Development of The Project Evaluation and Selection Process & The Congestion Management Process

September 2009

Purpose

This report documents two key work tasks undertaken by the RTC that began in January of 2009. The first task is the development of a new process for the evaluation and selection of federally funded projects within the Las Vegas metropolitan area. The process is mainly focused on federally funded projects on higher order facilities since the RTC has proven, time-tested procedures for the selection and prioritization of locally funded projects.

The second task undertaken by the RTC is the development of a systematic congestion management process (CMP) that will ultimately be used as one of the agency's tools to mitigate congestion on transportation facilities within the Las Vegas metropolitan area. The two processes are discussed concurrently within this report since there is significant overlap of the requirements related to the development of each.

1. Project Evaluation and Selection Process Requirement

Background

The RTC of Southern Nevada serves as the designated metropolitan planning organization (MPO) for all of Clark County. Since the region has a combined population exceeding 200,000 persons, the area is also a Transportation Management Area (TMA) as defined by federal regulation. Pursuant to 23 USC 134(i)(5) and 49 USC 1607 the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) must jointly certify TMAs at least every four years.

The certification process is comprehensive in scope and focuses on compliance with federal regulations, challenges, successes and experiences of the cooperative relationship among the metropolitan planning organization, the state department of transportation and the transit operators in the region (RTC is the primary transit provider for the Las Vegas valley). At the conclusion of the Certification Review, a joint FHWA/FTA set of findings are provided to the Metropolitan Planning Organization (MPO).

2008 Certification Findings

In general, the RTC received high marks for its work as an MPO. General observations from the joint review team indicate that the RTC:

- Is a highly functioning agency
- Maintains a very strong technical planning process

- Maintains a strong planning process resulting in a significant role in guiding investments
- Maintains a strong working relationship with the Nevada Department of Transportation (NDOT) and
- As an MPO takes great care to coordinate planning analyses with member entities

The Review Team further identified three areas of 'notable' performance for the RTC.

1. The RTC is a very professional agency with knowledgeable staff.
2. The RTC is very strong as it relates to ongoing coordination – it conducts monthly Planning Liaison meetings with NDOT/FHWA/FTA.
3. The RTC's communication and public involvement activities are commendable.

The Review Team also indicated that, "with the exception of the one corrective action identified below, the agency could serve as a model TMA for the nation".

1.1 Corrective Action – Requirement for Improved Project Evaluation and Selection Process

The Review Team determined that in order to improve the performance of the metropolitan planning process in Southern Nevada and to meet the goals and requirements of the regional transportation planning process, the following Corrective Action was needed:

- The RTC shall develop and implement a 'technically valid project selection and evaluation process for projects to be included in the TIP'. The process that includes quality system performance and evaluation tools will be used to guide investments and set regional transportation investment priorities. The RTC shall initiate a process improvement team, with appropriate representation of all modes and stakeholder interests, to assist in the development of the project selection and evaluation process. The process will be summarized in a report to the FHWA and FTA by the end of the 2009 federal fiscal year (September 30, 2009) and then the process will be implemented to select and evaluate projects for successive TIP cycles.

2. Congestion Management System Process Requirement

The Safe, Accountable, Flexible, Efficient Transportation Equity Act - a Legacy for Users (SAFETEA-LU), is the most recent reauthorization of the nation's surface transportation program. While many of the programs continued from previous transportation legislation, one of the more significant changes was the updated requirement for the development and incorporation of a congestion management process (CMP) in transportation management areas, as opposed to congestion management systems. The federal certification team (FHWA and FTA) acknowledged that the RTC has made significant strides towards the continuing mitigation of congestion through a variety of activities rooted in planning and operations, however, the team requested that

the agency "formalize" the activities as required in CFR 450.320 – illustrated in the appendix of this report.

2.1. Moving Forward – Developing a CMP prior to Project Evaluation and Selection

SAFETEA-LU mandates that all non-attainment TMA's institute a Congestion Management Process (CMP) identified in CFR 450.320. The CFR states: "In a TMA designated as non-attainment for ozone or carbon monoxide (Las Vegas metropolitan area is not in attainment for either pollutant), federal funds may not be programmed for any project that will result in a significant increase in the carrying capacity for SOV's (i.e., a new general-purpose highway on a new location or adding general-purpose lanes, with the exception of safety improvements or the elimination of bottlenecks), unless the project is addressed through a congestion management process meeting the requirements of the legislation."

As no capacity projects can be considered unless they have "passed through" a CMP, the RTC determined that in order to have a meaningful project evaluation and selection process, it was sequentially necessary to complete the development and structuring of a CMP first.

Cooperative Approach for CMP and Project Evaluation and Selection

The RTC established a team that met periodically between February and September, 2009 to assist the agency in both the development of a CMP and a Project Evaluation and Selection process; the team was named the Process Evaluation Team (PET); referred to interchangeably as the **Team**. It included participants from the RTC's member entities, federal and state partners (FHWA, FTA, NDOT), unincorporated Clark County, the Cities of Las Vegas, North Las Vegas, Henderson, Boulder City and Mesquite. In addition, Process Evaluation Team invitations were extended to the Department of Aviation, the Clark County Department of Air Quality and Environmental Management (DAQEM), the Southern Nevada Water Authority, the Las Vegas Convention and Visitor's Authority, the Nevada Motor Carrier Transport Association, pedestrian advocacy (Safe Communities Partnership), cycling advocacy (Outside Las Vegas Foundation), the University of Nevada at Las Vegas (the Transportation Research Center) and the local tribal governments. A copy of contact information is provided in the appendix of this report.

2.2. Background for the CMP Development

The RTC modeled the development of the CMP from the U.S. DOT's - *An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning.* According to the Guidebook a well-designed CMP should help the MPO to:

- Identify congestion at locations;
- Determine the causes of congestion;
- Develop alternative strategies to mitigate congestion;

- Evaluate the potential of different strategies;
- Propose alternative strategies that best address the causes and impacts of congestion; and
- Track and evaluate the impact of previously implemented congestion management strategies.

Once congestion management strategies have been identified and selected as part of the Metropolitan transportation plan, the CMP can also be used to:

- Set priorities among projects for incorporation into the Transportation Improvement Program;
- Provide information for environmental analysis of proposed projects;
- Develop more detailed assessments of the potential for congestion, reduction at the corridor or activity center level; and
- Assist in the ongoing monitoring and evaluation of projects and programs implemented throughout the region.

The model CMP process comprises a number of different elements that add up to a coherent, objectives driven, performance-based approach to solving congestion problems. These components are described in the final rule on statewide in Metropolitan Transportation Planning defined within CFR 450.320. The rule states that the CMP shall include:

1. Methods to monitor and evaluate the performance of the multimodal transportation system, and identify the causes of recurring and nonrecurring congestion; identify and evaluate alternative strategies, provide information supporting the implementation of actions, and evaluate the effectiveness of implemented actions.

2. Definition of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods. Since levels of acceptable system performance may vary among local communities, performance measures should be tailored to specific needs of an area and established cooperatively by the state, affected MPO and local officials in consultation with the operators of major modes of transportation in the coverage area.

3. Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources and coordinated with operations managers in the metropolitan area.

4. Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improve safety of existing and future transportation systems based on the established performance measures. The following categories of strategies, or combination of strategies, are some examples of what should be appropriately considered for each area:

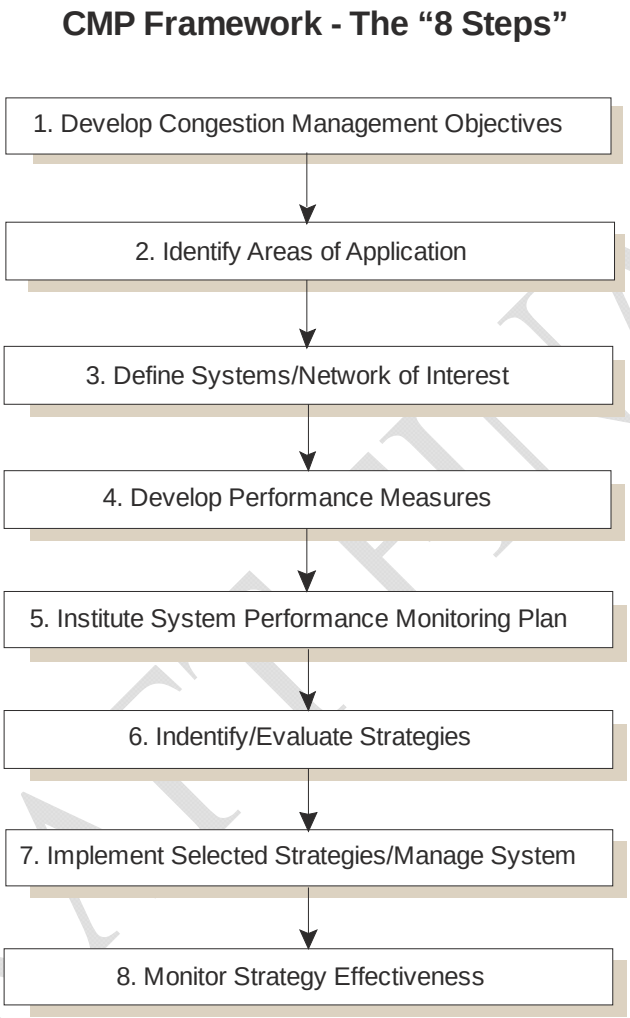
    - Demand management measures, including growth management and congestion pricing;
    - Traffic operational improvements;
    - Public transportation improvements;
    - ITS technologies as related to the regional ITS architecture; and
    - Where necessary, additional system capacity.

5. Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy proposed for implementation.

6. Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures. The result of this evaluation shall be provided to decision makers and the public to provide guidance on selection of effective strategies for future implementation.

Below is the U.S. DOT's Guidebook's recommended 8-Step process defined in the publication, which was followed by the PET in support of the CMP development.

Figure 1: CMP Framework



2.3. Process Evaluation Team (PET) Decisions Related to the CMP Development for the Las Vegas Valley

The RTC addressed the detailed six requirements from the legislation (listed above) through completion of the recommended 8-step CMP process. According to the U.S. DOT, if the 8-step process in carried out as outlined in the guidance, the results should lead to the satisfaction of the requirements outlined in CFR 450.320.

The documentation presents the CMP Step heading, followed by a brief description of the requirement and concludes with "agreed to" Team decisions for each of the major headings.

Step 1 - Develop Congestion Management Objectives

Guidance*: It is recommended that congestion management objectives be derived from the vision and goals articulated and the regional transportation plan. While these goals may be couched in general terms, congestion management objectives should be defined in terms that enable participants in the process to focus on specific aspects of congestion, and to advance a timeframe within which the objective would be attained.*

Team Recommendation: The congestion management objectives for the Las Vegas Valley are derived from goals identified in the RTP. A complete listing of the RTC's nine (9) adopted goals and corresponding objectives is presented in the appendix of this report. The following selected Goals/objectives served as the basis for selecting the Congestion Management Objectives by the Team. The goals have been grouped to define major emphasis area, more discussion on the grouping is defined later in the report.

Goal 1 – Implement transportation systems that improve air quality and protect the environment
Goal 10: Reduce greenhouse gas emissions and carbon footprint
Goal 11: Contribute to the long-term sustainability of Southern Nevada communities.

- Objective 1.1 Reduce travel times especially at peak periods
- Objective 1.3 Increase the number of persons per vehicle

Goal 3 – Enhance the efficiency of existing transportation facilities

- Objective 3.1 Improve information on travel conditions and options
- Objective 3.3 Implement freeway ramp metering

Recommendation - Congestion Management Objective(s) and Strategies (Team agreement):

1. Freeways: **Increase system reliability by reducing delays associated with incidents**

Strategy Freeways: The RTC will accomplish this by improving information on travel conditions through installation and use dynamic freeway message signs providing travelers with real time information on the reliability/timing of the trip (providing the traveler with options), by increasing the effective carrying capacity of the freeway network through the use of ramp metering (flow improvement strategy), and by establishing high occupant vehicle travel lanes that reward non-single occupant vehicle travel (increases person throughput).

2. Arterials: Reduce Travel Times and Delays Especially During Peak Periods

Strategy Arterials: Maximize transportation system management activities; including but not limited to; improved median control, incorporation of access management techniques, traffic signal ITS, operation of transit, enhanced sidewalks, where appropriate bikeways, improved intersection throughput (appropriate bays length for queuing, free flow right turn lanes).

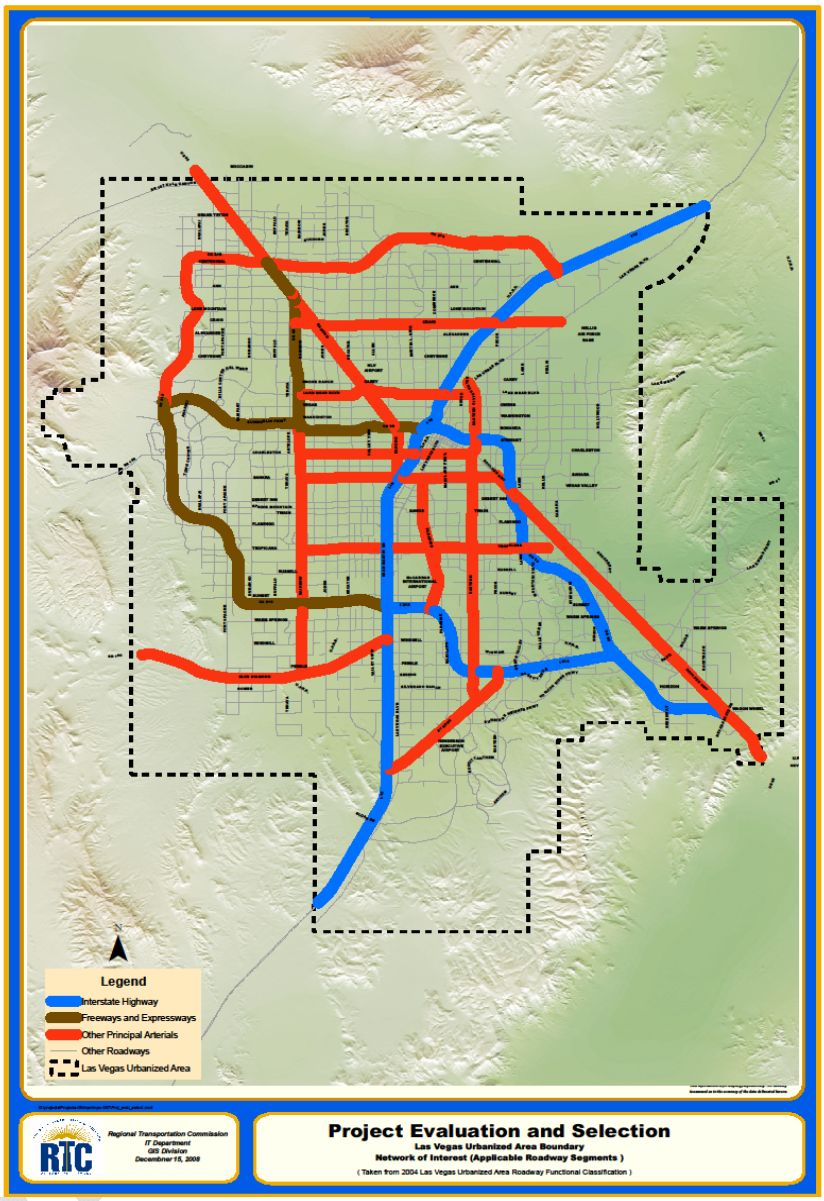
Step 2 – Identify Areas of Application

Guidance: *A congestion management process should be applied to a specific geographic area in the network of service transportation facilities. Often an area of application may lay within the same geographic area contained in the regional ITS architecture. This alignment would allow system inventories in network descriptions to directly link the CMP to the regional ITS architecture.*

In Transportation Management Areas (TMA) the geographic limits of the CMP must encompass at least the TMA boundary. It would be advantageous to include the entire metropolitan area boundary which is the TMA boundary plus the area that will become urbanized within 20 years, or some other rational criteria, such as the limits of an air quality nonattainment area.

Team Recommendation: The Team agreed with the guidance and set the CMP area of application to coincide with the Las Vegas area urbanized boundary. Figure 2 illustrates the agreed-to Area of Application; shown as dashed lines.

Figure 2 – Area of Application and Network of Interest



Step 3 – Define System/Network of Interest

Guidance: *Whatever the geopolitical boundaries of the CMP, the CMP network should identify the characteristics of the service transportation network under consideration. The CMP should be multimodal, so that the network should include both highway and transit facilities. The CMP could consider particular corridors or activity centers, in addition to encompassing an entire metropolitan area. A CMP may also comprise a combination of regional, corridor, and activity area definitions, with each component serving different, specific purposes.*

Team Recommendation: The team recommends that the high speed limited access facilities within the Las Vegas urbanized area be defined as the system for which the CMP will be applied. This includes Interstate 15, Interstate 515, US Highways 93 and 95, and the Bruce Woodbury Beltway/Clark County 215. This system definition shall be for both transit and vehicle modes of travel. The system definition fits for both modes for several reasons. First, the Team agreed to definition of - reducing travel times especially during the peaks - is beneficial for the operation of transit. BRT or express route service running on the freeway system benefits greatly by the increase in travel speeds and reduction of delays.

In addition, the presence of high occupancy (HOV) vehicle lanes on freeways allows for the operation of transit within the HOV lanes reducing the competition with single occupant vehicle trips, which makes transit service more viable. Secondly, the system definition works well across all segments of the inclusive system due to the ever growing demand for vehicular travel in Southern Nevada; the freeways are the locations of the greatest, recurring congestion in the Las Vegas valley. As such, the Team did not think it advisable to consider different system definitions for different geographic areas of Las Vegas valley. Principal arterials (identified in the adopted Las Vegas Urbanized Area's – Roadway Functional Classification System) are included on Figure 2, because improvements to them may support the reduction of congestion on the high speed, limited access facility system.

In addition to displaying the Area of Application, **Figure 2** also defines the roadway Network of Interest as discussed above.

Step 4 - Develop Performance Measures

Guidance: *Due the fact that the state of performance on transportation facilities is a subject that could be communicated to the public, it is beneficial not to use highly technical measures such as level of service. The guidance states the five key points that characterize good performance measures.*

- *Clarity and Simplicity (e.g., simple to present and interpret, unambiguous, quantifiable units, professional credibility)*
- *Descriptive and Predictive Ability (e.g., describes existing conditions, can be used to identify problems and to predict changes)*
- *Analysis Capability (e.g., can be calculated easily and with existing field data, techniques available for estimating the measure, achieves consistent results)*
- *Accuracy and Precision (e.g., sensitive to significant changes in assumptions, precision is consistent with planning applications and with an operational analysis)*
- *Flexibility (e.g., applies to multiple modes, meaningful at varying scales and settings)*

Team Recommendation: Performance Measures will include: (**1**) **travel time, (2) travel speed** and (**3**) **incident duration**. These measures all work on any variety of levels. First of all they are clear and simple. The information can be used to identify performance conditions by segments across the network. Travel speed and travel time can be easily calculated and represented across all areas of the network geography.

Incident duration is selected because it highlights the non-recurring congestion and allows for year to year comparison to evaluate different techniques, including incident response time/removal and can serve to understand the time it takes for the dissipation of incident related queues. This information can lead to the development of innovative strategies – like the NDOT's Freeway Patrol Service.

Step 5 – Developing a Performance Monitoring Plan

Guidance: *The final rule on the Metropolitan Transportation Planning calls for a coordinated program for data collection and system performance monitoring to assess the extent of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. Typically data collection needs are based on the selected performance measures and appropriate analytical methods. Moreover the selected data elements should be relevant to the area, readily available, timely, reliable, consistent, and susceptible to forecasting. The guide goes on to indicate to the extent possible this data collection program should be coordinated with existing data sources, including archived operational/ITS data and coordinated with operation managers in the metropolitan area*

Team Recommendation: The RTC's computerized traffic operations system is called the Freeway and Arterial System of Transportation (FAST). FAST already has an operational/ITS data collection and archive system in place. As such, there is no need to develop a performance monitoring plan rather only to identify how this information will be brought into the CMP process. A synopsis of the RTC's Performance Monitoring Plan along with data examples are provided in the appendix of this report.

The system uses automated detection devices and cameras to collect a variety of information on the freeway network in the Las Vegas Valley. Data collected includes; (1) average annual daily traffic, (2) volume-to-capacity ratios, (3) average travel time, (4) average travel speed, (5) vehicle miles of travel, (6) recording of incidents and delays, and (7) classification vehicles by type (trucks, buses and cars) using its automated process. Data is collected and stored by month; therefore, analysis periods can be tailored to daily, quarterly, monthly, or calendar year schedules.

Step 6 – Identifying and Evaluating Strategies

This process defines methods and strategies that can be used to select beneficial projects as they are rooted in the project evaluation and selection process (discussed later in the document).

Guidance:

Identifying Congested Locations - *Selection of the appropriate performance measures, analytical tools, and available data enables the identification of congestion locations. Congestion may be recurring or nonrecurring; the CMP should be capable of analyzing both types of congestion. Recurring congestion, which takes place at predictable intervals at particular locations, can generally be traced to a specific cause, such as a physical bottleneck or to conditions such as sunlight. Causes of nonrecurring congestion may be more difficult to isolate, and solutions may require nontraditional strategies.*

In addressing recurring or nonrecurring congestion, the CMP might incorporate different levels of analysis, whether at the regional, corridor, or activity area scale. Ongoing data collection and monitoring is helpful in determining the effectiveness of strategies and the utility of the CMP itself.

Selecting Appropriate Analysis Tools – *A variety of traffic analysis tools has been developed for different purposes. These tools are intended for application at different geographic scales, for different facility types, by travel mode, and according to the type of management strategy under consideration. Therefore, it is important to select analysis tools that are sensitive both to the congestion measures to be used and the types of congestion management strategies under consideration. These analytical tools can be grouped as follows:*

- *Sketch-planning tools produce general order- of- magnitude estimates of travel demand and traffic operations in response to transportation improvements. Sketch planning approaches are typically the simplest and least costly of the traffic analysis tools*

- *Travel demand models are mathematical models that forecast long-term future travel demand based on current conditions and future projections of households and employment characteristics. While these models are beneficial in defining benefits and impacts of major highway improvements, they are less sensitive to defining operational characteristics or changes resulting from implementation of different strategies.*

- *Analytical-Deterministic Tools are rooted in the Highway Capacity Manual; these tools quickly predict capacity, density, speed, delay, and queuing on a variety of transportation facilities. These tools are most useful in analyzing performance of isolated or small-scale transportation facilities.*

- *Traffic Signal Optimization Tools are also rooted in HCM procedures; however these tools primarily help to develop optimal signal facing and timing plans for isolated signals, intersections, arterial streets, or signal networks. This includes capacity calculations, cycle length, and splits optimization.*

- *Macro Simulation Models are based on the deterministic relationship of the flow speed, and density of the traffic strain. Simulation in a macroscopic model takes place completely within a section by section basis rather than by tracking individual vehicles.*

Team Recommendation:

a) The initial identification of congested locations will be rooted in use of FAST performance monitoring process through the direct observation of (1) speed, (2) travel time, and (3) delay and are aggregately displayed as a volume-to-capacity graphic. The three measures will enable the RTC to identify and show the most congested segments on the system/Network of Interest for the Las Vegas valley defined within Step 3 of this process.

It is expected that there will be an annual report – completed in May of each year. This process will be completed and identify the most congested locations along with the annual post-implementation analysis report of previously constructed projects. This information will assist the RTC and its member entities in developing/selecting strategies that target problem areas based on efficiency of previous solutions or to select from one or group of the strategies listed in category **c)** listed below.

b) Analysis tools help to quantify the benefits related to some of these selected strategies through CMP process. For majority of the time, the FAST monitoring system will serve as the base tool for the evaluation of **existing conditions** on selected segments of the network. Depending on the complexity of nominated projects, it is foreseeable for the RTC to utilize the travel forecast model, traffic signal optimization tools and potentially simulation models to verify the benefits of proposed projects on the Network of Interest.

c) Congestion Mitigation Strategies – The targeting of locations to apply transportation strategies will be linked to the information that comes out the process of identifying congested locations/segments of interest (V/C map- first step). In addition to the following congestion management strategies listed below, the RTC will provide an annual Transportation Facility Assessment (TFA) to the Team. The TFA establishes a comprehensive inventory of roadway attributes which provides valuable and necessary information for project proponents to define and nominate feasible projects. A sample of the TFA for freeways and arterials is located later in the document as part of the Project Evaluation and Selection Process, illustrated in Figures 5 and 6.

In general, congestion management strategies can be grouped into the following broad categories provided below; this list forms the basis of alternatives that project proponent may select to address congestion, continuity and mobility. The following provides project proponents with the basis for annual nomination of potential strategies – represented as projects.

1) Adding more base capacity - Related strategies include:

- Adding travel lanes on major freeways and streets,
- Adding capacity to the transit system,
- Closing gaps in the street network,
- Removing bottlenecks by constructing overpasses or underpasses at congested intersections,
- Adding/designating high occupancy vehicle lanes, and
- Increasing intercity freight rail capacity to reduce or ease use on highways.

2) Operating existing capacity more efficiently - Related strategies include:

- Metering traffic onto freeways,
- Optimizing the timing of traffic signals,
- Responding more quickly to traffic incidents,
- Enhancing travel ways for transit operation (RTC intends to operate BRT on the freeways in HOV lanes),
- Realigning transit service schedules and stop locations,
- Providing travelers with information on travel conditions,
- Improving management of work zones,
- Providing real-time transit information including schedules and arrivals,
- Managing freight better,
- Developing reversible commuter lanes,
- Developing congestion pricing strategies,
- Providing movable median barriers to add capacity during peaks,
- Restricting turns at key intersections,
- Making geometric improvements to roads and intersections,
- Converting streets to one-way operation, and
- Managing access.

3) Reducing the demand on the system-travel demand management (TDM) - Related strategies include:

- Programs that encourage transit use and ride sharing,
- Parking management,
- Flexible work hours,
- Telecommuting programs,
- Bikeways and other strategies to promote non-motorized travel,
- Parking fees at selected end-of-trip facilities,
- Land-use controls,
- Growth management restriction policy development that supports transit oriented design for corridors and communities, and
- Incentives for high density development.

Step 7 – Implementation and Management

Guidance: *This step involves the implementation and management of the defined strategies. Managers of the CMP should work closely with the operating agencies that have participated in the CMP process throughout the implementation of the congestion management strategies and activities.*

Team Recommendation: The RTC does not have to create or constitute a special committee to achieve the management requirement over the implemented strategies. It is recommended that the Operations /Management Committee (OMC) would serve as the logical home for the oversight responsibilities, as this group collectively addresses issues related to the operation of traffic across the jurisdictions within the Las Vegas valley.

Step 8 – Monitoring Strategy Effectiveness

Guidance*: Managers of the CMP should periodically evaluate the effectiveness of strategies identified through the CMP. It is essential that the analysis utilize the performance measures developed through the CMP to determine the effectiveness of the selected strategies. In assessing the degree to which the CMP strategies address the problems of congestion, it is important to also assess the issue of how well and to what extent the strategies were implemented and to consider intervening factors that may have contributed to the success or failure of the selected projects or programs.*

Based on feedback from the assessment process, the CMP should make appropriate adjustments to their effectiveness forecasting process and the CMP itself. These adjustments may be with respect to the strategies considered, or may reflect back to the performance measures used; the data collection and management component of the process; or the analytical methods and tools applied. The CMP should be subject not only to periodic review, but to a timetable for upgrading the tools and methods to keep pace with current practice.

Team Recommendation: Following this discussion, the schematic/blueprint for the RTC's Project Evaluation and Selection Process is presented in Figure 5. As displayed in the graphic, the evaluation and selection procedures drive the nomination/selection of projects for both SOV and non-SOV projects. If nominated, SOV projects are then 'run' through the CMP process. In some cases, the analysis could result in a modification of the SOV project, as indicated in 450.320.

In non-attainment areas like the Las Vegas Valley, the prerequisite for adding single occupant lanes to the network of interest is to consider both demand management strategies and operational improvements prior to selecting additional capacity. The CMP rule further requires MPOs to consider other travel demand reduction and operational management strategies appropriate for the corridor but not appropriate for incorporation into the SOV facility itself. In this case, "corridor" means considering a travel way larger than the physical limits of the facility under consideration itself.

The *implementation schedule, implementation responsibilities*, and *possible funding sources* for each strategy (or combination of strategies) are addressed in two places. *Implementation schedule* is driven by the annual system evaluation of the implemented actions. The RTC's adopted cycle for the update of the RTP/TIP identifies the annual call for projects beginning in September. The agreed-to-timeline is located in the appendix of this report.

The annual evaluation of post-implementation effectiveness will be completed by April with the results presented in May. This will provide adequate time for the RTC's member entities and NDOT to nominate projects appropriate to the issues both from the post implementation analysis and from the identification of congested segments.

Implementation responsibilities are identified in the RTC's programming document, the TIP.

2.4 Why CMP Steps 1-6 Precede Project Evaluation and the Selection Process

CFR 450.320 states: In a TMA designated as non-attainment for ozone or carbon monoxide, federal funds **may not** be programmed for any project that will result in a significant increase in the carrying capacity for SOV's (i.e., a new general-purpose highway in a new location or adding general-purpose lanes, with the exception of safety improvements or the elimination of bottlenecks) **unless** the project is addressed through a congestion management process meeting the requirements of the legislation.

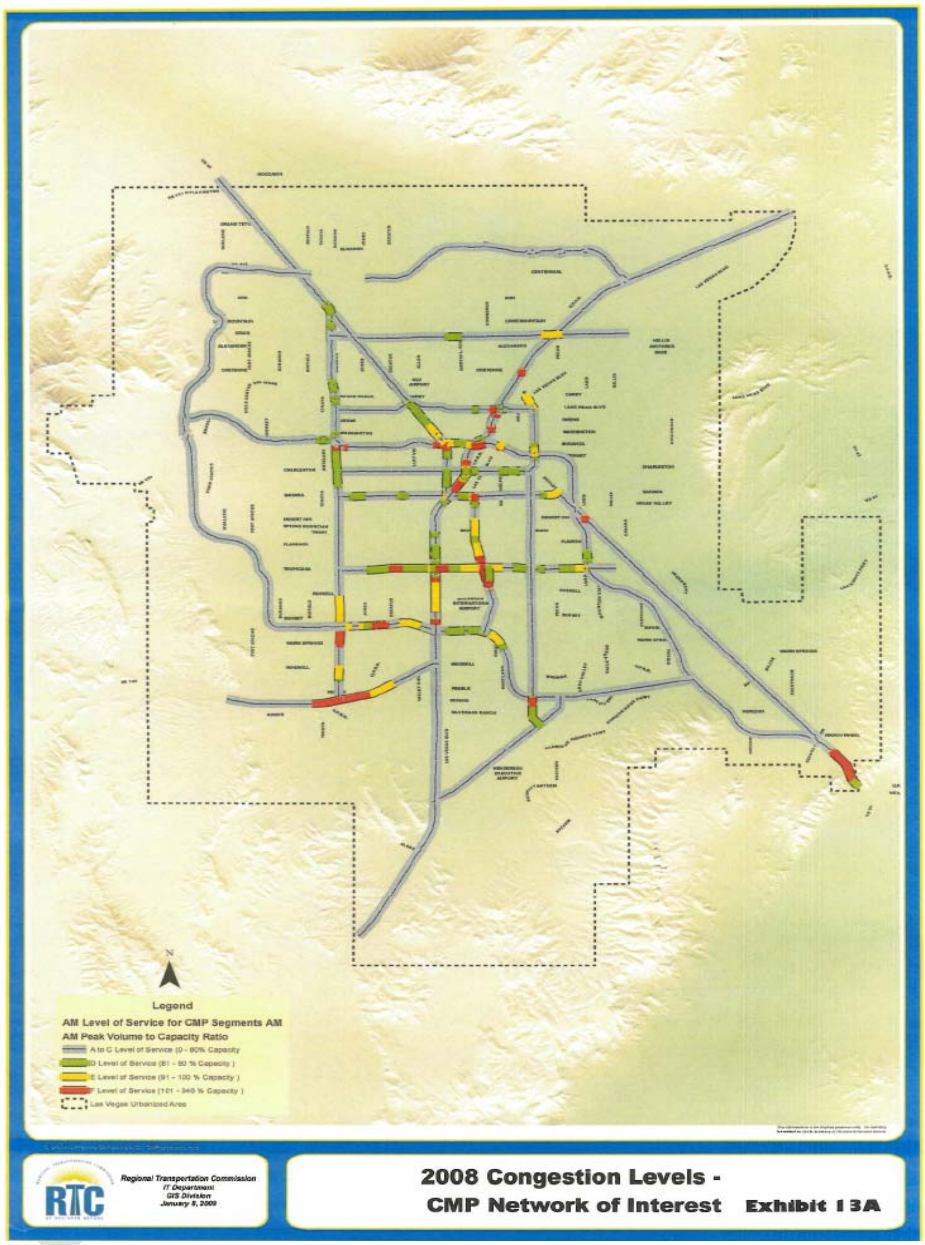
Therefore prior to any consideration of project evaluation and selection, it is required that the MPO first address or respond (identify project related strategies) to the situations that are causing recurring and non-recurring congestion on the arterial and freeway network. The Team has chosen to accomplish this by providing congestion measures on roadway segments established on the Network of Interest (adopted in the CMP development) through level of service measures derived from volume-to-capacity representations, taken from FAST data collection efforts and augmented by the regional travel forecast model where data gaps exist.

Note – The Team decided that extent of influence (Network of Interest) of the system for Project Evaluation and Project Selection shall be the same as the CMP roadway network.

2.5 Initial Step to Define Problem Areas for CMP

Consider the P.M. peak volume-to-capacity map; see Figure 3. Once this step is completed and with the assistance of attribute information contained in the Transportation Needs Assessment, the agency's partners may move forward with the nomination of projects to address congested conditions on roadway segments identified on the Network of Interest. This final step of the CMP signaled the point in time for the Team to apply (develop) a process for the evaluation and selection of projects.

Figure 3 Volume-to-Capacity P.M. Peak Conditions



3.0 - Establishing a Blueprint for the Project Evaluation and Selection Process

Framework for Project Evaluation and Selection

To create a blueprint of the effort for the Team, the RTC began by posing the following key questions to the Team about the process development:

1. How is this process linked or related to the Congestion Management Plan requirements?

2. What will form the basis for the evaluation of nominated projects?

3. What information will be used to identify transportation opportunities to solve the identified congestion problems and advance the agency's mobility vision?

4. What criteria will be used to select nominated projects?

5. When will this "selection process" take place and how does it fit into the existing RTP and TIP development structure?

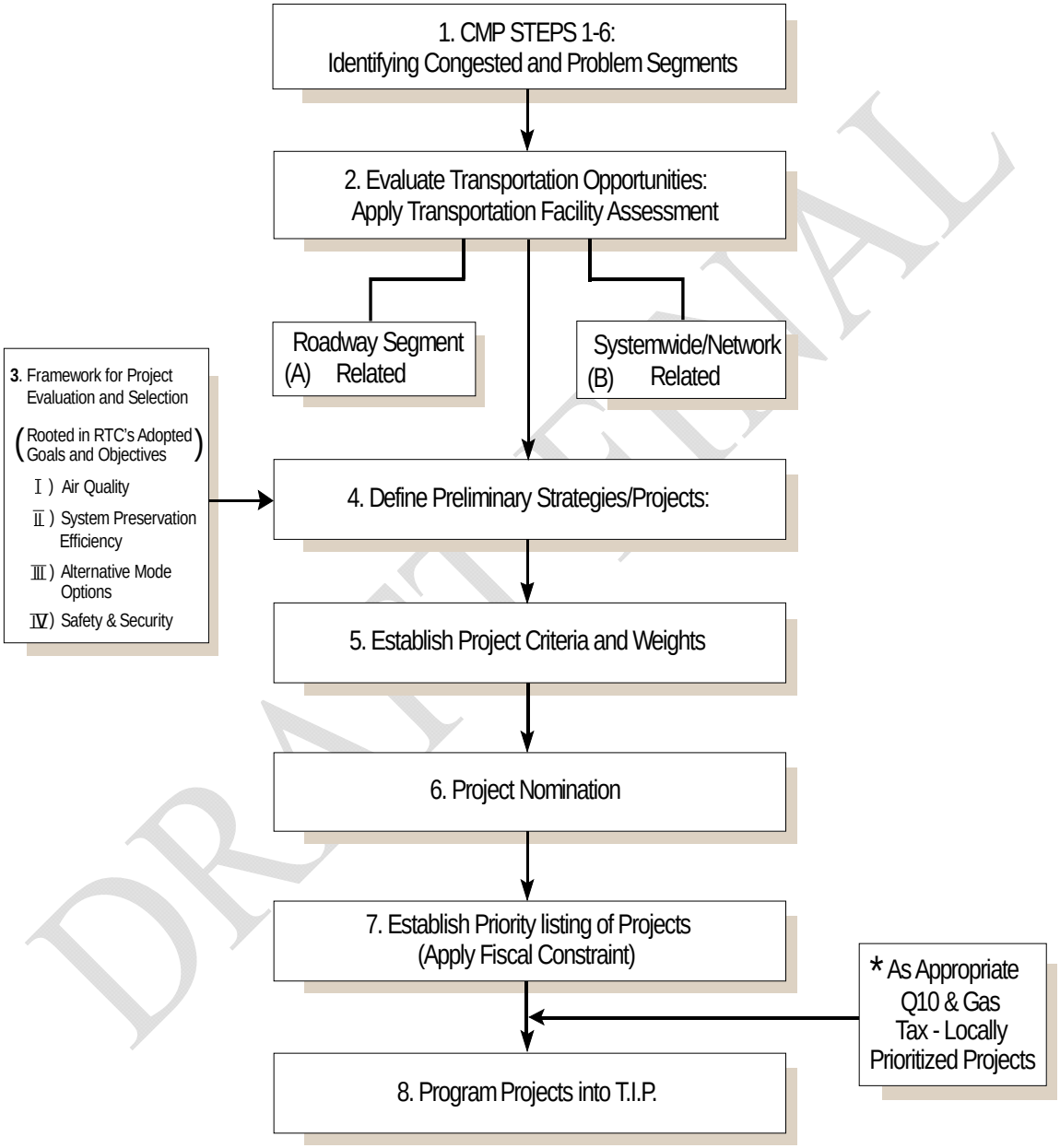
3.1 How the PET developed the Process for Project Evaluation and Selection

Before obtaining input from the Process Evaluation Team, the RTC considered it essential to develop a process schematic or blueprint setting out the logical sequencing of actions necessary to achieve a cooperatively developed project evaluation and selection process as driven by the questions identified above. Working with the RTC's federal partners, an agreed-to 8-Step Schematic was developed for the Team to follow.

The 8-Step Project Evaluation and Selection Schematic (Figure 4) forms the blueprint and served as the Team's scope of activities scheduled to be accomplished over the course of the Team meetings.

Figure 4

Project Evaluation and Selection Process



3.2 Overview of the 8 - Step Process identified for Project Evaluation and Selection

Step 1 – Complete Steps 1-6 of the CMP

As identified previously, the Team agreed to use the assumptions leading up to Step 6 in the CMP, including; area of influence, network of interest and congestion management objectives for freeways and arterials. Additionally, the Team agreed to the P.M. peak condition **volume-to-capacity map** as the "trigger" or starting point for identifying problem segments on the agreed to Network of Interest, because no new capacity projects may be advanced unless they "pass through" the CMP (with the exception of safety improvements or the elimination of bottlenecks).

The CMP and Project Evaluation and Selection Process are interconnected in several ways. First, the CMP language for air quality non-attainment areas like the Las Vegas metropolitan area - requires agencies to evaluate strategies other than new SOV capacity first before programming lane capacity and second, there is 100% overlap of the transportation networks of the two processes. This interconnectivity is why Steps 1-6 in the CMP lead directly to the process identified as Step 1 in **Project Evaluation and Selection**.

Projects not required to be considered in a CMP (bottlenecks and safety improvements). The FHWA identifies bottlenecks as *locations where the physical capacity is restricted, with flows from upstream sections (with higher capacities) being funneled into them. This is roughly the same as a storm pipe that can carry only so much water — during floods the excess water just backs up behind it, much the same as traffic at bottleneck locations. However, the situation is even worse for traffic. Once traffic flow breaks down to stop-and-go conditions, capacity is actually reduced — fewer cars can get through the bottleneck because of the extra turbulence. Bottlenecks can be very specific chokepoints in the system, such as a poorly functioning freeway-to-freeway interchange, or an entire highway corridor where a system of bottlenecks exists, such as a closely spaced series of interchanges with local streets.*

Step 2 - Evaluate Transportation Opportunities: Apply the Transportation Facility Assessment.

Even prior to consideration of project evaluation and selection, it was determined that it was essential for project sponsors to have necessary information on the facilities that fall within the Network of Interest so that appropriate projects (solutions) may be considered to respond to transportation needs. The RTC has termed this action within the process as **Transportation Facility Assessment.** It is to be completed for both roadway segments and system wide activities by the agency.

The Transportation Facility Assessment is designed to provide a comprehensive profile of the roadways attributes, which will deliver necessary information to project proponents when identifying a strategy to address either congestion or a mobility need.

A. Roadways Segments

Arterials: As an example, Figure 5 displays the facility attribute information for a selected segment of Tropicana Avenue that falls within the network of interest. The RTC has and will annually complete the fulfillment of the data. Attribute information is presented for segments and intersections obtained through actual data collection using either coverages from street digital imaging, FAST (speeds, signal spacing, ITS presence), empirical traffic data counts (RTC and NDOT count data base), the agency's transit department (throughput, bus stops), the Nevada Office of Traffic Safety crash data, bikeways information and Clark County right-of-way information.

Figure 5 Tropicana Avenue - Roadway Segments of Interest

Roadway Attributes	Data Type	Roadway Segments			
		Rainbow to Decatur	Decatur to I-15	I-15 to Maryland Pk.	Maryland Pk. to I-515
		(A)	(B)	(C)	(D)
V/C (Peak Period Range)	Value	≥1.0	≥1.0	≥1.0	≥1.0
AADT	Value	28,500	29,500	41,333	26,000
Total Number of Travel Lanes	Value	6	6	6 / 8	6
Breakdown Lanes	Yes/No	No	No	No	No
Average Travel Speed (Peak)***	Values	29, 36	13, 23	21, 26	17, 29
Average Travel Speed (Off-Peak)***	Values	33, 35	28, 31	25, 29	18, 31
Signals per mile	Value	2.0	4.8	4.0	3.3
ITS Coordination	Yes/No	Yes	Yes	Yes	YesS
ITS Cameras	Yes/No	No	No	Yes	No
Dedicated Turn Lanes (see matrix)	Yes/No	Done	Done	Done	Done
Raised Median	Yes/No (%)	Yes - 5%	Yes - 10%	Yes - 50%	Yes - 95%
Driveways per segment / mile	Values	22 / 11	31 / 21	25 / 10	97 / 32
Sidewalks	Yes/No	Yes	Partial	Partial	Yes
Sidewalk Classification*	Value	2	2 / 4	4 / 2	2 / 3
Bicycle Facilities (implemented)	Yes/No	No	No	No	No
Bus Stops / Turnouts	Values	16 / 0	10 / 0	16 / 0	27 / 0
Transit Passenger Throughput (Peak)	Value	N/A	N/A	N/A	N/A
Transit Passenger Throughput (Daily)	Value	1,121	818	1,921	2,328
Crashes (Vehicles)**	Value	458	683	978	1003
Crashes (Pedestrians)**	Value	15	13	14	34
Crashes (Pedalcycles)**	Value	8	6	8	17
ROW Utilization (Available ROW?)	Yes/No	No	No	No	No
Access to freeway	Yes/No	Yes	Yes	Yes	Yes

Intersection Approach Information – Included as part of the Arterial Segment Attribute information (selected intersections along Tropicana Avenue for display)

Intersection approach information is provided as follows: 1. Single left turn bay; 2. Dual left –turn bay; 3. Right turn pocket; 4. RTO lane; 5. No right on Red

Tropicana Avenue

Turn Matrices for Signalized Intersections

Approach	1	2	3	4	5
Intersection 1:	Rainbow				
East Bound		X			
West Bound		X		X	
North Bound		X		X	
South Bound		X			
Intersection 2:	Torrey Pines				
East Bound	X				
West Bound	X				
North Bound	X				
South Bound	X				
Intersection 3:	Jones				
East Bound		X			
West Bound		X			
North Bound		X			
South Bound		X			
Intersection 4:	Decatur				
East Bound	X				
West Bound	X				
North Bound		X		X	
South Bound		X		X	
Intersection 5:	Cameron				
East Bound	X				
West Bound	X				
North Bound	X				
South Bound	X				
Intersection 6:	Arville				
East Bound	X				
West Bound	X				
North Bound	X				
South Bound		X			
Intersection 7:	Wynn				
East Bound	X				
West Bound	X				
North Bound	X			X	
South Bound	X			X	

Freeways: Figure 6 displays the facility attribute information for selected segments on Interstate 15. The agency relies on much of the same information sources from the arterials (counts, v/c range, speeds, ITS presence, travel lane management, crashes, transit throughput and right-of-way available).

Figure 6 – Roadway Attributes Limited Access Facilities

Limited Access Facilities Roadway Attributes	Data Type	Interstate 15 Segments					
		I-215 to Tropic-ana (A)	Tropic-ana to Spring Mtn. (B)	Spring Mtn. to Charles-ton (D)	Charles-ton to U.S. 95 (E)	U.S. 95 to Lake Mead (F)	Lake Mead to Craig (G)
V/C (Peak Period Range)	Value	≥1.0	≥1.0	≥1.0	≥1.0	≥1.0	>0.8 - 0.9
AADT	Value	105,250	129,000	129,000	128,000	82,750	48,250
Total Number of Travel Lanes	Value	8 (4/4)	6 (3/3)	6 (3/3)	8 (4/4)	6 (3/3)	6 (3/3)
Average Travel Speed (Peak)***	Value	15, 35	27, 33	20, 36	28, 34	22, 38	43, 53
Average Travel Speed (Off-Peak)***	Value	22, 36	27, 36	35, 39	35, 43	48, 50	47, 54
ITS - Freeway Detectors	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes
ITS - Dynamic Message Sign(s)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes
ITS - Camera(s)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes
HOV Lanes	Yes/No	No	No	No	No	No	No
Express Lanes	Yes/No	No	No	No	No	No	No
Lane Operating Restrictions	Yes/No	No	No	No	No	No	No
Freeway Service Patrol	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes
Transit Passenger Throughput (Peak)	Value	N/A	N/A	N/A	N/A	N/A	N/A
Transit Passenger Throughput (Daily)	Value	N/A	N/A	N/A	N/A	N/A	N/A
Crashes (Vehicles) **	Value	476	646	1,138	355	463	311
ROW Utilization (Available ROW?)	Yes/No	Yes	Yes	Yes	No	Yes	Yes

b. Systemwide/Network Related Assessments

The Team agreed that the following reports should also be provided on systemwide elements that cannot necessarily be expressed in a corridor fashion. The information that comes out of the process allows for consideration of projects that impact policy; these include: (1) Transit shown in Figure 7, (2) Transportation Demand Management shown in Figure 8, and (3) Bicycle facilities shown in Figure 9.

Figure 7: Transit Ridership by Month (Total of All Routes)

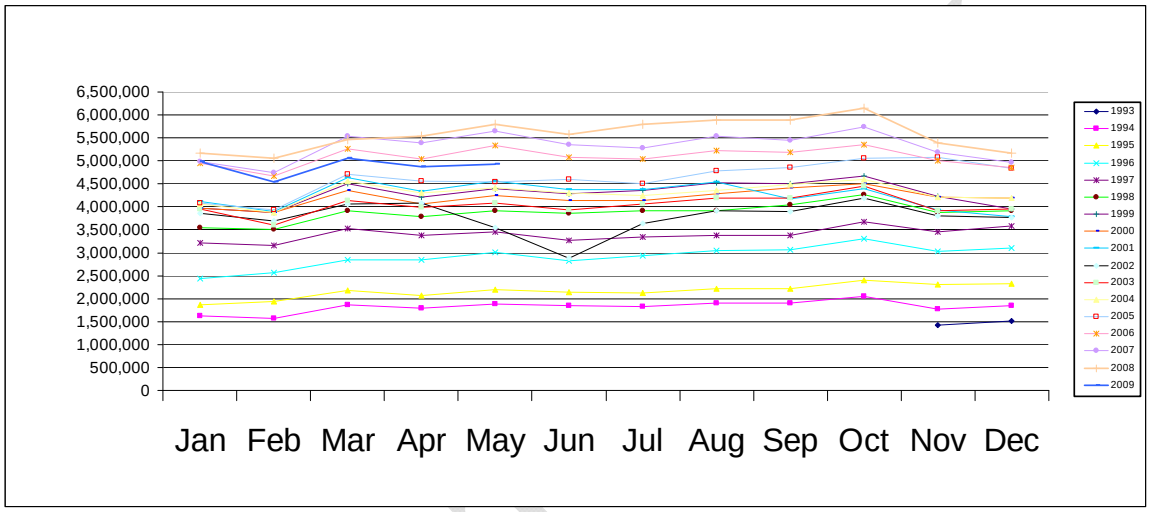
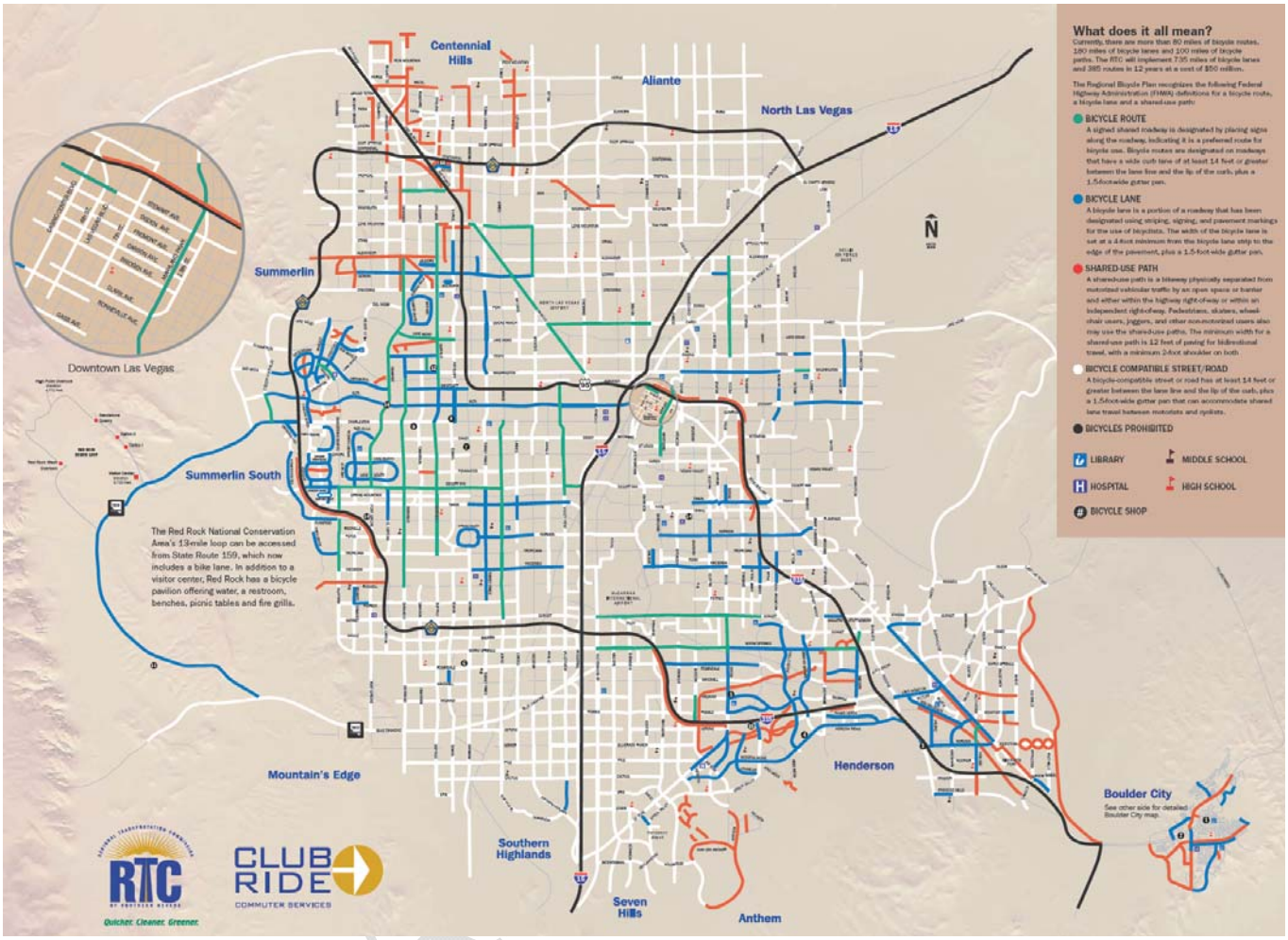


Figure 8: Transportation Demand Management

	2004	2005	2006	2007	2008
Total Program Registrants	10,096	13,795	16,724	17,821	21,158
SOVs Taken Off the Roads	300,481	361,921	278,317	255,251	320,079
Carbon Monoxide Reduced	65.1	78.4	60.3	55.3	69.3

Figure 9: Bicycle Facilities



Note: Of the 690 bicycle lane miles adopted, 192 miles have been constructed. Of the 390 bicycle route miles adopted, 82 miles have been constructed. Of the 760 shared use travel lanes adopted, 107 miles have been constructed

Step 3 – Framework: Establish Sources for Values linked to Project Evaluation and Selection – RTC's Goals and Objectives

Critical to the development of strategies used to evaluate and select projects is the need to define the value system or metrics that will drive the process. While the process opened the opportunity to develop "new" directions addressing congestion and mobility, the Team agreed that the nomination of projects would be best rooted in the RTC adopted goals and objectives. A full description of the agency's Goals, Objectives and Measures of Effectiveness is listed in the Appendix of this report.

There is not a one-to-one relationship, in other words, not every goal and corresponding objective will be used in deciding what is important in the selection of projects, criteria for the nomination form, or the weighting of projects for comparative analysis. With agreement from the Team, the RTC collapsed the adopted 11 goals into the following four categories: I - Air Quality, II- System Preservation and Efficiency, III -Alternative Mode Options, and IV- Safety and Security.

The following displays the goals under each grouped category. This information was essential in the development of 1) the congestion management strategy options listed in Step 6 of the CMP and 2) in the project criteria that defined project nomination and weighting (Steps 5 and 6 discussed later).

I - Air Quality

Goal 1: Implement transportation systems that improve air quality and protect the environment
Goal 10: Reduce greenhouse gas emissions and carbon footprint
Goal 11: Contribute to the long-term sustainability of Southern Nevada communities

II - System Efficiency & Preservation

Goal 3: Enhance the efficiency of existing transportation facilities
Goal 9: Support more efficient freight travel

III – Alternative Mode Options

Goal 2: Develop fully integrated modal options
Goal 4: Improve access to mass transportation facilities and services
Goal 5: Secure funding for expansion, operations and maintenance of systems and routes
Goal 6: Enhance public awareness and support of the regional transportation system

IV – Safety & Security

Goal 7: Improve safety for all travelers
Goal 8: Improve security for all travelers

Step 4 - Define Preliminary Strategies

This is not so much a process step as it is direction to the project proponents, because, at this point they will have to cobble several elements together in order to provide adequate consideration of congestion reduction and mobility improvements. These elements include: 1) the volume to capacity map (P.M. peak), 2) the transportation facility assessment, 3) the congestion management strategies (listed in Step 6 of the CMP) and the 4) grouped Goals by category.

Based on these elements the project proponents should be able to recommend appropriate action(s) needed to improve the function of transportation facilities and be ready to complete a Project Nomination Form discussed below. However, before project

proponents could complete this step, the Team had to work through defining Step 5 – Establishment of Project Criteria and Weights.

Step 5 - Establish Project Criteria and Weights

This step in the process is crucial because it establishes values that the Team considered significant when evaluating and selecting projects and will serve as the basis for ranking projects once they have been submitted through the project submittal form - which employs much of what was defined during the development of the project criteria and weighting.

In response, staff developed several options for the Team to consider. The group ultimately decided on three project forms to identify criteria that would be considered for projects on the network of interest, they include; 1) freeways, 2) arterials and 3) transit projects.

While a discussion of the three project forms and their differences is presented, there are three aspects to the forms for freeways and arterials. These aspects include; 1) criteria for freeways – 100 possible points and criteria for arterials – 90 possible points, and 3) a simple benefit/cost equation yielding up to 15 additional points. **Therefore freeways can score up to 115 points and arterials up to 105 points.** The transit criteria will be discussed separately, but can score up to 110 points.

The project must fall on the Network of Interest to be considered. If the project is a bottleneck elimination or safety improvement, then the selected project advances without further evaluation. Additionally, the Team believed that three additional factors were germane enough to the process that both forms should factor the following criteria into consideration; 1) system continuity (making a critical connection), 2) local priority (importance to the sponsoring entity) and 3) project readiness (ability to construct) which totals 30 points for both forms.

- Pre-rating Criteria for Limited Access Facilities -

Limited Access Facility Projects - Prescreen for Applicability		
Criterion	**Measure**	**Points**
Network of Interest	Yes/No - If "No", Send to Alternate Funding Source Evaluation	Pre-Rating
Bottleneck Elimination	Yes/No - If "Yes", Send Directly to Funding	Pre-Rating
Safety Improvement	Yes/No - If "Yes", Send Directly to Funding	Pre-Rating
Limited Access Facility Projects - Prescreen for Capacity		
Criterion	**Measure**	**Points**
Congestion Reduction	Project will reduce congestion	Mandatory
NEPA Compliance	No obvious negative impacts per RTP Environmental Justice, natural or cultural resources, or air quality that can not be addressed.	Mandatory
Plan Consistency	Consistent with adopted Regional Transportation Plan	Mandatory
Alternates Considered - Yes/No	Auxiliary Lane(s)	
	HOV lane	
	Demand Management	
	Demand management and operational improvements to parallel facilities	
	Other:	
If "No" to any of the above, one or more of these must be true:	Right-of-way not available and/or cannot be acquired at a reasonable cost.	
	Alternates have been implemented and roadway still congested.	
	Modeling shows that implementation of all feasible alternatives will not reduce congestion to an acceptable level; however TDM will continue and operational improvements will be implemented as part of the project.	
Will alternates accomplish desired congestion reduction? Yes/No	If "No", consider SOV Improvement	Pre-Rating

Similar to the initial criteria information, the first three lines of the forms for both the freeways and arterials are the same and mandatory for all projects. These include a requirement to reduce congestion, compliance with NEPA (no obvious negative impacts) and consistency with adopted local plans. Both forms seek to determine if alternatives (prior to SOV) were considered and the facts leading to the inability to implement the alternatives. Additionally the form considers and assigns weights or values to; 1) level of service, 2) AADT – demand, 3) funding participation, and 4) safety.

- Limited Access Facilities –

Limited Access Facility Projects (Freeway, Expressway, Super Arterial, Junior Expressway)		
Criterion	**Measure**	**Points**
System Continuity	2+ mode link	10
	Removes system gap	5
	Extends system	0
Project Readiness for Construction	Within one year	10
	Three years	5
	Four years or more	0
Current Level of Service - Peak Periods	F	30
	E	20
	D	10
	A/C	0
Current AADT	>100,000	25
	≥60,000 ≤100,000	20
	<60,000	15
Funding Participation by private and other governmental sources	>75 Percent	20
	>50 Percent	15
	>25 Percent	10
	<25 Percent and >$100,000	5
Safety for all modes per mile	> 9 crashes per MVMT	5
	> 7 crashes per MVMT	4
	> 5 crashes per MVMT	3
	> 3 crashes per MVMT	2
	> 1 crashes per MVMT	1
Limited Access Facility Projects	**Maximum Available Score**	**100**

-Arterial Projects-

The first section of the form contains the same mandatory requirements as those defined for freeway/limited access projects and seeks the same information regarding alternative feasibility. The only difference between the two forms is that arterials has the opportunity for 10 additional possible points and is related to the existence of bus pullouts and there is less weight associated with AADT and Levels of Service.

Arterial Roadway Projects - Rating		
Criterion	**Measure**	**Points**
System Continuity	2+ mode link	10
	Removes system gap	5
	Extends system	0
Project Readiness for Construction	Within one year	10
	Three years	5
	Four years or more	0
Bus Pullout(s)	Bus pullouts are included in project.	10
Current Level of Service - Peak Periods	F	20
	E	10
	D	5
	A/C	0
Current AADT	>60,000	15
	≥20,000 ≤60,000	10
	<20,000	5
Funding Participation by private and other governmental sources	>75 Percent	20
	>50 Percent	15
	>25 Percent	10
	<25 Percent and >$100,000	5
Safety for all modes per mile	> 9 crashes per MVMT	5
	> 7 crashes per MVMT	4
	> 5 crashes per MVMT	3
	> 3 crashes per MVMT	2
	> 1 crashes per MVMT	1
Arterial Roadway Projects	**Maximum Available Score**	**90**

- Benefit/Cost - Criteria for both project types

The purpose of this benefit cost is simple and straightforward. It is to determine the relative merit of the project cost to its benefit – to reduce congestion or improve mobility. The more cost effective the project, the higher the score/benefit. The calculation is simply the total possible points (minus the points for the benefit/cost) divided by the cost of the project in units of millions of dollars.

Benefit / Cost		
Criterion	**Measure**	**Points**
(Subtotal points divided by cost in millions)	Greater than 15	15
	Greater than 10	10
	Greater than 5	8
	Greater than 1	6
	Greater than 0.5	4
	Greater than 0.25	2
Benefit / Cost	**Maximum Available Score**	**15**

- Transit Projects -

The purpose of the transit criteria is a comparative tool for assessing transit projects against one another. Measures include; efficiency, connectivity, sustainability, cost effectiveness, roadway LOS, TAZ/job connection, safety and security and fleet adequacy. Similar to limited access facilities and arterial, the criteria include the same benefit/cost measure.

Transit Projects		
Criterion	**Measure**	**Points**
Efficiency	Service in exclusive or HOV corridor	10
	Increased frequency of service	5
Connectivity (both applicable)	Served by park and ride lot	5
	Improved connectivity with bike or pedestrian modes	5
Air Quality/Sustainability	Replacement vehicle hybrid, biofuel, or other very low emissions	10
Cost Effectiveness - Subsidy per passenger	Fare revenue projected to meet agency objective (45% operating cost)	5
	Fare revenue not projected to meet agency objective (45% operating cost)	0
Current Level of Service - Peak Period	F	10
	E	8
	D	5
	A/C	0
Employment	Within/Borders TAZ with >50 Jobs per Acre	5
Safety/Security	Improved safety/security	10
Fleet Adequacy	Bus replacement	10
	Service support	8
	Vehicle expansion	4
	Other	2
Transit Projects	**Maximum Available Score**	**70**

Benefit / Cost		
Criterion	**Measure**	**Points**
(Subtotal points divided by cost in millions)	Greater than 15	15
	Greater than 10	10
	Greater than 5	8
	Greater than 1	6
	Greater than 0.5	4
	Greater than 0.25	2
Benefit / Cost	**Maximum Available Score**	**15**

Step 6 - Establish Project Nomination Form (rooted in criteria and weighting)

Once the Team decided on the criteria formats, the development of the project nomination form was straightforward. The adopted form, illustrated above, incorporates all of the criteria for each of the project types. It is anticipated that the project proponent will be the party responsible for completing the project nomination form, as they will be provided with adequate data for the nomination of projects including; 1) the annual transportation facility assessment, 2) the listing the comprehensive congestion management strategies, and 3) the volume to capacity map (P.M. peak).

Step 7 - Establish Priority Listing of Projects

Once the project submissions are scored, a list of prioritized projects (rooted in scores) will be presented to be for consideration, modification or acceptance. The agreed to list will form basis of prioritized projects on the Network of Interest for consideration by the Commission. The Commission may approve the listing as presented or they may collectively decide to alter or modify the prioritized listing of projects.

Step 8 - Program Projects into TIP

In usual RTC practice, the listing of projects is advanced to the Commission for approval. Once approved, the listing of projects on the Network of Interest is forwarded to the NDOT for inclusion in the STIP.

Prerequisite to Project Selection - Project Application Submittal

Using input from the Team and following the requirements to develop a Project Evaluation and Selection Process, the RTC developed what it terms the **Project Submittal Application.** During the period of project nomination, each project proponent will be required to complete this form, which ultimately provides a score/priority ranking for the proposed project. The agreed-to form is presented below.

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA

LANE(S) CAPACITY PROJECT SUBMITTAL APPLICATION

1. RTC Member Agency:	
2. Contact Person/Title:	
3. Address:	
4. Phone Number: **Fax Number:**	
5. E-Mail:	
6. Project Name:	
7. Project Limits:	
8. Project Description: [Attach additional sheets if necessary]	
9. What is the estimated cost of the project?	Amount (in whole dollars) _____ Preliminary Engineering _____ Right-of-Way _____ Construction _____ Total If known, attach calculations.
10. Qualifying Questions for Congestion Management Process (CMP):	Network of Interest — Yes/No - If "No", Send to Alternate Funding Source Evaluation — Pre-Rating Bottleneck Elimination — Yes/No - If "Yes", Send Directly to Funding — Pre-Rating Safety Improvement — Yes/No - If "Yes", Send Directly to Funding — Pre-Rating

11. Mandatory Qualifying Criteria for CMP. If "No" to any, project does not qualify for Single Occupant Vehicle Lane(s) (SOV) funding under CMP.	Yes/No	Congestion Reduction	Project will reduce congestion
	Yes/No	NEPA Compliance	No obvious negative impacts per RTP Environmental Justice, natural or cultural resources, or air quality that can not be addressed.
	Yes/No	Plan Consistency	Consistent with adopted Regional Transportation Plan
12. What is the Roadway's functional classification? **If Principal Arterial, go to Question #12b**	____ Limited Access Facility ____ Principal Arterial		
12a. Alternatives to Limited Access Facility SOV Considered – Yes/No	Yes/No	Auxiliary Lane(s)	
	Yes/No	HOV lane	
	Yes/No	Transportation Demand Management	
	Yes/No	Transportation demand management and operational improvements to parallel facilities	
	Yes/No	Other:	
12b. Alternatives to Principal Arterial SOV Considered – Yes/No.	Yes/No	Access management/Raised medians	
	Yes/No	Bus Pullout(s)	
	Yes/No	Transportation Demand Management	
	Yes/No	Transportation demand management and operational improvements to parallel facilities	
	Yes/No	Intersection improvements, including signalization	
	Yes/No	Other:	
12c. Will alternatives accomplish desired congestion reduction?	If "No", proceed to CMP SOV Criteria, Item #13.		
12d. If "No" to any of Alternatives in #12a/b and one or more of these items is true, proceed to CMP SOV Criteria. If not, consider alternatives prior to application.	True/False	Right-of-way not available and/or cannot be acquired at a reasonable cost.	
	True/False	Alternates have been implemented and roadway still congested.	
	True/False	Modeling shows that implementation of all feasible alternatives will not reduce congestion to an acceptable level; however TDM will continue and operational improvements will be implemented as part of the project.	
Congestion Management Process Single Occupant Vehicle Lane Criteria			
13. System Continuity: Will the project improve system continuity by either of these means? If so, award 10 points.	2+ mode link, modes include roadway, bicycle, pedestrian transit, HOV Removes system gap Number of points: _____		
14. How ready is the project to be constructed?	Within one year	10	Number of points: _____
	Three years	5	
	More than four years	0	
15. If Principal Arterial Project,	Are bus pullouts are included in project? If so award, 10 points. Number of Points _____		

16. What is the current level of service during the peak periods?		**Freeway**	**Arterial**	
	F	30	20	Number of points: _____
	E	20	10	
	D	10	5	
	A/C	0	0	
17. What is current AADT?	**Freeway**		**Arterial**		Number of points: _____
	>100,000	25	>60,000	15	
	≥60,000 ≤100,000	20	≥20,000 ≤60,000	10	
	<60,000	15	<20,000	5	
18. What is the funding participation by private and other governmental sources?	>75 Percent	20	Number of points: _____		
	>50 Percent	15			
	>25 Percent	10			
	≤25 Percent and ≥$100K	2			
19. What is the current rate of crashes per million vehicles miles traveled (MVMT) per year per mile for all modes?	> 9 crashes per MVMT	5	Number of points: _____		
	> 7 crashes per MVMT	4			
	> 5 crashes per MVMT	3			
	> 3 crashes per MVMT	2			
	> 1 crashes per MVMT	1			
20. What is the benefit/cost ratio (total points thus far divided by the total project cost in units of millions of dollars per Question 9)?	Greater than 15	15	Number of points: _____		
	Greater than 10	10			
	Greater than 5	8			
	Greater than 1	6			
	Greater than 0.5	4			
	Greater than 0.25	2			
21. Total Points Here	_____ Freeway _____ Principal Arterial				
If you have any questions, or need more information please call:	Jerry Duke (702) 676-1729				

Appendix A

Funding Sources

Revenue Source	Adopted Uses	Recipient
Question 10 1991 & 2002 Revenue		
Motor Vehicle Fuel Tax	Street and arterial highway improvements	RTC
Room Tax	Improvements in resort corridors	Generating entity
Development Tax	1991: Construction of the Las Vegas Beltway; 2002: upgrading of the Las Vegas Beltway to full freeway standard improvements in resort corridors	Clark County
Motor Vehicle Privilege Tax	Construction of the Las Vegas Beltway	Clark County
Jet Aviation Fuel Tax	1991: Airport Connector; 2002: Increase the rate levied to support transportation improvements related to the region's airports administered by the Clark County Department of Aviation, including McCarran International Airport	Clark County
Capital Projects Tax Levy	2002: Redirection of part of the existing levy to support transportation infrastructure improvements	
Sales and Use Tax	1991: Public transit system; 2002: Increase the rate of tax and apply the additional revenues generated to highway, intermodal as well as transit expenditures, including • A new High-Speed Lane Miles Program; • Supplemental funding for the Clark County Beltway program to 2008; • Operations of the regional trails system; • Operations of the FAST traffic arterial management system (FAST is jointly funded by RTC and NDOT with the latter primarily funding the operations of the freeway management system); • Operations of the Clark County Department of Air Quality and Environmental Management, and • Various intermodal programs to support on-street bicycle facilities, ITS activities, traffic signal improvements and provision of bus turnouts.	RTC
Federal Funding		
Surface Transportation Program (STP), Urban Element	May not be used to build new capacity projects for single occupant vehicles, unless the projects come from the adopted Congestion Management System for the area.	RTC
Congestion Management and Air Quality Mitigation Program (CMAQ)	Must demonstrate projects will reduce motor vehicle emissions in a cost-effective manner, including transit and operating subsidies for new or innovative projects. Cannot be used for projects that result in new capacity for single occupant vehicles.	RTC
Earmarked Funding	Only authorized project.	As specified in legislation
Federal Transit Administration (FTA) 5307	Capital expenditures for transit development and maintenance, no operation and maintenance except for experimental or innovative services. Must certify that at least 1% of these funds are allocated to "enhancement" activities and a similar amount to safety and security projects	RTC

Revenue Source	Adopted Uses	Recipient
FTA 5309	Supplements 5307 to support larger capital investments such as intermodal terminals and maintenance facilities, and New Starts program.	RTC
National Highway System (NHS)	Most of the available funding used for bond repayments.	NDOT
Interstate Maintenance Program (Not in TIP)	Ongoing maintenance, rehabilitation and reconstruction of the Interstate Highway system	NDOT
Surface Transportation Program funds (STP), State-wide and Enhancements	New construction, maintenance, transit, ridesharing/employer trip reduction, centralized traffic control systems, and traffic management programs. The STP funding is subdivided into several sub categories. State-wide and Enhancement are administered by NDOT. Safety projects are a 10% set-aside of State-wide and include hazard elimination and protection of rail crossings. Enhancements are a 10% set-aside and include: • Bicycle/pedestrian facilities; • Safety and educational activities for bicyclists and pedestrians; • Acquisition of scenic easements and scenic or historic sites; • Scenic or historic highway programs, including tourist and welcome center facilities; • Landscaping and other scenic beautification, historic preservation; • Rehabilitation and operation of historic transportation buildings, structures, or facilities, including historic railroad facilities and canals; • Preservation of abandoned railroad facilities, including the conversion of and use thereof for pedestrians and bicyclists; • Control and removal of outdoor advertising; • Archaeological planning and research; • Environmental mitigation to address water pollution due to highway runoff or reduce vehicle caused wildlife mortality while maintaining habitat connectivity; and • Establishment of transportation museums.	NDOT
Bridge Replacement and Rehabilitation Program	Maintenance, rehabilitation and reconstruction of bridges on public roads. Not included in TIP	NDOT
Federal and Public Lands Highways Programs	Development of a coordinated program of transportation facilities serving federal lands	FHWA
FTA 5311 Non-Urban Programs	Operating support for the Southern Nevada Transit Coalition and various not-for-profit providers of specialized services outside the Las Vegas Urbanized Area	NDOT
FTA 5310, 5316 & 5317	Elderly Individuals and Persons with Disabilities, Job Access and Reverse Commute (JARC), and New Freedom. Funded projects under all three programs must be derived from the Coordinated Public Transit and Human Services Transportation Plan.	RTC

Revenue Source	Adopted Uses	Recipient
State Funding		
State Gas Tax	Of 24.75¢ per gallon, 17.65¢ goes to the State Highway Fund, 6.35¢ to cities and counties and 0.75¢ to the State Petroleum Clean-up Trust Fund. Except for administration, Highway Fund must be used exclusively for the construction, maintenance and repair of public highways. Administration includes NDOT, DMV & Public Safety. Most of the rest goes to bond & debt repayment.	NDOT
Gas / Diesel Tax Indexing	Transportation projects. Each county may index gas tax according to cost of living or inflation.	NDOT
State Bond Revenues	Funding capacity at its limit.	NDOT
Additional State Revenues – AB.595	Bonding authority for a one-time lump sum payment to the Department of Transportation of $300 million dollars from the Las Vegas Visitor's and Convention Authority (LVCVA), three cents of Clark County Ad Valorem property tax and a statewide rental car tax.	NDOT
Private Funding		
Developer and Private Funding	As appropriate related to needs generated by new development and as raised in the private market to fund Monorail extension to McCarran Airport.	Generating Entity

Appendix B

I - Goals, Objectives, Measures of Effectiveness

Vision: Provide a safe, convenient and effective regional transportation system that enhances mobility and air quality for citizens and visitors.

Objective	Measures of Effectiveness [Not Project Implementation]	Project Evaluation Criteria [Mandatory]
Goal 1. Implement transportation systems that improve air quality and protect the environment. **Goal 10. Reduce greenhouse gas emissions and carbon footprint.** **Goal 11. Contribute to the long-term sustainability of Southern Nevada communities.**		
Objective 1.5 Reduce the number of vehicle cold starts	Measure 1.5.2 Number pedestrian and bicycle corridors connecting residential with commercial areas, employment centers, and schools Measure 1.5.3 Number of subdivision walls with pedestrian/bicycle portals	This is a linkage necessary to connectivity within or among modes or to destinations.
Objective 1.6 Include environmental considerations in preliminary project planning	Measure 1.6.1 Proportion of early stage project design projects that include multi-disciplinary human and natural environmental analyses.	[A preliminary environmental and Title VI review of the SOV project has been completed and reveals no obvious negative impacts that can not be addressed.]
Goal 2. Develop fully integrated modal options.		
Objective 2.5 Plan for transit service to Ivanpah Airport	Measure 2.5.1 Transit service to Ivanpah Airport is included in TIP consistent with planned Airport opening date.	This is a linkage necessary to connectivity within or among modes or to destinations.
Objective 2.6 Improve access to transit stops and other destinations	Measure 2.6.1 Proportion of alternate mode corridors that provide continuous access to transit and other regional destinations Measure 2.6.2 Number of subdivision walls with pedestrian/bicycle portals that allow access to transit and other nearby regional destinations Measure 2.6.3 Number of transit routes that convey travelers from suburban residential and rural areas to urban transit stops.	This is a linkage necessary to connectivity within or among modes or to destinations. This provides equipment and facilities necessary to accommodate bicycles on transit, at transit stations, at park and ride/pool facilities, and/or at places of employment.

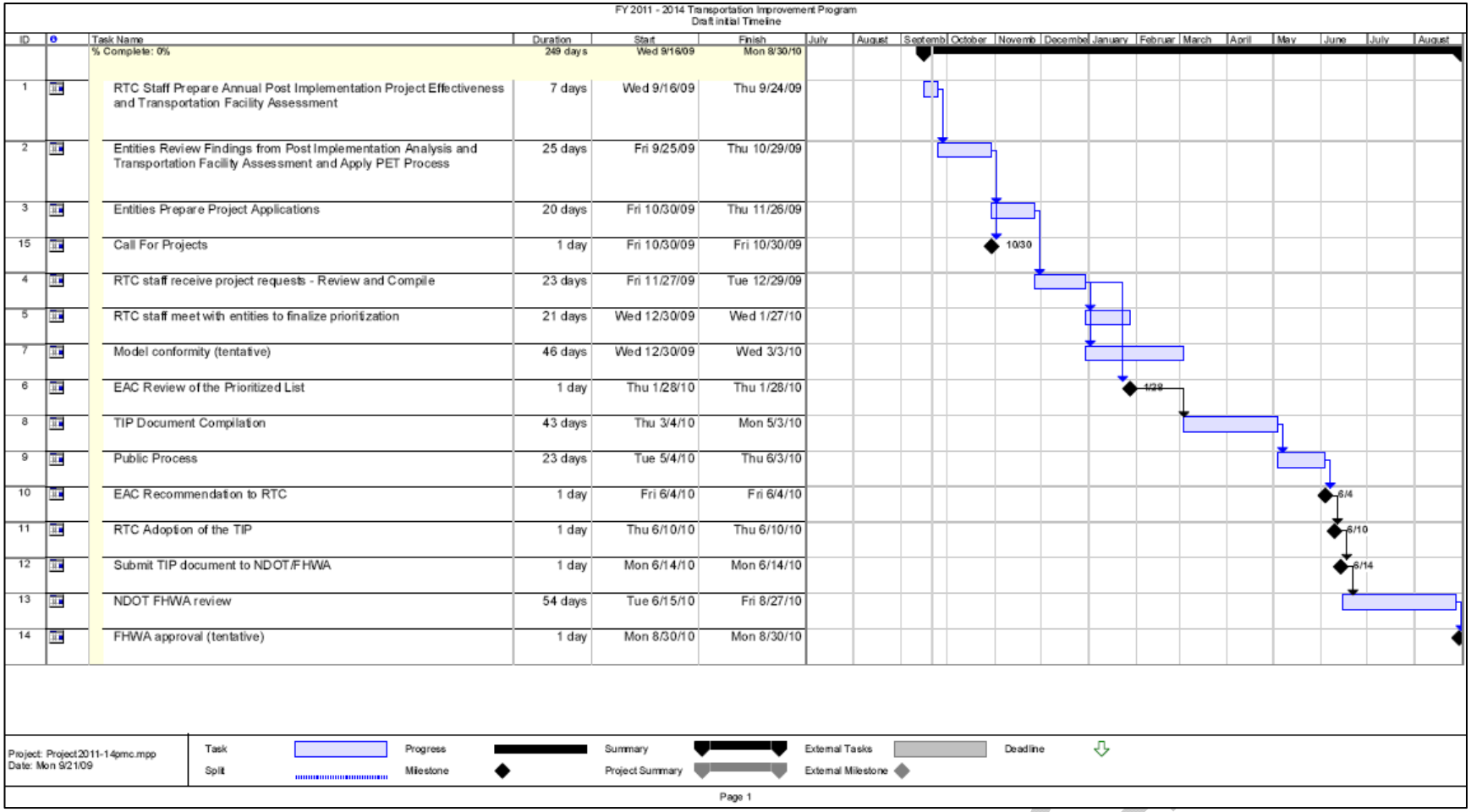
Objective	Measures of Effectiveness [Not Project Implementation]	Project Evaluation Criteria [Mandatory]
Goal 3: Enhance the efficiency of existing transportation facilities		
Objective 3.5 Maximizes effectiveness of HOV lanes	Measure 3.5.1 Maintenance of HOV lanes at LOS "C" or better at all times [Measure 3.5.2 Policies for HOV lane management adopted and applied as conditions warrant, including tolling as enabled by State law] [Measure 3.5.3 Policies for HOV lane management that recognize paratransit]	This freeway project is an HOV lane. Project is a park and ride/pool facility or auxiliary lane in support of HOV lane
Objective 3.6 Supports arterial roadway improvements that increase capacity without adding lane miles	Measure 3.6.1 Carrying capacity of arterial roadways Measure 3.6.2 Number of pull-out bus stops Measure 3.6.3 Extent of Freeway Service Patrol coverage Measure 3.6.4 Number of arterial corridor improvement plans that include efficiency improvements	This is an access management, bus pullout, ITS, incident management or other efficiency improvement project.
Objective 3.7 Adopts congestion mitigation plans as part of roadway construction contracts	Measure 3.7.1 Proportion of roadway construction projects that include congestion mitigation as an element of the construction plan Measure 3.7.2 Proportion of congestion mitigation plans that involve alternate modes	[A congestion mitigation study has been completed for this SOV project and results are positive.]
Objective 3.8 Increase the use of project mitigation measures that reduce congestion	Measure 3.8.1 Increased project funding for park and ride/pool facilities Measure 3.8.2 Increased project funding for HOV lanes Measure 3.8.3 Increased use of auxiliary lanes	Freeway SOV lane project mitigation includes park and ride facilities, HOV and/or auxiliary lanes. This SOV project is located on a highly congested roadway segment.

Objective	Measures of Effectiveness [Not Project Implementation]	Project Evaluation Criteria [Mandatory]
Goal 4. Improve access to mass transportation facilities and services.		
Objective 4.3 Identifies barriers such as affordability and gaps in service	Measure 4.3.1 Specific programs and services designed to improve affordability for low-income residents Measure 4.3.2 Specific programs and services designed to improve continuity of service	This is a transit service improvement or subsidy.
Goal 5. Secure funding for expansion, operations and maintenance of systems and routes.		
Objective 5.5 Improve revenues from mass transportation	[Measure 5.5.1 Farebox recovery rate of at least 45 percent] [Measure 5.5.2 Advertising revenues improve] [Measure 5.5.3 Operating and maintenance costs reflect an efficient allocation of resources.]	Project benefit/cost relationship is favorable compared to other alternatives.
Objective 5.6 Explore other sources of revenue for construction, operation and maintenance of all types of facilities	[Measure 5.6.1 A variety of tolling strategies is defined and studied, if enabled.] Measure 5.6.2 Tolling is included in HOV lane funding studies, if enabled.	There is private participation in funding for this project. Project benefit/cost relationship is favorable compared to other alternatives. Right-of-way sufficient to support planned improvements through project build out has been acquired.
Goal 6. Enhance public awareness and support of the regional transportation system.		
Objective 6.3 Provide opportunities for disabled, minority and low-income persons to participate in the planning process	[Measure 6.3.1 Proportion of disabled, minority and low-income persons serving on citizen Committees] Measure 6.3.2 Proportion of public participation materials that are available in more than one language Measure 6.3.3 Proportion of participation venues that are accessible	Planning for this SOV project has included public participation, particularly in impacted areas and by minorities, the disabled, and the elderly.

Objective	Measures of Effectiveness [Not Project Implementation]	Project Evaluation Criteria [Mandatory]
Objective 6.4 Ensure all interested parties have an opportunity to participate	Measure 6.4.1 Contact information for all interested parties is maintained Measure 6.4.2 Interested parties are notified of all appropriate participation opportunities Measure 6.4.3 Number of participation opportunities in addition to required public hearings Measure 6.4.4 Number of participation opportunities offered as part of the agendas of public meetings held by other entities	There is public support for this SOV project as evidenced by resolution(s) of support from governing bodies in which the project is located. [This SOV project is consistent with adopted local and regional transportation plans.]
Goal 7. Improve safety for all travelers.		
Objective 7.3 Maintain roadways	[Measure 7.3.1 Develop pavement condition evaluation methodology] [Measure 7.3.2 Reduce pavement cuts]	Give first priority to facilities maintenance per SAFETEA-LU. Project includes alternate mode improvements. Project improves safety
Objective 7.4 Maintain bicycle facilities	[Measure 7.4.1 Monitoring program that includes condition of bicycle facilities] Measure 7.4.2 Funding allocated to maintenance and repair of bicycle facilities is sufficient to ensure user safety. Measure 7.4.3 Reduce interruptions in sidewalk and roadway continuity	Give first priority to alternate mode maintenance and continuity. Project improves safety for pedestrians and cyclists.
Goal 8. Improve security for all travelers.		
Objective 8.3 Incorporates security features as appropriate	[Measure 8.3.1 Adopted security standards]	If appropriate, project incorporates security standards.
Goal 9. Support more efficient freight travel.		
Objective 9.3 Recognize freight implications of improvements to public facilities	Measure 9.3.3 Reduction in non-grade separated intersections with rail corridors	Roadway improvement project includes rail grade separations as appropriate. Truck electrification facilities are included in other projects as appropriate.

Appendix C

Completion Schedule


FY 2011 - 2014 Transportation Improvement Program
Draft initial Timeline
ID
Task Name
Duration
Start
Finish
% Complete: 0%
249 days
Wed 9/16/09
Mon 8/30/10
1 RTC Staff Prepare Annual Post Implementation Project Effectiveness and Transportation Facility Assessment 7 days Wed 9/16/09 Thu 9/24/09
2 Entities Review Findings from Post Implementation Analysis and Transportation Facility Assessment and Apply PET Process 25 days Fri 9/25/09 Thu 10/29/09
3 Entities Prepare Project Applications 20 days Fri 10/30/09 Thu 11/26/09
15 Call For Projects 1 day Fri 10/30/09 Fri 10/30/09
4 RTC staff receive project requests - Review and Compile 23 days Fri 11/27/09 Tue 12/29/09
5 RTC staff meet with entities to finalize prioritization 21 days Wed 12/30/09 Wed 1/27/10
7 Model conformity (tentative) 46 days Wed 12/30/09 Wed 3/3/10
6 EAC Review of the Prioritized List 1 day Thu 1/28/10 Thu 1/28/10
8 TIP Document Compilation 43 days Thu 3/4/10 Mon 5/3/10
9 Public Process 23 days Tue 5/4/10 Thu 6/3/10
10 EAC Recommendation to RTC 1 day Fri 6/4/10 Fri 6/4/10
11 RTC Adoption of the TIP 1 day Thu 6/10/10 Thu 6/10/10
12 Submit TIP document to NDOT/FHWA 1 day Mon 6/14/10 Mon 6/14/10
13 NDOT FHWA review 54 days Tue 6/15/10 Fri 8/27/10
14 FHWA approval (tentative) 1 day Mon 8/30/10 Mon 8/30/10
July
August
Septemb
October
Novemb
Decembe
January
Februar
March
April
May
June
July
August
10/30
1/28
6/4
6/10
6/14
Project: Project2011-14pmc.mpp
Date: Mon 9/21/09
Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline
Page 1

Appendix D

Freeway and Arterial System of Transportation

The Freeway and Arterial System of Transportation (FAST) collects and evaluates data related to freeway and signalized arterial performance. Freeway data is collected on I-15 between I-215 and Lake Mead Blvd and I-515 between Charleston and I-15. Before the end of 2009, FAST will be collecting and evaluating data on US 95 between I-15 and Summerlin Parkway. Over the next two years freeway coverage is expected to extend north along US 95 and I-15 and south along I-515.

Arterial data is collected along arterials where FAST provides signal coordination. FAST is responsible for the coordination of nearly 1,200 signals, and this covers major arterial corridors bounded by St. Rose Parkway and Blue Diamond Road to the south, Ft. Apache Road to the west, Elkhorn Road to the north, and Nellis Blvd. to the east.

The following data is collected and evaluated by FAST.

FREEWAYS FAST uses Intelligent Transportation Systems (ITS) software and hardware to collect travel time, speed and volume data on the freeways described above. Two datasets are currently maintained:

- one that aggregates freeway travel times that are reported on freeway dynamic message signs, and
- the other that gathers speed, travel time, and volume data directly from freeway detectors.

The travel time-based data is currently more readily available with datasets available between September 2008 and the present. Processed data from the freeway detectors is available between May 2007 and October 2008. Raw detector data is available to the present; however, it hasn't been processed.

The travel time-based data provides travel times for most days since September 2008 in 15 minute intervals between 6 a.m. and 7 p.m. With operational changes in August 2009, the data is now available through 9 p.m. The data presents a detailed description of the extent and location of congestion. The data sets are being updated to include a listing of traffic incidents. The combination of travel time data and incidents allows for the calculation of recurring and nonrecurring measures. Additionally, the data is being reviewed in conjunction with roadway construction information to quantify the impacts of roadway construction on freeway performance and incidents.

The travel time datasets are limited to a reporting of travel times for origin-destination pairs that are part of the FAST travel time program. This program provides extensive coverage of I-15 between I-215 at the south and US 95 (Spaghetti Bowl). As the travel time program expands, additional origin-destination pairs will be added.

The freeway detector data reports volumes, travel times, and speeds for individual 1/3-mile segments of the freeway. This allows for customized aggregation of data. Additionally this data reports volumes which allows evaluators to create speed-flow diagrams that can be used to evaluate operational effectiveness of incident management and ramp metering and assess impacts of construction. The volume totals can be

disaggregated to report volume by vehicle length so that the impact of heavy vehicles on freeway performance can be evaluated. This data is also available for individual freeway lanes.

ARTERIALS

FAST maintains a list, updated monthly, that reports the communication and coordination status of all signalized intersections in the FAST database.

To quantify signal coordination performance, FAST uses Global Positioning System (GPS) devices to collect and archive travel times on coordinated arterial corridors. Over 1,000 travel runs are made each year. Travel runs are made at various times of the day, so that the effectiveness of signal coordination for peak and off-peak periods can be evaluated. Specific measures include average speed, delay, travel time, and number and location of stops. FAST synthesizes the travel time data with hourly count data provided by NDOT to further evaluate the benefits of signal coordination.

Appendix E

RTC Project Identification and Prioritization Policies and Procedures – Local Projects -

RTC Policies and Procedures relating to project identification and prioritization are as follows:

2.0 PROJECT DEVELOPMENT

2.1 PROJECT LIST AND PRIORITY LIST

The RTC shall keep a perpetual "Project List" of approved projects it has accepted under its authority. In addition, the RTC shall periodically review the project lists from the Regional Transportation Plan and Transportation Improvement Program pertaining to federally funded locally sponsored intermodal priorities.

The RTC Executive Advisory Committee shall review at least annually the existing Priority List and prepare a recommendation of projects, if any, to be included in the new list. Prior to finalizing the recommended new priority list, the projects shall be submitted to the members of the RTC Utility Coordination Committee who shall review the proposed projects and scheduling for conflicts with other planned projects. The Utility Coordination Committee's comments shall be forwarded to the Executive Advisory Committee for consideration. An updated cost estimate and project schedule shall also be prepared during the annual priority list review, which is to begin in October and be completed to coincide with the RTC Budgetary and Transportation Improvement Program processes.

The following information is required at the time a project is submitted for inclusion into the Capital Improvement Program:

1. *Project Location*
2. *Project Limits*
3. *Project Description (a brief description outlining work to be completed, i.e., new construction or widening of existing facility, number of lanes added, landscaping improvements, signalization improvements, major drainage structures, interchanges/grade separations, etc.)*
4. *Project phase (Preliminary Engineering, Right-of-Way Acquisition, Construction)*
5. *Approximate fiscal year start and completion*
6. *Funding timeline*

DEFINITION FOR AREA-WIDE MAJOR PROJECT

Area-wide Major Projects are hereby defined as those that have an existing annual average daily traffic (AADT) volume of at least 40,000 and a 10-year projected AADT volume of at least 60,000, or are part of I-15, US 95, I-515, Summerlin Parkway, Super Arterials and the Las Vegas Betway/I-215 including interchanges and grade separations on roadways with at least 100' right-of-way, or as otherwise determined by the RTC Board. Area-wide significance for grade separations on roadway with less than 100' right-of way will be determined on a case by case basis. The extent of grade separations and interchanges shall be limited to touchdown points based on AASHTO or other applicable standards.

AREA-WIDE MAJOR PROJECTS PRIORITIZATION PROCESS

Following is the recommended process for prioritizing area-wide major projects. Area-wide major projects be prioritized using a 2-step process. The first step screens proposed projects to determine the overall regional benefit in terms of air quality and congestion. The second step prioritizes the projects. Projects may be submitted for screening at any time throughout the year, but projects are screened and prioritized annually. The process is documented.

Step 1: Screen Proposed Projects

Projects that meet the definition of an area-wide major project are screened to determine if they have an overall positive benefit on a regional basis. RTC staff does the initial screening based on the following pass/fail factors; projects that pass a majority of the factors proceed to Step 2.

1. Vehicle Miles Traveled (VMT) – The regional model output is used to compare the change in VMT when the project is added. Given the very large VMT (over 27,000,000), a change of ±10,000 is considered significant for a single project. No significant change or a reduction in VMT is considered passing.

2. CO/NOX – The change in CO would be based on the regional model output by comparing the change in CO production when the project is added. No change or a reduction in CO would be considered passing.

3. Level of Service (LOS) in the Area of Potential Effect – The change in the level of service would be calculated with and without the project to determine the overall effect. LOS would be an indicator of conditions in an area, and would allow a wider range of measures, such as delay or volume/capacity. No change or an improvement in LOS would be considered passing.

4. 5-Year Forecast Volume/Capacity (V/C) – The V/C in the near-term (5-year) would be calculated with and without the project. No change or reduction in V/C on the affected facility would be considered passing.

5. 10-Year Forecast V/C - The 10-year forecast V/C would be calculated with and without the project. No change or in V/C on the affected facility would be considered positive.

Speed or Travel Time– Speed and travel time are essentially the same. The speed would compare the difference between the free-flow speed and the congested speed in the 5-year horizon. A congested speed within 10% of the free-flow speed would be considered passing. Travel time would compare the difference between free-flow and congested travel times in the 5-year horizon. A congested travel time within 20% of the free-flow condition would be considered acceptable

PROJECT PRIORITIZATION OF QUESTION 10 HIGH SPEED LANE MILES

The following is intended to provide direction to the process of assigning prioritization points to proposed Question 10 (Q10) high speed lane mile projects. The information represents criteria agreed to at the 8/18/2004 Working Group meeting.

Q10 High Speed Lane Mile Criteria (Roadways 100' wide or greater)

1. Project Readiness	***Points Available***
Design/NEPA	*.30 x (50y1 25y2 10y3)*
Right-of-Way Acquisition	*.30 x (50y1 25y2 10y3)*
Construction	*.90 x (50y1 25y2 10y3)*

Application: Readiness refers to projects that can feasibly be advanced within the next 3-5 year period. The rating system scores proposed projects on the three distinct phases normally associated with project development. In the event Design and ROW are complete at the time of ranking (project actually ready for construction), the project will assigned the maximum points available for Design, ROW and Construction. Note that each category has a different weight used to multiply the appropriate year/point assignment identified within the parenthesis.

2. Multiple Funding 15 Maximum Points

Application: The concept is to reward projects that leverage non-Q10 high speed lane mile funds to maximize the availability of Q10 funds for other projects. The maximum points that can be assigned for this criterion are 15. The assignment is calculated as follows:

$$\frac{\text{Non Q10 Dollars pledged to project}}{\text{Total Project Cost}} \times 15 = \text{Points}$$

3. Congestion / Demand Accommodation 100 Points

Application: The maximum points available for this criterion are 100. The concept is to reward high speed lanes mile projects that directly assist in congestion mitigation. A v/c ratio of .75 or greater signifies that the project is suitable for Question 10 funds. When modeling a project, a change in projected volume typically reflects the geographic need for the proposed facility. This need is demonstrated by a growth in volume after the completion of the project. The criteria is as follows:

If the v/c ratio is greater than or equal to .75 ***OR*** *projected volumes increase greater than 10%, 100 points are assigned to the project.*

4. High Speed Lane Mile Construction 15 Points per Mile

Application: The concept is to reward projects that increase the supply of high speed lane miles. The group agreed to assign 15 points for each mile of roadway constructed within the project. The assignment does not account for multiple

lanes within the proposed project as was identified in previous scoring assessments.

5. Interchange 20 Points
Application: The concept is to reward points to the construction of new interchanges since they facilitate rapid distribution of traffic. The group agreed that points should not be assigned to enhance existing interchange facilities.

6. Grade Separation 10 Points
Application: The group agreed to assign 10 points per construction of each new grade separation. Projects that include more than one grade separation can receive multiple point assignments for each additional grade separation within the proposed project.

7. Connectivity 5 Points
Application: The idea is to reward points to projects that link high speed roadways and create travel connections where none existed prior. This connection can be at-grade or may be a grade separation. In the case of grade separation, the project would also be assigned the points from the Grade Separation criterion listed above.

8. Project Cost and Benefit
The use of Benefit / Cost analyses will be applied to the range of projects which are eligible for Question 10 funding in the following manner:

Projects submitted for funding that are ready for construction shall only receive a funding recommendation upon completion of a benefit/cost (B/C) analysis performed prior to funding approval. The analysis must show a reduction in congestion as one of its measured benefits and demonstrate a B/C ratio of at least 1.0.

Projects submitted for funding that are in the Study, Engineering/Design/NEPA, or Right-of-Way Acquisition phase will use the following B/C calculation: Project Cost ÷ Total Assigned Points = Cost per points, where "Total Assigned Points" represents the total points derived for the project using the first seven prioritization criteria. It is this score that embodies the relational benefits amongst eligible projects. Projects in this category exceeding $100,000 per point will be reviewed on a case-by-case basis to determine their eligibility for funding.

DEFINITION OF AN ELIGIBLE QUESTION 10 HIGH SPEED LANE MILE PROJECT

In order for a project to be eligible for high speed lane mile funding, the roadway must be at least 100 feet wide, have a posted speed of 40 mph or greater and

when complete, add high speed lane mile(s) to the regional travel network or facilitate a connection that links similarly defined roadways.

Appendix F

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

Information Booklet for Projects in FY 2010-2012

Congestion Mitigation and Air Quality Improvement Program (CMAQ) – Project Eligibility

Introduction

The CMAQ program supports two important goals for the federal Department of Transportation: improving air quality and relieving congestion.

According to the recent Federal Highway Administration guidance on CMAQ, States and MPOs must give priority to two categories of funding. First, priority is for diesel retrofits, particularly where necessary to facilitate contract compliance, and other cost-effective emission reduction activities, taking into consideration air quality and health effects. Second, priority is to be given to cost-effective congestion mitigation activities that provide air quality benefits.

Generally, the federal share for CMAQ projects is 80 percent, with a local match of 20 percent.

General Conditions for Project Eligibility

CMAQ funds may be used to establish new or expanded transportation projects or programs that reduce emissions, including capital investments in transportation infrastructure, congestion relief efforts, diesel engine retrofits, or other capital projects.

CMAQ funds may be used for operating assistance, as long as it is limited to new transit services, intermodal facilities, and travel demand management strategies, as well as the incremental cost of expanding existing transit services. The intent is to help start up viable new transportation services that can demonstrate air quality benefits and eventually cover their costs as much as possible.

CMAQ-invested projects or programs must reduce CO, ozone precursors, and PM emissions from transportation. These reductions must contribute to the area's overall clean air strategy and can be demonstrated by the assessment that is required under federal guidance.

Activities in support of eligible projects also may be appropriate for CMAQ investments. Studies that are part of the project development pipeline (e.g., preliminary engineering) under NEPA are eligible for CMAQ support, as are FTA's Alternatives Analyses. General studies that fall outside specific project development do not qualify for CMAQ funding.

Eligible Projects and Programs

1. Congestion Reduction and Traffic Flow Improvements:
    a. *Traditional traffic flow improvements*, such as the construction of roundabouts, bottleneck eliminations, intersection improvements, and left-turn or other managed lanes, are eligible for CMAQ funding provided they demonstrate net emissions benefits.
    b. *Intelligent Transportation Systems (ITS) projects*, such as traffic synchronization (or signal interconnects), traffic management, and traveler information systems.
2. Bicycle and Pedestrian Facilities and Programs:
    a. Constructing bicycle and pedestrian facilities (e.g., paths, bike racks, support facilities) that are not exclusively recreational and reduce vehicle trips
    b. Non-construction outreach related to safe bicycle use
3. Travel Demand Management:
    a. Physical assets and services that provide real-time information on network performance and support better decision-making for travelers choosing modes, times, routes, and locations. Such projects can help ease congestion and reduce single-occupancy vehicle use.
    b. Examples: Traveler information services, shuttle services, guaranteed ride home programs, carpools and vanpools, traffic calming measures, telecommuting, and employer-based commuter choice programs.
    c. CMAQ funds may support capital expenses and up to three years of operating assistance to administer and manager new or expanded programs.
4. Transit Improvements:
    a. Transit System Start-Ups; Transit Transfer Facilities; Transit Facility Improvements; and Transit Service (eligible only for the first three years) and Equipment
5. Park-and-Ride Facilities
6. Alternative Non-Transit Vehicles:
    a. CMAQ funds may be used to purchase publicly-owned alternative fuel vehicles, including passenger vehicles, refuse trucks, street cleaners, and others. Costs associated with converting fleets to run on alternative fuels are also eligible.
7. Freight/Intermodal:
    a. Projects and programs targeting freight capital costs are eligible provided that air quality benefits can be demonstrated.
    b. These projects fall generally into two categories: primary efforts that target emissions directly or secondary projects that reduce net emissions. Successful primary project include new diesel engine technology or retrofits or vehicles or engines. Secondary projects reduce emissions through shifts in or additions to infrastructure.

Ineligible Projects and Programs

1. Transit Operations (other than the first three years): CMAQ funds may not replace existing funding sources for transit operations or increase the general subsidy of existing operations.
2. Routine Maintenance: This includes rehabilitation projects and retiming existing signals and interconnects, as they only maintain existing levels of highway and transit service.
3. Projects that add new capacity for single-occupancy vehicle lanes, unless construction is limited to high-occupancy vehicle lanes.
4. Stand alone projects to purchase fuel.
5. Project already obligated.

Appendix G

GLOSSARY

AADT – Average Annual Daily Traffic, normally expressed only in motorized vehicles using the roadway.

Auxiliary Lane – An additional freeway lane between adjacent interchanges that improves the weaving conflicts between exiting and entering vehicles. The lane begins where an on-ramp enters the freeway and ends at the next off-ramp.

Bottleneck – "Physical bottlenecks are locations where the physical capacity is restricted, with flows from upstream sections (with higher capacities) being funneled into them. This is roughly the same as a storm pipe that can carry only so much water — during floods the excess water just backs up behind it, much the same as traffic at bottleneck locations. However, the situation is even worse for traffic. Once traffic flow breaks down to stop-and-go conditions, capacity is actually reduced — fewer cars can get through the bottleneck because of the extra turbulence. Bottlenecks can be very specific chokepoints in the system, such as a poorly functioning freeway-to-freeway interchange, or an entire highway corridor where a system of bottlenecks exists, such as a closely spaced series of interchanges with local streets."
FHWA, *Traffic Congestion and Reliability: Linking Solutions to Problems*, July 19, 2004

High Employment Ratio – More jobs than could be expected to be filled by nearby residents. The median ratio of employment to dwelling units in Clark County is 1.10. A balanced employment/housing ratio is defined as 10 percent of the Traffic Analysis Zones (TAZs) above and below the median for a total of 20 percent of the TAZs about the median.

Level of Service (LOS) – The measure can be the relationship between roadway capacity and the volume of traffic it carries. The scale represents the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS A and congested conditions rated as LOS F. On a freeway, LOS F is "stop and go" or worse. On a street, LOS F is gridlock. Signalized intersections are evaluated on the basis of how long vehicles must wait.

MVMT – Million Vehicle Miles Traveled.

NEPA Compliance Criterion – NEPA requires that each project be reviewed to determine its direct, cumulative and indirect impacts on the natural, cultural, and social environments. Topics addressed for SOV projects normally include:

- Air Quality
- Water Quality
- Community - Social Issues - Environmental Justice
- Land Use
- Public Lands
- Hazardous Materials and Solid Waste
- Historic - Archeological - Cultural Environment
- Natural Environment including Threatened and Endangered Species
- Noise and Vibration

- Wetlands and Waters of the US
- Floodplains
- Energy Usage
- Visual Resources
- Public Safety
- Construction Impacts

The study necessary to bring the project to the application stage will allow identification of any fairly obvious environmental impacts that cannot be mitigated. An example might be that the route is planned to traverse a Wilderness area. Since Wilderness areas are, by definition, roadless, this would be an impact that could not be addressed, except by moving the facility outside of the area and then it would be a different project with different impacts. Prior to environmental justice considerations, freeways were often planned through poor communities, because the land was less expensive. Now this would be a negative impact that could not be remedied without realigning the roadway. Another example might be the widening of an arterial roadway through an historic neighborhood and requiring demolition of several houses listed on the National Register. Upgrading a collector street into a principal arterial roadway without a foreseeable amendment to the Regional Transportation Plan might be another.

Safety Improvement - improvements at locations with known and potential hazards and/or crash problems. Examples include:

- Highway-rail crossing grade separations, crossbars, lights
- Intersection improvements
- Pavement and shoulder widening
- Guardrail and barrier improvements
- Breakaway utility poles and sign supports
- Pavement grooving and skid-resistant overlays
- Shoulder rumble strips
- Minor structural replacements or modifications
- Signing and pavement markings particularly at ped/bike crossings and in school zones
- Measures to reduce wildlife collisions

Traffic Analysis Zone (TAZ) – A special geographic area delineated by state and or local transportation agencies for tabulating traffic-related data. A TAZ usually consists of one or more Census blocks, block groups, or tracts.

Transportation Demand Management (TDM) – Programs intended to reduce the number of trips rather than to increase the capacity of transportation facilities. Programs include transit, car and van pooling, flexible work schedules and staggered work shifts.