INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS **

ITS Category		H=High, M=Medium, L=Low	
Arterial / Traffic Management		**Needs**	**Relative Priority**
Examples: Signal Coordination, Centralized Control, Vehicle Detection Systems, Video Systems, Adaptive Signal Control, Traffic Management Systems / Centers, Highway Rail Intersection Technologies	1	Improve system operation monitoring	H
	2	Improve signal optimization	H
	3	Improve traffic flow monitoring	H
	4	Provide more widespread centralized computer control	M
	5	Improve hardware issues in interconnecting signal systems between agencies	L
	6	Improve signal control and timing	H
	7	Improve/implement ability to remotely modify signal timing	H
	8	Reduce emergency vehicle delays at signals	M
	9	Reduce transit vehicle delays at signals	M
	10	Better balance signal timings favoring local traffic over through traffic	L
	11	Improve inter-jurisdictional continuity	H
	12	Upgrade signal hardware	H
	13	Remote monitoring of signal system status / operations by public safety agencies	M
	14	Reduce vehicle traffic delays at grade crossings	H
	15	Better coordinate grade crossing operations with signals	H

ITS Category		H=High, M=Medium, L=Low	
Freeway Management		**Needs**	**Relative Priority**
Examples: Vehicle Speed Detection Systems, Video Systems, Ramp Metering, Variable Message Signs, Highway Advisory Radio, Traffic Management Systems/Centers	16	Deploy additional vehicle detection coverage	M
	17	Implement additional field device interconnect	L
	18	Improve collection of traffic demand data	M
	19	Improve information exchange between Caltrans District 8 and other Caltrans Districts	M
	20	Improve information exchange between Caltrans and Nevada DOT and Arizona DOT	M
	21	Improve information exchange between Caltrans District 8 and other local agencies	H
	22	Improve incident response, especially in rural areas	M
	23	Better manage periods of high traffic demand in poor roadway conditions	L

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS **

ITS Category		H=High, M=Medium, L=Low	
Public Transportation Management		**Needs**	**Relative Priority**
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	24	Improve regional and interregional trip planning	M
	25	Improve patron safety (in-vehicle and at stations / waypoints)	M
	26	Provide transit priority at signals	M
	27	Implement bus queue jump lanes	M
	28	Improve transit transfers within and between systems and modes to improve service delivery	H
	29	Enable dissemination / display of bus arrival times	M
	30	Enable transit agencies to locate bus fleet (AVI/AVL)	H
	31	Improve information exchange between/among transit agencies	H
	32	Improve information exchange between transit agencies and freeway / arterial management centers	L
	33	Disseminate better rail information and arrival times (connectivity issues)	H
	34	Enable emergency information dissemination to transit operators	M

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS **

ITS Category		H=High, M=Medium, L=Low	
Emergency Management		**Needs**	**Relative Priority**
Examples: Incident Detection, Incident Management, Hazardous Materials Response and Handling, Emergency Notification and Personal Security, Emergency Vehicle Management, Advanced Dispatching and Response Systems	35	Reduce response delays at signals	M
	36	Improve response to weather events	M
	37	Improve incident response coordination between agencies	M
	38	Improve incident detection	M
	39	Improve incident response times	M
	40	Improve communications in mountain and rural areas of the region	M
	41	Provide better information dissemination regarding diversion of traffic and alternative routing	L
	42	Improve traffic management during wildfires (evacuation, response, suppression, etc.)	L
	43	Improve response to hazardous materials spills / incidents (better manage resulting traffic congestion, improve clean-up time)	M
	44	Increase use of portable traffic control equipment (CMS, HAR, etc.)	L

ITS Category		H=High, M=Medium, L=Low	
Maintenance and Construction Operations		**Needs**	**Relative Priority**
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	45	Provide automated vehicle location systems for maintenance and construction operations vehicles	L
	46	Improve / enhance work zone traffic handling plans	M
	47	Improve detection and removal of falling rocks, snow, mud and trees on roadways	M
	48	Improve coordination on construction notification and information distribution	H
	49	Improve fleet information / management (maintenance schedules, mileage accumulations, tracking snow removal vehicles w/AVL)	L
	50	Coordinate traffic control plans between jurisdictions	M
	51	Increase use of portable traffic control equipment (CMS, HAR, etc.)	M
	52	Provide signal preemption for some maintenance fleet vehicles	L

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS **

ITS Category		H=High, M=Medium, L=Low	
Regional Traveler Information		**Needs**	**Relative Priority**
Examples: En-route Traveler Information, Pre-trip Traveler Information, Portable Event Management Systems, In-vehicle Route Guidance, Variable Message Signs, Highway Advisory Radio, Internet, Media, Tourist Information Systems	53	Provide quality real time congestion related information	H
	54	Expand traveler information delivery methods	M
	55	Improve method of disseminating Caltrans delay and incident data	H
	56	Use public access cable television to disseminate traffic and weather information	L
	57	Improve quality and timeliness of communications	M
	58	Provide timely, accurate information on road conditions	H
	59	Provide better notification of recreational routes closed in winter	M
	60	Develop interstate / inter-region traveler information covering a wide area (targeted to CVO)	M
	61	Improve targeted traveler information for tourists and recreation travelers at visitor information areas / rest stops, etc.	L
	62	Provide weather and road info access at rest stops	L
	63	Provide more data source locations for the National Weather Service	M
	64	Provide information distribution to private/commercial information service providers (ISPs)	M
	65	Provide better road construction information and notification	H
	66	Improve traveler information/directions (suggested routing for travelers not familiar with the region)	M

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS **

ITS Category		H=High, M=Medium, L=Low	
Commercial Vehicle Operations		**Needs**	**Relative Priority**
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	67	Provide interstate / inter-region traveler information covering a wide area (targeted to CVO)	M
	68	Provide tracking of hazmat vehicles	L
	69	Provide better information dissemination of winter vehicle restrictions (Chain control issues (ON/OFF))	L
	70	Improve truck storage / parking information (during major road closures)	M
	71	Disseminate better information regarding limited alternative routes	M
	72	Improve congestion management during seasonal/local events	M

ITS Category		H=High, M=Medium, L=Low	
Electronic Payment Systems		**Needs**	**Relative Priority**
Examples: Electronic Toll Collection Systems, Electronic Transit Fare Payment Systems (Smart Cards)	73	Improve transit fare payment systems	M
	74	Deploy Universal Card (parking / transit / tolls)	L

ITS Category		H=High, M=Medium, L=Low	
Advanced Vehicle Control and Safety Systems		**Needs**	**Relative Priority**
Examples: Longitudinal Collision Avoidance, Lateral Collision Avoidance, Intersection Collision Avoidance, Vision Enhancement for Crash Avoidance, Safety Readiness, Pre-crash Restraint Deployment, Automated Highway System	75	Provide snow plow tracking project	L
	76	Deploy advanced warning signs for road icing, excess speed, etc.	M
	77	Reduce red light running	H

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS **

ITS Category		H=High, M=Medium, L=Low	
Integration		**Needs**	**Relative Priority**
Examples: Integration of Systems, Integration With Traffic Management Centers, Central vs. Distributed Control, Communications Infrastructure, Integration of Agencies, Institutional Issues	78	Improve information sharing among agencies	H
	79	Improve communication limitations	M
	80	Reduce dependency on proprietary systems	M
	81	Provide central information clearinghouse	M
	82	Reduce impacts of different operating systems for signal control	M
	83	Develop integrated GIS for Region	M
	84	Develop political agreements (MOUs)	M
	85	Improve system compatibility	M

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS SERVICES **
(IN MARKET PACKAGE TERMS)

ARCHIVED DATA MANAGEMENT
Archived Data (AD)

AD1	ITS Data Mart
AD2	ITS Data Warehouse
AD3	ITS Virtual Data Warehouse

PUBLIC TRANSPORTATION
Advanced Public Transportation Systems (APTS)

APTS1	Transit Vehicle Tracking
APTS2	Transit Fixed-Route Operations
APTS3	Demand Response Transit Operations
APTS4	Transit Passenger and Fare Management
APTS5	Transit Security
APTS6	Transit Maintenance
APTS7	Multi-modal Coordination
APTS8	Transit Traveler Information

TRAVELER INFORMATION
Advanced Traveler Information Systems (ATIS)

ATIS1	Broadcast Traveler Information
ATIS2	Interactive Traveler Information
ATIS3	Autonomous Route Guidance
ATIS4	Dynamic Route Guidance
ATIS5	ISP Based Route Guidance
ATIS6	Integrated Transportation Management/Route Guidance
ATIS7	Yellow Pages and Reservation
ATIS8	Dynamic Ridesharing
ATIS9	In Vehicle Signing

TRAFFIC MANAGEMENT
Advanced Transportation Management Systems (ATMS)

ATMS01	Network Surveillance
ATMS02	Probe Surveillance
ATMS03	Surface Street Control
ATMS04	Freeway Control
ATMS05	HOV Lane Management
ATMS06	Traffic Information Dissemination
ATMS07	Regional Traffic Control
ATMS08	Incident Management System
ATMS09	Traffic Forecast and Demand Management
ATMS10	Electronic Toll Collection
ATMS11	Emissions Monitoring and Management
ATMS12	Virtual TMC and Smart Probe Data
ATMS13	Standard Railroad Grade Crossing
ATMS14	Advanced Railroad Grade Crossing
ATMS15	Railroad Operations Coordination
ATMS16	Parking Facility Management
ATMS17	Regional Parking Management
ATMS18	Reversible Lane Management
ATMS19	Speed Monitoring
ATMS20	Drawbridge Management

VEHICLE SAFETY
Advanced Vehicle Safety Systems (AVSS)

AVSS01	Vehicle Safety Monitoring
AVSS02	Driver Safety Monitoring
AVSS03	Longitudinal Safety Warning
AVSS04	Lateral Safety Warning
AVSS05	Intersection Safety Warning
AVSS06	Pre-Crash Restraint Deployment
AVSS07	Driver Visibility Improvement
AVSS08	Advanced Vehicle Longitudinal Control
AVSS09	Advanced Vehicle Lateral Control
AVSS10	Intersection Collision Avoidance
AVSS11	Automated Highway System

COMMERCIAL VEHICLE OPERATIONS
Commercial Vehicle Operations (CVO)

CVO01	Fleet Administration
CVO02	Freight Administration
CVO03	Electronic Clearance
CVO04	CV Administrative Processes
CVO05	International Border Electronic Clearance
CVO06	Weigh-In-Motion
CVO07	Roadside CVO Safety
CVO08	On-board CVO Safety
CVO09	CVO Fleet Maintenance
CVO10	HAZMAT Management

EMERGENCY MANAGEMENT
Emergency Management (EM)

EM1	Emergency Response
EM2	Emergency Routing
EM3	Mayday Support
EM4	Roadway Service Patrols

MAINTENANCE & CONSTRUCTION OPERATIONS
Maintenance & Construction Operations (MCO)

MC01	Maintenance and Construction Vehicle Tracking
MC02	Maintenance and Construction Vehicle Maintenance
MC03	Road Weather Data Collection
MC04	Weather Information Processing and Distribution
MC05	Roadway Automated Treatment
MC06	Winter Maintenance
MC07	Roadway Maintenance and Construction
MC08	Work Zone Management
MC09	Work Zone Safety Monitoring
MC10	Maintenance and Construction Activity Coordination

From the National ITS Architecture (v4.0)

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS AND SERVICES**

Market Packages		Existing or Planned in the Inland Empire	Identified Inland Empire Need	No Inland Empire Need	Inland Empire Need Indeterminate
ARCHIVED DATA MANAGEMENT *Archived Data (AD)*					
AD1	ITS Data Mart	✓			
AD2	ITS Data Warehouse		✓		
AD3	ITS Virtual Data Warehouse				✓
PUBLIC TRANSPORTATION *Advanced Public Transportation Systems (APTS)*					
APTS1	Transit Vehicle Tracking	✓			
APTS2	Transit Fixed-Route Operations	✓			
APTS3	Demand Response Transit Operations	✓			
APTS4	Transit Passenger and Fare Management	✓			
APTS5	Transit Security	✓			
APTS6	Transit Maintenance	✓			
APTS7	Multi-modal Coordination		✓		
APTS8	Transit Traveler Information		✓		
TRAVELER INFORMATION *Advanced Traveler Information Systems (ATIS)*					
ATIS1	Broadcast Traveler Information	✓			
ATIS2	Interactive Traveler Information	✓			
ATIS3	Autonomous Route Guidance	✓			
ATIS4	Dynamic Route Guidance				✓
ATIS5	ISP Based Route Guidance	✓			
ATIS6	Integrated Transportation Management/Route Guidance				✓
ATIS7	Yellow Pages and Reservation				✓
ATIS8	Dynamic Ridesharing	✓			
ATIS9	In Vehicle Signing				✓
TRAFFIC MANAGEMENT *Advanced Transportation Management Systems (ATMS)*					
ATMS01	Network Surveillance	✓			
ATMS02	Probe Surveillance				✓
ATMS03	Surface Street Control	✓			
ATMS04	Freeway Control	✓			
ATMS05	HOV Lane Management	✓			
ATMS06	Traffic Information Dissemination	✓			
ATMS07	Regional Traffic Control		✓		
ATMS08	Incident Management System		✓		
ATMS09	Traffic Forecast and Demand Management				✓
ATMS10	Electronic Toll Collection				✓

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS AND SERVICES**

Market Packages		Existing or Planned in the Inland Empire	Identified Inland Empire Need	No Inland Empire Need	Inland Empire Need Indeterminate
ATMS11	Emissions Monitoring and Management	✓			✓
ATMS12	Virtual TMC and Smart Probe Data				✓
ATMS13	Standard Railroad Grade Crossing	✓			
ATMS14	Advanced Railroad Grade Crossing		✓		
ATMS15	Railroad Operations Coordination		✓		
ATMS16	Parking Facility Management	✓			
ATMS17	Regional Parking Management				✓
ATMS18	Reversible Lane Management			✓	
ATMS19	Speed Monitoring		✓		
ATMS20	Drawbridge Management			✓	
VEHICLE SAFETY *Advanced Vehicle Safety Systems (AVSS)*					
AVSS01	Vehicle Safety Monitoring				✓
AVSS02	Driver Safety Monitoring				✓
AVSS03	Longitudinal Safety Warning				✓
AVSS04	Lateral Safety Warning				✓
AVSS05	Intersection Safety Warning				✓
AVSS06	Pre-Crash Restraint Deployment				✓
AVSS07	Driver Visibility Improvement				✓
AVSS08	Advanced Vehicle Longitudinal Control				✓
AVSS09	Advanced Vehicle Lateral Control				✓
AVSS10	Intersection Collision Avoidance				✓
AVSS11	Automated Highway System				✓
COMMERCIAL VEHICLE OPERATIONS *Commercial Vehicle Operations (CVO)*					
CVO01	Fleet Administration	✓			
CVO02	Freight Administration				✓
CVO03	Electronic Clearance	✓			
CVO04	CV Administrative Processes	✓			
CVO05	International Border Electronic Clearance				✓
CVO06	Weigh-In-Motion	✓			
CVO07	Roadside CVO Safety	✓			
CVO08	On-board CVO Safety				✓
CVO09	CVO Fleet Maintenance				✓
CVO10	HAZMAT Management		✓		
EMERGENCY MANAGEMENT *Emergency Management (EM)*					
EM1	Emergency Response	✓			
EM2	Emergency Routing				✓
EM3	Mayday Support				✓

INLAND EMPIRE REGIONAL ITS ARCHITECTURE PROJECT
** ITS NEEDS AND SERVICES**

Market Packages		Existing or Planned in the Inland Empire	Identified Inland Empire Need	No Inland Empire Need	Inland Empire Need Indeterminate
EM4	Roadway Service Patrols	✓			
MAINTENANCE & CONSTRUCTION OPERATIONS *Maintenance & Construction Operations (MCO)*					
MC01	Maintenance and Construction Vehicle Tracking			✓	
MC02	Maintenance and Construction Vehicle Maintenance				✓
MC03	Road Weather Data Collection	✓			
MC04	Weather Information Processing and Distribution	✓			
MC05	Roadway Automated Treatment				✓
MC06	Winter Maintenance	✓			
MC07	Roadway Maintenance and Construction	✓			
MC08	Work Zone Management		✓		
MC09	Work Zone Safety Monitoring		✓		
MC10	Maintenance and Construction Activity Coordination		✓		