CONGESTION MANAGEMENT SYSTEM

PROCEDURES AND RESPONSIBILITIES REPORT

Endorsed by the OMPO Policy Committee

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OAHU METROPOLITAN PLANNING ORGANIZATION

CONGESTION MANAGEMENT SYSTEM

PROCEDURES AND RESPONSIBILITIES REPORT

Prepared by:

OAHU METROPOLITAN PLANNING ORGANIZATION

in association with

State of Hawaii Department of Transportation

State of Hawaii Department of Business, Economic Development & Tourism

City and County of Honolulu Department of Transportation Services

City and County of Honolulu Department of Planning and Permitting

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707 RICHARDS STREET, SUITE 200, HONOLULU, HAWAII 96813-4623 (808) 587-2015

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TABLE OF CONTENTS

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ACRONYMS

The following is a list of acronyms used throughout this report:

ADA	Americans with Disabilities Act
CAC	Citizen Advisory Committee
CFR	Code of Federal Regulations
CMS	Congestion Management System
DBEDT	Department of Business, Economic Development and Tourism (State)
DOT	Department of Transportation (State)
DPP	Department of Planning and Permitting (City)
DTS	Department of Transportation Services (City)
FHWA	Federal Highway Administration
FMS	Freeway Management System
FTA	Federal Transit Administration
FY	Fiscal Year
HOV	High-Occupancy Vehicle
ITS	Intelligent Transportation Systems
OMPO	Oahu Metropolitan Planning Organization
ORTP	Oahu Regional Transportation Plan
OTS	Oahu Transit Services
OWP	Overall Work Program
TAC	Technical Advisory Committee
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TMA	Transportation Management Areas
TSM	Transportation System Management
V/C	Volume-to-capacity ratio

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BACKGROUND

Federal regulations (23CFR §450.320) require the State Department of Transportation (DOT), Oahu Metropolitan Planning Organization (OMPO), and the transit operator to cooperatively develop a Congestion Management System (CMS) as part of the metropolitan transportation planning process. In 1994, DOT engaged the consultant firm of Austin Tsutsumi and Associates to develop a CMS. At that time, a statewide CMS was required. With the passage of the National Highway System (NHS) Designation Act of 1995, the formerly required management systems were made optional except for the CMS in transportation management areas. The DOT decided to continue to develop all systems on a statewide basis. It is OMPO's understanding that this remains the intent of the DOT.

The Transportation Equity Act for the 21st Century (TEA 21), passed by Congress in 1998, reiterated the importance of the CMS to the metropolitan planning process. Federal regulation 23CFR §450.320 states that for metropolitan areas with a population greater than 200,000 (referred to as transportation management areas or TMA) the planning process must include the development of a CMS that provides for effective management of new and existing transportation facilities. As a TMA, OMPO must meet this requirement.

In March 2000, the OMPO Certification Review, conducted by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) reiterated the necessity of incorporating a CMS into the planning process. OMPO reported that it is in the process of implementing a CMS.

At its September 14, 1999 meeting, the OMPO Technical Advisory Committee (TAC) agreed to form a temporary committee, comprised of key agency personnel, to develop a set of recommendations for incorporating the CMS into the metropolitan planning process. The temporary committee outlined procedures and responsibilities that were needed in order to incorporate the CMS into the OMPO planning process and to implement the CMS on Oahu.

In December 1999, DOT finalized their report, *Development of the State of Hawaii Congestion Management System: CMS Analytical Process, Data Collection and Evaluation* heretofore referred to as the *Development of the CMS*. The report "concentrated on developing the methodology to identify critical surface transportation corridors and routes on each island. Analytical methodology was developed to quantify and prioritize congestion problems according to the extent, intensity, and severity of congestion at specified locations. It also included a demonstration program to collect travel time/running speed data as well as the identification of agency resource requirements for the CMS" (p. ES-1).

The result of the efforts of the OMPO CMS temporary committee and the recommendations found in the *Development of the CMS*, is this report, the *CMS Procedures and Responsibilities Report*.

OBJECTIVE OF THE CONGESTION MANAGEMENT SYSTEM

The objective of the Congestion Management System is to develop, establish, and implement, on a continuing basis, a system that results in the identification and implementation of strategies that provide the most efficient use of existing and future surface transportation facilities in all areas of Oahu.

The CMS is a performance-based system that is intended to effectively manage existing and new transportation facilities through the use of travel demand and operational management strategies where these actions are shown to be effective. Agency staff involved in CMS activities will monitor and analyze the magnitude of congestion on a multimodal transportation system, and plan and implement actions, appropriate to the scope of the problem, that alleviate congestion and enhance the performance of the transportation system.

The primary reason to develop and implement a CMS is to provide decision-makers with a better understanding of existing and anticipated system performance, and to provide them with better information on the effectiveness of congestion management strategies. This will provide for more informed and better decision-making. In addition, a better knowledge base of strategy effectiveness will assist future efforts in selecting congestion management strategies for analysis and implementation, and provide better information overall for decision-making.

The CMS structure proposed for Oahu is designed to use the existing statewide and metropolitan planning and programming processes while containing the components required in the federal regulations (23 CFR §500.109). The CMS will support the long-term transportation goals as identified in the Oahu Regional Transportation Plan (ORTP), and provide guidance on how these goals can be achieved through strategies to alleviate congestion. Information resulting from CMS activities include statistics on system operating performance, the location and severity of congestion, changes in system performance over time, congestion management strategy evaluation and cost-effectiveness, and strategy performance results.

DEFINITIONS

CONGESTION MANAGEMENT SYSTEM TECHNICAL COMMITTEE

The CMS Technical Committee is a new committee that was first recommended in the DOT report, *Development of the CMS*. Coordination and cooperation among multiple agencies is necessary to ensure that the CMS functions properly and provides the desired information. This joint City/State/OMPO Technical Committee will coordinate CMS activities, ensure the timely development and delivery of CMS products, and provide technical information to the OMPO TAC and the OMPO Policy Committee regarding potential Transportation Improvement Program (TIP) and regional transportation plan projects. The CMS Technical Committee will also periodically review CMS activities, procedures, and techniques and update the CMS process as new technologies become available.

The CMS Technical Committee will consist of staff from the agencies identified below:

- State Department of Transportation (DOT)
- City Department of Transportation Services (DTS)
- Oahu Metropolitan Planning Organization (OMPO)
- Federal Highway Administration (FHWA) - Ex-Officio
- State Department of Business, Economic Development and Tourism (DBEDT) - As Needed
- City Department of Planning and Permitting (DPP) - As Needed

Both DOT and DTS currently have staff members involved in "CMS activities" to some degree. For projects that involve both City and State facilities, the two departments currently work together to identify the deficiencies and come up with solutions. DPP currently reviews environmental assessments and environmental impact statements in coordination with DTS. As part of the CMS Technical Committee, DPP and DBEDT will be called upon as necessary. DPP could provide input on new land use developments such as residential subdivisions, sports complexes, or commercial developments. DBEDT could provide input when necessary on census and population data. FHWA is an ex-officio member of the CMS Technical Committee. FHWA will monitor the CMS and its incorporation into the metropolitan planning process.

It is likely that both DOT and DTS will have their own transportation areas of concern, or may jointly monitor a route or corridor in which there may be both State and City roadways, or roadways that serve as transit corridors. Each agency will individually or jointly analyze the collected data, as appropriate. Each agency will select alternative strategies to mitigate congestion on a route or corridor, and evaluate the potential effectiveness of each strategy in order to establish the priority of this particular project as compared to other potential transportation projects.

Members of the CMS Technical Committee will correspond with each other on CMS-related issues, as they currently do for existing projects, and will meet on a regular or as-needed basis. The group will provide a more structured process through which technical staff from each agency will exchange data and ensure technical compatibility. As requested by the implementing entity, the CMS Technical Committee will evaluate and support, as appropriate, CMS-related activities targeted at reducing congestion not identified through the OMPO CMS process.

CONGESTION

Congestion being addressed by the CMS refers to vehicular traffic congestion on the surface transportation system. Congestion is defined as the level at which transportation system performance is no longer acceptable due to traffic interference. The level of system performance deemed acceptable by State and local officials may vary by type of transportation facility, geographic location (metropolitan area or subarea, rural area), time of year, and/or time of day.

The *Development of the CMS* report identified areas of the transportation system that are currently working satisfactorily, and quantified the congestion problem where congestion is occurring on the system. The *Development of the CMS* report also recommended that the congestion threshold for level of service (LOS) in urban areas, such as Honolulu, be defined as LOS E. Suburban areas were also

defined as LOS E, with rural Oahu areas as either D or E. The LOS and volume-to-capacity (v/c) ratios in Table 1 were proposed in the DOT *Proposed Data Collection Program*, the precursor to the *Development of the CMS* report, as the CMS threshold criteria. These criteria will serve as the guidelines to determine when travel time/travel speed studies should be implemented to document the severity, extent, and locations of congestion. The procedures described in the *Highway Capacity Manual* will be used to estimate v/c ratios and determine levels of service, as identified for each facility type.

TABLE 1: LEVELS OF SERVICE AND VOLUME-TO-CAPACITY (V/C) RATIOS

ISLAND	Oahu	Oahu	Oahu	Neighbor Islands	Neighbor Islands
Area Type	Urban	Suburban	Rural	Urban	Rural
Threshold Criteria	v/c LOS	v/c LOS	v/c LOS	v/c LOS	v/c LOS
Facility Type					
Regional					
Freeway	0.84 E	0.84 E	NA	NA	NA
Multi-Lane Highway	0.86 E	0.86 E	0.72 D	0.72 D	0.72 D
Two-Lane Highway	0.51 E	0.51 E	0.43 D	0.43 D	0.43 D
Subregional					
Multi-Lane Highway	0.84 E	0.84 E	0.70 D	0.70 D	0.70 D
Two-Lane Highway	0.52 E	0.52 E	0.43 D	0.43 D	0.43 D
Circulation					
Multi-Lane Highway	0.84 E	0.84 E	0.70 D	0.70 D	0.70 D
Two-Lane Highway	0.64 E	0.64 E	0.43 D	0.43 D	0.43 D
Signalized Intersections	0.90 E	0.90 E	0.90 E	0.90 E	0.90 E

Source: State of Hawaii, Department of Transportation. 1995. *Proposed Data Collection Program, Draft*. Page 13.

AREA OF APPLICATION

The area of application is the geographic area where congestion levels will be monitored and congestion management strategies will be evaluated and implemented.

The geographical area of consideration will include areas where congestion is occurring, or is expected to occur. DOT and DTS will, as appropriate, review the assessment found in the *Development of the CMS* of transportation corridors or facilities with existing or potential recurring congestion, and assess the level of the current or potential congestion on a continuing basis. The collected data for corridors in the *Development of the CMS* was based upon the importance of the corridor as a major travel route and regional transportation corridor. Indicators of importance include traffic volumes, availability of alternative routes, and importance to regional travel. DOT and DTS will use the results of the *Development of the CMS* as a baseline of how the surface transportation system is working.

TRANSPORTATION SYSTEM

The definition of the transportation system is to be included in the CMS functions and analysis. The CMS network is that portion of the transportation system where system performance will be evaluated and tracked over time, and where specific congestion management strategies will be directed through the CMS process.

In general, the managed transportation system will include freeways, principal arterials, and minor arterials as defined by the State's functional classification system. The transit system and pedestrian and bicycle facilities will not be analyzed as part of the evaluation of the transportation system performance. They will be viewed within the solution set of congestion mitigation measures.

PERFORMANCE MEASURES

Performance measures provide the basis for evaluating the transportation system operating conditions and identifying the location and severity of congestion. In addition, performance measures provide the mechanism for quantifying the level of congestion on the transportation system.

AGENCY STAFF

Agency staff refers to staff from OMPO's participating agencies (DOT or DTS) spearheading the particular congestion-related project.

PERFORMANCE MEASURES

Performance measures used to identify congestion may not necessarily be the same as those used to evaluate the effectiveness of congestion strategies. These measures will be multimodal in nature and will be useful for regional and subregional analysis, not merely for spot problem identification.

The following is a list of potential performance measures that may be used in the CMS program:

Roadway Performance Measures Currently Used by DOT and/or DTS

- Level of service (based on v/c ratios)
- Complaints and suggestions by the public
- Visual observation of traffic flow
- Traffic volumes

- Travel times based on the methodology outlined in the *Development of the CMS* report
- Accident records
- t-test analysis

Transit Performance Measures Currently Used by DTS

- Load factors
- Schedule adherence
- Level of service
- Passengers/revenue vehicle mile
- Passengers/revenue vehicle hour

Pedestrian/Bicycle Performance Measures Currently Used by DOT and/or DTS

- Congestion concern on popular recreational pathways
- Conflicts between pedestrian and bicycles
- Interaction with vehicles
- Pathway/route utilization

Performance Measures that Could be Obtained from the OMPO Model

- Average speed by facility type and area type
- Vehicle miles traveled by facility type and area type
- Vehicle hours traveled by facility type and area type
- Screenline volumes by facility type

ROLE OF THE CMS TECHNICAL COMMITTEE

The CMS Technical Committee members will review and evaluate performance measures currently used by DOT and DTS. Performance measures and the data collection systems to support them will be phased in over time, as technology becomes available. The CMS Technical Committee will strive to select performance measures that meet the following criteria:

- Clearly understood
- Sensitive to modes

- Sensitive to time (e.g., spreading of peak period)
- Not too difficult or costly to collect
- Can be forecast into the future
- Sensitive to the impact of congestion mitigation strategies (on people and/or goods)

ROLE OF THE OMPO TAC

TAC will periodically review the effectiveness of the performance measures being used, and update them, as appropriate.

PERFORMANCE MONITORING PLAN

The Performance Monitoring Plan is the mechanism for collecting the data needed to quantify the performance measures and track congestion over time. The plan will specify data to be collected, frequency of data collection, data collection locations, data collection responsibility, data analysis techniques, database management requirements, performance analysis reporting.

ROLE OF AGENCY STAFF

Current DOT and DTS data collection efforts, as reflected in Appendix A, will be used to the extent possible to provide the inventory for the CMS. Baseline data of traffic operations on the major roadways on Oahu is available in the *Development of the CMS* report. This travel time data will be used as the basis for the CMS inventory. Efforts will be made to collect travel time data using Intelligent Transportation System (ITS) technology, but until ITS measures are available, the travel time data collection methodology described in the *Development of the CMS* report will be used as an interim methodology. While DOT and DTS have the option of collecting new data at any time, travel time-related baseline data will be updated by DOT and DTS approximately every five years unless otherwise directed by TAC. Data currently collected by DOT and DTS for other projects will be used to supplement the baseline data if appropriate.

IDENTIFICATION AND EVALUATION OF PROPOSED STRATEGIES

Identification and evaluation of proposed CMS strategies include screening and evaluating strategies for potential effectiveness in addressing the identified congestion problems. Depending on the project, these can function at either the systemwide or corridor/subarea level of analysis. They will provide guidance in selecting strategies, actions, and policies required to manage congestion. It is anticipated that these strategies will answer questions on how effective specific congestion management strategies could be and the costs associated with implementation.

IDENTIFICATION

ROLE OF AGENCY STAFF

DOT and DTS staff will identify and evaluate their respective agency's proposed strategies. Strategies will include both traditional and non-traditional strategies, and deal with both existing and future congestion. The inventory of data and analysis of that data will be used to analyze deficiencies and to develop and evaluate strategies and solutions.

Within DOT, the DOT-Highways Traffic Branch will take the lead in identifying and evaluating proposed highway strategies.

DOT and DTS staff will each consider the following classes of congestion management strategies:

Demand Management

- TDM
- HOV strategies
- Transit operational improvements
- Non-motorized and non-traditional modes
- Congestion pricing
- Growth management

Operational Management

- Traffic operational improvements
- Access management
- Incident management
- ITS

Capital Intensive Improvements

- Lane additions
- Transit capital improvements

Examples of strategies that could generally be considered for portions of the system include:

Non-Freeway System

- Traffic signal synchronization
- Peak hour parking restrictions

Freeways

- Improvement of geometrics
- ITS measures (variable message signs, incident management)

Transit

- Improved schedules
- Bus traffic signal preemptions

Bicycle/Pedestrian

- Enhancement/expansion of bicycle facilities
- Enhancement/expansion of pedestrian facilities

EVALUATION

As part of evaluating proposed strategies, DOT and DTS will determine which available solution will have the highest potential "payoff." They will forecast system performance given a set of strategies. With input from DPP or DBEDT, as appropriate, they will also consider the impacts of local land use actions.

ROLE OF AGENCY STAFF

Agency staff will consider the following factors in their analysis:

- Identification of the underlying cause of the congestion problem. Staff will evaluate whether queued traffic on a section of the freeway, for instance, is caused by higher demand than available capacity, or by poor travel time on a parallel arterial network. Improving the surface street network in this example could directly improve conditions on the freeway.

- Problem needs to be addressed not only as a site-specific concern but as a system-level concern. Without a system-level evaluation, one localized problem may be corrected, without benefiting the total system. For instance, if a problem upstream is corrected, it may transfer the congestion downstream.

- Field observation. A problem may appear to have one cause and solution evident from the data, but field inspection may present an entirely different picture.

When appropriate, agency staff will run the OMPO travel demand model to evaluate proposed strategies. Depending on the strategy, the model could evaluate impacts on specific links as well as tabulate the results on a regional basis. DOT and DTS may use a combination of strategy-specific analysis techniques and the OMPO model results to evaluate a strategy or set of strategies. In some cases, the OMPO model will be capable of identifying impacts and benefits directly. In other cases, the results of a strategy-specific evaluation may be input into the model for the analysis of regional impacts. In other instances, the strategy-specific evaluation will be able to provide only an assessment of the localized impacts, and the results will not be appropriate for input into the model.

Agency staff will also consider the cost-effectiveness of strategies. Because one strategy or alternative has a higher effectiveness than another, it does not necessarily mean that it is preferable. A less effective but less costly alternative may be preferred, particularly if it is able to achieve the established performance objectives for the corridor or subarea. Cost factors to consider in a cost-effectiveness analysis include annual labor cost, annual capital cost, annual direct operational cost, annual overhead cost, and annual cost savings.

Agency staff will assess the effectiveness of a strategy by using measures of effectiveness that are sensitive to changes in the factors that the strategy is expected to impact. Cost-effectiveness parameters may include cost per peak period trip reduced, cost per mile per hour (mph) of speed increase, cost per thousand passenger-miles of travel reduced, cost per thousand hours saved, etc. Cost-benefit analyses may include the dollar value of time savings, energy savings, or, as appropriate, the revenue generated by the strategy less administrative and other costs.

Agency staff will evaluate the quantitative results as well as the benefits of CMS strategies that cannot be quantified.

Analysis will also be done on the effectiveness of Transportation Demand Management (TDM), Transportation System Management (TSM), High-Occupancy Vehicle (HOV), land use, ITS, and congestion pricing strategies as much as possible.

The implementing agency will propose the congestion-related projects for inclusion into the TIP or ORTP.

ROLE OF THE CMS TECHNICAL COMMITTEE

The CMS Technical Committee will collectively discuss and compare the effectiveness of each proposed strategy, regardless of mode or operational jurisdiction, based on evaluations done by City and State staff. The Committee will also prepare a list of CMS projects based on their evaluations, and make appropriate recommendations for the inclusion of the project or program into the ORTP or TIP.

The CMS Technical Committee will provide periodic status reports on CMS activities, as needed, to the TAC and Policy Committee.

ROLE OF THE OMPO CITIZEN ADVISORY COMMITTEE (CAC) AND THE GENERAL PUBLIC

The public will be able to comment on CMS-related projects as well as other transportation projects on the proposed TIP project listing.

ROLE OF THE OMPO TAC

TAC will evaluate the technical merits of each proposed TIP project, and recommend a prioritized listing of congestion-related projects as well as other transportation-related projects for Policy Committee action.

ROLE OF THE OMPO POLICY COMMITTEE

The Policy Committee will prioritize congestion-related projects and other transportation projects before deciding which projects to include in the TIP. Priorities may be established based on a variety of factors, including congestion, safety, public input, and technical evaluations and rankings.

IMPLEMENTATION OF SELECTED PROJECTS

DOT and DTS are responsible for the implementation of TIP projects developed in the planning process. For each of the projects generated from the CMS process, the agencies will address specific details such as who will be involved in these strategies, what the costs will be, what the time-frame will be, and how the project will be financed.

EVALUATION OF THE EFFECTIVENESS OF SELECTED PROJECTS

The performance of the transportation system is the final component of the CMS. The selected projects for implementation will be evaluated through data collection and evaluation of effectiveness. Feedback received by the agencies and the CMS Technical Committee will provide additional information regarding the effectiveness of specific projects and actions that alleviate congestion. This component serves as the "feedback loop" to the planning and programming process so that the CMS Technical Committee can evaluate whether the CMS is achieving the desired goals in an efficient and effective manner.

During 1998 and 1999, DTS monitored the traffic operations of three City projects (Punchbowl Street Conversion, Traffic Demonstration Project to Simulate the Reduction of One Lane on Kalakaua Avenue, and CityExpress!). For these projects, DTS chose to use the same performance measures for both quantifying the existing conditions as well as evaluating the project's effectiveness.

ROLE OF AGENCY STAFF

DOT and DTS will primarily evaluate projects that will have corridor, subarea, or regional impacts; that are designed to affect travel patterns, behavior, and mode choice; or that represent controversial actions. They may also choose to evaluate projects for which existing knowledge is limited or the measured effectiveness of a project varies considerably between applications in other metropolitan areas or states. The appropriate agency staff will be involved in the data gathering and analysis tasks and preparation of the appropriate report.

As a start, DOT will review the effectiveness of the H-3 Freeway, the Zipper Lane, and the Moanalua Freeway improvements. As DTS has done in the past, the evaluation will cover not only the facilities on which the improvements were made, but other parallel facilities that may have been affected.

Approach

Examples of ways to measure the effectiveness of various strategy classes are:

- TDM Strategies: change in vehicle occupancy in targeted corridors, change in mode split and average vehicle ridership at work sites, change in work schedules
- HOV Strategies: change in corridor HOV occupancy, change in corridor vehicle occupancy
- Congestion Pricing: change in temporal volume distribution, change in corridor mode split, change in corridor average speed
- Transit Capital Improvements: change in mode split at destinations/origins served, change in total and corridor transit passengers
- TSM Strategies: change in speed, change in intersection delay
- Access Management: change in speed, change in accident rate
- ITS: change in origin/destination travel time (for traveler info/route diversion), change in average speed (for freeway/network control integration)
- Incident Management: incident duration by type, travel time variance

ROLE OF THE CMS TECHNICAL COMMITTEE

The CMS Technical Committee will review the results of project evaluations. The results of the evaluations will assist the CMS Technical Committee in refining implemented projects and identifying projects appropriate for addressing other needs and deficiencies. The results and recommendations will be presented by the CMS Technical Committee to the TAC and Policy Committee for their review.

ROLE OF THE OMPO TAC

TAC will review the results of the evaluations, and make recommendations to the CMS Technical Committee for future projects.

ROLE OF THE OMPO POLICY COMMITTEE

The Policy Committee will review the results of the project evaluations.

CMS DOCUMENTATION

The following reports will be as brief as possible, user-oriented, and will rely on graphical portrayals of data where appropriate:

- Performance Monitoring and Evaluation Plan
- Effectiveness Evaluation Report

ROLE OF AGENCY STAFF

Effectiveness Evaluation Reports - DOT or DTS, as appropriate, will evaluate and document the effectiveness of implemented strategies. A report will be produced only when an evaluation is conducted.

ROLE OF THE CMS TECHNICAL COMMITTEE

CMS Procedures and Responsibilities Report - This document will change only when an element of the CMS changes. The CMS Technical Committee will update the procedures and responsibilities and amend the report as necessary.

CMS Performance Monitoring and Evaluation Plan - The CMS Technical Committee will document data collection and analysis procedures to be used by DOT and DTS. The committee will update this document whenever plans or procedures change.

ROLE OF THE OMPO TAC

TAC will review and accept the reports produced.

SCHEDULE

DOT has a work element (W.E. 201.01-01) in the FY 2001 Overall Work Program to implement the CMS. Part of this work element includes the training of agency staff on the methodology of reducing and processing the raw data collected, and the application of the data to evaluate and develop congestion mitigation strategies. The project also involves the evaluation of a previously implemented CMS-related project. This work element is anticipated to be complete by June 2001.

Therefore, by June 2001, the following CMS-related tasks will be completed:

- Documentation of data collection and analysis procedures (CMS Performance Monitoring and Evaluation Plan).
- Data collection to measure the effectiveness of certain previously implemented projects.
- Identification, evaluation, and recommendation of transportation strategies to address serious congestion problem locations. This process would be ongoing.
- Effectiveness Evaluation Report(s).

APPENDIX A

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DOT'S CURRENT DATA COLLECTION EFFORTS

- Work Element 201.01-01, Implementation of the Congestion Management System, is included in the FY 2001 Overall Work Program (OWP). As part of this work element, DOT will collect data to measure the effectiveness of certain strategies and projects that have been implemented since the development of the CMS.

- Traffic Operations Section - Staff investigate complaints by counting traffic, and reviewing crash data, past projects, and past complaints. One staff member investigates pedestrian, bicycle, and Americans with Disabilities Act (ADA)-related complaints.

- Planning Survey Section - Field crew technicians collect data. They update the photolog system and straight line diagrams. Student interns from University of Hawaii also work part-time in this section.

- Existing traffic counts are currently used as input into the computer traffic flow simulation model for the H-1 freeway. The model uses v/c ratios to test various "what if" scenarios.

- The Freeway Management System (FMS) is currently under development. Data such as vehicle counts, speeds, and the number of cars in each lane will be collected using vehicle detectors. The system, divided into 5 phases, is currently estimated to take about 8 to 10 years to develop.

DTS' CURRENT DATA COLLECTION EFFORTS

- DTS has one crew of traffic technicians who collect most of the traffic data for the DTS traffic engineers and transportation planners so that they can monitor congestion on the City streets. The data collected include: traffic volume counts, speed classification counts, laser speed studies, turning movement counts, queuing counts, pedestrian counts, delay studies, travel time data, and bike counts.

- A signal timing review project is currently under development. This project will optimize 281 traffic signals on Oahu. Under this contract, the consultant will perform the following data-gathering tasks:

    - Conduct 24-hour traffic counts at certain locations

    - Conduct travel time surveys using the floating car method on selected routes

    - Compile accident data on certain roadways, and recommend solutions

    The consultant will also research and provide guidance on the integration of ITS traffic signal technology. The consultant will determine if the traffic signal systems within the study area have the capability of generating peak period approach counts or turning movement counts using detector data. If the capability does not exist, the contractor will determine what software options are available.

- Oahu Transit Services (OTS), the transit operator, tracks load factors and schedule adherence. OTS also collects data, such as vehicle miles and passenger miles, to input into the annual National Transit Database report.

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