June 2nd, 2006

ITS Functional Requirements Working Paper
Deliverable A2–c4

Central Coast
ITS Implementation Plan

Association of Monterey Bay Area Governments

TRANSCORE.

CENTRAL COAST ITS IMPLEMENTATION PLAN

ITS Functional Requirements – Working Paper

Deliverable A2-c4

Prepared for:

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1. INTRODUCTION

1.1 Project Overview

The Central Coast Region has a long history of planning and designing Intelligent Transportation Systems (ITS). Beginning in 1998, Stakeholder Agencies from the 5-County Region (Santa Cruz, San Benito, Monterey, San Luis Obispo, Santa Barbara) came together to collaboratively begin the process to determine the Region's viability to apply ITS to the area's transportation issues. From 1998 through 2000, the Stakeholder Agencies, later identified as the Central Coast ITS Coordinating Group, worked in partnership with TransCore to develop the *2000 Central Coast ITS Strategic Deployment Plan (SDP)*.

The results of the *2000 SDP* were highly encouraging. Not only did the CCITS Coordinating Group conclude that ITS technology had tremendous potential for improving Regional mobility, safety, and economic competitiveness, the effort also developed the Central Coast Regional ITS Architecture, ITS promotional publications (e.g., brochure, video tape, presentation materials, etc.), list of specific ITS Projects to implement over a phased timeframe, and solidified the Group's commitment to ITS in the Central Coast. Subsequent to the development of the *2000 SDP* and fully committed to the on-going implementation of ITS in the Central Coast, the CCITS Coordinating Group continues to meet on a quarterly basis to guide ITS planning and deployment activities. The CCITS Coordinating Group has since become the body to advise the Central Coast Stakeholder Agencies on adherence/updates to the Regional ITS Architecture, advise and assist them in seeking discretionary funding for ITS Projects, and finally to coordinate and share information on planned or proposed ITS Projects in the Region.

Since the *2000 SDP* was completed, many ITS Projects that were identified within its contents have been implemented and programmed, such as:

- Caltrans District 5 Transportation Management Center (TMC)
- Detection stations along US 101 (via Minor B project funds) and as part of a roadway rehabilitation project
- Changeable Message Signs (CMS) located at the US 101 @ SR 154 interchange (NB & SB) (Programmed)
- Ramp meter (NB) located at the US 101 @ Garden Street. interchange
- Monterey-Salinas Transit (MST) Automated Vehicle Location (AVL) system
- Dynamic Speed/Curve Warning system along SR 17 (including microwave/laser detection system, CCTV, & CMS)

Not only are these project implementations cause for excitement as they make evident the Central Coast's commitment to ITS, but they also demonstrate the CCITS Coordinating Group's actual use of the *2000 SDP*, indicating that it is indeed a plan/document that they really use and not just let sit on a shelf. Despite these ITS successes, the CCITS Coordinating Group wants to accomplish more. However, the recent funding climate in California and within the Central Coast has made it extremely difficult to obtain the necessary monies to implement more of the *2000 SDP's* ITS Projects. The following list identifies some of these high priority ITS Projects in the Central Coast that have yet to be implemented due to funding constraints:

- Installation and hook-up/connection of various ITS field elements from around the Central Coast (e.g., detection stations, CCTV, CMS, etc.) to the Caltrans District 5 TMC
- Connection between the Caltrans District 4 and 5 TMCs for monitoring and control capabilities of the ITS elements along Pacific Coast Highway (SR 1) & SR 17 (in Santa Cruz)
- Connections between the Caltrans District 5, District 6 (Fresno), and District 7 (Los Angeles) TMCs for information sharing and control/coordination purposes
- Implementation of the ramp meter (SB) at the US 101 @ Cabrillo Blvd. interchange

As the Central Coast Agencies continued their deployment, operation, and management of ITS devices, the CCITS Coordinating Group foresaw the benefits of reaching out to multiple groups throughout the Region. The concept of formulating a more cohesive ITS education piece could assist with informing more Agencies and policy makers about the "state of ITS" within the Region. The ITS promotional publications prepared for the *2000 SDP* have been used extensively to educate and inform both Agency staff as well as the general public about the value/benefits of ITS deployment, and its ability to improve not only the safety of the transportation network but also its efficiency and effectiveness of moving people and goods. The CCITS Coordinating Group continues to educate, whenever possible, and its members are strong advocates for improving capacity through technological advances.

At this time, Caltrans has awarded a grant to the Region under the FHWA Partnership Planning Program on the promotion and deployment of ITS in the Central Coast. Funded by this grant, the Central Coast ITS Implementation Plan project is expected to provide a more expeditious, unified, and consistent integration of ITS into the State and Regional transportation planning and programming processes in the Central Coast. Further, the Central Coast ITS Implementation project will perform the following activities for the Region:

- Utilize the work undertaken over the last several years and maintain the momentum gained
- Update the Central Coast Regional ITS Architecture to the National ITS Architecture (Version 5) and Turbo Architecture (Version 3)
- Ensure compliance of the Region with the current USDOT FHWA Rule and Federal Transit Administration Policy for National ITS Architecture
- Provide a strategy for moving forward with ITS
- Establish and implement a CCITS Regional Architecture Implementation Plan and Maintenance Plan
- Work with the Regional Stakeholder Agencies and Caltrans to incorporate ITS into the Regional transportation planning and programming process
- Provide cooperative agreement templates
- Review/update promotional/informational ITS publications
- Provide assistance promoting ITS technology and knowledge in the Central Coast
- Provide an authoritative resource of ITS information to Caltrans, Regional, and Local Agencies
- Provide training in the use of the Turbo Architecture software

2. CCITS FUNCTIONAL REQUIREMENTS

After the Operational Concepts, the next step in developing (and maintaining) an ITS architecture is the description of what the various ITS elements in the inventory (will) do – their Functional Requirements (FRs). FRs describe what functions each ITS element is to perform. Each requirement should be described in enough detail to understand what the system will do, but not so detailed as to be used to build or include in a procurement package (e.g., an RFP, etc.) – your ITS implementation project will need to expand the FRs for that.

The National ITS Architecture includes a large set of pre-defined FRs based upon the functionality of the Equipment Packages that are part of Market Packages (MPs). These FRs are organized into logical groups, called Functional Areas. Earlier in the architecture development process, each of the inventory elements were mapped to MPs, thereby creating the linkage between these pre-defined FRs and the ITS elements.

During the FR definition process, some of the FRs were tailored to describe the elements' actual functionality more accurately. In some cases, the pre-defined FRs did not include descriptions of some specific functionality (to be) performed, so additional FRs were created for those elements.

Each FR in an architecture has an associated Status attribute. The default values are: Existing (the requirement is currently being performed by the element) or Planned (to be done at some point in the future). The CCITS architectures have an additional value available: Programmed. This value may be used if the ITS element also has the status of Programmed (the element is included in the applicable planning cycle(s)) and that function is included in the programmed implementation phase. A requirement can have a Status that is different than the supporting ITS element, but it should be an "earlier" Status (i.e., Planned before Programmed before Existing).

With the new CCITS architecture structure (separate Turbo databases for each MPO with local and Regionally significant ITS project architectures), there are separate FRs for each element in each project architecture. This is by design to try and segregate the requirements included to support local ITS-related operations from those included in support of its Regional operations, if any. An ITS element can have FRs in multiple architectures if that element is part of multiple architectures. For example, a TMC may have FRs to support operating the local signal system as well as those for coordinating with other TMCs.

The CCITS Functional Requirements Reports (included herein and posted on the CCITS project website at: http://www.iteris.com/ccits-admin/html/deliverables.html by MPO) presents the FRs for the various CCITS Agencies included in the specific MPO architecture. The FRs are sorted by ITS element and then by Functional Area and include the local and Regionally significant ITS architectures in each MPO database. (The number in parentheses following the FR status is the actual requirement number from the applicable ITS architecture and is for reference purposes only.)

Please note that these Functional Requirements are based upon the FRs previously submitted to and reviewed by the CCITS Team. (Comment resolution forms have been posted on the CCITS project website.) We have attempted incorporate all of the applicable comments from that review as well as to keep the FRs between each of the architectures consistent (and it will require coordination and cooperation between CCITS Agencies to maintain the consistency). If you find any errors/omissions/discrepancies, log them on a new comment review form. Major issues will

be addressed as part of this project and subsequently reflected in the CCITS Architecture Final Report. However, all other issues will be left to the MPOs to address during the next maintenance cycle.

Please see the FHWA's National ITS Architecture CD or visit their website (at http://itsarch.iteris.com/itsarch/index.htm) to get a more in-depth description of the concepts discussed above.

APPENDIX A – FUNCTIONAL REQUIREMENTS: AMBAG & SANTA CRUZ/SAN BENITO/MONTEREY COUNTIES

APPENDIX B – FUNCTIONAL REQUIREMENT: SAN LUIS OBISPO COUNTY

APPENDIX C – FUNCTIONAL REQUIREMENTS: SANTA BARBARA COUNTY