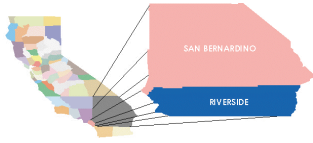
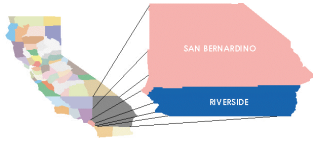


APPENDIX A
LIST OF ACRONYMS



List of Acronyms

| | |
|----------|--|
| AASHTO | American Association of State Highway and Transportation Officials |
| AD | Archived Data |
| ADOT | Arizona Department of Transportation |
| ADUS | Archived Data User Service |
| ANSI | American National Standards Institute |
| APTS | Advanced Public Transportation Systems |
| ASTM | American Society For Testing and Materials |
| ATIS | Advanced Traveler Information System |
| ATMIS | Advanced Transportation Management and Information System |
| ATMS | Advanced Transportation Management System |
| AVI | Automated Vehicle Identification |
| AVL | Automated Vehicle Locator |
| AVSS | Advanced Vehicle Safety Systems |
| CAD | Computer Aided Dispatch |
| Caltrans | California Department of Transportation |
| CCTV | Closed Circuit Television |
| CEA | Consumer Electronics Association |
| CVISN | Commercial Vehicle Information Systems & Networks |
| CVO | Commercial Vehicle Operations |
| CHP | California Highway Patrol |
| CMS | Changeable Message Sign |
| DOT | Department of Transportation |
| EIA | Energy Information Administration |
| EM | Emergency Management |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FSP | Freeway Service Patrol |
| FTA | Federal Transit Administration |
| HAR | Highway Advisory Radio |
| HOV | High Occupancy Vehicles |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISP | Information Service Provider |
| ITE | Institute of Transportation Engineers |
| ITS | Intelligent Transportation System(s) |
| MCO | Maintenance & Construction Operations |
| MOU | Memorandum of Understanding |
| MPO | Metropolitan Planning Organization |
| NDOT | Nevada Department of Transportation |
| NEMA | National Electrical Manufacturers Association |
| PeMS | Freeway Performance Measurement System |
| RCTC | Riverside County Transportation Commission |



| | |
|--------|--|
| RTA | Riverside Transit Authority |
| RTP | Regional Transportation Plan |
| RTIP | Regional Transportation Improvement Program |
| RWIS | Road Weather Information System |
| SAE | Society of Automotive Engineers |
| SANBAG | San Bernardino Associated Governments |
| SCAG | Southern California Association of Governments |
| STIP | State Transportation Improvement Program |
| TANN | Travel Advisory News Network |
| TEA-21 | Transportation Equity Act for the 21 st Century |
| TIP | Transportation Improvement Program |
| TMC | Traffic Management Center |
| TMC | Transportation Management Center |
| TOC | Traffic Operations Center |
| TOC | Transportation Operations Center |

APPENDIX B
LIST OF STAKEHOLDERS

Appendix B
Inland Empire Regional ITS Architecture - Stakeholder List

| Agency | Stakeholder Category |
|---------------------------------------|-----------------------------|
| California Speedway | Activity Centers |
| Carousel Mall | Activity Centers |
| Desert Hills Factory Outlets | Activity Centers |
| Galleria at Tyler | Activity Centers |
| Inland Center Mall | Activity Centers |
| Ontario Mills Mall | Activity Centers |
| Riverside Plaza | Activity Centers |
| March Joint Powers Authority | Airports |
| Ontario International Airport | Airports |
| Palm Springs International Airport | Airports |
| San Bernardino International Airport | Airports |
| Southern California Logistics Airport | Airports |
| Adelanto | Cities |
| Banning | Cities |
| Barstow | Cities |
| Beaumont | Cities |
| Big Bear Lake | Cities |
| Blythe | Cities |
| Calimesa | Cities |
| Canyon Lake | Cities |
| Cathedral City | Cities |
| Chino | Cities |
| Chino Hills | Cities |
| Coachella | Cities |
| Colton | Cities |
| Corona | Cities |
| Desert Hot Springs | Cities |
| Fontana | Cities |
| Grand Terrace | Cities |
| Hemet | Cities |
| Hesperia | Cities |
| Highland | Cities |
| Indian Wells | Cities |
| Indio | Cities |
| La Quinta | Cities |
| Lake Elsinore | Cities |
| Loma Linda | Cities |
| Montclair | Cities |
| Moreno Valley | Cities |
| Murrieta | Cities |
| Needles | Cities |
| Norco | Cities |
| Ontario | Cities |
| Palm Desert | Cities |
| Palm Springs | Cities |
| Perris | Cities |
| Rancho Cucamonga | Cities |
| Rancho Mirage | Cities |
| Redlands | Cities |
| Rialto | Cities |
| Riverside | Cities |

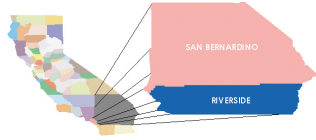
Appendix B
Inland Empire Regional ITS Architecture - Stakeholder List

| Agency | Stakeholder Category |
|---|-----------------------------|
| San Bernardino | Cities |
| San Jacinto | Cities |
| Temecula | Cities |
| Twentynine Palms | Cities |
| Upland | Cities |
| Victorville | Cities |
| Yucaipa | Cities |
| Federal Emergency Management Agency (FEMA) | Federal Agencies |
| Federal Railroad Administration (FRA) | Federal Agencies |
| Federal Transit Administration (FTA) | Federal Agencies |
| FHWA, CA Division | Federal Agencies |
| FTA/FHWA L.A. Metropolitan Office | Federal Agencies |
| Coachella Valley Assn. of Governments (CVAG) | Local Agencies |
| Riverside County | Local Agencies |
| Riverside County Transportation Commission | Local Agencies |
| San Bernardino Associated Governments | Local Agencies |
| San Bernardino County | Local Agencies |
| Southern California Assn. Of Governments (SCAG) | Local Agencies |
| Western Riv. Council of Governments (WRCOG) | Local Agencies |
| Arizona Department of Transportation (ADOT) | Other State Agencies |
| Nevada Department of Transportation (NDOT) | Other State Agencies |
| Regional Transportation Commission (RTC) of Southern Nevada | Other Local Agencies |
| California Highway Patrol (CHP) | Public Safety Agencies |
| Riverside County Fire | Public Safety Agencies |
| Riverside County Sheriff - Tech. Services Division | Public Safety Agencies |
| San Bernardino County Fire | Public Safety Agencies |
| San Bernardino County Sheriff | Public Safety Agencies |
| Caltrans, Division of Research and Innovation | State Agencies |
| Calif. Alliance for Advanced Transportation Systems (CAATS) | Public/Private |
| California Air Resources Board | State Agencies |
| California Transportation Commission | State Agencies |
| Caltrans, District 8 | State Agencies |
| Apple Valley | Town |
| Yucca Valley | Town |
| Banning | Transit Agencies |
| Beaumont | Transit Agencies |
| Corona | Transit Agencies |

Appendix B
Inland Empire Regional ITS Architecture - Stakeholder List

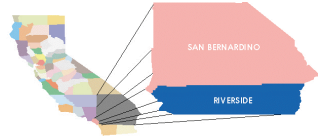
| Agency | Stakeholder Category |
|---|-----------------------------|
| Morongo Basin Transit Authority | Transit Agencies |
| Mountain Area Regional Transit Authority | Transit Agencies |
| Needles Area Transit | Transit Agencies |
| Omnitrans | Transit Agencies |
| Palo Verde Valley Transit Agency (City of Blythe) | Transit Agencies |
| Riverside Special Services | Transit Agencies |
| Riverside Transit Agency | Transit Agencies |
| So. Calif. Regional Rail Authority (SCRRA) | Transit Agencies |
| SunLine Transit Agency | Transit Agencies |
| Victor Valley Transit Authority (V/TA) | Transit Agencies |

APPENDIX C
INVENTORY BY STAKEHOLDER

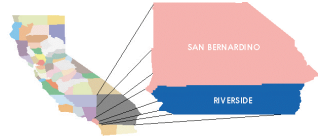


Inland Empire Inventory by Stakeholder

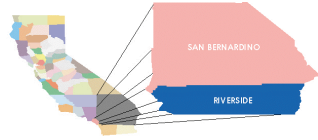
| <u>Stakeholder</u> | <u>Element</u> | <u>Status</u> | <u>Architecture Entity</u> |
|--|---|----------------------|--|
| <i>Arizona DOT (ADOT)</i> | Arizona DOT (ADOT) ATMS | Planned | Other TM (Terminator) |
| <i>California Department of Motor Vehicles (DMV)</i> | DMV CVO Administration (PrePass) | Existing | Commercial Vehicle Administration (Subsystem) |
| <i>California Highway Patrol (CHP)</i> | CHP CAD System | Existing | Emergency Management (Subsystem) |
| | CHP Vehicles | Existing | Emergency Vehicle Subsystem (Subsystem) |
| <i>Caltrans D-8</i> | Caltrans D-8 TMC | Existing | Archived Data Management Subsystem (Subsystem) |
| | | Existing | Information Service Provider (Subsystem) |
| | Caltrans D-8 Maintenance and Construction Mgmt System | Existing | Maintenance and Construction Mgmt (Subsystem) |
| | Caltrans D-8 Roadway Maintenance Vehicles | Existing | Maintenance and Construction Vehicle (Subsystem) |
| | Caltrans D-8 Signal Ops Roadside Equipment | Existing | Roadway Subsystem (Subsystem) |
| | Caltrans D-8 TMC Roadside Equipment | Existing | Roadway Subsystem (Subsystem) |
| | Caltrans D-8 Signal Ops | Existing | Traffic Management (Subsystem) |
| | Caltrans D-8 TMC | Existing | Traffic Management (Subsystem) |
| <i>Caltrans HQ</i> | Caltrans CVO Administration (Pre-pass) | Existing | Commercial Vehicle Administration (Subsystem) |
| | CVO Weigh Stations (including weigh-in-motion) | Existing | Commercial Vehicle Check (Subsystem) |



| <u><i>Stakeholder</i></u> | <u><i>Element</i></u> | <u><i>Status</i></u> | <u><i>Architecture Entity</i></u> |
|---------------------------|---------------------------------|----------------------|--|
| <i>City of Corona</i> | Corona TMC | Existing | Information Service Provider (Subsystem) |
| | Corona TMC Roadside Equipment | Existing | Roadway Subsystem (Subsystem) |
| | Corona TMC | Existing | Traffic Management (Subsystem) |
| <i>City of Fontana</i> | Fontana Police Dispatch Center | Existing | Emergency Management (Subsystem) |
| | Fontana Emergency Vehicles | Existing | Emergency Vehicle Subsystem (Subsystem) |
| | Fontana Traveler Information | Existing | Information Service Provider (Subsystem) |
| | Fontana TMC | Existing | Information Service Provider (Subsystem) |
| | Fontana TMC Roadside Equipment | Existing | Roadway Subsystem (Subsystem) |
| | Fontana TMC | Existing | Traffic Management (Subsystem) |
| <i>City of Temecula</i> | Temecula TOC Roadside Equipment | Existing | Roadway Subsystem (Subsystem) |
| | Temecula TOC | Existing | Traffic Management (Subsystem) |
| <i>General Public</i> | User Personal Computing Devices | Existing | Personal Information Access (Subsystem) |



| <u>Stakeholder</u> | <u>Element</u> | <u>Status</u> | <u>Architecture Entity</u> |
|--|---|---------------|--|
| <i>Local Cities and Counties</i> | | | |
| | Local Police and Sheriff Departments Systems | Existing | Emergency Management (Subsystem) |
| | Local and other Fire Departments Systems | Existing | Emergency Management (Subsystem) |
| | Local and other Fire Vehicles | Existing | Emergency Vehicle Subsystem (Subsystem) |
| | Local Police and Sheriff Dept Vehicles | Existing | Emergency Vehicle Subsystem (Subsystem) |
| | Local City and County Roadside Equipment | Existing | Roadway Subsystem (Subsystem) |
| | Local City and County Signal Systems | Existing | Traffic Management (Subsystem) |
| | Municipal and small transit agencies systems | Existing | Transit Management (Subsystem) |
| | Municipal and small transit agencies vehicles | Existing | Transit Vehicle Subsystem (Subsystem) |
| <i>Metrolink</i> | | | |
| | Metrolink Operations Center | Existing | Transit Management (Subsystem) |
| | Metrolink Trains | Existing | Transit Vehicle Subsystem (Subsystem) |
| <i>Nevada DOT (NDOT)</i> | | | |
| | Nevada DOT (NDOT) ATMS | Existing | Other TM (Terminator) |
| <i>Omnitrans</i> | | | |
| | Omnitrans Fixed Route | Existing | Transit Management (Subsystem) |
| | Omnitrans Paratransit | Existing | Transit Management (Subsystem) |
| | Omnitrans Transit Vehicles | Existing | Transit Vehicle Subsystem (Subsystem) |
| <i>Partners for Advanced Transit and Highways (PATH)</i> | | | |
| | Performance Monitoring System (PeMS) | Existing | Archived Data Management Subsystem (Subsystem) |
| | | Existing | Other TM (Terminator) |
| <i>Private Commercial Vehicle Owners</i> | | | |
| | Commercial Vehicles | Existing | Commercial Vehicle Subsystem (Subsystem) |

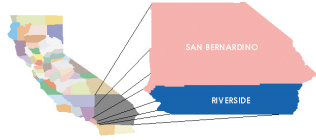


| <u>Stakeholder</u> | <u>Element</u> | <u>Status</u> | <u>Architecture Entity</u> |
|--|---|---------------|--|
| <i>Private Tow Companies</i> | | | |
| | Tow Trucks (FSP) | Existing | Emergency Vehicle Subsystem (Subsystem) |
| <i>Railroad Operators</i> | | | |
| | Rail Grade Crossing Warning Eqpt. | Existing | Wayside Equipment (Terminator) |
| <i>Riverside County Transportation Commission (RCTC)</i> | | | |
| | Riverside Freeway Service Patrol | Existing | Emergency Management (Subsystem) |
| | North Main Corona Metrolink Station Pkg Mgmt System | Planned | Parking Management (Subsystem) |
| | Ride Pro | Existing | Personal Information Access (Subsystem) |
| | Riverside County Smart Call Boxes | Existing | Roadway Subsystem (Subsystem) |
| | Riverside County Call Boxes | Existing | Emergency Telecommunications System (Terminator) |
| <i>Riverside Transit Agency (RTA)</i> | | | |
| | RTA Fixed Route | Existing | Transit Management (Subsystem) |
| | RTA Paratransit | Existing | Transit Management (Subsystem) |
| | RTA Transit Vehicles | Existing | Transit Vehicle Subsystem (Subsystem) |
| <i>San Bernardino Associated Governments (SANBAG)</i> | | | |
| | Inland Empire Call Answering Center | Existing | Emergency Management (Subsystem) |
| | San Bernardino Freeway Service Patrol | Planned | Emergency Management (Subsystem) |
| | San Bernardino County Smart Call Boxes | Existing | Roadway Subsystem (Subsystem) |
| | San Bernardino County Call Boxes | Existing | Emergency Telecommunications System (Terminator) |
| <i>Southern California Association of Governments (SCAG)</i> | | | |
| | Regional Archived Data Repository | Existing | Archived Data Management Subsystem (Subsystem) |



| <u><i>Stakeholder</i></u> | <u><i>Element</i></u> | <u><i>Status</i></u> | <u><i>Architecture Entity</i></u> |
|---|---------------------------------------|----------------------|--|
| <i>Southern California Economic Partnership</i> | Traveler Advisory News Network (TANN) | Existing | Information Service Provider (Subsystem) |
| <i>SunLine Transit Agency</i> | SunLine Fixed Route | Existing | Transit Management (Subsystem) |
| | SunLine Paratransit | Existing | Transit Management (Subsystem) |
| | SunLine Transit Vehicles | Existing | Transit Vehicle Subsystem (Subsystem) |
| <i>TV, radio and other media outlets (Internet, kiosks, etc.)</i> | Media | Existing | Information Service Provider (Subsystem) |
| | | Existing | Media (Terminator) |

APPENDIX D
INVENTORY BY ARCHITECTURE ENTITY

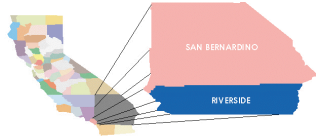


Inland Empire Inventory by Architecture Entity

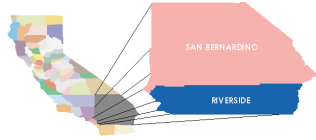
| <u>Architecture Entity</u> | <u>Element</u> | <u>Stakeholder</u> | <u>Status</u> |
|------------------------------------|--|---|----------------------|
| Archived Data Management Subsystem | Caltrans D-8 TMC | Caltrans D-8 | Existing |
| | Performance Monitoring System (PeMS) | Partners for Advanced Transit and Highways (PATH) | Existing |
| | Regional Archived Data Repository | Southern California Association of Governments (SCAG) | Existing |
| Commercial Vehicle Administration | Caltrans CVO Administration (Pre-pass) | Caltrans HQ | Existing |
| | DMV CVO Administration (PrePass) | California Department of Motor Vehicles (DMV) | Existing |
| Commercial Vehicle Check | CVO Weigh Stations (including weigh-in-motion) | Caltrans HQ | Existing |
| Commercial Vehicle Subsystem | Commercial Vehicles | Private Commercial Vehicle Owners | Existing |
| Emergency Management | CHP CAD System | California Highway Patrol (CHP) | Existing |
| | Fontana Police Dispatch Center | City of Fontana | Existing |
| | Inland Empire Call Answering Center | San Bernardino Associated Governments (SANBAG) | Existing |
| | Local and other Fire Departments Systems | Local Cities and Counties | Existing |
| | Local Police and Sheriff Departments Systems | Local Cities and Counties | Existing |
| | Riverside Freeway Service Patrol | Riverside County Transportation Commission (RCTC) | Existing |
| | San Bernardino Freeway Service Patrol | San Bernardino Associated Governments (SANBAG) | Planned |
| Emergency Vehicle Subsystem | CHP Vehicles | California Highway Patrol (CHP) | Existing |
| | Fontana Emergency Vehicles | City of Fontana | Existing |
| | Local and other Fire Vehicles | Local Cities and Counties | Existing |
| | Local Police and Sheriff Dept Vehicles | Local Cities and Counties | Existing |
| | Tow Trucks (FSP) | Private Tow Companies | Existing |



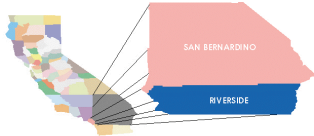
| <u><i>Architecture Entity Element</i></u> | <u><i>Stakeholder</i></u> | <u><i>Status</i></u> |
|---|--|----------------------|
| Emissions Management | | |
| Fleet and Freight Management | | |
| Information Service Provider | | |
| Caltrans D-8 TMC | Caltrans D-8 | Existing |
| Corona TMC | City of Corona | Existing |
| Fontana TMC | City of Fontana | Existing |
| Fontana Traveler Information | City of Fontana | Existing |
| Media | TV, radio and other media outlets (Internet, kiosks, etc.) | Existing |
| Traveler Advisory News Network (TANN) | Southern California Economic Partnership | Existing |
| Maintenance and Construction Management | | |
| Caltrans D-8 Maintenance and Construction Mgmt System | Caltrans D-8 | Existing |
| Maintenance and Construction Vehicle | | |
| Caltrans D-8 Roadway Maintenance Vehicles | Caltrans D-8 | Existing |
| Parking Management | | |
| North Main Corona Metrolink Station Pkg Mgmt System | Riverside County Transportation Commission (RCTC) | Planned |
| Personal Information Access | | |
| Ride Pro | Riverside County Transportation Commission (RCTC) | Existing |
| User Personal Computing Devices | General Public | Existing |
| Remote Traveler Support | | |



| <u>Architecture Entity</u> | <u>Element</u> | <u>Stakeholder</u> | <u>Status</u> |
|----------------------------|--|---|---------------|
| Roadway Subsystem | Caltrans D-8 Signal Ops Roadside Equipment | Caltrans D-8 | Existing |
| | Caltrans D-8 TMC Roadside Equipment | Caltrans D-8 | Existing |
| | Corona TMC Roadside Equipment | City of Corona | Existing |
| | Fontana TMC Roadside Equipment | City of Fontana | Existing |
| | Local City and County Roadside Equipment | Local Cities and Counties | Existing |
| | Riverside County Smart Call Boxes | Riverside County Transportation Commission (RCTC) | Existing |
| | San Bernardino County Smart Call Boxes | San Bernardino Associated Governments (SANBAG) | Existing |
| | Temecula TOC Roadside Equipment | City of Temecula | Existing |
| Toll Administration | | | |
| Toll Collection | | | |
| Traffic Management | Caltrans D-8 Signal Ops | Caltrans D-8 | Existing |
| | Caltrans D-8 TMC | Caltrans D-8 | Existing |
| | Corona TMC | City of Corona | Existing |
| | Fontana TMC | City of Fontana | Existing |
| | Local City and County Signal Systems | Local Cities and Counties | Existing |
| | Temecula TOC | City of Temecula | Existing |

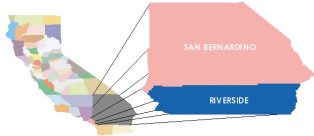


| <u>Architecture Entity</u> | <u>Element</u> | <u>Stakeholder</u> | <u>Status</u> |
|----------------------------|---|--------------------------------|---------------|
| Transit Management | Metrolink Operations Center | Metrolink | Existing |
| | Municipal and small transit agencies systems | Local Cities and Counties | Existing |
| | Omnitrans Fixed Route | Omnitrans | Existing |
| | Omnitrans Paratransit | Omnitrans | Existing |
| | RTA Fixed Route | Riverside Transit Agency (RTA) | Existing |
| | RTA Paratransit | Riverside Transit Agency (RTA) | Existing |
| | SunLine Fixed Route | SunLine Transit Agency | Existing |
| | SunLine Paratransit | SunLine Transit Agency | Existing |
| Transit Vehicle Subsystem | Metrolink Trains | Metrolink | Existing |
| | Municipal and small transit agencies vehicles | Local Cities and Counties | Existing |
| | Omnitrans Transit Vehicles | Omnitrans | Existing |
| | RTA Transit Vehicles | Riverside Transit Agency (RTA) | Existing |
| | SunLine Transit Vehicles | SunLine Transit Agency | Existing |
| Vehicle | | | |

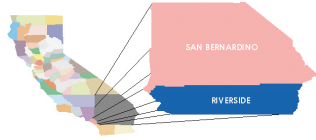


Terminators

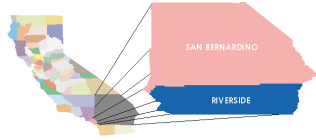
| <u>Architecture Entity</u> | <u>Element</u> | <u>Stakeholder</u> | <u>Status</u> |
|--|----------------------------------|---|---------------|
| Archived Data Administrator | | | |
| Archived Data User Systems | | | |
| Asset Management | | | |
| Basic Commercial Vehicle | | | |
| Basic Maintenance and Construction Vehicle | | | |
| Basic Transit Vehicle | | | |
| Basic Vehicle | | | |
| Care Facility | | | |
| Commercial Vehicle Driver | | | |
| Commercial Vehicle Manager | | | |
| CVO Information Requestor | | | |
| CVO Inspector | | | |
| DMV | | | |
| Driver | | | |
| Emergency Personnel | | | |
| Emergency System Operator | | | |
| Emergency Telecommunications System | | | |
| | Riverside County Call Boxes | Riverside County Transportation Commission (RCTC) | Existing |
| | San Bernardino County Call Boxes | San Bernardino Associated Governments (SANBAG) | Existing |



| <u>Architecture Entity</u> | <u>Element</u> | <u>Stakeholder</u> | <u>Status</u> |
|---|----------------|--|---------------|
| Enforcement Agency | | | |
| Environment | | | |
| Equipment Repair Facility | | | |
| Event Promoters | | | |
| Financial Institution | | | |
| Government Reporting Systems | | | |
| Intermodal Freight Depot | | | |
| Intermodal Freight Shipper | | | |
| ISP Operator | | | |
| Location Data Source | | | |
| Maintenance and Construction Administrative | | | |
| Maintenance and Construction Center Personnel | | | |
| Maintenance and Construction Field Personnel | | | |
| Map Update Provider | | | |
| Media | Media | TV, radio and other media outlets (Internet, kiosks, etc.) | Existing |
| Multimodal Crossings | | | |
| Multimodal Transportation Service Provider | | | |
| Other Archives | | | |
| Other CVAS | | | |
| Other Data Sources | | | |

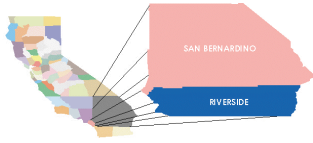


| <u>Architecture Entity</u> | <u>Element</u> | <u>Stakeholder</u> | <u>Status</u> |
|--|--------------------------------------|---|---------------|
| Other EM | | | |
| Other ISP | | | |
| Other MCM | | | |
| Other MCV | | | |
| Other Parking | | | |
| Other Roadway | | | |
| Other TM | | | |
| | Arizona DOT (ADOT) ATMS | Arizona DOT (ADOT) | Planned |
| | Nevada DOT (NDOT) ATMS | Nevada DOT (NDOT) | Existing |
| | Performance Monitoring System (PeMS) | Partners for Advanced Transit and Highways (PATH) | Existing |
| Other Toll Administration | | | |
| Other TRM | | | |
| Other Vehicle | | | |
| Parking Operator | | | |
| Pedestrians | | | |
| Potential Obstacles | | | |
| Rail Operations | | | |
| Roadway Environment | | | |
| Secure Area Environment | | | |
| Storage Facility | | | |
| Surface Transportation Weather Service | | | |



| <u><i>Architecture Entity</i></u> | <u><i>Element</i></u> | <u><i>Stakeholder</i></u> | <u><i>Status</i></u> |
|-----------------------------------|-----------------------------------|---------------------------|----------------------|
| Toll Administrator | | | |
| Toll Operator | | | |
| Trade Regulatory Agencies | | | |
| Traffic | | | |
| Traffic Operations Personnel | | | |
| Transit Driver | | | |
| Transit Fleet Manager | | | |
| Transit Maintenance Personnel | | | |
| Transit System Operators | | | |
| Transit User | | | |
| Traveler | | | |
| Traveler Card | | | |
| Vehicle Characteristics | | | |
| Wayside Equipment | | | |
| | Rail Grade Crossing Warning Eqpt. | Railroad Operators | Existing |
| Weather Service | | | |
| Yellow Pages Service Providers | | | |

APPENDIX E
ITS NEEDS SURVEY



ITS Needs Survey and Exercise

Background:

The following pages contain a fairly comprehensive listing of ITS Needs that Iteris compiled based on our knowledge of the Inland Empire transportation challenges and based on situations we have encountered in other similar locales. This list was distributed at the project Workshop conducted in San Bernardino on March 4, 2003. The group went over the list in some detail and Iteris was able to garner some valuable input regarding Relative Priority of specific Needs on the list.

How can you help?

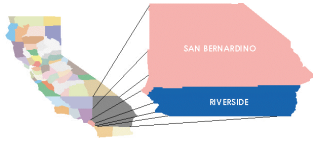
We are asking all of the project stakeholders to scan through the following list of potential ITS Needs and give us their input on relevancy and priority. Please let us know whether specific Needs are either a High Priority for the Region or a Low Priority for the Region, from your perspective. There is even value in having reviewers scan only specific subject areas of the list to provide input. For example, there would be value in having transit agency representatives review and provide input on the Public Transportation Management portion of the list, even if they do not provide input on other portions of the list. Also, more importantly, please let us know if you have any other items to add to the list.

Specific Instructions:

Please insert your name, agency and other requested contact information on the following page. Then please review the following list of ITS Needs and provide your input on the relative priority of selected Needs for the Inland Empire. Insert the letter H for High, M for Medium and L for Low in the “Relative Priority” column of the ITS Needs list.

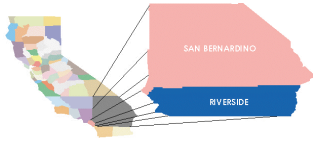
Then, please email this file to Tom Petrosino, of Iteris at tmp@iteris.com.

We will then take the input into account when preparing Needs and Services deliverable.



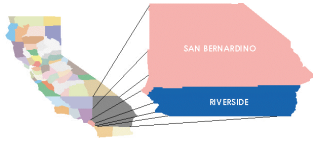
Workshop #2
ITS Needs Exercise

| | |
|----------------------|--|
| Reviewer Name | |
| Representing | |
| Phone # | |
| Email address | |



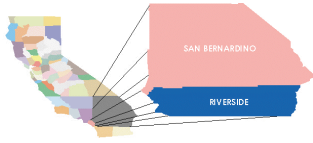
H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|--|--|-------------------|
| Arterial / Traffic Management | | |
| <i>Examples: Signal Coordination, Centralized Control, Vehicle Detection Systems, Video Systems, Adaptive Signal Control, Traffic Management Systems / Centers, Highway Rail Intersection Technologies</i> | Improve system operation monitoring | |
| | Provide systemwide arterial management strategies | |
| | Develop access management plans/strategies (signal spacing) | |
| | Improve signal optimization | |
| | Improve traffic flow monitoring | |
| | Provide more widespread centralized computer control | |
| | Improve hardware issues in interconnecting signal systems between agencies | |
| | Improve signal control and timing | |
| | Improve/implement ability to remotely modify signal timing | |
| | Better manage congestion at signals | |
| | Reduce detector failures when pavement “breaks up” | |
| | Improve emergency vehicle preemption systems (speed-up return to coordination) | |
| | Reduce emergency vehicle delays at signals | |
| | Reduce transit vehicle delays at signals | |
| | Better balance signal timings favoring local traffic over through traffic | |
| | Improve inter-jurisdictional continuity | |
| | Upgrade signal hardware | |
| | Implement or improve signal coordination | |
| | Better manage periods of high traffic demand in poor roadway conditions | |
| | Provide quality real time congestion related information | |
| | Remote monitoring of signal system status / operations by public safety agencies | |
| | Reduce vehicle traffic delays at grade crossings | |
| | Better coordinate grade crossing operations with signals | |
| Deploy network vs. corridor based signal coordination | | |
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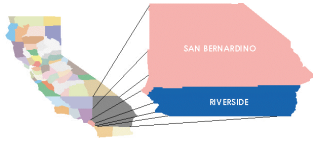
H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|---|--|-------------------|
| Freeway Management Systems | | |
| <i>Examples: Vehicle Speed Detection Systems, Video Systems, Ramp Metering, Variable Message Signs, Highway Advisory Radio, Traffic Management Systems/Centers</i> | Deploy additional vehicle detection coverage | |
| | Implement additional field device interconnect | |
| | Improve collection of traffic demand data | |
| | Improve inter-agency coordination | |
| | Improve information exchange between Caltrans District 8 and other Caltrans Districts | |
| | Improve information exchange between Caltrans and Nevada DOT and Arizona DOT | |
| | Improve information exchange between Caltrans District 8 and other local agencies | |
| | Improve incident response, especially in rural areas | |
| | Disseminate more timely incident information dissemination (traveler information) | |
| | Better manage periods of high traffic demand in poor roadway conditions | |
| | Provide quality real time congestion related information | |
| | Improve traveler information/directions (suggested routing for travelers not familiar with the region) | |
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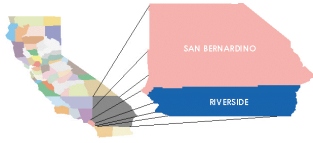
H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|---|--|-------------------|
| Public Transportation Management | | |
| <i>Examples: Public Transportation Management, En-route Transit Information, Personalized Public Transit, Public Traveler Safety, Traveler Service Information, Ride Matching and Reservations, Smart Card Payment/Transaction Systems</i> | Improve regional and interregional trip planning | |
| | Improve patron safety (in-vehicle and at stations / waypoints) | |
| | Better notification and coordination of special event loads resulting in congestion | |
| | Provide transit priority at signals | |
| | Implement bus queue jump lanes | |
| | Improve transit transfers within and between systems and modes to improve service delivery | |
| | Enable dissemination / display of bus arrival times | |
| | Enable transit agencies to locate bus fleet (AVI/AVL) | |
| | Improved information exchange between/among transit agencies | |
| | Improved information exchange between transit agencies and freeway / arterial management centers | |
| | Disseminate better rail information and arrival times (connectivity issues) | |
| | Provide quality real time congestion related information | |
| | Enable emergency information dissemination to transit operators | |
| | Improve efficiency of social service transportation providers | |
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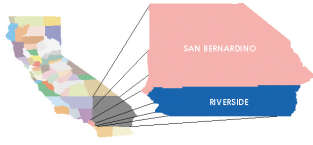
H=High, M-Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|---|---|-------------------|
| Emergency Management | | |
| <i>Examples: Incident Detection, Incident Management, Hazardous Materials Response and Handling, Emergency Notification and Personal Security, Emergency Vehicle Management, Advanced Dispatching and Response Systems</i> | Reduce response delays at signals | |
| | Improve response to weather events | |
| | Provide alternate route plans | |
| | Increase broad understanding of existing incident management procedures for: OES, FEMA, FHWA, CDF, USFS, CHP, Fish & Game, etc. | |
| | Increase broad understanding of, and implement Standardized Emergency Management System (SEMS) | |
| | Better notification of recreational routes closed in winter | |
| | Improve incident response coordination between agencies | |
| | Improve incident detection | |
| | Improve incident response times | |
| | Improve communications in mountain and rural areas of the region | |
| | Better information dissemination regarding diversion of trucks | |
| | Improve traffic management during wildfires (evacuation, response, suppression, etc.) | |
| | Improve response to hazardous materials spills / incidents (better manage resulting traffic congestion, improve clean-up time) | |
| | Increase use of portable traffic control equipment (CMS, HAR, etc.) | |
| | Provide quality real time congestion related information | |
| | Improve traveler information / directions (suggested routing for travelers not familiar with the region) | |
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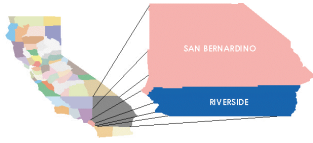
H=High, M-Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|--|---|-------------------|
| Maintenance and Construction Operations <i>Examples: Advanced Work Zone Management and Traffic Control, Vehicle Detection Systems, Video Systems, Vehicle / Speed Detection Systems, Variable Message Signs, Highway Advisory Radio, Integration with Traffic Management Systems / Centers, Advanced Dispatching and Routing Systems, Advanced Vehicle Tracking Systems, Fleet Maintenance and Management Systems</i> | | |
| | Provide automated vehicle location systems for maintenance and construction operations vehicles | |
| | Improve / enhance work zone traffic handling plans | |
| | Improve detection and removal of falling rocks, snow, mud and trees on roadways | |
| | Provide more data source locations for the National Weather Service | |
| | Improve coordination on construction notification and information distribution | |
| | Improve fleet information / management (maintenance schedules, mileage accumulations, tracking snow removal vehicles w/AVL) | |
| | Coordinate traffic control plans between jurisdictions | |
| | Increase use of portable traffic control equipment (CMS, HAR, etc.) | |
| | Provide signal preemption for some maintenance fleet vehicles | |
| | Interagency coordination on most advantageous placement of maintenance vehicles (prior to anticipated need) | |
| | Provide quality real time congestion related information | |
| | Improved traveler information/directions (suggested routing for travelers not familiar with the region) | |
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H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|---|---|-------------------|
| Regional Traveler Information | | |
| <i>Examples: En-route Traveler Information, Pre-trip Traveler Information, Portable Event Management Systems, In-vehicle Route Guidance, Traffic Information, Variable Message Signs, Highway Advisory Radio, Internet, Media, Tourist Information Systems</i> | Provide quality real time congestion related information | |
| | Expand traveler information delivery methods | |
| | Improve method of disseminating Caltrans delay and incident data | |
| | Use public access cable television to disseminate traffic and weather information | |
| | Improve quality and timeliness of communications | |
| | Improve processes for announcing when chain control is in effect in mountains and passes | |
| | Better disseminate correct traffic information | |
| | Provide timely, accurate information on road conditions | |
| | Better manage traffic flow to and from recreation areas | |
| | Improve procedures to get accurate information disseminated in a timely manner | |
| | Develop interstate / inter-region traveler information covering a wide area (targeted to CVO) | |
| | Improve targeted traveler information for tourists and recreation travelers at visitor information areas / rest stops, etc. | |
| | Provide weather and road info access at rest stops (could be radar screen video/monitor) | |
| | Provide more data source locations for the National Weather Service | |
| | Provide information distribution to private/commercial information service providers (ISPs) | |
| | Provide better road construction information and notification | |
| | Provide more timely dissemination of traveler information | |
| | Provide alternate weather and road information | |
| | Improve traveler information/directions (suggested routing for travelers not familiar with the region) | |
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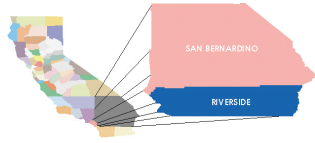


H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|---|---|-------------------|
| Commercial Vehicle Operations | | |
| <i>Examples: Commercial Vehicle Electronic Clearance, Automated Roadside Safety Inspection, On-board Safety Monitoring, Commercial Vehicle Administration Processes, Hazardous Material Incident Response, Commercial Vehicle Fleet Management, Services to Assist Agricultural Harvesting and Migration</i> | Provide interstate / inter-region traveler information covering a wide area (targeted to CVO) | |
| | Provide tracking of hazmat vehicles | |
| | Provide better information dissemination of winter vehicle restrictions (Chain control issues (ON/OFF)) | |
| | Provide quality real time congestion related information | |
| | Improve truck storage / parking information (during major road closures) | |
| | Disseminate better information regarding limited alternative routes | |
| | Improve congestion management during seasonal/local events | |
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H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|---|---------------------------------------|-------------------|
| Electronic Payment Systems | | |
| <i>Examples: Electronic Toll Collection Systems, Electronic Transit Fare Payment Systems (Smart Cards)</i> | Improved transit fare payment systems | |
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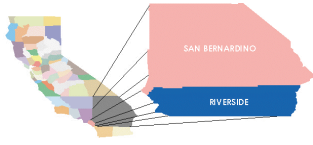
H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|--|---|-------------------|
| Advanced Vehicle Control and Safety Systems | | |
| <i>Examples: Longitudinal Collision Avoidance, Lateral Collision Avoidance, Intersection Collision Avoidance, Vision Enhancement for Crash Avoidance, Safety Readiness, Pre-crash Restraint Deployment, Automated Highway System</i> | Snow plow tracking project | |
| | Advanced warning signs for road icing, excess speed, etc. | |
| | Reduce red light running | |
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H=High, M=Medium, L=Low

| ITS Categories | Needs | Relative Priority |
|--|--|-------------------|
| Integration | | |
| <i>Examples: Integration of Systems, Integration With Traffic Management Centers, Central vs. Distributed Control, Communications Infrastructure, Integration of Agencies, Institutional Issues</i> | Improve information sharing among agencies | |
| | Improve communication limitations | |
| | Reduce dependency on proprietary systems | |
| | Improve understanding and capabilities of other agencies | |
| | Develop better understand needs of other agencies | |
| | Coordination with schools and Office of Emergency Services | |
| | Provide central information clearinghouse | |
| | Use common verbiage | |
| | Use common road condition classifications | |
| | Reduce impacts of different operating systems for signal control | |
| | Develop integrated GIS for Region | |
| | Develop political agreements (MOUs) | |
| | Improve system compatibility | |
| | Improve agency coordination (Incident Mgmt, General Information, ICS & Incident Command) | |
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APPENDIX F
INTERCONNECT DIAGRAMS
AND
ARCHITECTURE FLOWS DIAGRAMS
(FROM TURBO ARCHITECTURE TOOL)



The diagrams in Appendix F follow the order of the Inventory by Stakeholder (Appendix C), and the Stakeholders' respective Associated Elements. Please follow that order to find a specific diagram.

Because of the sheer size of the complete set of architecture diagrams (118 pages), the complete set is NOT included in this electronic file. The complete set of diagrams is being provided as a separate electronic file. This will accomplish two things: 1) it will keep the file size down to a manageable size for electronic distribution of the document, and 2) it will (hopefully) prevent stakeholders from needlessly printing the complete set of diagrams, saving paper, unless it is their desire to do so.

Also, the complete set of architecture diagrams is being distributed electronically in Word format, rather than in Adobe Acrobat format. This is being done because of a slight degradation of quality of the diagrams when converted to the Adobe Acrobat format.

In the more simple diagrams that follow, as a general rule, the stakeholder/associated element for which the diagram represents, is shown in the upper left of the diagram; with the other related stakeholders/associated elements appearing below and to the right of the primary stakeholder/associated element.

For the more complex diagrams, the stakeholder/associated element for which the diagram represents is shown in the center of the diagram; with the other related stakeholders/associated elements surrounding the primary stakeholder/associated element.

Certain of the Diagrams are very complex and have been inserted into this Appendix on 11x17 size paper. Even with this increase in paper size some of those diagrams are not readable in this format. Wherever this is the case, those diagrams will be plotted in a large "engineering drawing" format (D or E size, as appropriate) and distributed to all of the directly affected Stakeholders. These plots can also be made available for viewing to other interested Stakeholders in the Inland Empire region.

APPENDIX G
INLAND EMPIRE PROJECTS
RIVERSIDE COUNTY PROJECTS
SAN BERNARDINO COUNTY PROJECTS

**Appendix G
Inland Empire Projects**

| Project # | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|--|--|---|--|
| IE-1 | Caltrans D-8 TMC Connection to NDOT ATMS - The initial objective of this project would be the establishment of a communications link between the Nevada DOT ATMS that would allow for the exchange of traffic, travel and incident information between Nevada DOT and Caltrans. Most typically this would include the capability for each agency to monitor traffic condition information and be alerted to incidents occurring in the other agency's jurisdiction. This could allow for better motorist notification and traffic handling. In the longer term, each agency may decide that they would allow the other to take limited control of field assets in certain pre-defined situations. | - Caltrans - NDOT | ATMS 6 ATMS 7 | 1 |
| IE-2 | Caltrans Traffic Operations Systems (TOS) Expansion - This project is a "catch-all" for expansion of the many and varied Caltrans traffic management systems and field elements that are monitored and controlled by Caltrans at the Inland Empire TMC. TOS elements referenced by this project include: closed circuit television (CCTV) cameras and systems, highway advisory radio (HAR) systems and transmitters, road weather information systems (RWIS) and field sensors, changeable message signs (CMS), vehicle speed detection stations, communications infrastructure, etc. | - Caltrans - CHP - others as appropriate | ATMS 1 ATMS 4 ATMS 6 ATMS 8 ATMS 19 MCO 3 MCO 4 | 1 |
| IE-3 | Inland Empire Dynamic Ridesharing System - This project would implement a dynamic ridesharing system that would facilitate a mode shift from single occupant vehicles (SOVs) to transit and other ridesharing opportunities. This could be a stand-alone project or part of a larger Southern California effort. | - SANBAG - RCTC - SCAG - transit operators - the private sector - others as appropriate | ATMS 9 APTS 8 | 1 |
| IE-4 | Traffic Signal Interconnect - This project is a "catch-all" for any agency (local or state) desiring to implement traffic signal interconnects within its own jurisdiction. The interconnect technology is not specified in this project description; it could be via fiber optics, copper wire, wireless technologies or some other technology. | - Caltrans - various cities | ATMS 7 | 1 |

**Appendix G
Inland Empire Projects**

| Project # | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|---|---|---|--|
| IE-5 | Ultimate Inland Empire Caltrans/CHP Transportation Management Center (TMC) - Development of a fully functional TMC staffed by Caltrans and CHP personnel. The proposed physical structure should meet all state and federal guidelines for an Emergency Operating Center. A proposed site for a TMC building has been identified near the I-15/SR-210 interchange. Consideration to be give to establishing a regional data collection point and a single point for ISP interface. | - Caltrans - CHP - others as appropriate | EM 1 ATMS 4 ATMS 6 ATMS 8 AD 1 MCO 3 | 1 |
| IE-6 | Commercial Vehicle Traveler Information System - This project would implement an advanced traveler information system (ATIS) geared toward commercial vehicle operators. The system could disseminate information regarding traffic, truck routing and commercial vehicle amenities (truck stops, truck fueling locations, etc.). This could be a stand-alone project or part of a larger Southern California or statewide effort. | - the private sector - others as appropriate | ATIS 1 ATIS 2 ATIS 7 | 2 |
| IE-7 | Emergency Vehicle Traffic Signal Preemption (Caltrans) - This project would implement emergency vehicle preemption at selected Caltrans operated/controlled signalized intersections throughout the Inland Empire. | - Caltrans - various - emergency response agencies | EM 2 | 2 |
| IE-8 | Emergency Vehicle Traffic Signal Preemption (other local agencies) - This project would implement emergency vehicle preemption at selected local city and county operated/controlled signalized intersections throughout the Inland Empire. | - various local city and county agencies - various emergency response agencies | EM 2 | 2 |
| IE-9 | Freeway Ramp Metering Expansion - This project would expand the current freeway ramp metering program in the Inland Empire as congestion and ramp volumes warrant. The Ultimate TMC should have the capability to monitor and control the ramp metering function. | - Caltrans - other local agencies as appropriate | ATMS 4 | 2 |

**Appendix G
Inland Empire Projects**

| Project # | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|--|--|------------------------------------|--|
| IE-10 | Local Agency TMC Development (other local agencies) - These projects would develop local agency (city and county level) TMCs with varying levels of capability depending on the needs of the individual local agency. These projects would allow for command and control of the field assets of each individual agency as well as the ability to share data and or information with other agencies on an as needed basis. Shared control of field assets would be voluntary on an agency by agency basis. | - local city and county agencies as appropriate - others as appropriate | ATMS 1 ATMS 3 ATMS 6 AD 1 | 2 |
| IE-11 | Regional Universal Transit Fare Card System - This project will implement a Universal Fare Media system to be used by the various transit operators in the Inland Empire. The standard will likely be established on a statewide basis or on a regionwide basis and extended to be implemented in the Inland Empire. | - Caltrans - SCAG - various transit agencies | APTS 4 | 2 |
| IE-12 | Transit Vehicle Traffic Signal Priority (Caltrans) - This project would implement transit vehicle priority at selected Caltrans operated/controlled signalized intersections throughout the Inland Empire. | - Caltrans - various transit agencies | APTS 7 | 2 |
| IE-13 | Transit Vehicle Traffic Signal Priority (other local agencies) - This project would implement transit vehicle priority at selected local city and county operated/controlled signalized intersections throughout the Inland Empire. | - various local city and county agencies - various transit agencies | APTS 7 | 2 |
| IE-14 | Caltrans CVO Administration Connection to Regional Data Archive - This project would connect elements of the Caltrans CVO Administration system(s) to a Southern California Regional Data Archive. The primary intent of the data collection would be to gather truck count and classification data for data reporting purposes such as HPMS, as well as for other regional transportation and air quality planning purposes. Other data may be requested for other purposes in the future. | - DMV - SCAG - Caltrans | AD 1 AD 2 | 3 |

**Appendix G
Inland Empire Projects**

| Project # | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|--|--|------------------------------------|--|
| IE-15 | Caltrans D-8 TMC Connection to ADOT ATMS - The initial objective of this project would be the establishment of a communications link between the Arizona DOT ATMS that would allow for the exchange of traffic, travel and incident information between Arizona DOT and Caltrans. Most typically this would include the capability for each agency to monitor traffic condition information and be alerted to incidents occurring in the other agency's jurisdiction. This could allow for better motorist notification and traffic handling. In the longer term, each agency may decide that they would allow the other to take limited control of field assets in certain pre-defined situations. | - Caltrans - ADOT | ATMS 6 ATMS 7 | 3 |
| IE-16 | Caltrans D-8 TMC Connection to Metrolink Operations Center - This project would establish a communications link between the Caltrans D-8 TMC and the Metrolink Operations Center that would allow Caltrans to view Metrolink train location information and Metrolink to view traffic condition information. This would be most beneficial to Metrolink in an emergency when one or more of the Metrolink rail lines is not in operation. The agencies could exchange of traffic, travel, incident and train location information. This project is similar in concept to intertie projects between cities and Caltrans D-8. | - Caltrans - Metrolink | ATIS 1 ATMS 7 | 3 |
| IE-17 | Caltrans D-8 TMC Connection to Various Transit Management Centers - This project will establish a communications link between the Caltrans D-8 TMC and various Transit Management Centers that would allow Caltrans to view transit vehicle location information and the various Transit Management Centers to view traffic condition information. The agencies could exchange of traffic, travel, incident and vehicle location information. This project is similar in concept to intertie projects between cities and Caltrans D-8. | - Caltrans - various transit agencies | ATIS 1 ATMS 7 | 3 |
| IE-18 | Caltrans Maintenance Vehicle AVL - This project would implement automated vehicle location (AVL) technology on Caltrans D-8 maintenance vehicles. This system could be used to more efficiently deploy field assets during adverse weather events. It could eventually allow maintenance supervisors in a central location to monitor usage and quantities of maintenance materials (sand, road de-icing salt, etc.) carried in maintenance vehicles. Additionally, if implemented, this system could also monitor maintenance vehicle "health" to better manage the mechanical condition of the maintenance vehicle fleet. | - Caltrans | MCO 1 | 3 |

**Appendix G
Inland Empire Projects**

| Project # | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|--|--|------------------------------------|--|
| IE-19 | DMV CVO Administration Connection to Regional Data Archive - This project would connect elements of the DMV CVO Administration system(s) to a Southern California Regional Data Archive. The primary intent of the data collection would be to gather truck count and classification data for data reporting purposes such as HPMS, as well as for other regional transportation and air quality planning purposes. Other data may be requested for other purposes in the future. | - DMV - SCAG - Caltrans | AD 1 AD 2 | 3 |
| IE-20 | Interconnect various city signal systems with Caltrans signal system(s) - This project would implement enhanced interconnects and possibly coordination between various city signal systems and Caltrans signal system(s). | - Caltrans and various cities | ATMS 7 | 3 |
| IE-21 | Interconnect various local city signal systems with other local city signal system(s) - This project would implement enhanced interconnects and possibly coordination between various city signal systems and Caltrans signal system(s). This project is similar in concept to the San Bernardino Valley Coordinated Signal System project. | - Caltrans - various cities | ATMS 7 | 3 |
| IE-22 | Interconnect various transit management systems with other transit management systems - This project would enable transit agencies to exchange incident, vehicle location and arrival status information among multiple transit operators. This is similar in concept to a project currently underway where RTA and SunLine will be able to share vehicle location information to better coordinate service at their common service boundary. | - Omnitrans - RTA - SunLine - Metrolink - other local transit operators - others as appropriate | APTS 8 | 3 |
| IE-23 | ITS Data Warehouse - This project will implement a multi-agency ITS data warehouse for the Inland Empire. | - various agencies as appropriate | AD 2 | 3 |
| IE-24 | Local traffic signal system connection to TANN - This project will allow for the transfer of traveler information originating in local traffic signal systems to TANN for further dissemination. | - local city and county agencies as appropriate - TANN - others as appropriate | ATIS 1 | 3 |

**Appendix G
Inland Empire Projects**

| Project # | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|---|--|------------------------------------|--|
| IE-25 | Transit Management Systems connection to TANN - This project will allow for the transfer of transit vehicle arrival status and transit traveler information originating in the transit agencies to TANN for further dissemination. | <ul style="list-style-type: none"> - Omnitrans - RTA - SunLine - Metrolink - other local transit operators - others as appropriate | APTS 8 | 3 |

**Appendix G
Riverside County Projects**

| Project # | City | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|-------------|---|-------------------------------|--|--|
| Riv-1 | Corona | City of Corona TMC - This project will implement a city-owned/operated TMC located at a City facility. The TMC development will include the implementation of an advanced transportation management system (ATMS) that includes advanced traffic signal controllers, CCTV, dynamic message signs and an upgraded communications system between the TMC and the field assets. Traveler information will be made available from the TMC to the local cable television system and an Internet website as well as other media outlets. | - Corona | ATMS 1 ATMS 3 ATMS 6 ATIS 1 | 1 |
| Riv-2 | Corona | City of Corona TMC Intertie to Caltrans D-8 TMC - This project would interconnect the City of Corona TMC and the Caltrans D-8 TMC. Each agency will be able to view traffic conditions on the roadway network of the other agency, including video images. Shared control of field elements is not anticipated at this time but the capability could be implemented in the future if the respective agencies so desire. Part of this project will also include coordination of Caltrans operated traffic signals with City operated signals. | - Corona - Caltrans | ATMS 7 ATIS 1 | 1 |
| Riv-3 | Temecula | City of Temecula TOC - This project will implement a city-owned/operated TOC located at a City facility. The TOC development will include the implementation of improved traffic condition monitoring and CCTV. | - Temecula | ATMS 1 ATMS 3 ATMS 6 | 1 |
| Riv-4 | Temecula | City of Temecula TOC Intertie to Caltrans D-8 TMC - This project would interconnect the City of Temecula TOC and the Caltrans D-8 TMC. Each agency will be able to view traffic conditions on the roadway network of the other agency, including video images. Shared control of field elements is not anticipated at this time but the capability could be implemented in the future if the respective agencies so desire. | - Temecula - Caltrans | ATMS 1 ATMS 3 ATMS 6 ATMS 7 ATIS 1 | 1 |

**Appendix G
Riverside County Projects**

| Project # | City | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|-------------|---|---|--|--|
| Riv-5 | various | Interconnect RTA AVL system(s) with SunLine AVL system(s) - This project will enable RTA and SunLine to exchange vehicle location and arrival status information to better coordinate service at their common service boundary. | - RTA - SunLine | APTS 8 | 1 |
| Riv-6 | various | RTA/SunLine jointly deployed Advanced Public Transit Systems (APTS) - This project will implement a variety of transit technologies on RTA and SunLine fixed route and paratransit fleets. Among the candidate technologies are an AVL/CAD system, automated passenger counters (APCs) and a transit traveler information system. | - RTA - SunLine - others as appropriate | APTS 1 APTS 2 APTS 3 APTS 4 APTS 8 | 1 |
| Riv-7 | Corona | North Main Corona Metrolink Station Parking Management System - This system will implement a yet to be constructed parking structure at the North Main Corona Metrolink Station. It will include visual displays at the entrances of the structure that convey parking availability to incoming customers. It is envisioned that there would also be a connection to the appropriate transit management systems that would allow the display of real time bus and train arrival status on the same visual display. | - RCTC - Metrolink - RTA - others as appropriate | ATMS 16 APTS 8 | 2 |
| Riv-8 | Corona | TANN connection to North Main Corona Metrolink Station Parking Management System - This project will allow for the transfer of transit vehicle arrival status for the various transit agencies serving the North Main Corona Metrolink Station, as well as parking availability status to TANN. | - RCTC - TANN - others as appropriate | ATIS 1 | 2 |
| Riv-9 | Corona | Transit Management Systems (Riv Co) connection to North Main Corona Metrolink Station Parking Management System - This project will allow for the transfer of transit vehicle arrival status for the various transit agencies serving the North Main Corona Metrolink Station to the North Main Corona Metrolink Station Parking Management System. | - RCTC - Metrolink - RTA - Corona Cruiser - others as appropriate | ATMS 16 APTS 8 | 2 |

**Appendix G
Riverside County Projects**

| Project # | City | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|---------------|---|--|------------------------------------|--|
| Riv-10 | Corona | Transit Signal Priority Project - This project will implement transit signal priority at selected intersections, or on selected corridors, in the City of Corona. | - Corona - RTA - Corona Cruiser - others as appropriate | APTS 7 | 2 |
| Riv-11 | Moreno Valley | Transit Signal Priority Project - This project will implement transit signal priority at selected intersections, or on selected corridors, in the City of Moreno Valley. | - Moreno Valley - RTA - others as appropriate | APTS 7 | 2 |
| Riv-12 | Temecula | Transit Signal Priority Project - This project will implement transit signal priority at selected intersections, or on selected corridors, in the City of Temecula. | - Temecula - RTA - others as appropriate | APTS 7 | 3 |
| Riv-13 | various | Transit Signal Priority Project - This project will implement transit signal priority at selected intersections, or on selected corridors, in the Coachella Valley area. | - SunLine Transit - various cities | APTS 7 | 3 |

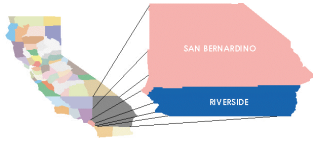
**Appendix G
San Bernardino County Projects**

| Project # | City | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|-------------|---|---|--|--|
| SB-1 | Fontana | City of Fontana TMC Intertie to Caltrans D-8 TMC - This project would interconnect the City of Fontana TMC and the Caltrans D-8 TMC. Each agency will be able to view traffic conditions on the roadway network of the other agency, including video images. Shared control of field elements is not anticipated at this time but the capability could be implemented in the future if the respective agencies so desire. Part of this project will also include coordination of Caltrans operated traffic signals with City operated signals. | - Fontana - Caltrans | ATMS 1 ATMS 3 ATMS 6 ATMS 7 ATIS 1 | 1 |
| SB-2 | various | Omnitrans Advanced Public Transit Systems (APTS) - This project will implement a variety of transit technologies on Omnitrans fixed route and paratransit fleets. Among the candidate technologies are an AVL/CAD system, automated passenger counters (APCs) and a transit traveler information system. | - Omnitrans | APTS 1 APTS 2 APTS 3 APTS 4 APTS 8 | 1 |
| SB-3 | various | San Bernardino Valley Coordinated Traffic Signal System Project (Tiers 1, 2, 3 and 4) - The overall project, currently in deployment of Tier 1 and soon to begin Tier 2, will eventually interconnect and coordinate approximately 1,200 signals on regionally significant arterials in the San Bernardino Valley. The goal of the project is to coordinate signals to minimize stops and delays to motorists. The project relies on using existing interconnect, where available, and adding hardwire, spread spectrum or telephone interconnect for the missing links. The project will also upgrade and expand existing traffic control systems with new, advanced traffic control systems and controllers. Eventually, Valley traffic signals could be controlled by one (or a small number) of systems for true "Regional Traffic Control". | - SANBAG - Caltrans - various SB Valley cities - SB County | ATMS 7 | 1 |
| SB-4 | Fontana | Transit Signal Priority Project - This project will implement transit signal priority at selected intersections, or on selected corridors, in the City of Fontana. | - Fontana - Omnitrans - others as appropriate | APTS 7 | 2 |

**Appendix G
San Bernardino County Projects**

| Project # | City | Project Description | Participating Agencies | Market Package(s) Addressed | Priority for Deployment (1=H, 2=M, 3=L) |
|------------------|-------------|---|--|------------------------------------|--|
| SB-5 | Fontana | Fontana Traveler Information connection to TANN - This project will allow for the transfer of traveler information originating in the Fontana Traveler Information System to TANN. | - Fontana - TANN - others as appropriate | ATIS 1 | 3 |

APPENDIX H
SAMPLE AGREEMENTS



Sample Memorandum of Understanding

This Memorandum of Understanding (MOU) recognizes that _____ Corridor, is an important regional route and provides important local access to commercial and other activities in each of the jurisdictions it serves. As regional routes, there is a need to provide efficient traffic operations across jurisdictional boundaries. Because of the importance of the Corridor to the local and regional economies, each local jurisdiction will retain the authority to control its own transportation systems, including the operation of traffic signals.

The purpose of this MOU is to acknowledge the agreement of all participating agencies to work cooperatively to improve the management and operation of the parallel arterials along the Corridor transportation systems. This MOU is *not* a legally binding contract – it constitutes solely a guide to the intentions and policies of the participating agencies.

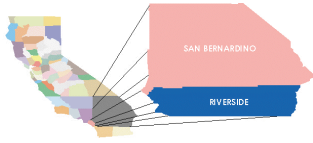
This MOU sets forth the roles and responsibilities of the participating agencies in the development, implementation and maintenance of intelligent transportation system projects. The MOU is not intended to authorize funding. Commitments providing for the payment of funds or authorizing specific work phases will be covered by one or more separate agreements.

Responsibilities

Corridor Technical Advisory Committee (TAC): The TAC consists of staff members of the agencies listed above. The TAC will be responsible for providing advice on the design, implementation, and operation of the transportation facilities along the Corridor and the associated arterials. It is the responsibility of each agency represented on the TAC to ensure that the appropriate staff person who can address the specific issues on the agenda attend the TAC meetings. The TAC will meet on an as-needed basis to fulfill its responsibilities.

Cities, County and State: The participation agencies that operate and maintain traffic systems have the following responsibilities:

1. Design and engineering review,
2. Operations and maintenance of traffic systems within the agency's own jurisdiction,
3. Review of timing plans and participation in timing plan development,
4. Construction management (when applicable),
5. Cooperate with all participating agencies to develop traffic operations strategies to efficiently move traffic in the corridor,
6. Implementing timing plans and periodically reviewing changes when updates are made,
7. Sharing the use of interconnect cable and communications equipment with nearby jurisdictions to provide cost-effective signal system communications,
8. Notify nearby jurisdictions when service interruptions occur that could affect system operations.
9. Responding to emergency traffic conditions.



Metropolitan Planning Organization (MPO): The MPO will have the following responsibilities:

1. County-wide planning,
2. Pursuing funding for future phases,
3. Grand management,
4. Partnership agreement of development,
5. Design and engineering review,
6. Developing necessary agreements,
7. Construction management (when applicable),
8. System operations and management,
9. Providing funding to manage the program,
10. Managing the delivery of capital project elements of the program,
11. Program administration and management,
12. Overall design, engineering, contract management,
13. Coordinating the TAC meetings.

Roles of Others: Others will assist with coordination issues, including providing advice and other assistance with multi-agency agreements, programming and funding issues, resolution of disagreements and contracting issues.

Other Agreements

Other transportation related agreements (maintenance or otherwise) will remain effective between the agencies in the corridor.

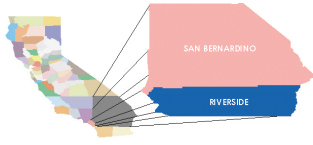
Term

This MOU is in effect as of _____ and will terminate on _____ unless the term is modified by the Technical Advisory Committee, and respective participating City Counsels or Governing Boards.

The following agencies support the Memorandum of Understanding for the Corridor Management:

Signed by:

Date



Sample Interagency Agreement using a Joint Powers Authority Method

The _____, a municipal corporation _____ duly organized and existing under its Charter and the Constitution of the State of California (the “City”) and the _____ Transit District, a transit district duly organized and created in accordance with the Public Utilities Code of the State of California (the “District”) and the _____ Joint Powers Board, a joint exercise of powers agency comprised of the City _____, _____ Transit District, and _____ Transportation Authority, duly created and organized in accordance with the Government Code of the State of California (the “JPB”) all of which entities shall be referred to herein collectively as the “Members,” hereby enter into this Joint Powers Agreement (this “Agreement”) creating the Joint Powers Authority (the “Authority”). All Members are public entities organized and operating under the laws of the State of California and each is a public agency as defined in the Government Code of the State of California.

Recitals

- A. The Members may jointly exercise any power common to them
- B. The Members desire to jointly participate in the construction, development and operation of a _____.
- C. The governing board of each Member has determined that it is in such Member’s best interest and in the public interest that this Agreement be executed and that it participates as a Member of the Authority.

Agreement

- 1. Formation of the Authority. The Members hereby create a separate joint exercise of powers agency which is named the _____ Joint Powers Authority.
- 2. Parties to Agreement. Each Member certifies that it intends to, and does, contract with every Member that is a signatory to this Agreement and, in addition, with such other entities as may later be added as Members pursuant to Section 16 of this Agreement. Each Member also certifies that the deletion of any Member from this Agreement does not affect this Agreement nor each remaining Member’s intent to contract with the other Members then remaining.
- 3. Purpose. Subject to compliance with all relevant environmental review and regulations, the Authority will develop, design, construct, renovate, rehabilitate, improve, operate, manage and maintain a _____.
- 4. Limitation. Except as otherwise authorized or permitted by the Law and for purposes of, and to the extent required by the Government Code of the State of California, the Authority is subject to the restrictions upon the manner of exercising the powers of the City as specified in the Bylaws.
- 5. Powers. The Authority is authorized, in it’s own name, to do all acts necessary to fulfill the purposes of this Agreement including, but not limited to each of the following:
 - (a) Make and enter into contracts;
 - (b) Incur debts, liabilities and obligations; provided that no debt, liability or obligation of Authority is a debt, liability or obligation of any Member except as separately agreed to by a Member;



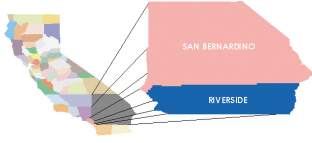
- (c) Acquire, hold, construct, manage, maintain, sell or otherwise dispose of real and personal property by appropriate mean;
- (d) Receive contributions and donations of property, funds, services and other forms of assistance from any source;
- (e) Apply for, accept, and receive and disburse grants, loans, and other aids from any agency of the United States of America or the State of California;
- (f) Sue and be sued in its own name;
- (g) Employ agents and employees;
- (h) Lease real or personal property as lessee and as lessor;
- (i) Receive, collect, invest and disburse moneys;
- (j) Execute and deliver certificates of participation, issue revenue bonds and issue other forms and evidences of indebtedness, as provided by law;
- (k) Carry out other duties as required to accomplish other responsibilities as set forth in this Agreement;
- (l) Assign, delegate or contract with a Member or third party to perform any of the duties of the Board, including, but not limited to, acting as administrator for the Authority;
- (m) Charge and apportion to local agencies (with the exception of the Members) that benefit from its services the administrative costs and expenses incurred in the exercise of the powers authorized in this Agreement and leases.
- (n) Exercise all other powers necessary and proper to carry out the provisions of the Agreement, and
- (o) Enter into and approve agreements and leases.

These powers will be exercised in the manner provided by applicable law and as expressly set forth in this Agreement.

6. Appointment of an Administrator.

- (a) The City is hereby appointed by the Members as the administrator (the “Administrator”) to execute the provisions of this Agreement and implement programs undertaken by the Authority. The Members acknowledge that this designation may cause potential conflicts of interest to arise and waive any liability on the part of the City arising out of any such conflict of interest.
- (b) Subject to Section 7 of this Agreement, the Authority will compensate the City for services rendered.
- (c) If the City ceases to serve as the Administrator, the Board may appoint a successor entity, agency, person, firm or corporation, including a nonprofit corporation, to serve as the Administrator to execute the provisions of this Agreement and implement programs undertaken by the Authority.

7. Capitalization of the Authority. Capitalization of the Authority which shall include but not be limited to all costs incurred and associated with the design, planning, construction, operation and maintenance pursuant to this Agreement shall e derived exclusively from external funding sources.



The Members of the Authority shall not be responsible for any costs incurred by the Authority in fulfillment of its purposes pursuant to this Agreement and/or the Bylaws.

8. Board of Directors.

- (a) Directors and Alternates. Each member shall initially appoint three directors. Each Member may, in a director's absence appoint an alternate director for said director. Any new member added after the formation of the Authority may appoint additional directors and alternate directors in accordance with Section 16 of this Agreement.
- (b) Compensation. Directors and alternate directors are not entitled to compensation. The Board may authorize reimbursement of expenses incurred by directors or alternate directors.
- (c) Delegation of Powers. The Board may, pursuant to section 9, delegate certain powers to committees but may not delegate the power to dismiss the Administrator, or amend the Bylaws.

9. Committees. The Board may create committees as set forth in the Bylaws. All directors are eligible for appointment to one or more committees.

10. Officers and Employees.

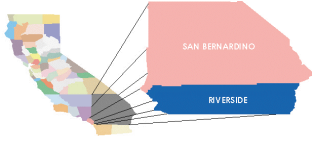
- (a) The officers of the Authority are the Chair, Vice-Chair, Executive Director, Chief Financial Officer, Secretary and Legal Counsel.
- (b) The Chair and Vice-Chair are directors elected by the Board at its first meeting. The initial term of the Chair and Vice-Chair shall run from the date of their election to office. Thereafter, the term of office for the Chair and Vice-Chair is one (1) year. The Executive Director, Secretary, Chief Financial Officer and Legal Counsel serve as set forth in the Bylaws. The duties of the officers are described in the Bylaws. The Chair and Vice-Chair assume their office upon election. The Executive Director, Chief Financial Officer, Secretary and Legal Counsel assume the duties of their office upon appointment by the Board. If either the Chair or Vice-Chair ceases to be a director, the resulting vacancy will be filled at the next meeting of the Board.
- (c) The Chair and Vice-Chair are not entitled to compensation. The Board may authorize reimbursement of expenses incurred by officers.

11. Limitation of Liability of Members for Debts and Obligations of the Authority. The debts, liabilities, and obligations of the Authority do not constitute the debts, liabilities, nor obligations of any party to this Agreement. A Member may separately contract for or assume responsibility for specific debts, liabilities, or obligations of the Authority. Notwithstanding any other provision of this Agreement, no fee, assessment or charge may be levied against a current Member without express consent of the Member.

12. Fiscal Year. The first fiscal year of the Authority is the period from the date of this Agreement through June 30, _____. Each subsequent fiscal year of the Authority begins on July 1 and ends on June 30.

13. Budget. The Board may adopt, at its sole discretion, an annual or multi-year budget before the beginning of a fiscal year.

14. Annual Audits and Audit Reports. The Chief Financial Officer will cause an annual financial audit to be made by an independent public accountant with respect to all Authority receipts, disbursements,



other transactions and entries into the books. A report of the financial audit will be filed as a public record with each Member. The audit will be file no later than required by State law. The Authority will pay the cost of the financial audit in the same manner as other administrative costs.

15. Establishment and Administration of Funds.

- (a) The Authority is responsible for the strict accountability of all funds and reports of all receipts and disbursements. It will comply with every provision of law relating to the establishment and administration of funds.
- (b) The funds will be accounted for on a full accrual basis.
- (c) The Chief Financial Officer will receive, invest, and disburse funds only in accordance with procedures established by the Board and in conformity with applicable law. The Chief Financial Officer will procure a fidelity bond in accordance with the Bylaws.

16. New Members. For the purpose of this Section only, all Members admitted after the formation of the Authority are New Members.

- (a) A public entity may be admitted as a New Member only upon concurrence of the Members evidenced by an amendment of this Agreement and upon complying with all other requirements established by the Board and the Bylaws.
- (b) Each applicant for membership as a New Member must pay all fees and expenses, if any, set by the Board.
- (c) For each New Member admitted, the City shall appoint one (1) additional director and one (1) additional alternate director to serve on the Board of the Authority.

17. Ex-Officio Members. Public entities may be invited to serve as ex-officio Members of the Authority as provided in the Bylaws.

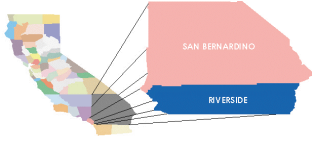
18. Withdrawal. Members may withdraw in accordance with conditions set forth in the Bylaws provided that no Member may withdraw if such withdrawal would adversely affect any bonds, liabilities or other forms of indebtedness issued by the Authority.

19. Indemnification. The Authority shall acquire such insurance protection as it deems necessary to protect the interests of the Authority, the Members to this Agreement and the public. The Authority shall assume the defense of and indemnify and save harmless each party to this Agreement and its respective officers, agents and employees, from all claims, losses, damages, costs, injury and liability of every kind, nature and description directly or indirectly arising from the performance of any of the activities of the Authority undertaken pursuant to this Agreement.

20. Expulsions/Suspension. The Authority may expel or suspend a Member by a two-thirds (2/3) vote of the Board for an event of default of this Agreement or the Bylaws as determined by the Board. The procedures for hearing and notice of expulsion and suspension of a Member are as provided in the Bylaws.

21. Termination and Distribution.

- (a) This Agreement shall continue until terminated. However, it may not be terminated until such time as all principal of an interest on any bonds, liabilities or other forms of indebtedness of the Authority are paid in full. Thereafter, this Agreement may be terminated by the written consent of two-thirds (2/3) of the Members; provided, however,



that this Agreement and the Authority continue to exist after termination for the purpose of disposing of all claims, distribution of assets and other functions necessary to conclude the obligations and affairs of the Authority.

- (b) After completion of the Authority’s purposes, any surplus money on deposit in any fund or account of the Authority will be disbursed as provided in the Bylaws. The Board is vested with all powers of the Authority for the purpose of concluding and dissolving the business affairs of the Authority.

22. Adoption of City Contracting Provisions. The Authority hereby adopts the provisions of the Municipal Code of the City _____ Administrative Code, as amended, and as set forth below.

- (a) Public Contracting Provisions. The Authority shall comply with all restrictions and requirements prohibiting discrimination of any kind in employment and contracting as amended from time to time, which is hereby incorporated by reference as if fully set forth herein. The Authority shall be only responsible for the administration of such requirements. Unless otherwise provided by a resolution of the Board of the Authority, prevailing wages shall be paid for the construction and operation of the transit terminal and related facilities.

23. Notices. Notice to each Member under this Agreement is sufficient if mailed to the Member and separately to the Member’s direct to their respective addresses as follows:

City:

District:

Joint Powers Board:

24. Prohibition Against Assignment. No Member may assign a right, claim, or interest it may have under this Agreement. No creditor, assignee or third party beneficiary of a Member has a right, claim or title to any part, share, interest, fund or asset of the Authority. However, nothing in this Section prevents the Authority from assigning any interest or right it may have under this Agreement to a third party.

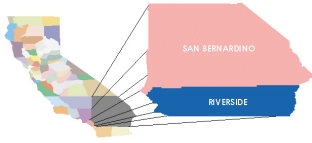
25. Amendments. This Agreement may be amended at any time by the written agreement of the Members.

26. Severability. If any portion, term, condition or provision of this Agreement is determined by a court to be illegal or in conflict with a law of the State of California, or is otherwise rendered unenforceable or ineffectual, the validity of the remaining portions, terms, conditions and provisions is not affected.

27. Liability of the Authority. Subject to limitations thereon contained in any trust agreement or other documents pursuant tot which financing of the Authority are implemented, funds of the Authority may be used to defend, indemnify, and hold harmless the authority, any Member, any director or alternate, and any employee or officer of the Authority for their actions taken within the scope of their duties while acting on behalf of the Authority.

28. Environmental Compliance. Execution of this Agreement does not substitute for any required review process nor guarantee approval. Design and development will be considered through the local land use permitting process, which requires environmental.

29. Governing Law. This Agreement will be governed by and construed in accordance with the laws of the State of California.



30. Counterparts. This Agreement may be executed in several counterparts, each of which is an original and all of which constitutes but one and the same instrument.

31. Effective Date. This Agreement becomes effective and the Authority exists as a separate public entity upon its execution by the Members.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year written below.

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|---------------|
| <i>Flow: archive requests</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: archive status</i> | | | |
| <i>Flow: arriving train information</i> | | | |
| | IEEE | Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a HRI | IEEE P1570 |
| <i>Flow: bad tag list</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Fare Collection (FC) Business Area Standard | NTCIP 1408 |
| <i>Flow: broadcast information</i> | | | |
| | EIA/CEA | Data Radio Channel (DARC) System | CEA/EIA-794 |
| | EIA/CEA | Subcarrier Traffic Information Channel (STIC) System | CEA/EIA-795 |
| | SAE | ISP-Vehicle Location Referencing Standard | SAE J1746 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Standard for ATIS Message Sets Delivered Over Bandwidth Restricted Media | SAE J2369 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: commercial vehicle archive data</i> | | | |
| | ANSI | Commercial Vehicle Safety and Credentials Information Exchange | ANSI TS285 |
| | ANSI | Commercial Vehicle Credentials | ANSI TS286 |
| <i>Flow: credentials information</i> | | | |
| <i>Flow: credentials status information</i> | | | |
| | ANSI | Commercial Vehicle Safety and Credentials Information Exchange | ANSI TS285 |
| <i>Flow: data collection and monitoring control</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Data Collection & Monitoring Devices | NTCIP 1206 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: driver instructions</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | TCIP - Control Center (CC) Business Area Standard | NTCIP 1407 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|--------------------|
| <i>Flow: electronic screening request</i> | | | |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control | ASTM PS 105-99 |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz | ASTM PS 111-98 |
| | IEEE | Standard for Message Sets for Vehicle/Roadside Communications | IEEE Std 1455-1999 |
| <i>Flow: emergency notification</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Incident Management (IM) Business Area Standard | NTCIP 1402 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| <i>Flow: emergency traffic control request</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| <i>Flow: emergency traffic control response</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: environmental conditions data</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Object Definitions for Environmental Sensor Stations & Roadside Weather Info System | NTCIP 1204 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: equipment maintenance status</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | |
| <i>Flow: external reports</i> | | | |
| <i>Flow: fare and payment status</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Fare Collection (FC) Business Area Standard | NTCIP 1408 |
| <i>Flow: fare management information</i> | | | |
| <i>Flow: field equipment status</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: freeway control data</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Ramp Meter Controller Objects | NTCIP 1207 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: freeway control status</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Ramp Meter Controller Objects | NTCIP 1207 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|-----------------|
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: hri operational status</i> | | | |
| | IEEE | Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection | IEEE P1570 |
| <i>Flow: incident information</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: incident information for media</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |
| <i>Flow: incident information request</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|----------------------|
| <i>Flow: incident response status</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |
| <i>Flow: intersection blockage notification</i> | | | |
| | IEEE | Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection | IEEE P1570 |
| <i>Flow: local signal preemption request</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | ASTM | Standard Specification for 5.9 GHz Data Link Layer | ASTM 5 GHz Data Link |
| | ASTM | Standard Specification for 5.9 GHz Physical Layer | ASTM 5 GHz Phys |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control | ASTM PS 105-99 |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz | ASTM PS 111-98 |
| | IEEE | Security/Privacy of Vehicle/RS Communications including Smart Card Communications | IEEE P1556 |
| <i>Flow: local signal priority request</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | ASTM | Standard Specification for 5.9 GHz Data Link Layer | ASTM 5 GHz Data Link |
| | ASTM | Standard Specification for 5.9 GHz Physical Layer | ASTM 5 GHz Phys |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control | ASTM PS 105-99 |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz | ASTM PS 111-98 |
| | IEEE | Security/Privacy of Vehicle/RS Communications including Smart Card Communications | IEEE P1556 |
| <i>Flow: maint and constr archive data</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|---|-----------------|
| <i>Flow: maint and constr resource request</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: maint and constr resource response</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: maint and constr work plans</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: media information request</i> | | | |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Incident Management (IM) Business Area Standard | NTCIP 1402 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| <i>Flow: parking archive data</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|--------------------|
| <i>Flow: parking information</i> | | | |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: parking lot data request</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: pass/pull-in</i> | | | |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control | ASTM PS 105-99 |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz | ASTM PS 111-98 |
| | IEEE | Standard for Message Sets for Vehicle/Roadside Communications | IEEE Std 1455-1999 |
| <i>Flow: personal transit information</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Passenger Information (PI) Business Area Standard | NTCIP 1403 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|--|-----------------|--|-----------------|
| <i>Flow: remote surveillance control</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: request for road network conditions</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: request for vehicle measures</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | TCIP - Control Center (CC) Business Area Standard | NTCIP 1407 |
| <i>Flow: request tag data</i> | | | |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control | ASTM PS 105-99 |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz | ASTM PS 111-98 |
| <i>Flow: resource deployment status</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |
| <i>Flow: resource request</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | IEEE | Standard for Traffic Incident Management Message Sets for Use by EMCs | IEEE P1512.1 |
| | IEEE | Standard for Emergency Management Data Dictionary | IEEE P1512.a |
| | IEEE | Standard for Common Incident Management Message Sets (IMMS) for use by EMCs | IEEE P1512-2000 |
| <i>Flow: road network conditions</i> | | | |
| | AASHTO/ITE/NEMA | Message Set for Weather Reports | NTCIP 1301 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |

**Appendix I
Inland Empire ITS Standards**

| Flow | Name | Lead SDO | Standard Name | |
|-------------|--|-----------------|---|---------------|
| | <i>Flow: road network probe information</i> | | | |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | <i>Flow: road network probe information</i> | | | |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | <i>Flow: road network probe information</i> | | | |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | <i>Flow: road weather information</i> | | | |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | <i>Flow: roadside archive data</i> | | | |
| | | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | | AASHTO/ITE/NEMA | Data Collection & Monitoring Devices | NTCIP 1206 |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| | <i>Flow: roadway information system data</i> | | | |
| | | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | | AASHTO/ITE/NEMA | Object Definitions for Dynamic Message Signs | NTCIP 1203 |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| | <i>Flow: roadway information system status</i> | | | |
| | | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | | AASHTO/ITE/NEMA | Object Definitions for Dynamic Message Signs | NTCIP 1203 |
| | | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|----------------|
| <i>Flow: roadway maintenance status</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | |
| <i>Flow: safety inspection report</i> | | | |
| | ANSI | Commercial Vehicle Safety Reports | ANSI TS284 |
| <i>Flow: safety status information</i> | | | |
| | ANSI | Commercial Vehicle Safety and Credentials Information Exchange | ANSI TS285 |
| <i>Flow: signal control data</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Object Definitions for Actuated Traffic Signal Controller Units | NTCIP 1202 |
| | AASHTO/ITE/NEMA | Objects for Signal Systems Master | NTCIP 1210 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: signal control status</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Object Definitions for Actuated Traffic Signal Controller Units | NTCIP 1202 |
| | AASHTO/ITE/NEMA | Objects for Signal Systems Master | NTCIP 1210 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: speed monitoring control</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Transportation System Sensor Objects | NTCIP 1209 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: speed monitoring information</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Transportation System Sensor Objects | NTCIP 1209 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: tag data</i> | | | |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control | ASTM PS 105-99 |
| | ASTM | Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz | ASTM PS 111-98 |
| <i>Flow: track status</i> | | | |
| | IEEE | Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection | IEEE P1570 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|---|-----------------------|
| <i>Flow: traffic archive data</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ASTM | ADMS Data Dictionary Specifications | ASTM DD 17.54.00.2 |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: traffic control coordination</i> | | | |
| | AASHTO/ITE/NEMA | Objects for Signal Systems Master | NTCIP 1210 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: traffic control priority request</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: traffic control priority status</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Objects for Signal Control Priority | NTCIP 1211 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| <i>Flow: traffic flow</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Transportation System Sensor Objects | NTCIP 1209 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: traffic images</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Data Dictionary for Closed Circuit Television (CCTV) | NTCIP 1205 |
| | AASHTO/ITE/NEMA | Object Definitions for Video Switches | NTCIP 1208 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: traffic information coordination</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | |
| | ITE | Standard for Functional Level Traffic Management Data Dictionary (TMDD) | ITE TM 1.03 |
| | ITE | Message Sets for External TMC Communication (MS/ETMCC) | ITE TM 2.01 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|--|-----------------|--|---------------|
| <i>Flow: traffic sensor control</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Transportation System Sensor Objects | NTCIP 1209 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: transit and fare schedules</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Scheduling/Runcutting (SCH) Business Area Standard | NTCIP 1404 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: transit archive data</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Passenger Information (PI) Business Area Standard | NTCIP 1403 |
| | AASHTO/ITE/NEMA | TCIP - Onboard (OB) Business Area Standard | NTCIP 1406 |
| | AASHTO/ITE/NEMA | TCIP - Control Center (CC) Business Area Standard | NTCIP 1407 |
| | AASHTO/ITE/NEMA | TCIP - Fare Collection (FC) Business Area Standard | NTCIP 1408 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: transit incident information</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Incident Management (IM) Business Area Standard | NTCIP 1402 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Incident Management (IM) Business Area Standard | NTCIP 1402 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: transit incidents for media</i> | | | |
| <i>Flow: transit information for media</i> | | | |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|---------------|
| <i>Flow: transit information request</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Passenger Information (PI) Business Area Standard | NTCIP 1403 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: transit information user request</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Passenger Information (PI) Business Area Standard | NTCIP 1403 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: transit parking coordination</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| <i>Flow: transit parking lot response</i> | | | |
| <i>Flow: transit schedule information</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Scheduling/Runcutting (SCH) Business Area Standard | NTCIP 1404 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | TCIP - Control Center (CC) Business Area Standard | NTCIP 1407 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|------------|
| <i>Flow: transit traveler information</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Passenger Information (PI) Business Area Standard | NTCIP 1403 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: transit traveler request</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Passenger Information (PI) Business Area Standard | NTCIP 1403 |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| <i>Flow: transit vehicle conditions</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Onboard (OB) Business Area Standard | NTCIP 1406 |
| <i>Flow: transit vehicle location data</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Onboard (OB) Business Area Standard | NTCIP 1406 |
| | AASHTO/ITE/NEMA | TCIP - Common Public Transportation (CPT) Business Area Standard | NTCIP 1401 |
| | AASHTO/ITE/NEMA | TCIP - Onboard (OB) Business Area Standard | NTCIP 1406 |
| <i>Flow: transit vehicle passenger and use data</i> | | | |
| <i>Flow: transit vehicle schedule performance</i> | | | |
| | AASHTO/ITE/NEMA | TCIP - Spatial Representation (SP) Business Area Standard | NTCIP 1405 |
| | AASHTO/ITE/NEMA | TCIP - Onboard (OB) Business Area Standard | NTCIP 1406 |
| | AASHTO/ITE/NEMA | TCIP - Control Center (CC) Business Area Standard | NTCIP 1407 |

**Appendix I
Inland Empire ITS Standards**

| Flow Name | Lead SDO | Standard Name | |
|---|-----------------|--|-----------------------|
| <i>Flow: traveler archive data</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | ASTM | ADMS Data Dictionary Specifications | ASTM DD 17.54.00.2 |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: traveler information for media</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
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| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
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| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | See Footnotes |
| | SAE | Data Dictionary for Advanced Traveler Information System (ATIS) | SAE J2353 |
| | SAE | Message Set for Advanced Traveler Information System (ATIS) | SAE J2354 |
| | SAE | Rules for Standardizing Street Names and Route IDs | SAE J2529 |
| | SAE | Messages for Handling Strings and Look-Up Tables in ATIS Standards | SAE J2540 |
| <i>Flow: video surveillance control</i> | | | |
| | AASHTO/ITE/NEMA | Global Object Definitions | NTCIP 1201 |
| | AASHTO/ITE/NEMA | Data Dictionary for Closed Circuit Television (CCTV) | NTCIP 1205 |
| | AASHTO/ITE/NEMA | Object Definitions for Video Switches | NTCIP 1208 |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Field Standards Group | See Footnotes |
| <i>Flow: work plan feedback</i> | | | |
| | AASHTO/ITE/NEMA | NTCIP Center-to-Center Standards Group | |
| <i>Flow: work zone information</i> | | | |

Appendix I
Inland Empire ITS Standards

| Footnotes: | | |
|---|---|------------|
| NTCIP Center-to-Center Standards Group | Standard Name | |
| AASHTO/ITE/NEMA | Base Standard: Octet Encoding Rules (OER) | NTCIP 1102 |
| AASHTO/ITE/NEMA | CORBA Naming Convention | NTCIP 1104 |
| AASHTO/ITE/NEMA | CORBA Security Service | NTCIP 1105 |
| AASHTO/ITE/NEMA | CORBA Near-Real Time Data Service | NTCIP 1106 |
| AASHTO/ITE/NEMA | Subnet Profile for Ethernet | NTCIP 2104 |
| AASHTO/ITE/NEMA | Internet (TCP/IP and UDP/IP) Transport Profile | NTCIP 2202 |
| AASHTO/ITE/NEMA | Application Profile for File Transfer Protocol (FTP) | NTCIP 2303 |
| AASHTO/ITE/NEMA | Application Profile for Data Exchange ASN.1 (DATEX) | NTCIP 2304 |
| AASHTO/ITE/NEMA | Application Profile for Common Object Request Broker Architecture (CORBA) | NTCIP 2305 |
| AASHTO/ITE/NEMA | Information Profile for DATEX | NTCIP 2501 |
| AASHTO/ITE/NEMA | Information Profile for CORBA | NTCIP 2502 |
| NTCIP Center-to-Field Standards Group | | |
| AASHTO/ITE/NEMA | Simple Transportation Management Framework (STMF) | NTCIP 1101 |
| AASHTO/ITE/NEMA | Base Standard: Octet Encoding Rules (OER) | NTCIP 1102 |
| AASHTO/ITE/NEMA | Simple Transportation Management Protocol (STMP) | NTCIP 1103 |
| AASHTO/ITE/NEMA | Class B Profile | NTCIP 2001 |
| AASHTO/ITE/NEMA | Point to Multi-Point Protocol Using RS-232 Subnetwork Profile | NTCIP 2101 |
| AASHTO/ITE/NEMA | Subnet Profile for PMPP Over FSK modems | NTCIP 2102 |
| AASHTO/ITE/NEMA | Subnet Profile for Point-to-Point Protocol using RS 232 | NTCIP 2103 |
| AASHTO/ITE/NEMA | Subnet Profile for Ethernet | NTCIP 2104 |
| AASHTO/ITE/NEMA | Transportation Transport Profile | NTCIP 2201 |
| AASHTO/ITE/NEMA | Internet (TCP/IP and UDP/IP) Transport Profile | NTCIP 2202 |
| AASHTO/ITE/NEMA | Application Profile for Simple Transportation Management Framework (STMF) | NTCIP 2301 |
| AASHTO/ITE/NEMA | Application Profile for Trivial File Transfer Protocol | NTCIP 2302 |
| AASHTO/ITE/NEMA | Application Profile for File Transfer Protocol (FTP) | NTCIP 2303 |
| | | |

Appendix I
Inland Empire ITS Standards

| Standards Acronyms | | |
|---------------------------|--|--|
| AASHTO | American Association of State Highway and Transportation Officials | |
| ANSI | American National Standards Institute | |
| ASTM | American Society For Testing and Materials | |
| CEA | Consumer Electronics Association | |
| EIA | Energy Information Administration | |
| IEEE | Institute of Electrical and Electronics Engineers | |
| ITE | Institute of Transportation Engineers | |
| NEMA | National Electrical Manufacturers Association | |
| SAE | Society of Automotive Engineers | |