruction and resurfacing to certain facilities. Potentially explore appropriate design standards for freight-heavy facilities.
	Additional lanes – general purpose	Expand capacity by the strategic addition of new lanes to key expressways and arterials.
	Additional lanes – truck-only lanes	Expand capacity by the strategic addition of new truck-only lanes to key expressways and arterials. Potentially explore capacity for truck-only facilities to be self-supporting.

New highway corridor	Expand capacity by the strategic addition of new roadways highways and bridges, on either the arterial or expressway system, to fill gaps in the network. Potentially explore capacity for new facilities to be self-supporting.
New or improved interchanges	Expand capacity by the addition of new expressway interchanges or improvements of existing interchanges. Improve safety by reconfiguring existing interchanges.
Spot improvements	Geometric improvements to address horizontal and vertical clearances, turning radii, etc.; improvements to lane configurations, including turning lanes.
Additional truck parking	Additional truck parking facilities in locations with shortages.

Capital projects, operational improvements, and regulatory reforms may be combined to serve larger policy goals. For example, GO TO 2040 identifies high-level goals such as mitigating congestion, improving reliability, and prioritizing maintenance; it also calls on the region to leverage existing infrastructure by reinvesting in existing communities. At a later stage in the freight planning process, the Freight Committee can explore various packages of projects or investment scenarios to help the region meet these and potential new freight policy goals.

Potential research methodologies for identified projects and programs

To ensure that the identified projects and programs can be studied as part of the freight planning process, it is important to identify appropriate datasets and research methodologies. This technical knowledge will assist staff and the Committee in assessing existing conditions, evaluating projects and programs, and making final recommendations.

CMAA staff has begun to explore potential research strategies that could be applied to the development of the regional freight plan. This technical work is ongoing, and the list of projects and programs that can be reasonably studied may be narrowed as the planning process moves forward. The following table summarizes potential travel demand modeling applications, as well as other technical resources, that could be applied to each of the projects and programs identified in Table 1. Staff encourages the input of the Freight Committee, particularly in identifying other potential data resources and research methodologies. In addition to the technical methodologies listed in Table 2 below, CMAA staff recognizes that extensive literature review and stakeholder outreach could apply to each type of project and program.

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Table 2. Potential research methodologies for projects and programs

	Strategy	Travel Modeling Applications	Other Potential Technical Resources
Operational programs	Off-peak deliveries	Evaluate travel time savings realized by traveling in less congested periods.	Analysis of Municipal Survey results, analysis of municipal codes.
	Consolidated deliveries	Evaluate travel time savings caused by reducing the number of trips.	
	Centralized delivery/pickup facilities	Potential evaluation of travel time savings, depending on structure of centralized delivery/pickup program.	
	Congestion pricing	Using CMAP's pricing module, evaluate travel time savings realized by reducing travel times on expressway managed lanes.	
	Intelligent transportation systems (ITS)	N/A	Review of U.S. DOT ITS Joint Program Office benefits and costs database .
	Emerging technologies	N/A	
Regulatory reforms	Truck routing improvements	Staff recently coded truck restrictions into the modeling network.	Analysis of municipal codes. LTA project: existing conditions report.
	Truck permitting clearinghouse	N/A	LTA project: existing conditions report.
	Address delivery time restrictions	Could be addressed by manually adjusting trip tables; most likely to affect estimates for localized areas.	Analysis of Municipal Survey results, analysis of municipal codes.
	Address truck parking restrictions	N/A	Analysis of Municipal Survey results, analysis of municipal codes.
	Supportive land use and zoning	N/A	Analysis of CMAP's Land Use Inventory, supplemented with private datasets.
	Right-of-way easements strategies	N/A	

Capital projects	Highway-rail grade separations	Not regularly included in regional travel modeling, but could be incorporated.	Analysis of ICC's grade crossing delay dataset, analysis of data sources for excessive delay.
	Rail-rail grade separations	N/A	Evaluation of passenger delay caused by freight conflicts, on-time performance impacts to Metra and Amtrak caused by freight conflicts, and freight delay caused by freight conflicts.
	Pavement improvements	N/A	Analysis of IDOT data sources for pavement conditions on freight-significant roadways.
	Additional lanes – general purpose	Regularly included in regional travel modeling.	Economic impacts analysis, air quality analysis.
	Additional lanes – truck-only lanes	Regularly included in regional travel modeling.	Economic impacts analysis, air quality analysis.
	New highway corridor	Regularly included in regional travel modeling.	Economic impacts analysis, air quality analysis.
	New or improved interchanges	New interchanges are regularly included in regional travel modeling. Microsimulations can be applied to measure impacts of improved interchanges and some spot improvements such as lane drops.	Economic impacts analysis, air quality analysis.
	Spot improvements	Low vertical clearance locations and posted bridges can be included in the regional travel model. Geometric deficiencies can be evaluated with microsimulation models.	Inventory of deficiencies such as vertical clearances, load-posted bridges, lane drops, etc.
	Additional truck parking	N/A	Inventory of truck parking facilities in the region.

Note: **Extensive literature review and stakeholder outreach** could apply to all projects and programs.

Data

CMAP has many data resources that could be applied to an existing conditions report for freight. On the transportation side, these resources come mainly from the Congestion Management Process (CMP) [Regional Performance Measurement](#) work and the [Freight Data and Resources](#) webpage. These areas contain data on safety, system preservation, travel time reliability, mobility, accessibility, and other topics. They also inventory existing facilities and volumes, report warehousing data, estimate emissions from commercial vehicles, and summarize municipal trucking regulations.

For land use, most of this information comes from CMAP's [Land Use Inventory](#), as well as its subscription to private datasets. Together, these land use resources describe the general locations of industrial and commercial land, as well as provide detailed information on individual facilities (e.g., square footages, year built) and time series data.

Finally, in the area of economic development, CMAP has compiled resources via the [Regional Economic Indicators](#) series and numerous standalone reports on [industry clusters](#). Specific items include analyses of total employment and workforce development, impacts on income and regional economic activity, and emerging trends. Upcoming research in the economic development area will include analysis of supply chains in the region.

Tools

CMAP has a number of data tools that could be applied to an existing conditions report for freight. Chief among these are CMAP's two [travel demand models](#): the four-step (or "trip-based") model and the activity-based model. The four-step model can test strategies that affect numerous factors, including land use, highway capacity, travel times, travel costs, and time of day of travel. Standard model outputs include changes in volume, congestion, delay, travel time, and accessibility. That said, the four-step model has a number of limitations. For example, it does not generate results for safety or reliability, nor does it include information on intersection geometrics or traffic signal cycles.

CMAP continually works to refine its modeling tools. The agency is currently developing a "dynamic traffic assignment" for use in its travel demand models. The dynamic traffic assignment provides a better reflection of roadway operations and queuing, which may result in a better estimate of the impacts of operational improvements. For example, it accepts inputs representing system disruptions, such as incidents or flooding, described by the number of lanes closed and the duration of the closure. The software reports standard transportation model outputs such as link travel time and volume, but it also includes an option to report reliability statistics.

Additionally, staff is currently working on freight modeling improvements that incorporate national supply chains and regional truck tours. Together, these improvements predict how freight moves into, through, and out from the region. At this time, the freight model components have not been calibrated. This model uses economic relationships to simulate individual shipments that are passed from supplier to buyer, and to estimate the transport and

logistics paths that are used for these shipments. Additionally, the freight modeling work includes water and rail freight network information.

Finally, CMAP staff acknowledges that a regional freight plan cannot be developed through quantitative or technical tools alone. As such, staff is committed to reach out to local implementers and the private sector to better understand freight issues. Also, staff has reviewed freight plans developed in other major regions and has contacted staff at peer MPOs to learn more about their freight plan development processes (Agenda Item No. 6).