Intelligent Transportation Systems - ITS Regional ITS Architecture

ASSOCIATION OF CENTRAL OKLAHOMA GOVERNMENTS

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<td>Association of Central Oklahoma Governments</td>
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<td>ARP</td>
<td>Alternate Route Plan</td>
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<td>CCTV</td>
<td>Closed Circuit Television</td>
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<td>Congestion Management Systems</td>
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<td>Commercial Vehicle Information Systems Network</td>
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<td>CVO</td>
<td>Commercial Vehicle Operations</td>
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<td>DMS</td>
<td>Dynamic Message Signs</td>
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<td>Early Deployment Plan</td>
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<td>Incident Management Coalition Memorandum of Understanding</td>
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<td>Incident Management Plan</td>
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<td>INCOG</td>
<td>Indian Nations Council of Governments</td>
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<td>Intermodal Transportation Policy Committee</td>
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<td>ITS</td>
<td>Intelligent Transportation Systems</td>
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<td>Intermodal Transportation Technical Committee</td>
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<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
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<td>OCARTS</td>
<td>Oklahoma City Area Regional Transportation Study</td>
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<td>Oklahoma Highway Patrol</td>
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<td>OKC</td>
<td>City of Oklahoma City</td>
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<td>OTA</td>
<td>Oklahoma Transportation Authority</td>
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<td>RTMC</td>
<td>Regional Traffic Management Center</td>
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<td>SC</td>
<td>ITS Steering Committee</td>
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<td>SDO</td>
<td>Standards Development Organization</td>
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<td>TEA21</td>
<td>Transportation Equity Act for the 21st Century</td>
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<td>Traffic Management Center</td>
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<td>Technology and Operations Subcommittee</td>
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<td>Unified Planning Work Program</td>
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INTRODUCTION

Intelligent Transportation Systems (ITS) represent the application of information processing, communications technologies, advanced control strategies, and electronics to the field of transportation, so as to improve the quality of life, promote a strong economy, as well as enhance and protect environmental quality.

“The vision for the OCARTS area is one of enhanced transportation, mobility, efficiency, productivity, and safety through the use of user-friendly ITS technologies and systems.”

In Fiscal Year (FY) 2003, ACOG, the Metropolitan Planning Organization (MPO) for the Oklahoma City area, continued with its effort to realize this vision for Intelligent Transportation Systems within the Oklahoma City Area Regional Transportation Study (OCARTS) area. The purpose of this report is to document the cooperative planning and programming of Intelligent Transportation Systems initiatives, with particular emphasis on the development of the OCARTS area Regional ITS Architecture, an important activity that began in FY 2001.

PRECEDING ACTIVITIES

OCARTS AREA ITS EARLY DEPLOYMENT PLAN

Traffic incidents have been identified as an important cause of congestion in the OCARTS area. As a result, special attention focused on the management of incidents and the use of alternate routes during the development of an ITS Early Deployment Plan (EDP) for the Central Oklahoma region. Over the course of two years, the document was laid out and completed in coordination with the Oklahoma Department of Transportation (ODOT) to provide the framework for using ITS technologies to enhance the regional transportation network.

The EDP consists of several components:

- ITS Early Deployment Plan – A 20-Year Plan for Deploying Technology Based Solutions
- Incident Management Plan – An Approach for Management of Incidents on the OCARTS Area Transportation System
- Alternate Route Plan – A Report that identifies Potential Alternate Routes for each of the Major Transportation Corridors in the OCARTS area

The Intermodal Transportation Policy Committee formally accepted the OCARTS ITS EDP Executive Summary on October 28, 1999. Since then, the EDP has served as the region’s basic guide for the coordinated region-wide planning and implementation of ITS initiatives.

* Source: OCARTS ITS Early Deployment Plan - An Approach for Managing Traffic Congestion in the OCARTS Area, prepared by BRW for ACOG and ODOT, July 1999
OCARTS AREA ITS COMMITTEES

Region-wide planning and implementation of ITS initiatives is overseen by several OCARTS area ITS committees, established in early FY 2001. These committees are structured in such a way that overall guidance concerning ITS improvements in the region are provided by an ITS Steering Committee, which is technically supported by an Incident Management Subcommittee, a Technology and Operations Subcommittee, and a Traveler Information Subcommittee, as illustrated in Figure 1.

**ITS Steering Committee (SC)**

The ITS Steering Committee provides overall guidance for the regional ITS planning and assures consistency with the Statewide ITS Plan. The Steering Committee identifies potential “Kickstart” projects and appropriate short- and long-term ITS funding sources. The committee plays a major role in the education of agency leaders to solicit their support and commitment. Another function of the Steering Committee is to compile and integrate information received from each of the subcommittees and to present the results to the appropriate committees for approval.

**Incident Management Subcommittee (IMSC)**

The Incident Management Subcommittee’s main involvement revolves around the implementation of the EDP’s Alternate Route Plan and the Incident Management Plan, as well as the development of a regional Incident Management Procedures Manual and Resource Guide (IM Guide). The committee also facilitates the coordination among member entities and agencies to identify needed improvements on the chosen alternate routes. The initiation of “Quick Clearance” legislation to speed up the clearing of traffic lanes during non-injury accidents is another key issue. The Incident Management Subcommittee further assists the Steering Committee in the identification of potential Kickstart projects. Secondary functions of the IMSC are the participation in various ITS training courses, the active support of public education and media campaigns, etc.

**Technology and Operations Subcommittee (TOSC)**

The Technology and Operations Subcommittee has played and continues to play a fundamental role in the completion and the ongoing maintenance of the OCARTS area Regional ITS Architecture. The subcommittee is also in charge of research, discussion, and documentation of the conceptual design of future ITS components and services, as well as the identification of applicable standards. The subcommittee members furthermore participate in the appropriate ITS Architecture training courses and workshops.
Traveler Information Subcommittee (TISC)
The Traveler Information Subcommittee has not yet been convened. The anticipated functions of the subcommittee revolve around public education campaigns, as well as the coordination of interagency information exchange, the collection, preparation, and dissemination of Traveler Information, as well as the discussion of Public-Private Partnerships.

The OCARTS area ITS committees met several times throughout FY 2001, 2002, and 2003. Their activities and actions have been documented in the FY 2001 and FY 2002 Intelligent Transportation Systems Reports, as well as the FY 2002 Incident Management Report.\(^b\)

\(^b\) The Unified Planning Work Program (UPWP) FY 2001-2.03, Subtask 2 and FY 2002-2.03, Subtask 2 – Intelligent Transportation Systems Reports and the UPWP FY 2002-2.03, Subtask 3 - Incident Management Report are available at the ACOG office.
ITS Steering Committee
Agencies to be included:
- Oklahoma Department of Transportation (ODOT) - (Planning, Traffic Engineering, and Division 3 and 4)
- Federal Highway Administration (FHWA), Association of Central Oklahoma Governments (ACOG)
- Department of Public Safety (DPS), Oklahoma Transportation Authority (OTA)
- Edmond -, Midwest City -, Moore -, Norman -, and Oklahoma City - Traffic Management
- Oklahoma County Emergency Management, and Central Oklahoma Transit and Parking Authority (COTPA)

Function:

Products:
- Oklahoma City Metropolitan ITS Regional Architecture

Incident Management Subcommittee
Committee Members:
- ODOT (Planning, Traffic Engineering, Div. 3&4), ACOG, DPS, City Governments, COTPA, OKC Emergency Management, 911 ACOG, and Fire, Rescue and Law Enforcement

Function:
**Short Term**
- Development of IM and Alternate Route MOUs, Kickstart Project, Initiation of “Steer - Clear” Legislation

**Long Term**
- Development of IM Guide to formalize the Incident Management Process

Traveler Information Subcommittee
Committee Members:
- ODOT (Planning, Traffic Engineering, Div. 3&4), ACOG, COTPA, University of Oklahoma, Media, Air Quality Team, OK Mesonet, Public Information Offices, OK Dept. of Tourism and Recreation, DPS, etc.

Function:
- Public Education Campaign, Collection, Preparation, and Dissemination of Traveler Information, Coordination of Information Exchange

Technology and Operations Subcommittee
Committee Members:
- ODOT (Planning, Traffic Engineering, Div. 3&4), ACOG, City Engineers, COTPA, and University of Oklahoma

Function:
COMPLIANCE WITH FEDERAL ITS RULES

To better integrate ITS initiatives into the overall metropolitan transportation planning process, the federal government proposed ITS rules in May 2000. These rules consist of several components:

- The **ITS Integration Strategy** – ensures conformity to the National ITS Architecture and Standards for all federally funded projects and supports the development of integrated technology. The Integration Strategy defines key policies and thus guides, manages, and determines funding of ITS investments.

- The **Regional ITS Architecture** – provides detailed conceptual designs and operational procedures within the ITS Integration Strategy’s vision. It can be developed region-wide or incrementally.

- The **Systems Engineering Analysis and Project Implementation** – prescribes the use of the systems engineering process to select a project from alternatives accomplishing the same objective, by considering the total project life cycle for technical merit, cost, and responsiveness to customer needs. Systems Engineering Analysis further requires ITS projects to use applicable standards and interoperability tests, as officially adopted by the U.S. DOT.

The proposed rules were enacted on April 8, 2001. According to the guidance published alongside these rules, the integration strategy, had to be developed and documented no later than the first update of the long-range transportation plan or the transportation improvement program that occurred two years following the effective date of the final rule. The regional architecture had to be developed four years subsequent to beginning to deploy ITS projects or four years from the effective date of the rule for those areas that are currently deploying ITS projects.

**ITS INTEGRATION STRATEGY**

It was determined that the ITS Early Deployment Plan fulfills all requirements of the first component of the federal ITS rules and therefore serves as the OCARTS area Integration Strategy. This determination was made during an informal meeting of ODOT, Federal Highway Administration (FHWA), and ACOG staff in early September of 2000. Specific reference to the EDP as the region’s Integration Strategy was thereafter included in the 2025 OCARTS Plan.

**REGIONAL ITS ARCHITECTURE**

During the informal September 2000 meeting with ODOT, FHWA, and ACOG staff, it was also determined that the EDP did not comply with all stated requirements of the second component and, without further enhancements, could not serve as the OCARTS area Regional ITS Architecture.

**SYSTEMS ENGINEERING ANALYSIS**

The OCARTS area has neither programmed any deployment of ITS nor undertaken the associated Systems Engineering Analysis. However, prior to the implementation of ITS improvements, the systems engineering process will be used to select projects from available alternatives.

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\(^c\) The 2025 OCARTS Plan – the Long Range Transportation Plan for the Oklahoma City metropolitan area – was formally adopted by the Intermodal Transportation Policy Committee on September 28, 2000.
DEVELOPMENT OF THE OCARTS REGIONAL ITS ARCHITECTURE

Successful ITS integration and interoperability require addressing both technical as well as institutional integration. “Technical integration of electronic systems is a complex issue that requires considerable up-front planning and meticulous execution for electronic information to be stored and accessed by various parts of a system. Institutional integration involves coordination between various agencies and jurisdictions to achieve seamless operations and/or interoperability.”

Intelligent Transportation Systems “are most effective and cost beneficial when systems are integrated and interoperable. The greatest benefits in terms of safety, efficiency, and costs are realized when electronic systems are systematically integrated to form a whole in which information is shared with all and systems are interoperable.”

To achieve institutional integration of systems, transportation agencies must agree on the benefits of ITS and the value of being part of an integrated system. They have to agree on roles, responsibilities, and shared operational strategies. Furthermore, they must agree on standards, technologies and operating procedures to ensure interoperability. The transportation agencies “must be fully committed to achieving institutional integration in order for integration to be successful. They also have to coordinate with agencies for which transportation is a key, but not a primary part of their business, such as emergency management and law enforcement agencies.”

To accomplish this kind of integration, OCARTS area stakeholders sought to define the operational and institutional network necessary. Therefore, the following chapter describes the development of the OCARTS area Regional ITS Architecture in detail. It begins with the discussion of the requirements of a regional architecture, followed by a brief review of the EDP in light of these requirements. A description of the Regional ITS Architecture development workshops and associated activities is given. Also included is an example of the typical components of an OCARTS member entity in the region’s ITS Architecture.

REQUIREMENTS OF A REGIONAL ITS ARCHITECTURE

“The Regional ITS Architecture represents the development of a local implementation of the National ITS Architecture. The regional architecture is tailored to meet local needs, meaning that it does not address the entire National ITS Architecture and can also address services not included in the National ITS Architecture.”

The completion of the Regional ITS Architecture will ensure compliance with the federal ITS rules and serve as the basis for future ITS deployment within the region.

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The Regional ITS Architecture has to contain the following:

- Description of the region
- Identification of the participating agencies and other stakeholders
- Description of roles and responsibilities of the participating entities
- “Architecture Flow-level” description, including system functional and interface requirements, as defined in the National ITS Architecture, of how agencies, modes, and systems will interact and operate, if the architecture is to fulfill the identified user needs and promote ITS integration within a region
- Agreements needed for integrated operation across jurisdictions
- Identification of applicable standards
- Description of sequence of projects necessary for implementation

To describe the level of detail required in a Regional ITS Architecture the following graphic might be helpful:

*Figure 2: Example of Architecture Flows*

The Regional ITS Architecture builds upon the needs, goals, objectives, and ITS system assessment that are described in the region’s ITS Integration Strategy. The regional architecture can be developed incrementally, if coordination with all other regional ITS projects is provided.

**Review of the OCARTS Area ITS Early Deployment Plan**

As previously stated, the OCARTS area ITS Early Deployment Plan did not comply with all requirements and could therefore not be used as the Regional ITS Architecture for the Central Oklahoma region.

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*Architecture Flows, as described by the National ITS Architecture, are technology independent and function oriented to fulfill specific needs. They simply describe “what information” needs to be exchanged and “what functions” need to be performed, but do not prescribe “how” this is to be done.*

*According to FHWA guidance, the formalization of these types of agreements is at the discretion of the region and participating stakeholders.*
It was cooperatively determined by FHWA, ODOT and ACOG staff that the following components were missing and had to be completed, prior to fulfilling all requirements mentioned:

- The function-oriented architecture description, required for a regional architecture, is not contained in the EDP. Instead, the EDP provides only a description of technologies.
- In addition, agreements needed for integrated operation across jurisdictional boundaries are currently neither described nor initiated by the EDP.

REQUEST FOR REGIONAL ITS ARCHITECTURE WORKSHOPS

During the informal meeting with FHWA, ODOT, and ACOG staff in September 2000, it was suggested to utilize “Turbo Architecture” software in the development of the information flow diagrams, using the framework provided by the EDP as the baseline.

FHWA representatives further informed ODOT and ACOG staff of Regional ITS Architecture workshops that would aid in the draft of a regional architecture, as well as introduce the workshop attendees to the use of the Turbo Architecture software. After further research, ODOT, OCARTS area and Tulsa area MPO staff decided to apply for the workshops as part of their respective ITS Service Plan funding applications in FFY 2001.

REGIONAL ITS ARCHITECTURE TIER I WORKSHOP

As discussed during a meeting held in October 2000, ODOT, ACOG and the Indian Nations Council of Governments (INCOG) staff agreed to have one combined Regional ITS Architecture Tier I workshop that would call on stakeholders throughout the state. The purpose of the course was to provide attending entities and agencies with the information needed to begin the development of an ITS blueprint for coordinated ITS improvements in their respective region.

ODOT agreed to host this combined workshop on June 21, 2001. This one-day gathering of statewide transportation professionals introduced participants to the basic steps and concepts necessary to begin development of a regional ITS architecture.

The objectives of the Tier I Architecture workshop were to help participants:

- Understand the need for ITS integration in the local area
- Understand the need for a regional architecture
- Understand the process by which a regional architecture is developed
- Understand how the National ITS Architecture can assist in developing local architectures
The following agencies representing the OCARTS area participated in the Tier I workshop:

- Midwest City and Norman Traffic Management
- Norman Law Enforcement
- Oklahoma Department of Transportation – Planning Division, Traffic Division, Waterways Division, and District 4
- ODOT’s Statewide ITS Consultant Team, including PB Farradyne, Transportation Engineering Consultants, and the University of Oklahoma
- Oklahoma Transportation Authority
- Federal Highway Administration – Oklahoma Division Office

The Regional ITS Architecture Tier I workshop called for the description of the planning boundary, the definition of the planning time horizon, the identification of the "Champion" who will lead the effort to develop the regional architecture, as well as the identification of next steps, such as an ITS Infrastructure Survey, necessary to develop a regional architecture.

**ITS Infrastructure Survey**

To continue the effort begun with the Tier I workshop, the OCARTS area was expected to accomplish the following tasks with the assistance of the FHWA Division, Resource Center, and/or Headquarters staff:

- Follow through with the next steps outlined in the Tier I Workshop and obtain the needed inventory information identified by the FHWA Architecture Team
- Organize and facilitate additional stakeholder meetings to obtain the information needed to move to the Tier II
- Select a date for the Tier II workshop (usually 4-6 months after the initial Tier I) – contingent upon completion of all preparatory actions

Tasked to complete the Regional ITS Architecture development, the OCARTS area ITS Technology and Operations Subcommittee defined the OCARTS area boundary as the boundaries for the regional architecture and set the planning time horizon to ten years. In close coordination with subcommittee members and with the support of the FHWA sponsored Iteris® consultants, ACOG staff developed and sent out surveys to assemble an OCARTS area inventory of existing and planned local systems and transportation services during the month of July 2002. The compilation of the OCARTS area ITS Inventory involved:

- Creation of Stakeholder List
- Customization of survey forms
- Sending surveys and following-up
- Compiling returned information
- Conducting telephone interviews for additional information

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8 Current legislation requires conformance to the National ITS Architecture and Standards. Iteris works closely with FHWA and the U.S. Department of Transportation (USDOT) to develop processes by which regions of the country can develop integrated and interoperable Intelligent Transportation Systems. Iteris assists in the development of regional and project architectures that are consistent with the National ITS Architecture.
The Technology and Operations Subcommittee (TOSC) members assisted agencies within their jurisdiction with the completion of these ITS Surveys. The compiled information was put into a database and prepared for presentation at the subsequent subcommittee meeting, held on August 6, 2001. The committee members reviewed the compiled ITS survey results for completeness and coherency, before proceeding with the presentation of the entire OCARTS area ITS Inventory to the Steering Committee, ITTC, and ITPC. The surveys were grouped by area of interest:

- Freeway Management
- Arterial Traffic Management
- Emergency Management
- Public Transportation
- Regional Traveler Information
- Commercial Vehicle Operations
- Credentialling (of Commercial Vehicles)
- Construction and Maintenance
- Parking Management
- Archive Data
- At-Grade Rail Intersection
- Electronic Tolling

A total of 55 surveys had been sent of which 38 had been returned at the time of the TOSC meeting. TOSC members suggested including further stakeholders to complement the current survey results in the areas of Commercial Vehicle Operations, Credentialling, and Parking Management. ACOG staff agreed to obtain the additional information prior to the presentation of the ITS Inventory to the ITS Steering Committee.

At the August 8, 2001 meeting of the OCARTS area ITS Steering Committee, the OCARTS ITS Inventory was presented. The completed inventory contained information about existing and planned ITS services, needs, and information flows, as compiled by ACOG staff and the Technology and Operations Subcommittee. The Steering Committee reviewed and subsequently authorized the use of the compiled survey results as base data for the development of the Regional ITS Architecture.

The compiled ITS Inventory was sent to the FHWA Architecture team and the Iteris consultants on August 17, 2001, in order to meet the deadline for the Regional ITS architecture Tier II workshop.

The Technology and Operations Subcommittee and Steering Committee members were encouraged to actively participate in the upcoming Regional ITS Architecture Tier II workshop.

**REGIONAL ITS ARCHITECTURE TIER II WORKSHOP**

The Tier II Architecture workshop was a 3-day event, hosted by ACOG on October 23 - 25, 2001. The objective of the training was to help participants develop a draft version of the regional architecture and to provide stakeholders with enough knowledge and insight to enable them to continue and complete the activity after the workshop.

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^h Ultimately, 48 out of 56 surveys were returned by OCARTS area stakeholders, thus resulting in an overwhelming response rate of 86%. 

ACOG 11 Intelligent Transportation Systems
As initiated earlier by the Regional ITS Architecture Tier I workshop, this hands-on workshop was based on the compiled OCARTS ITS Inventory of existing and planned ITS infrastructure and services. The information was entered into a Turbo Architecture database by the FHWA Architecture Team and Iteris consultants and double-checked by ACOG staff for completeness prior to the actual workshop.

This rough draft of a regional architecture supplied the base for the Tier II “three-day customization” workshop that was attended by local stakeholders and professional city, county, and state staff, responsible for the planning and implementation of ITS improvements. Also invited was staff from local law enforcement agencies, fire departments, and emergency medical services to gain their input on desired integration and information exchange. The following agencies participated:

- Federal Highway Administration
- ODOT Planning Division, Maintenance Division, District 4, and Rail Division
- ODOT’s Statewide ITS Consultant Team, PB Farradyne, Traffic Engineering Consultants, and the University of Oklahoma
- Oklahoma Department of Public Safety
- Oklahoma Transportation Authority
- Central Oklahoma Transportation and Parking Authority
- Edmond, Midwest City, Norman and Oklahoma City Traffic Management
- Norman and Oklahoma City Law Enforcement
- Edmond, Norman and Oklahoma City Fire Department
- Norman 911 Communications Center

Involved participants decided what local transportation systems needed to be interconnected to exchange and share information. The workshop resulted in an OCARTS area Regional ITS Architecture draft, consisting of the existing and proposed transportation systems and services, based on the National ITS Architecture, but customized to accommodate specific local needs. The architecture draft existed in electronic form as a Turbo Architecture database.

**FINALIZATION OF THE OCARTS AREA REGIONAL ITS ARCHITECTURE**

Although, the draft OCARTS area Regional ITS Architecture identified information exchanges, system and interface requirements and defined the roles and responsibilities of the participating agencies, a few loopholes were still present in the draft regional architecture.

**FOLLOW-UP INTERVIEWS WITH STAKEHOLDERS AND FINE-TUNING OF ARCHITECTURE**

The draft architecture needed to be reviewed for logical errors or erroneous one-way information and data exchanges. To accomplish this task, ACOG staff conducted an extensive flow-by-flow review of the OCARTS area Regional ITS Architecture to validate the connections and interfaces, as well as the “existing” or “planned” status of all included ITS components and services. On several occasions, ACOG staff sought the assistance from stakeholders to gain missing information or to choose between conflicting scenarios.
After this all around review, the basic Regional ITS Architecture for the OCARTS area was completed in December 2002. However, maintenance of the regional architecture will be ongoing as new systems or services are planned and implemented. Also, input will be sought from additional stakeholders including, but not limited to the following:

- National Weather Service and MESONET
- Wrecker and Towing Operators
- Highway Safety Office
- Media
- Event Promoters and Large Venues
- Tinker Air Force Base

**REGIONAL ITS ARCHITECTURE COMPONENTS OF A MEMBER ENTITY**

The basic OCARTS area Regional ITS Architecture was developed with the help of the Turbo Architecture software. As a planning and integration tool, the application utilized user inputs and information from the National ITS Architecture databases to provide tabular and graphical outputs of regional or project architectures.

As previously indicated, the Turbo Architecture tool is not a complete end-to-end solution to fully develop ITS architectures. Stakeholder interaction, gathering local requirements and systems, and operational agreements are required beyond the data, diagrams, and reports that the tool provides. Nonetheless, the graphical depiction of the regional architectures makes the connections and data exchanges between ITS system components easier to follow.

Thus Attachment 1 shows the typical components of a member entity within the OCARTS area Regional ITS Architecture. Shown are the following subsystems, along with their existing and planned information, data, and systems connections:

- Local Municipality Traffic Management
- Local Municipality 911 Dispatch

Also shown is a subset of applicable standards in Attachment 2. The standards prescribe non-proprietary, technical specifications of how the different components exchange data and information. This is especially important in light of the U.S. Department of Transportation (US DOT) ITS Standards Program working toward the widespread use of standards to encourage the interoperability of ITS systems.

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1 A copy of the OCARTS area Regional ITS Architecture is available at the ACOG office.
2 Turbo Architecture is a standalone application, however, the data files generated by the software are Microsoft Access-compatible and can be manipulated using Microsoft Access.
3 Data exchanges/architecture flows are sometimes mapped to several standards because communications protocol, data dictionary, and message set standards are all required to share information between systems. On the other hand, some architecture flows are not mapped to ITS standards at all, because of the use of proprietary or non-ITS (e.g., financial institution) information that is unlikely to be standardized or because the standardization of the particular architecture flow is in its infancy or has not yet begun.
4 Through cooperative agreements with five Standards Development Organizations (SDO), the Standards Program is accelerating development of about 100 non-proprietary, industry-based, consensus ITS standards, and is encouraging stakeholder participation in the development process.
Intelligent Transportation Systems
INTEGRATION WITH STATEWIDE ITS ACTIVITIES

The key-partners in ITS are the Federal Highway Administration, the Oklahoma Department of Transportation and Oklahoma Transportation Authority, the Oklahoma Department of Public Safety, as well as local traffic management, public safety and emergency service personnel.

All ITS activities are therefore closely coordinated with the appropriate federal, state, and local agencies involved in ITS planning and implementation.

INTEGRATION OF THE REGIONAL INTO THE STATEWIDE ITS ARCHITECTURE

In September 2001, the Oklahoma Department of Transportation (ODOT) contracted with a consultant team to begin the development of the statewide Intelligent Transportation Systems and Commercial Vehicle Operations plans and deployment programs.

ACOG is a stakeholder to the statewide ITS efforts and thus ensures close coordination with the OCARTS area ITS activities. Staff assisted in ODOT’s ITS consultant selection by reviewing the initial Request for Proposal (RFP), by participating in the individual interviews with the prospective consultants, as well as by attending Statewide ITS and CVISN meetings.

One of the tasks undertaken by the Statewide ITS consultant team calls for the development of an ITS Implementation Plan for the OCARTS area. This ITS Implementation Plan will define ITS projects, their priority, estimated project costs (both capital and operations), and provide a schedule for implementation. In addition, ODOT’s consultant team will integrate the OCARTS area ITS Implementation Plan into the Statewide ITS Plan. This implementation plan is built on the defined OCARTS area ITS Integration Strategy as outlined in the Early Deployment Plan, as well as on the completed Regional ITS Architecture.
In intelligent transportation systems
ANTICIPATED FUTURE ITS ACTIVITIES

Since it is believed that ITS will remain critical to effectively combat congestion and incident related traffic problems, strong emphasis will continue to be placed on ITS in the OCARTS area.

CONTINUOUS MAINTENANCE OF THE REGIONAL ITS ARCHITECTURE

Over the past three years, the OCARTS area has been successful in developing the Regional ITS Architecture, the foundation for the deployment of ITS technologies in the region.

Now that the OCARTS area Regional ITS Architecture has been completed, ACOG staff will continue to update and make addition to the regional architecture, as more “players come on board” and as procedural changes dictate. Staff will also oversee the integration of the OCARTS area regional architecture into the Statewide ITS Architecture.

Furthermore, it is planned to begin using the updated software version of Turbo Architecture (2.0), which is supported by the latest national ITS Architecture (4.0). The revise National ITS Architecture includes the latest enhanced “Weather Coverage”, created through defining two market packages – ”Road Weather Data Collection and Weather Information Processing and Dissemination”. To help with the transition, a Turbo Architecture software training course has been requested from the National Highway Institute.

Interagency Operational Agreements and Memoranda of Understanding, as well as standards for interoperability and phasing of projects are among the tasks that remain to be completed before the Regional ITS Architecture will fully comply with federal ITS rules.

OTHER FUTURE ITS ACTIVITIES

The consultant team of PB Farradyne and Traffic Engineering Consultants was hired to develop the OCARTS Area Incident Management Procedures Manual and Resource Guide (IM Guide), which is currently underway. The final IM Guide is anticipated to be completed by the end of year 2003.
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ATTACHMENT 1:
REGIONAL ITS ARCHITECTURE COMPONENTS
OF A MEMBER ENTITY

Abbreviations used in the following diagrams are explained below:

DPS/OHP Comm Center .................................................. Department of Public Safety/Oklahoma Highway Patrol Communications Center
ODOT .................................................................................................................. Oklahoma Department of Transportation
OKC .................................................................................................................... City of Oklahoma City
OU DPS ............................................................................................................ University of Oklahoma, Department of Public Safety
Regional TMC .................................................................................................. Regional Traffic Management Center
Tinker AFB ...................................................................................................... Tinker Air Force Base
### ATTACHMENT 2: EXCERPT OF RELEVANT STANDARDS ACTIVITIES

<table>
<thead>
<tr>
<th>LEAD SDO</th>
<th>STANDARD NAME</th>
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<tbody>
<tr>
<td>AASHTO</td>
<td>Simple Transportation Management Framework (STMF)</td>
<td>NTCIP 1101</td>
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**Supports interfaces:**

<table>
<thead>
<tr>
<th>Source: Local Municipality Traffic Management</th>
<th>Destination: Local Municipality Traffic Signal Equipment</th>
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</thead>
<tbody>
<tr>
<td>Flow: sensor and surveillance control</td>
<td></td>
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<tr>
<td>Flow: signal control data</td>
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<td></td>
<td></td>
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<tr>
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<td>Destination: Local Municipality Traffic Management</td>
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<tr>
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<td></td>
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<tr>
<td>Flow: request for right-of-way</td>
<td></td>
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<tr>
<td>Flow: signal control status</td>
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**AASHTO**

**Simple Transportation Management Protocol (STMP)**

**NTCIP 1103**
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<tr>
<th>Source: EMSA Ambulances</th>
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<th>Source: Local Municipality Fire Vehicles</th>
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<th>Source: Local Municipality Fire Vehicles</th>
<th>Destination: OKC Traffic Management Division Signal Equipment</th>
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<tbody>
<tr>
<td>Flow: local signal preemption request</td>
<td>Support interfaces:</td>
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## ITE  
**TCIP - Spatial Representation (SP)**

### NTCIP 1405

**Business Area Standard**

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<td>incident response coordination</td>
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<tr>
<td>EMSA Emergency Medical Dispatch</td>
<td>Local Municipality 911 Dispatch</td>
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</tr>
<tr>
<td>Midwest City 911 Center</td>
<td>Local Municipality 911 Dispatch</td>
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<td>Moore 911 Center</td>
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<td>Norman 911 Center</td>
<td>Local Municipality 911 Dispatch</td>
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</tr>
</tbody>
</table>

**Abbreviations:**

- AASHTO - American Association of State Highway & Transportation Officials
- NTCIP - National Transportation Communications for ITS Protocol
- IEEE - Institute of Electrical and Electronics Engineers
- RS Communication - Roadside Communication
- ITE - Institute of Transportation Engineers
- TCIP - Transit Communications Interface Profile
- SDO - Standards Development Organization
- SP - Spatial Representation

For further information on ITS Standards, visit: www.its-standards.net.