

INTELLIGENT TRANSPORTATION SYSTEMS

Oahu Regional ITS Architecture
Procedures and Responsibilities
Report

October 2003

Oahu Metropolitan Planning Organization
707 Richards Street Suite 200
Honolulu, Hawaii 96813

OAHU REGIONAL ITS ARCHITECTURE

Procedures and Responsibilities Report

Prepared by:
Oahu Metropolitan Planning Organization

[[This page intentionally left blank.]]

Table of Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	Oahu Regional ITS Architecture	1
1.3	Relationship to the Long-range Plan.....	2
2	Policy on ITS Architecture Maintenance.....	3
3	OMPO ITS Organizational Structure.....	4
3.1	Policy Committee.....	4
3.2	Technical Advisory Committee	4
3.3	ITS Technical Task Force.....	4
3.4	Citizen Advisory Committee	5
3.5	OMPO Staff.....	5
4	ad hoc ITS Task Force	6
4.1	Membership	6
4.2	Role of the ad hoc ITS Technical Task Force.....	6
4.3	Role of OMPO Staff	7
4.4	Role of Agencies.....	7
4.5	Turbo Architecture.....	7
5	Approach.....	8
5.1	Defining Changes to the Architecture.....	8
5.2	Maintenance of the Regional ITS Architecture	8
5.3	ITS Projects Proposed for Programming in the TIP	9
5.4	ITS Projects Programmed in the STIP	10
5.5	ITS Projects Programmed Outside of the TIP and STIP Processes.....	10
6	Modifying the Architecture.....	11
6.1	ITS Projects Proposed for Programming in the TIP	11
6.2	Amending the Oahu Regional ITS Architecture.....	13
6.3	Locally Funded ITS Projects	16
7	Statewide ITS Projects.....	18

Appendices

Appendix A: Organizational Structure for Addressing ITS Policy Issues

Appendix B: Example of ITS Consistency Check

Appendix C: Contact Information

Appendix D: Description of Turbo Architecture

List of Figures

Figure 1: ITS Projects and the TIP -- Determining Consistency with the Oahu Regional ITS Architecture.....	12
Figure 2: Amending the Oahu Regional ITS Architecture	17
Figure 3: Statewide ITS Projects	19

[This page intentionally left blank.]

Acronyms

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

CAC	Citizen Advisory Committee
CFR	Code of Federal Regulations
CVISN	Commercial Vehicle Information Systems and Networks
DBEDT	Department of Business, Economic Development and Tourism (State agency)
DDC	Department of Design and Construction (City agency)
DIT	Department of Information Technology (City agency)
DOT	Department of Transportation (State agency)
DPP	Department of Planning and Permitting (City agency)
DTS	Department of Transportation Services (City agency)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FTA	Federal Transit Administration
FY	Fiscal Year
HESD	Honolulu Emergency Services Department (City agency)
HFD	Honolulu Fire Department (City agency)
HPD	Honolulu Police Department (City agency)
ITS	Intelligent Transportation Systems
OCDA	Oahu Civil Defense Agency (City agency)
OMPO	Oahu Metropolitan Planning Organization
ORITSA	Oahu Regional Intelligent Transportation Systems Architecture
ORTP	Oahu Regional Transportation Plan
OWP	Overall Work Program
STIP	Statewide Transportation Improvement Program
TAC	Technical Advisory Committee
TF	ad hoc ITS Technical Task Force
TIP	Transportation Improvement Program (for Oahu)
TMA	Transportation Management Area(s)

[This page intentionally left blank.]

1 Introduction

An intelligent transportation system (ITS) is a collection of technologies or systems (e.g., advance sensors, computers, communication systems) that enable multiple agencies to work together to collectively manage the entire regional transportation network. Among other things, an ITS increases roadway capacity without adding lanes and alerts drivers en route and pre-trip to conditions affecting travel (e.g., weather, construction, accidents, etc.). The ITS on Oahu will improve traffic congestion, internal agency operations, emergency response, dissemination of traffic-related information to the public, and several other aspects that enhance transportation mobility and safety.

1.1 Background

In early 2001, the United States Department of Transportation announced the release of the final Federal Highway Administration (FHWA) rule and the Federal Transit Administration (FTA) policy for applying the ITS National Architecture at the regional level. This rule/policy requires regions that are funding ITS projects through the National Highway Trust Fund to develop a Regional ITS Architecture that complies with the National ITS Architecture. Regions that had deployed an ITS project prior to April 8, 2001 are required to develop a regional ITS architecture within four years of this date (i.e., April 8, 2005). Areas yet to deploy an ITS project are required to have a regional ITS architecture developed within four years of the first deployment. ITS projects that are not funded through the National Highway Trust Fund are exempt from the rule/policy.

1.2 Oahu Regional ITS Architecture

In April 2003, the Oahu Metropolitan Planning Organization (OMPO) Policy Committee endorsed the *Oahu Regional ITS Architecture*. Documentation of the architecture is comprised of an Executive Summary, an Operational Concept, and an Integration Strategy.

- The Executive Summary provides an overview of the architecture, is in a brochure format, is posted on the OMPO website (www.OahuMPO.org), and has been distributed to members of the OMPO Policy Committee, Technical Advisory Committee, and Citizen Advisory Committee, and members of the public on OMPO's mailing list.
- The Operational Concept illustrates and defines the *Oahu Regional ITS Architecture* in terms of regionally significant transportation services, or market packages. The Operational Concept provides the framework for system definition as part of the Integration Strategy and defines the interconnections of specific elements, going into greater detail by defining the architecture flows or information/data shared between systems.
- The Integration Strategy identifies an effective process for deploying and operating current and planned ITS technologies in a cost-effective and practical manner. On Oahu, this process enables agencies to make better use of their

respective ITS elements – thereby obtaining more benefit from a fixed investment. The Oahu ITS Integration Strategy defines a process for deploying and operating ITS elements through nine policy initiatives and fourteen ITS project initiatives.

The endorsement of the *Oahu Regional ITS Architecture* enabled OMPO to fulfill the federal requirements for regions that are currently implementing ITS projects, 23 Code of Federal Regulations (CFR) 940.9(b), as previously summarized.

1.3 Relationship to the Long-range Plan

The *Oahu Regional Transportation Plan* is the official guide for the development of the major surface transportation facilities and programs to be implemented on Oahu. Based upon projected transportation needs, the plan identifies short-range and long-range strategies and actions that should ultimately lead to the development of an integrated intermodal transportation system that facilitates the safe, efficient, and economic movement of people and goods. The plan is updated every five years and amended as necessary.

The current update of the long-range plan is referred to as the *Transportation for Oahu Plan for 2025* or *TOP 2025*. The ORTP provides \$110 million for ITS projects that are consistent with the *Oahu Regional ITS Architecture*.

2 Policy on ITS Architecture Maintenance

Part (f) of 23 CFR 940.9 states that “the agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region.” In conjunction with this, the *Oahu Regional ITS Architecture* includes a policy statement as part of its Integration Strategy to meet this regulation. Policy A.5 states, “The region will establish a method for maintaining the ITS Architecture to ensure that eligibility for Federal transportation funding is maintained.”

This policy does not dictate the ITS architecture maintenance procedure, but supports the region in the development of a maintenance approach. Maintenance of the architecture includes:

- Assessing proposed ITS projects against the ITS architecture to determine if they are consistent and to determine if changes should be made to the architecture to reflect architecture flows proposed in the projects.
- Periodically updating the regional ITS architecture to ensure that the *Oahu Regional ITS Architecture* does not become obsolete. The number of years between updates depends on several factors – including the rate at which ITS is deployed, the number and types of changes made to the National ITS Architecture and standards, changed circumstances that result in new needs that may be met using ITS, and the rate of change of ITS technologies and systems available in the marketplace.

Most regions identify a group that would convene, when required, to perform/oversee the two activities noted above. Fortunately, the OMPO Policy Committee has already established an *Organizational Structure for Addressing ITS Policy Issues* (see Appendix A) in which it identifies an ad hoc ITS Task Force to deal with technical ITS issues. (The role of this task force is described in Section 4 of this document.)

Key activities, as described in the Integration Strategy, that are suggested in this policy include:

1. All partner agencies need to identify candidates for the ad hoc ITS Task Force that will focus on Architecture Maintenance. The Task Force will need to determine which agency will be the leader of the group, or if leadership will rotate among key partner agencies. The leader will be responsible for convening the larger group when necessary.
2. Partner agencies need to identify funding sources that can be used to fund regional ITS architecture maintenance activities, if funding is required.

3 OMP0 ITS Organizational Structure

The maintenance of the ORITSA architecture utilizes the existing structure as established and as stated in the *Organizational Structure for Addressing ITS Policy Issues*. (See Appendix A for a complete copy of the document.) Each of the functions for the respective committees listed is described along with their areas of responsibility.

3.1 Policy Committee

Function: To serve as ITS policy decision-maker.

Areas of Responsibility:

- a. Prioritize Oahu's ITS projects under the 3-C planning process, regardless of funding source
- b. Endorse the federal funding of Oahu's ITS projects
- c. Endorse general city-state coordination, agreements, or other interests
- d. Promote legislation to assist in the development and implementation of a fully integrated and coordinated ITS system

3.2 Technical Advisory Committee

Function: To serve as a technical resource to the Policy Committee

Areas of Responsibility:

- a. Identify potential policy issues to Policy Committee
- b. Make recommendations to Policy Committee on ITS policy issues
- c. Make technical (non-policy) ITS decisions in areas impacting city and state jurisdictions
- d. Document ITS planning activities in the Overall Work Program (OWP)
- e. Provide resources to inform Citizen Advisory Committee (CAC) of policy issues when public input is needed

3.3 ITS Technical Task Force

Composition:

- a. Technical Advisory Committee (TAC) agency representatives
- b. Ad hoc members as required by the agenda
- c. FHWA representative

Function: To serve as the ITS technical expert arm of the TAC

Areas of Responsibility:

- a. Be a forum for agencies to discuss and report progress on ITS activities
- b. Identify potential policy issues to TAC for Policy Committee action
- c. Resolve technical issues regarding implementation

- d. Identify technical issues not resolved by the ITS Technical Task Force which must be forwarded up to TAC for TAC action
- e. Develop pros, cons, and recommendations for TAC

3.4 Citizen Advisory Committee

Function: To provide public input to the Policy Committee

Areas of Responsibility:

- a. Chair to determine whether public input, through the CAC, will be sought
- b. Make recommendations to Policy Committee when public input is sought

3.5 OMPO Staff

Functions: To coordinate and promote discussions on potential policy issues within the OMPO process; and to advise the Policy Committee

Areas of Responsibility

- a. Participate in the ITS Technical Task Force, TAC, and CAC
- b. Identify potential policy issues

4 ad hoc ITS Task Force

4.1 Membership

Because the ITS Technical Task Force allows for ad hoc members, this will be the venue utilized for the maintenance of the Oahu Regional ITS Architecture. The standing task force members will be from the following OMPO participating agencies:

- Department of Transportation Services (DTS)
- Department of Transportation (DOT)
- Department of Planning and Permitting (DPP)
- Department of Business, Economic Development and Tourism (DBEDT)
- FHWA

As needed, members from the following agencies will be invited to participate on the Task Force:

- Department of Design and Construction (DDC)
- Department of Information Technology (DIT)
- Federal Motor Carrier Safety Administration (FMCSA)
- FTA
- Honolulu Emergency Services Department (HESD)
- Honolulu Fire Department (HFD)
- Honolulu Police Department (HPD)
- Oahu Civil Defense Agency (OCDA)
- Etc.

See Appendix C of this document for contact information.

4.2 Role of the ad hoc ITS Technical Task Force

With respect to maintaining the *Oahu Regional ITS Architecture*, the role of the ad hoc ITS Technical Task Force will be to:

- Assess proposed ITS projects against the ITS architecture to determine if they are consistent, and to determine if changes should be made to the architecture to reflect architecture flows proposed in the projects.
- Assess the regional ITS architecture to ensure that the *Oahu Regional ITS Architecture* does not become obsolete and to recommend changes to update the *Oahu Regional ITS Architecture*.

Meetings of the ad hoc ITS Technical Task Force will be convened, at a minimum, annually, and with the development of each Transportation Improvement Program (TIP). In addition, if ITS projects are added through amendments to the TIP, each non-administrative amendment of the TIP will also trigger a meeting of the ad hoc ITS Technical Task Force.

4.3 Role of OMPO Staff

OMPO shall initially assume chairmanship of the ad hoc ITS Technical Task Force. Under its chairmanship, OMPO shall be responsible for convening meetings as needed. OMPO shall maintain the *Oahu Regional ITS Architecture* and will be responsible for the maintenance of the master copy of the Turbo Architecture. (Refer to Appendix D for a description of Turbo Architecture.) Updates of any changes to the *Oahu Regional ITS Architecture* will be provided to the ad hoc ITS Technical Task Force.

4.4 Role of Agencies

Agencies that are making modifications to the *Oahu Regional ITS Architecture* will be responsible for coordinating with OMPO to convene meetings of the ad hoc ITS Technical Task Force and providing the group with appropriate information of the proposed changes. They will also be responsible for determining the agencies that will be participating on the ad hoc ITS Technical Task Force. Changes that are agreed to by the ad hoc ITS Technical Task Force shall be documented by the proposing agency through a technical memorandum and in Turbo Architecture. City and State agencies are the only entities that can make a change to the *Oahu Regional ITS Architecture*; private organizations will need to work with a sponsoring agency in an effort to make a change to the *Oahu Regional ITS Architecture*.

4.5 Turbo Architecture

Agencies that require Turbo Architecture can obtain a copy of the software through OMPO. OMPO will program the request as part of its OWP. See Appendix D for a description of Turbo Architecture, as obtained from the National ITS Architecture website.

5 Approach

This section defines when a change to the *Oahu Regional ITS Architecture* is required; the federal regulations; and how OMPO and its participating agencies will meet the federal regulations. Sections 6 and 7 of this document set forth the procedures for maintaining the *Oahu Regional ITS Architecture*. To better understand how these procedures were developed, the following discussion about OMPO's approach to implement federal ITS regulations is provided here.

5.1 Defining Changes to the Architecture

The *Oahu Regional ITS Architecture* details the specifics of the architecture flows for the existing conditions as well as the short- to mid-range ITS projects that are being developed by the participating agencies. The flows, as found in the documents that comprise the *Oahu Regional ITS Architecture*, are considered the "baseline flows". One of four changes can occur that would be considered a change in or modification to the architecture, and would require amending the architecture based on the approach and procedures described heretofore:

- An architecture flow changes from "planned" to "existing";
- An architecture flow changes from "unplanned" to "planned";
- An architecture flow changes from "unplanned" to "existing"; and
- An architecture flow is added; and
- A market package is added.

5.2 Maintenance of the Regional ITS Architecture

There are three benefits for maintaining the *Oahu Regional ITS Architecture*:

- *Maintenance of Federal transportation funding eligibility.* Maintaining the regional ITS architecture will ensure that the region will be eligible for Federal ITS funds.
- *Maintenance of agency consensus on ITS implementation plans.* Inter-agency consensus on ITS plans ensures that agencies can move forward with ITS deployments with the knowledge that these projects will be included in the regional plans and will be allocated Federal funding. This also improves schedule adherence and leads to the timely deployment of ITS elements within the region.
- *Ensuring that integrated connections that are planned are implemented, in order to help reduce overall deployment costs.* ITS initiatives that are planned for the mid-term often require certain ITS infrastructure to be fully implemented. Without timely deployment of this infrastructure, certain costs may be incurred (e.g., costs associated with delay in project deployment, costs to quickly acquire and deploy the needed infrastructure).

5.2.1 Regulation

23 CFR 940.9(f) states that “the agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region.”

5.2.2 Approach

The regulation provides the region flexibility in identifying an ITS architecture maintenance procedure as appropriate. As such, the procedures described in Sections 6 and 7 are likely to be unique to Oahu.

5.3 ITS Projects Proposed for Programming in the TIP

These procedures are associated with OMPO’s TIP process since federal regulations link ITS projects and the regional architecture to highway trust funds. Since the TIP process already exists, it is a convenient mechanism to monitor and to trigger the maintenance of the *Oahu Regional ITS Architecture*.

5.3.1 Regulation

23 CFR 940.11(d) states that “upon completion of the regional ITS architecture, the final design of all ITS projects funded with highway trust funds shall accommodate the interface requirements and information exchanges as specified in the regional ITS architecture. If the final design of the ITS project is inconsistent with the regional ITS architecture, then the regional ITS architecture shall be updated, as provided in the process defined in §940.9(f), to reflect the changes.”

5.3.2 Approach

This regulation is applicable to the TIP process in conjunction with the *Oahu Regional ITS Architecture*. The TIP is where regionally significant projects and projects that are receiving funds from the highway trust fund are programmed. The first sentence of this regulation requires all ITS projects programmed in the TIP comply or are consistent with the *Oahu Regional ITS Architecture*. The draft TIP will trigger a meeting of the ITS Task Force, who will determine whether projects contained within the draft TIP are consistent with the *Oahu Regional ITS Architecture*.

The second sentence of §940.11(d) addresses projects that are not found within the *Oahu Regional ITS Architecture* but are still programmed in the draft TIP. If the project is in the draft TIP, OMPO will assume that the project has agency support. Because the project is being funded with national highway trust funds, the project will need to be consistent with the *Oahu Regional ITS Architecture*, or the *Oahu Regional ITS Architecture* needs to be updated to incorporate the project. Note that the *Oahu Regional ITS Architecture* can be amended at any time. As such, the project will need to be consistent with the procedures described herein, as

noted in §940.9(f). It will also trigger an amendment to the *Oahu Regional ITS Architecture* to ensure that it is incorporated.

These processes are described in Section 6 of this document.

5.4 ITS Projects Programmed in the STIP

To date, there is no Statewide ITS regional architecture. Because this document is intended to be broad, it is addressing ITS projects that could be part of a future Statewide regional ITS architecture with an Oahu component. It is not intended to suggest or advocate that the State develop a Statewide regional ITS architecture at this time. Rather, it is intended to capture ITS projects that originate through the STIP process and may trigger modifications to the *Oahu Regional ITS Architecture*.

5.4.1 Regulation

23 CFR 940.11(e) states that, “prior to the completion of the regional ITS architecture, any major ITS project funded with highway trust funds that advances to final design shall have a project level ITS architecture that is coordinated with the development of the regional ITS architecture.”

5.4.2 Approach

This regulation may impact the *Oahu Regional ITS Architecture* if there is an ITS project in the STIP that uses highway trust funds and has an Oahu component. It should be noted that STIP projects with an Oahu component may or may not be included in the TIP.

This process is described in Section 7 of this document.

5.5 ITS Projects Programmed Outside of the TIP and STIP Processes

ITS projects that are not funded using federal monies are not addressed in the CFR. This means that there may be ITS projects being designed and implemented on Oahu that are programmed using money from sources outside of the national highway trust fund. These types of ITS projects that are regional in nature could be incorporated into the *Oahu Regional ITS Architecture*.

This process is addressed in Sections 6.2 and 6.3 of this document.

6 Modifying the Architecture

This section describes detailed procedures for ITS projects that are found in the TIP and TIP amendments. Administrative and non-administrative amendments to the *Oahu Regional ITS Architecture* are described.

6.1 ITS Projects Proposed for Programming in the TIP

At the time when projects are being considered for inclusion in the TIP, the ad hoc ITS Technical Task Force shall meet to determine which projects can be considered ITS projects. Of those projects, the ad hoc ITS Task Force shall then determine, by the approach outlined in Figure 1, whether they are consistent with the *Oahu Regional ITS Architecture*.

6.1.1 Is the project included in or consistent with the Oahu Regional ITS Architecture?

If the project is determined by the ad hoc ITS Technical Task Force to already be included in or consistent with the *Oahu Regional ITS Architecture*, then the project will be considered for inclusion into the TIP. If the project is found to be inconsistent with the *Oahu Regional ITS Architecture*, then the next question will be answered.

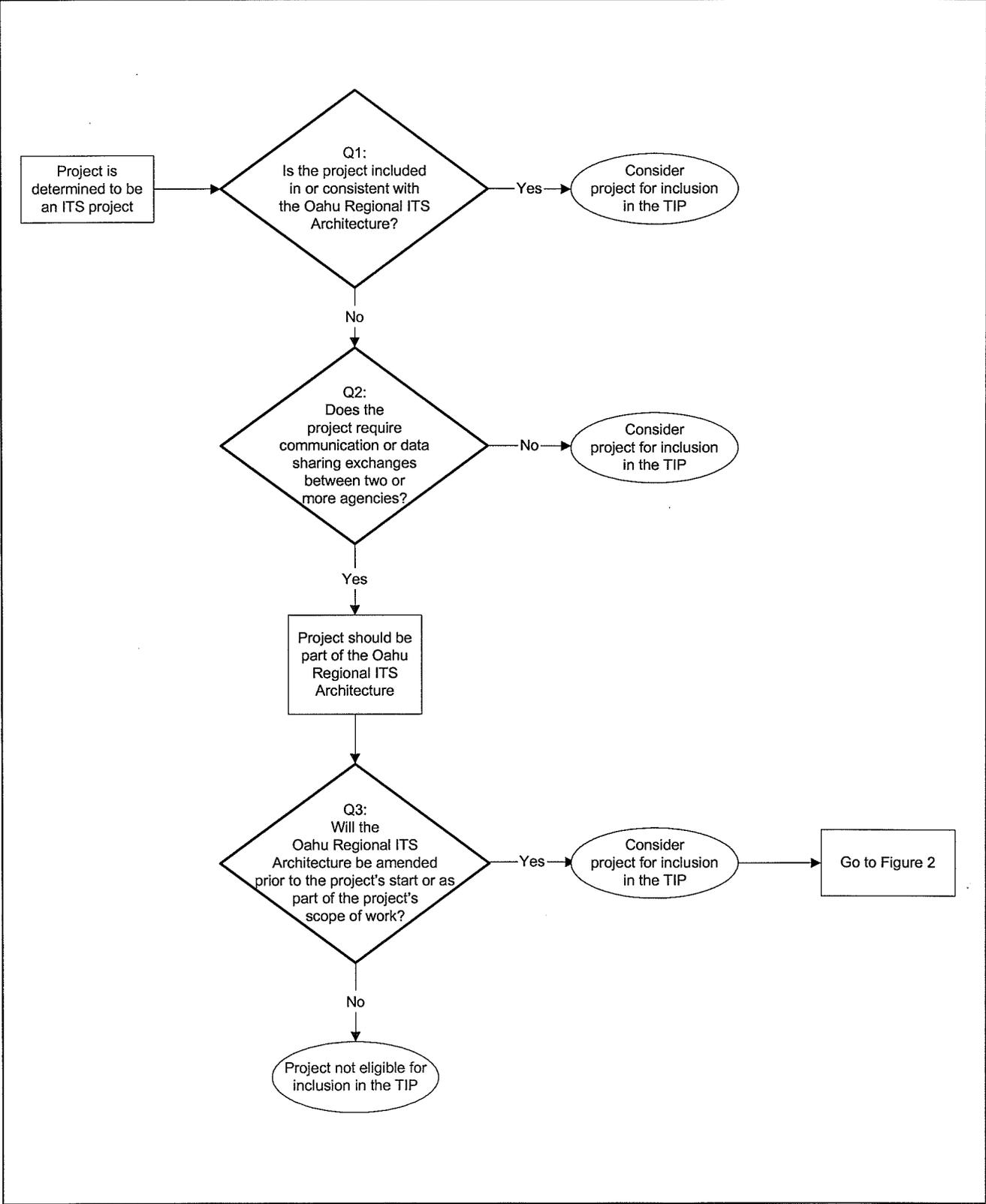
6.1.2 Does the project require communication links or data sharing between two or more agencies?

If the project is an ITS project and communication links or data sharing occurs within the proposing agency only (not between two or more agencies), then the project will be considered for inclusion into the TIP. However, if the project requires communication links or data sharing between two or more agencies, then the project is defined, by default, as a regional project and will need to go through the process to determine whether the project should be included in the *Oahu Regional ITS Architecture*.

6.1.3 Will the Oahu Regional ITS Architecture be amended prior to its start or as part of the project scope of work?

If, as part of the project scope of work, the *Oahu Regional ITS Architecture* will be amended, then the project will be considered for inclusion into the TIP. If there are no plans to amend the *Oahu Regional ITS Architecture* as part of the project scope of work or as part of the project, then the project is not eligible for inclusion in the TIP.

Figure 1: ITS Projects and the draft TIP -- Determining Consistency with the Oahu Regional ITS Architecture



As part of the project scope of work, the following procedures are to be followed:

1. The proposing agency will work with the ad hoc ITS Technical Task Force to determine how the *Oahu Regional ITS Architecture* should be amended.
2. The proposing agency will make a presentation to the TAC, and then to the Policy Committee, that details the amendment, including the following information:
 - Market package(s) to be added to the *Oahu Regional ITS Architecture*;
 - Agencies that will be part of the market package; and
 - List of anticipated communication and data exchanges that will transpire between agencies.

6.1.4 Documentation

The agency proposing change will prepare a short report on behalf of the ad hoc ITS Technical Task Force, that lists the ITS projects that are eligible for inclusion in the TIP. This report will be submitted to the OMPO staff member responsible for the TIP. An example of this report can be found in Appendix B.

6.2 Amending the Oahu Regional ITS Architecture

There are two types of amendments that can be made to the *Oahu Regional ITS Architecture*: administrative and non-administrative

6.2.1 Administrative Amendments

Administrative amendments do not require Policy Committee action and can be done by agency staff and the ad hoc ITS Technical Task Force. These amendments will amend the communication and data exchanges in the market packages of the *Oahu Regional ITS Architecture*. As of April 2003, there are six market packages in the *Oahu Regional ITS Architecture*. These are:

- ITS Virtual Data Warehouse (AD3)¹
- Broadcast Travel Information (ATIS1)
- Regional Traffic Control (ATMS07)
- Incident Management (ATMS08)
- Emergency Response (EM1)
- Emergency Routing (EM2)

6.2.1.1 Role of Agency and Task Force

Agency staff, as appropriate, will evaluate each proposed ITS project to determine if the project is consistent with the *Oahu Regional ITS Architecture*. For example, if DTS is proposing an ITS

¹ The (letters/number) designation refer to the designation the market package has in the National Architecture.

project, then DTS will be responsible for determining if the project is consistent with the *Oahu Regional ITS Architecture*.

The project will be considered consistent with the *Oahu ITS Regional Architecture* if it is part of one of the six market packages listed in Section 6.2.1. The proposing agency will work with the ad hoc ITS Technical Task force to document the communication and data exchanges between agencies.

If the agency finds the project to be consistent, and the communication flows are documented as “existing”, then no action by the agency staff is required.

If the project is consistent, and the communication flows are documented as “planned”, then agency staff shall prepare a technical memorandum to inform OMPO that the *Oahu Regional ITS Architecture* needs to be updated. Documentation of these exchanges will be provided by the proposing agency in two forms:

1. Technical memorandum that details each of the added or changed communication and data exchanges; and
2. Updated Turbo Architecture file.

6.2.1.2 Role of OMPO Staff

OMPO staff shall notify its participating agencies and appropriate ad hoc ITS Technical Task Force agency representatives, and incorporate agency changes to the *Oahu Regional ITS Architecture* and in the Turbo Architecture master file.

If a consultant is being retained to assist the agency in the development of the project, this should be included as one of the tasks and deliverables as specified in the contract.

6.2.2 Non-Administrative Amendments

Non-administrative amendments require Policy Committee action. If the project is not part of one of the six market packages previously listed, an amendment to the *Oahu Regional ITS Architecture* will be required.

6.2.2.1 Role of Agency and Task Force

If the ITS project is inconsistent with the *Oahu Regional ITS Architecture*, the proposing agency will coordinate with the chair of the ad hoc ITS Technical Task Force to convene a meeting of the ad hoc ITS Technical Task Force to propose an amendment to the *Oahu Regional ITS Architecture*. The agency that is proposing the amendment will identify, in writing, the other City and State agencies that should be invited to participate in the ad hoc ITS Technical Task Force meeting. Note that the agencies involved will be dependent on the type of project that is being proposed.

The proposing agency will work with the ad hoc ITS Technical Task Force to determine how the *Oahu Regional ITS Architecture* should be amended. When that decision has been made, the proposing agency will make a presentation to the Technical Advisory Committee that details the amendment, including the following information:

- Market package(s) to be added to the *Oahu Regional ITS Architecture*;
- Agencies that will be part of the market package; and
- List of anticipated communication and data exchanges that will transpire between agencies.

6.2.2.2 Role of the TAC

The TAC will be asked to recommend that the Policy Committee endorse the proposed amendment to the *Oahu Regional ITS Architecture*. If the TAC does not make such a recommendation, the project will be forwarded to the Policy Committee with the TAC's reasons for not recommending the Policy Committee endorse the proposed amendment noted. The proposing agency, at that time, can decide how it would like to proceed (e.g., leave proposal as is; amend proposal; fund project with local money; etc.)

If the TAC does recommend that the Policy Committee endorse the amendment, it may make suggestions for the agency to modify the proposal. The proposing agency will work with the ad hoc ITS Technical Task Force to incorporate these modifications before making a presentation to the Policy Committee.

6.2.2.3 Role of the Policy Committee

The Policy Committee will be asked to endorse the proposed amendment. If it does not endorse the amendment, the project is not eligible for federal funds through the TIP process. If the Policy Committee does endorse the amendment, the project can be considered for inclusion into the TIP.

6.2.2.4 Role of Proposing Agency

The proposing agency will work with the ad hoc ITS Technical Task Force to document the communication and data exchanges between agencies. Documentation of these exchanges will be provided by the proposing agency in two forms:

1. Technical memorandum that details each of the added or changed communication and data exchanges; and
2. Updated Turbo Architecture file.

If a consultant is being retained to assist the agency in the development of the project, this should be included as one of the tasks and deliverables as specified in the contract.

6.2.2.5 Role of OMPO staff

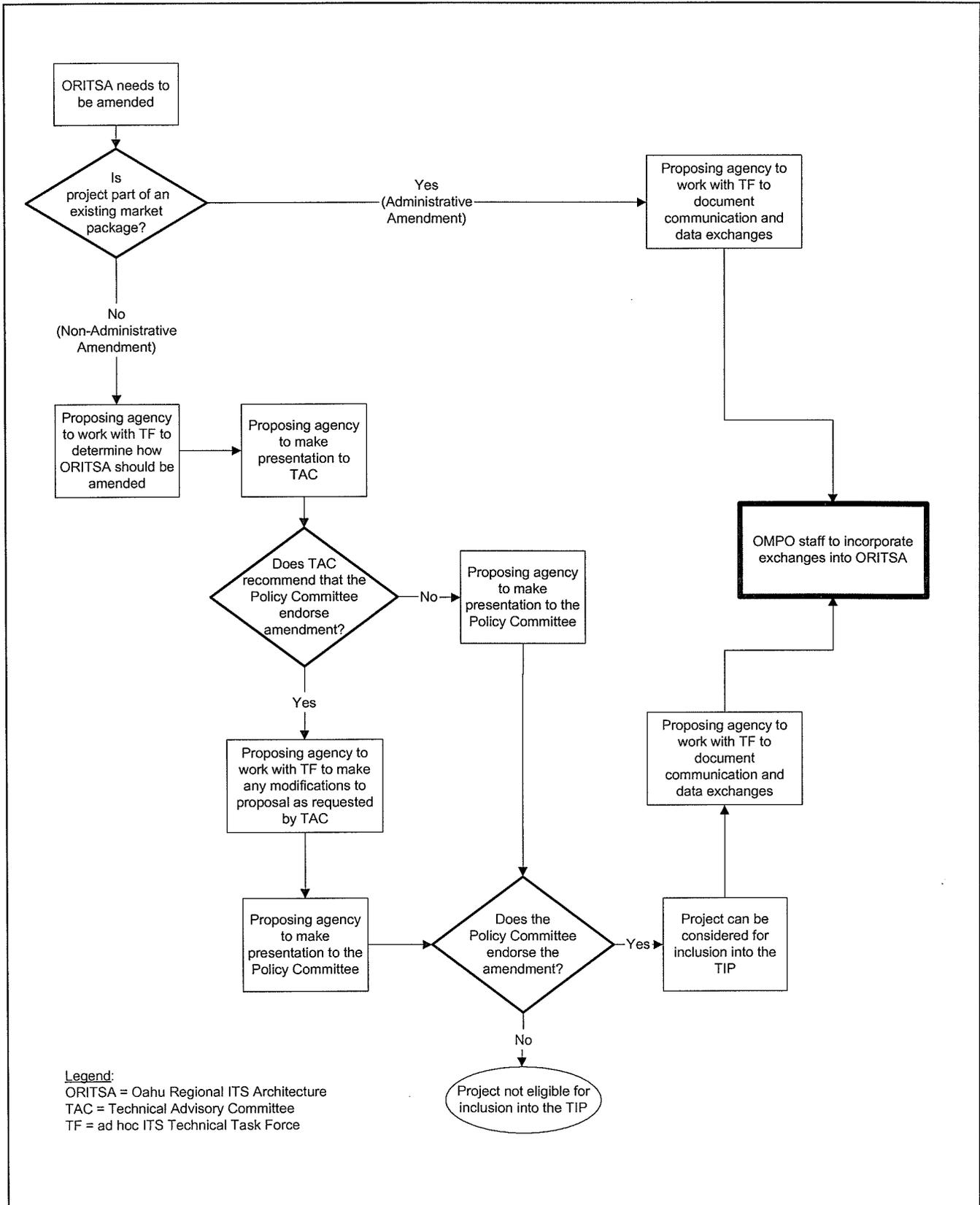
Upon receipt of the documentation of changes and the updated Turbo Architecture file, OMPO staff will incorporate them into the *Oahu Regional ITS Architecture* and maintain the master files.

Figure 2 outlines the process for amending the *Oahu Regional ITS Architecture*.

6.3 Locally-Funded ITS Projects

The process outlined in Figure 2 and described in Section 6.2 will also be followed for projects that are funded with monies that are not part of the national highway trust fund.

Figure 2: Amending the Oahu Regional ITS Architecture

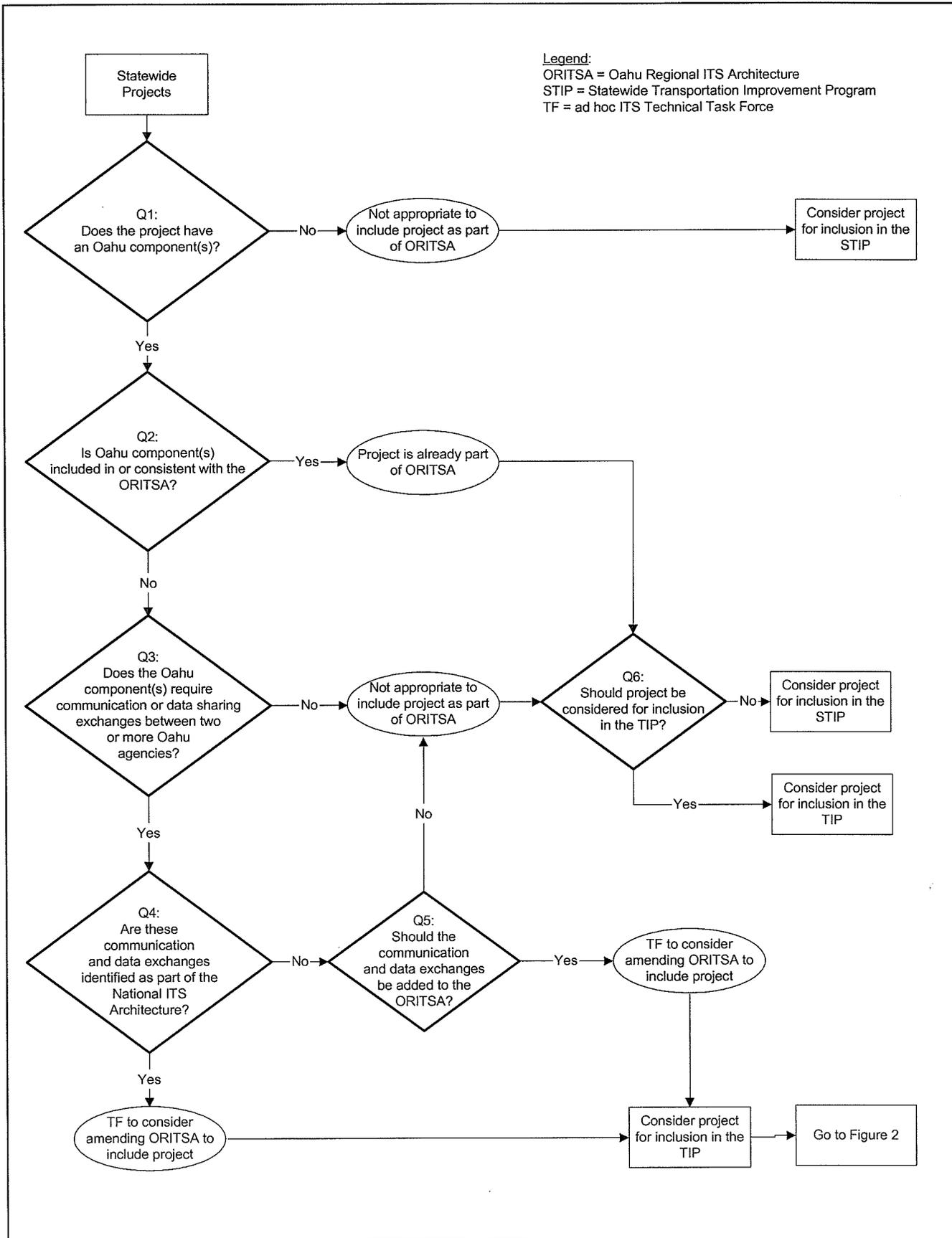


7 Statewide ITS Projects

As noted in Section 5.4 of this document, there may be Statewide ITS projects of which portions are implemented on Oahu. Depending on factors – such as having an identifiable, separate, and significant Oahu component – these projects may or may not be included in the TIP.

Figure 3 outlines a process that could be utilized to evaluate Statewide ITS projects and determine whether they should be part of the *Oahu Regional ITS Architecture*. As noted in Section 5, to date, there is no Statewide ITS architecture. Because this document is intended to be broad, it is addressing projects that could be part of a Statewide architecture and have an Oahu component. It is not intended to suggest or advocate that the State develop a Statewide architecture at this time; but rather, it is intended to incorporate ITS projects that originate through the STIP process and are eligible for national highway trust funds.

Figure 3: Statewide ITS Projects



[[This page intentionally left blank.]]

Appendix A
Organizational Structure for Addressing ITS
Policy Issues

[[This page intentionally left blank.]]

ORGANIZATIONAL STRUCTURE FOR ADDRESSING INTELLIGENT TRANSPORTATION SYSTEMS (ITS) POLICY ISSUES

1.0 BACKGROUND

Since mid-1997, the directors from Department of Transportation, Department of Transportation Services, Federal Highway Administration, and Oahu Metropolitan Planning Organization (DOT, DTS, FHWA, and OMPO, respectively) have met to discuss a mechanism to ensure proper coordination of ITS activities on Oahu. One factor that prompted these meetings was the flurry of ongoing ITS projects — ITS early deployment program, freeway management system, the City's traffic control center expansion plans, H-3 control center, National ITS Architecture workshop, and ITS scanning site trips.

As a result, the OMPO Technical Advisory Committee (TAC) met on July 22, 1998 and established a task force to develop an outline for an organizational structure to address ITS policy issues. The task force was given the following guidelines:

- use the existing OMPO structure,
- recognize the Policy Committee as the policy decision-maker,
- ensure coordination of city-state efforts, and

After two meetings, the task force drafted an outline for such a structure. This draft reflected TAC's guidelines, information obtained from an ITS scanning tour in Las Vegas, a National Architecture workshop, and ITS organizational charts from other areas.

2.0 ISSUES

One of the issues discussed by the task force dealt with what constituted a major policy issue that would require the involvement of the proposed organizational structure. Although the task force was able to agree that such a major policy issue would involve having a city and state interest or impact with at least one impact dealing with a policy, regulation, or plan, the task force recognized the difficulty in developing an actual definition in advance of future unforeseen circumstances. The task force had the option of either developing a more refined definition to preclude a future major issue from polarizing and bypassing the structure, or to keep the definition flexible. The task force chose the latter. As a check, the task force agreed to allow any member of any technical committee prior to the Policy Committee, to bring this decision to the next level.

The task force recognized the need to develop interagency agreements for future ITS projects, which may include the operations of a centralized, distributed, or hybrid traffic control center(s) and an incident management program. The proposed organizational structure will be the

mechanism whereby these agreements are developed (rather than being the agreement themselves).

To ensure that policy decisions are based on the best available information, an ITS Technical Task Force was established to serve as the ITS technical expert arm, through the TAC. There are various options available for organizing the task force. The task force could be chaired by either the city or state transportation departments, alternating between the departments, or jointly; or it could be chaired by OMPO staff. The task force could have a technical director; utilizing an FHWA Western Resource Center ITS representative, a consultant, or personnel from a participating agency. These decisions could be made by the TAC, Policy Committee, or left to the task force.

Because of the technical nature of ITS activities, there may be a few occasions when public input may not be required. The Citizen Advisory Committee (CAC) Chair will determine whether public input, through the CAC, will be sought.

To establish this proposed organizational structure, the associated procedures must be formalized into the OMPO planning process. This will provide the necessary commitment to ensure the required participation. Such a commitment could be established through a memorandum of understanding, the Comprehensive Agreement, or another similar instrument.

3.0 ITS VISION

The OMPO ITS vision is to create, through advanced technology and information sharing, a regional intermodal system that saves time, money, and lives, thus improving the overall quality of life throughout Oahu.

4.0 GUIDING VALUES

The purpose for establishing the organizational structure is to:

- promote ITS coordination between city and state efforts,
- resolve potential or actual city-state conflicts by providing policy direction in a proactive manner,
- act as visionaries for ITS on Oahu,
- assure that the development and expansion of Oahu's ITS system will be interoperable, compatible, and interchangeable,
- assure that Oahu users will find the ITS system to be relevant, user-friendly, assuring, useable, informative, and timely, and
- maximize resources.

5.0 COMPONENTS OF THE ORGANIZATIONAL STRUCTURE

A. Policy Committee

1. Function: To serve as ITS Policy Decision-Maker
2. Areas of Responsibility
 - a. Prioritize Oahu's ITS projects under the 3-C planning process, regardless of funding source
 - b. Endorse the federal funding of Oahu's ITS projects
 - c. Endorse general city-state coordination, agreements, or other interests
 - d. Promote legislation to assist in the development and implementation of a fully integrated and coordinated ITS system

B. Technical Advisory Committee

1. Function: To serve as a technical resource to the Policy Committee
2. Areas of Responsibility
 - a. Identify potential policy issues to Policy Committee
 - b. Make recommendations to Policy Committee on ITS policy issues
 - c. Make technical (non-policy) ITS decisions in areas impacting city and state jurisdictions
 - d. Document ITS planning activities in the Overall Work Program
 - e. Provide resources to inform CAC of policy issues when public input is needed

C. ITS Technical Task Force

1. Composition
 - a. TAC agencies representatives
 - b. Ad hoc members as required by the agenda (e.g., Honolulu Fire Department, Honolulu Police Department, Oahu Civil Defense Agency (HFD, HPD, OCDA, respectively))
 - c. FHWA representative
2. Function: To serve as the ITS technical expert arm of TAC
3. Areas of Responsibility
 - a. Be a forum for agencies to discuss and report progress on ITS activities
 - b. Identify potential policy issues to TAC for Policy Committee action

- c. Resolve technical issues regarding implementation
- d. Identify technical issues not resolved by the ITS Technical Task Force which must be forwarded up to TAC for TAC action
- e. Develop pros, cons, and recommendations for TAC

D. Citizen Advisory Committee

- 1. Function: To provide public input to Policy Committee
- 2. Areas of Responsibility
 - a. Chair to determine whether public input, through the CAC, will be sought
 - b. Make recommendations to Policy Committee when public input is sought

E. OMPO Staff

- 1. Functions
 - a. To coordinate and promote discussions on potential policy issues within the OMPO process
 - b. To advise the Policy Committee
- 2. Areas of Responsibility
 - a. Participate in the ITS Technical Task Force, TAC, and CAC
 - b. Identify potential policy issues

Appendix B
ITS Consistency Check
FYs 2002-2004 TIP Amendment 5

[[This page intentionally left blank.]]

OAHU TRANSPORTATION IMPROVEMENT PROGRAM
 FY 2002 THRU FY 2004

AS OF APPROVED AMENDMENT #5

OAHU REGIONAL INTELLIGENT TRANSPORTATION SYSTEM (ITS) ARCHITECTURE CHECK

	PROJECT	ITS MKT PKG	OAHU REG. ITS ARCH. INITIATIVE
	<u>STATE OF HAWAII PROJECTS</u>		
S5	Freeway Management System, Phase I, Interstate H-1, H-2 and Moanalua Freeway <i>Construct a freeway management system, including intelligent transportation systems (ITS) technologies and interagency coordination to monitor and manage traffic operations.</i>	ATMS08	SMT3
S6	Freeway Service Patrol, Interstate H-1, H-2, H-3 and Moanalua Freeway <i>Deploy freeway service patrols by procuring services to provide minor assistance to motorists (e.g., flat tire repairs, fuel, rides/tows off of the freeway, etc.), and assist emergency response agencies with managing and clearing freeway incidents.</i>	ATMS08	SMT3
	<u>CITY & COUNTY OF HONOLULU PROJECTS</u>		
C2	Computerized Traffic Control System <i>Upgrade system, including the installation of fiberoptic lines, detector data collection stations, provisions for video detection, and signal controller function enhancements for urban center and outlying areas. Continue program to upgrade and interconnect traffic signal systems in the Primary Urban Center and outlying areas to the Honolulu Traffic Control Center.</i>	ATMS07	SMT5 MT5
C32	Honolulu Traffic Control Center Operations <i>Operate and maintain Honolulu's traffic control center.</i>	ATMS07 ATMS08	SMT5 MT5
	<u>Other TIP projects that support or enhance the Oahu Regional ITS Architecture</u>		
S1	Farrington Highway Improvements, Nanakuili to Makaha <i>Construct safety and operational improvements to Farrington Highway, including sidewalks, signalized pedestrian crosswalks or bridges, and continuous left-turn lanes.</i>	ATMS07	

	PROJECT	ITS MKT PKG	OAHU REG. ITS ARCH. INITIATIVE
S7	Fort Weaver Road Widening, Farrington Highway to Geiger Road <i>Widen Fort Weaver Road from four lanes to six lanes from Farrington Highway to Geiger Road. Traffic signals will be synchronized.</i>	ATMS07	
S8	Fort Weaver Road Widening Near Laulaunui Street <i>Add two additional through lanes at the Laulaunui Street intersection, one on each side of Fort Weaver Road. Provide additional roadway lighting and traffic control devices, and relocate nearby bus facilities.</i>	ATMS07	
S13	Interstate Route H-1, Installation of Emergency Telephones, Halawa Interchange to Ainakoa Avenue <i>Install emergency solar-powered cellular telephones at various highway locations. Upgrade existing emergency cellular telephones to meet current Americans with Disabilities guidelines.</i>	ATMS08 EM1	
S27	Interstate Route H-1 Widening (Westbound), Waimalu Viaduct to Pearl City Off-Ramp <i>Widen the H-1 freeway to 6 lanes in the westbound direction from the Waimalu Viaduct to the Pearl City Off-ramp, meeting current Interstate freeway standards.</i>	ATMS08	ST4 SMT5
S46	Kamehameha Highway Traffic Improvements, Kahaluu to Waimea Bay, Phase 1 <i>Construct passing lanes, construct turning lanes at intersections, modify existing traffic signals, and install signs, flashers, and other warning devices.</i>	ATMS07	
S75	Kamehameha Highway Improvements, Waipahu Street to Ka Uka Boulevard <i>Install sidewalks, bikeways, highway lighting, underground drainage system, and upgrade intersection traffic flow.</i>	ATMS07	
S53	Kamehameha Highway Installation of Emergency Telephones - Weed Junction to Kamanuui Road <i>Install emergency solar-powered cellular telephones at various highway locations. Upgrade existing emergency cellular telephones to meet current Americans with Disabilities Act guidelines.</i>	ATMS08 EM1	
S59	Moanalua Freeway, Installation of Emergency Telephones <i>Install emergency solar-powered cellular telephones at various highway locations. Upgrade existing emergency cellular telephones to meet current Americans with Disabilities Act guidelines.</i>	ATMS08 EM1	
S62	Nimitz Highway Improvements, Keehi Interchange to Pacific Street <i>Implement interim improvements along Nimitz Highway such as intersection widening and contraflow operations, and evaluate and identify long-term improvements.</i>	ATMS07 ATMS08	
S69	Traffic Signal Modernization at Various Locations <i>Ala Moana Boulevard - Replace existing traffic signal system at the exit & entrance of Ala Moana Boulevard</i>	ATMS07	SMT2

	PROJECT	ITS MKT PKG	OAHU REG. ITS ARCH. INITIATIVE
C9	<p>Traffic Signals at Various Locations <i>Install new traffic signals at various island-wide locations. Four to five locations to be selected annually subject to investigation and warrant evaluation. Plan will provide for the safe and orderly flow of vehicular and pedestrian traffic at busy intersections.</i></p>	ATMS07	SMT2
C28	<p>Primary Corridor Transportation Project <i>Bus Rapid Transit (BRT) Alternative adopted as the Locally Preferred Alternative by the Honolulu City Council through Resolution No. 00-249. The Primary Corridor Transportation Project addresses the future mobility needs in Oahu's primary transportation corridor, which extends from Kapolei to UH-Manoa and Waikiki. The project's justification is discussed in Chapter 1, Purpose and Need, of the Major Investment Study/Draft Environmental Impact Statement (August 2000).</i></p>	ATMS07	SMT1
C12	<p><u>ITS projects not part of the Oahu Regional ITS Architecture</u> Automated Handi-Van Application and Trip Eligibility System <i>Design, purchase and install a system that will allow paratransit eligibility applications to be completed and processed electronically, and will assist in determining individual trip-by-trip eligibility.</i></p>	APTS3	
C18	<p>Bus Driver Dispatch and Timekeeping System <i>Purchase a Daily Operations System to the Transit Management Information System. The project, which will link driver scheduling with the time-keeping and real-time operations system, will streamline scheduling and payroll record-keeping as well as facilitate last-minute adjustments in scheduling and driver changes.</i></p>	APTS2	

Market Packages

- AD3 ITS Virtual Data Warehouse (Part of Oahu Regional ITS Architecture)
- ATIS1 Broadcast Traveler Information (Part of Oahu Regional ITS Architecture)
- ATMS07 Regional Traffic Control (Part of Oahu Regional ITS Architecture)
- ATMS08 Incident Management System (Part of Oahu Regional ITS Architecture)
- EM1 Emergency Response (Part of Oahu Regional ITS Architecture)
- EM2 Emergency Routing (Part of Oahu Regional ITS Architecture)
- APTS2 Transit Fixed-Route Operations (not part of the Oahu Regional ITS Architecture because no exchanges with other agencies)
- APTS3 Demand Response Transit Operations (not part of the Oahu Regional ITS Architecture because no exchanges with other agencies)

Oahu Regional ITS Architecture Initiatives

- SMT2** Emergency Vehicle Signal Pre-emption Expansion: This initiative expands the emergency vehicle signal priority systems (pre-emption) to include additional signalized intersections to enhance regional emergency response.
- ST3** Video Integration with Emergency Response Agencies: This initiative provides video images, streaming video and/or control of HDOT CCTV cameras to emergency response agencies to enhance emergency response operations. This capability will be similar to that currently provided by DTS to these agencies.
- SMT3** Freeway Management System Software Integration for Partner Agencies: This initiative installs Freeway Management System "client" software to allow partner agencies to monitor HDOT's FMS. Control and/or monitoring capabilities will be governed by interagency agreements.
- SMT5** Regional Telecommunications Assessment: In support of other regional initiatives, the regional telecommunications initiative focuses on the underlying support of ITS telecommunications infrastructure needs. This initiative primarily targets inter-agency center-to-center communications, but includes assessment of relevant (common) center-to-roadside and roadside-to-vehicle communications.
- MT5** Traffic Signal Integration: This initiative provides partner agencies with remote interfaces to the traffic signal system and associated arterial management elements (e.g., video). Control and/or monitoring capabilities will be governed MOUs. As DTS continues to improve and expand its arterial management system, this initiative will support relevant ongoing regional integration.

Appendix C
Contact Information

[[This page intentionally left blank.]]

The following contact information is provided for informational purposes only. It is incumbent on the agency/organization/entity that is using the information to ensure that it is up-to-date. The order that contacts are listed is entirely random.

Glenn Ifuku

Department of Business, Economic
Development & Tourism
PO Box 2359
Honolulu, Hawaii 96804

Gerald Hamada

Department of Design and Construction
650 South King Street, 2nd Floor
Honolulu, Hawaii 96813

Alvin Sunahara

Department of Information & Technology
650 S. King Street, 5th Floor
Honolulu, Hawaii 96813

Kathy Sokugawa

Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Cheryl D. Soon

Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Ty Fukumitsu

Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Donna Maiava

Department of Health
Emergency Medical Services System Branch
3627 Kilauea Avenue, Room 102
Honolulu, Hawaii 96816

Major General Robert G.F. Lee

Department of Defense
State Civil Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Salvatore Lanzilotti

Honolulu Emergency Services Department
3375 Koapaka Street, Suite H450
Honolulu, Hawaii 96819

Abraham Wong

Hawaii Division
Federal Highway Administration
P.O. Box 50206
Honolulu, Hawaii 96850

Rodney Haraga

Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Donny Gates

Honolulu Emergency Services Department
3375 Koapaka Street, Suite H450
Honolulu, Hawaii 96819

Richelle Takara

Hawaii Division
Federal Highway Administration
P.O. Box 50206
Honolulu, Hawaii 96850

Bryan Kimura

Department of Transportation
601 Kamokila Blvd., Room 602
Kapolei, Hawaii 96707

Chief Lee Donohue

Honolulu Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

Chief Attilio Leonardi

Honolulu Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819

Wendy Cunningham

Federal Motor Carrier Safety
Administration
P.O. Box 50206
Honolulu, Hawaii 96850

Sgt. Robert Lung

Honolulu Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

Roger Morton
Oahu Transit Services
811 Middle Street
Honolulu, Hawaii 96819

C.S. Papacostas
University of Hawaii
Holmes Hall 383
2540 Dole Street
Honolulu, Hawaii 96822

Doug Aton
Oahu Civil Defense Agency
650 South King Street, Basement
Honolulu, Hawaii 96813

Leslie Rogers
Federal Transit Administration
201 Mission Street, Suite 2210
San Francisco, California 94105

Gareth Sakakida
Hawaii Transportation Association
2850 Paa Street Room 204
Honolulu, Hawaii 96819

Gary Susag
Oahu Civil Defense Agency
650 South King Street, Basement
Honolulu, Hawaii 96813

Paul Page
Federal Transit Administration
201 Mission Street, Suite 2210
San Francisco, California 94105

Stanford Yuen (Code ROOG)
Facilities Office
US Naval Base, Pearl Harbor
517 Russell Avenue, Ste 110
Pearl Harbor, Hawaii 96860-4884

Gordon Lum
Oahu Metropolitan Planning Organization
707 Richards Street, Suite 200
Honolulu, Hawaii 96813

Shevaun Low
Oahu Metropolitan Planning Organization
707 Richards Street, Suite 200
Honolulu, Hawaii 96813

Blaine Kawamura
Tunnel Section
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Fred Pascua
Harbors Division
Department of Transportation
79 S. Nimitz Highway
Honolulu, Hawaii 96813-4898

Julia Tsumoto
Statewide Transportation Planning Office
Department of Transportation, 4th Floor
869 Punchbowl Street
Honolulu, Hawaii 96813

Martin Okabe
Oahu District
Department of Transportation
727 Kakoi Street
Honolulu, Hawaii 96819

Guy Ichinotsubo
Airports Division
Department of Transportation
400 Rodgers Blvd., Suite 700
Honolulu, Hawaii 96819-1880

Alex Kaonohi
Motor Vehicle Safety Office
Department of Transportation
869 Punchbowl Street, Room 511
Honolulu, Hawaii 96813

Goro Sulijoadikusumo
Highway Planning
Department of Transportation, 3rd Floor
869 Punchbowl Street
Honolulu, Hawaii 96813

Appendix D
Description of Turbo Architecture

[This page intentionally left blank.]

Downloaded from the National ITS Architecture website
(<http://itsarch.iteris.com/itsarch/html/turbo/turbomain.htm>) on July 1, 2003.

Turbo Architecture is an interactive software application that assists transportation planners and system integrators, both in the public and private sectors, in the development of regional and project architectures using the National ITS Architecture as a starting point.

NEW Turbo Architecture Version 2.0, available May 2002, will include a host of new features that make the software easier to use, more accessible to those with special needs, and more reliable than ever. Turbo Version 2.0 supports development of regional and project architectures that take advantage of all the new architecture Version 4.0 features including support for Maintenance and Construction Operations, rural enhancements, improved weather support, and a significantly improved commercial vehicle operations component that is completely consistent with the Commercial Vehicle Information Systems and Networks (CVISN) and International Border Clearance (IBC) programs.

The most important new feature in Turbo Version 2.0 is “Turbo Conversion”. Turbo Conversion will automatically convert existing regional and project architectures so they are consistent with Version 4.0 of the National ITS Architecture. This new tool provides users a convenient way to migrate their architectures to Version 4.0 so they can take advantage of all the new architecture features. The automated portion of the conversion process requires only a minute or two. Specialized conversion reports document all architecture changes that were made during the conversion. A new section in the Turbo User’s Manual, as well as a companion document, will provide detailed guidance and tips that will allow seamless migration to National ITS Architecture Version 4.0. This site also includes some [frequently asked questions and answers](#) about Turbo Version 2.0 and conversion.

More about Turbo... Turbo Architecture provides an *initial start* toward both architecture development and consistency with the National ITS Architecture. To properly use the software, the Turbo user must be familiar with the National ITS Architecture. National ITS Architecture and Turbo Architecture [training courses](#) are available for those who require additional background information on the National ITS Architecture or its application in regional and project architecture development.

Turbo Architecture allows a user to:

- Create a regional architecture
- Create one or more project architectures
- Maintain consistency between the regional and project architectures
- Generate a variety of architecture reports and diagrams

The user’s architectures are saved in Microsoft Access-compatible data files. Each data file may contain one regional architecture and multiple project architectures. Turbo Architecture helps the user integrate multiple project architectures both with each other and with a regional architecture.

Information can be entered into Turbo Architecture using either an interview or tabular forms. The interview guides the user through a series of questions and options that result in the creation of an inventory and a set of services. The user may also go directly to the tabular forms to create this inventory and set of services. In either case, this information is the basis for the user's architecture.

Once this initial data input is complete, Turbo Architecture provides powerful customization tools that allow the user to customize the architecture to match their specific requirements. Many reports and diagrams are available for display, print, or publication in other documents. The user can extend the National ITS Architecture by adding their own information flows and transportation elements for those areas not covered by the National ITS Architecture.

Turbo Architecture is a standard Windows Application that includes a user's manual, installation guide, and on-line help. The product is available from the *McTrans* Software Center at the University of Florida. Contact McTrans at e-mail mctrans@ce.ufl.edu, phone (352) 392-0378 or fax (352) 392-3224.

System Requirements

- PC-Compatible
- Operating Systems: Windows NT, 98, 2000, ME, and XP
- 80MB Free on Hard Drive
- Minimum 800X600 Monitor Resolution
- CD-ROM

