

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PLAN FOR THE KERN REGION

FINAL DELIVERABLE NO. 12 REGIONAL ITS PLAN APPENDIX C: RELATIONSHIPS BETWEEN ITS USER NEEDS AND RECOMMENDED ITS STRATEGIES

JUNE 2018



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 $\underline{http://www.kerncog.org/category/docs/its/}$

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Appendix C. RELATIONSHIPS BETWEEN ITS USER NEEDS AND RECOMMENDED ITS STRATEGIES

| Opin (Person) Coordinate and Person of Coordinate and Person of Coordinate in Control of Coordinate and Person of Coordin | ide information on roadway construction and oterance activities iterance activities is stopped queue in/near work zones sory to warn traffic of a stopped queue in/near work zones sory to warn traffic of a stopped queue in/near work zones over data collection capabilities and archiving on ways/expressways littor transportation infrastructure into transportation infrastructure into transportation infrastructure social media for traveler information dissemination social media for traveler information dissemination ove 5.1.1 system/web site, enhance freeway/expressway ic map, and enhance arterial traffic map e public safety/computer aided dispatch (CAD) data with sportation agencies |
|--|---|
| User Priority Points 122 112 112 113 115 | roadway construction and in finear work zones and provide construction and provide neapabilities and archiving on infrastructure or cement in work zones denforcement at high risk location aveler information dissemination ebsite, enhance freeway/expressice arterial traffic map mputer aided dispatch (CAD) dataras |
| 1 Intelligent Access Program – Weight Monitoring 2 Freight-Specific Dynamic Travel Planning 3 Road Weather Information for Freight Carriers 4 HAZMAT Management 5 Carrier Operations and Fleet Management 6 CV Administrative Processes 7 Roadside CVO Safety | rovide informati taintenance acti fonitor queue le divisory to warm nprove data coll eeways/express fonitor transpor novide/enhance se social media se social media se social media hare public safei hare public safei ansportation ag rovide travel tim |
| 1 Intelligent Access Program – Weight Monitoring 2 Freight-Specific Dynamic Travel Planning 3 Road Weather Information for Freight Carriers 4 HAZMAT Management 5 Carrier Operations and Fleet Management 6 CV Administrative Processes 7 Roadside CVO Safety | 93 93 92 91 91 90 89 89 89 89 |
| 3 Road Weather Information for Freight Carriers 4 HAZMAT Management 5 Carrier Operations and Fleet Management 6 CV Administrative Processes 7 Roadside CVO Safety | |
| 4 HAZMAT Management x 5 Carrier Operations and Fleet Management x 6 CV Administrative Processes 7 Roadside CVO Safety | |
| 5 Carrier Operations and Fleet Management x 6 CV Administrative Processes | |
| 6 CV Administrative Processes 7 Roadside CVO Safety | |
| 7 Roadside CVO Safety | |
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| | |
| 8 Roadside HAZMAT Security Detection and Mitigation x | |
| 9 Smart Roadside and Virtual WIM | |
| 10 ITS Data Warehouse x | x |
| 11 Performance Monitoring x | x x |
| 12 Transit Vehicle Tracking | |
| 13 Multi-modal Coordination 14 Transit Connection Protection | |
| 14 Transit Connection Protection | |
| 15 Transit Traveler Information | |
| 16 Transit Fleet Management | |
| 17 Transit Security | |
| 18 Route ID for the Visually Impaired | |
| 19 Dynamic Transit Operations | |
| 20 Transit Signal Priority | |
| 21 Transit Passenger Counting | |
| 22 Transit Fixed-Route Operations | |
| 23 Dynamic Ridesharing and Shared Use Transportation | |
| 24 Broadcast Traveler Information x x x | |

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| | | | | | | П | | Τ | | П | Т | Т | | П | П | Т | T | Г | | | | | | | П | | Т | Π | | \Box |
| | | | dinate timed transfers between routes, providers and es | nd coverage of environmental/weather/road conditions ction/monitoring systems | lop mobile apps to provide static and real-time transit mation | ement regional smart card for transit fare payment | nd/enhance/upgrade computer aid ed dispatch (CAD) m | de roadway flood wamings | de transit in formation using social media | oe traffic congestion during incidents | email alerts of major incidents to major employers | ementa central information/data clearinghouse | ince 511 to provide static and real-time transit mation | ade signal hardware | nd emergency vehicle preemption | ement/enhance web-based trip planner | e incuent information with other agencies dinate afferial and freeway management strategies | departure Inform | 1 - | owlde/enhance mobile data terminals for emergency shicles | nd/enhance/upgrade automatic vehicle location (AVI.) m | | nd security cameras on transit vehides, at transit ons/stops and park-and-ride facilities | ide freeway/expressway travelitimes and Provide arterial elitimes (on major arterials) | ement transits ignal priority technology | nentintersector | ide tracking of HAZMAT whicles ove ridesharing program/website | 3.5 | de target enforcement at locations with history of tions | nd CCTV camera coverage on artefials and ways/expressways |
| | | | og ge | Expa dete | Deve | lg I | Expa | Prog | Prové | Sed of | Se no | Œ. | Enha Infor | Upgr | g g | ign f | 8 8 | Prov | j. | Prove | Expa | Provi | Eppa | Prove | ldml | ğ. | Prove | Share | Provide | Eppa freev |
| | | User Priority Points | 88 | 88 | 87 | 86 | 86 | 86 | 85 | 85 | 85 | 84 | 84 | 82 | 82 | 81 8 | 1 80 | 79 | 79 | 78 | 76 | 75 | 75 | 75 | 74 | 73 | 72 71 | 71 | 69 | 69 |
| | 1 | Intelligent Access Program – Weight Monitoring | | | | Ш | | | | Ш | \perp | \perp | | Ш | | | \perp | | \perp | | | | | | | | | | | |
| | 2 | Freight-Specific Dynamic Travel Planning | | | | Ш | | \perp | | Ш | \perp | \perp | | Ш | Ш | \perp | \perp | | \perp | | | x | | | Ш | | \perp | | | |
| | 3 | Road Weather Information for Freight Carriers | | | | Ш | | | | Ш | _ | | | Ш | | \perp | \perp | | \perp | | | | | | | | \perp | | | |
| | 4 | HAZMAT Management | | | | Ш | | _ | | Ш | _ | _ | | Ш | Ш | \perp | \perp | <u> </u> | \bot | | | | | | Ш | | x | | | \sqcup |
| | 5 | Carrier Operations and Fleet Management | | | | Ш | | \perp | $oxed{oxed}$ | Ш | _ | _ | | Ш | Ш | \perp | \perp | | \bot | | | х | | | Ш | \perp | \perp | | | \perp |
| | 6 | CV Administrative Processes | | | | | | | | Ш | \perp | \perp | | | | | | | | | | | | | | \perp | | | | |
| | 7 | Roadside CVO Safety | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 | Roadside HAZIMAT Security Detection and Mitigation | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 9 | Smart Roadside and Virtual WIM | | | | | | | | | | | | | | | | | | | | | | | | | | | x | |
| [| 10 | ITS Data Warehouse | | | | | | | | Ш | \bot | x | | | Ш | | | | | | | | | | | | | | | oxdot |
| 3 | 11 | Performance Monitoring | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ate ₈ | 12 | Transit Vehicle Tracking | | | | \Box | | | | | \perp | \perp | | | Ш | x | | x | | | x | | | | | | | | | $oxed{oxed}$ |
| SSE | 13 | Multi-modal Coordination | x | | | Ш | | | | Ш | | | | Ш | Ш | | | | | | | | | | Ш | | | | | $oxed{oxed}$ |
| ž. | 14 | Transit Connection Protection | x | | | | | | | Ш | | | | | Ш | | | | | | | | | | | | | | | $oxed{oxed}$ |
| | 15 | Transit Traveler Information | | | x | | | | x | | | | x | | | x | | x | | | | | | | | | | | | |
| | 16 | Transit Fleet Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 17 | Transit Security | | | | | | | | | | | | | | | | | | | | | x | | | | | | | |
| [| 18 | Route ID for the Visually Impaired | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [| 19 | Dynamic Transit Operations | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [| 20 | Transit Signal Priority | | | | | | | | \Box | | | | | | | | | | | | | | | x | | | | | $oxed{oxed}$ |
| [| 21 | Transit Passenger Counting | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [| 22 | Transit Fixed-Route Operations | | | | | ж | | | \prod | \Box | \Box | | | | | | | | | | | | | | | | | | |
| | 23 | Dynamic Ridesharing and Shared Use Transportation | | | | | | | | | | | | | | | | | | | | | | | | | × | | | |
| | 24 | Broadcast Traveler Information | | | | | | | | | x | | | | | | | | | | | | | x | | | | | | |

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| | | | ement/improve incident detection capabilities | ement Smart Work Zone technology | ement/enhance remote monitoring of transit vehicle hanical condition | elop/implement system-wide arterial management legies | ittor/collect air quality data | vide on-line reservation system for demand-responsive sit services | ide curve speed warning | rovide on-board automated enunciators | uce vehicle delays at rail grade crossings, Provide health itoring of traffic signal equipment at intersections and rail crossings | rovide vehicle-over-height detection/warnings | educe commercial vehicle weight, width and height olations | /upgrade automated passenger counters | ations (CVO) | ill /upgrade automatic vehicle location (AVL) on freeway ce patrol vehicles and emergency vehicles | de interstate/inter-regional traveler information for mercial vehicles | ement/expand dynamic message sign (DMS) allations on arterials and freeways | ement/improve inter-jurisdictional signal coordination | ement/upgrade computer aided dispatch (CAD) system reeway service patrol | ide information on availlable truck parking facilities | loy weigh-in-motion/mobile weigh enforcement nology | rowe/expand vehicle detection coverage on ways/expressways | lers about trucks e | ement variable speed limits itor queue lengths at ramp locations | highway advisory radio (HA | ways/expressways ove ramp metering operations | locations of maintenan | ment automated/remote |
| | | | lmple | imple | Imple | Deve | Moni | Provi trans | Provi | CL. | Redu | Provi | Redu | Ecpa | Provi | Instal | Provi | Imple instal | lmple | Imple for fr | Provi | Depk | Impro | Warr | Imple | Ecpa | mor | - 7 | lmple |
| | | User Priority Points | 69 | 69 | 68 | 68 | 68 | 66 | 66 | 64 | 63 | 61 | 59 | 59 | 58 | 56 | 54 | 54 | 53 | 53 | 53 | 52 | 51 | 51 | 50 49 | 9 45 | 44 | 4 43 | 18 |
| | 1 | Intelligent Access Program – Weight Monitoring | | | | | | | | | | | x | | х | | | | | | | × | | | | | | 4 | \Box |
| | 2 | Freight-Specific Dynamic Travel Planning | | | | | | | | | | | | | x | | x | | | | | | | | | | | + | \coprod |
| | 3 | Road Weather Information for Freight Carriers | | | | | | | | | | | | | | | х | | | | | | | | | | | + | + |
| | 4 | HAZMAT Management | + | $\vdash \vdash$ | | | \square | | | $\vdash \vdash$ | | $\vdash \vdash$ | | | | | | | $\vdash \vdash$ | | \vdash | | | $\vdash \vdash$ | + | + | + | + | + |
| | 5 | Carrier Operations and Fleet Management | | | | | | | | | | | | | | | | | | | | | | | | | | + | \coprod |
| | 6 | CV Administrative Processes | | | | | | | | | | | | | х | | | | | | | | | | \perp | | | 4 | \Box |
| | 7 | Roadside CVO Safety | | | | | | | | | | | | | х | | | | | | | | | | | | | 4 | |
| | 8 | Roadside HAZMAT Security Detection and Mitigation | | | | | | | | | | | | | | | | | | | | | | | \perp | | | + | \sqcup |
| | 9 | Smart Roadside and Virtual WIM | | | | | | | | | | | | | | | | | | | | х | | | | | | 4 | |
| | 10 | ITS Data Warehouse | _ | \square | | | Ш | | | Ш | | Ш | | | | | | | \square | | Ш | | | | \perp | | \perp | 4 | \coprod |
| es Se | 11 | Performance Monitoring | _ | \sqcup | | | \sqcup | | igwdap | \sqcup | | \sqcup | | | | | | | \sqcup | | \sqcup | | | \sqcup | \perp | | \perp | \bot | \coprod |
| rate | 12 | Transit Vehicle Tracking | _ | \square | | | Ш | | | \square | | Ш | | | | | | | Ш | | \square | | | | \perp | | \perp | 4 | \coprod |
| ITS Strategi | 13 | Multi-modal Coordination | _ | \sqcup | | | \sqcup | | igwdown | \sqcup | | \sqcup | | | | | | | \sqcup | | \sqcup | | | \sqcup | \perp | | _ | \bot | \coprod |
| = | 14 | Transit Connection Protection | _ | \sqcup | | | Ш | | | Ш | | \sqcup | | | | | | | \sqcup | | Ш | | | \sqcup | \perp | | \perp | \bot | $\downarrow \downarrow \downarrow$ |
| | 15 | Transit Traveler Information | | | | | | | | х | | | | | | | | | | | | | | | \perp | | _ | \bot | \coprod |
| | 16 | Transit Fleet Management | | | x | | | | | | | | | | | | | | | | | | | | | | | 4 | |
| | 17 | Transit Security | | | | | Ш | | | | | | | | | | | | Ш | | | | | | | _ | | \perp | \coprod |
| | 18 | Route ID for the Visually Impaired | | | | | | | | х | | | | | | | | | | | | | | | | | | 4 | |
| | 19 | Dynamic Transit Operations | | | | | | × | | | | | | | | | | | | | | | | | | | | | |
| | 20 | Transit Signal Priority | | | | | Ш | | | Ш | | Ш | | \perp | | | | | Ш | | | | | | \perp | | | \perp | \coprod |
| | 21 | Transit Passenger Counting | | | | | | | | | | | | × | | | | | | | | | | | | | | | |
| | 22 | Transit Fixed-Route Operations | \perp | Ш | | | Ш | | | Ш | | Ш | | | | | | | Ш | | Ш | | | | \perp | \perp | \perp | \perp | \coprod |
| | 23 | Dynamic Ridesharing and Shared Use Transportation | | Ш | | | Ш | | | Ш | | Ш | | | | | | | Ш | | | | | | \perp | | | 丄 | Ш |
| | 24 | Broadcast Traveler Information | | | | | | | | | | | | | | | | | | | | | | | | × | | \perp | |

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| | | | ovide information and routing (detour) information to verelers during incident, construction, weather events, special events, c. | rovide/enhance road weather conditions information to avelers | prove signal timing/coordination | prove information exchange between Caltrans, local insportation agencies and transit agencies | ovide roadway closure/restriction information | ordinate construction and maintenance project schedules thin and between agencies | duce recurring traffic congestion | ovide incident and real-time traffic information to pergency responders and emergency management agencies | am work crews of errant vehicles | are congestion information with other agencies | prove a multi-agency, system-coordinated response to jor incidents | ent clearance time | ceive real-time roadway congestion information ovide/enhance congestion information to travelers | Jse archived data for planning, modeling, analysis and traffic nanagement strategy development | - ₹ | prove communications in rural areas | prove response to HAZMAT incidents prove incident notification to agencies and improve | communications | ovide information on roadway construction and sintenance activities | onitor queue lengths in/near work zones and provide visory to warn traffic of a stopped queue in/near work zones | prove data collection capabilities and archiving on neways/expressways | onitor transportation infrastructure | prove incident response | /enhance enforcement in work zones | ovace/eminance speed emon cerners at ingritish rocations se social media for traveler information dissemination | mprove 511 system/web site, enhance freeway/expressway raffic map, and enhance arterial traffic map | public safety/computer aided dis | arsportation agencies rovide travel times/delays through work zones |
| | | User Priority Points | 129 | 122 | 118 | 116 | 116 | 113 | 107 | 103 | 102 | あ 99 | 99 | 97 9 | 26 96 96 96 | _ | 95 | 95 | <u>트 트</u> 93 0 | .⊑ | 93 | 93 | <u>트 교</u> 92 | 91 | 91 | 91 9 | 5 | _ | W1 + | 5 G |
| | 25 | Traffic Information Dissemination | | | | | 1 | 1 | | 1 | 1 | x | | | | 1 | × | | | _ | | | | 1 | | | | | × | $\neg \neg$ |
| | 26 | Personalized Traveler Information | | | | | T | | | | | \sqcap | | \Box | x | | x | T | | \top | | | | T | \Box | \top | | | \top | \top |
| | 27 | Dynamic Route Guidance | x | | | | x | | | | | \sqcap | | \vdash | × | | | \top | \top | \top | | | | T | \Box | \top | \top | | \top | + |
| | 28 | Traffic Incident Management System | | | | | | | | | | \Box | | | | | | \sqcap | | \top | | | | | \Box | \top | | | x | \top |
| | 29 | Regional Traffic Management | | | x | | | | x | | | x | | | | | | | | | | | | | | | | | | |
| | 30 | Traffic Signal Control | | | x | | | | x | | | | | | | | | | | | | | | | | | | | | |
| | 31 | Connected Vehicle Traffic Signal System | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 32 | Infrastructure-Based Traffic Surveillance | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 33 | Speed Warning and Enforcement | | | | | | | | | | | | | | | | | | | | | | | | 1 | ĸ | | | |
| 8 | 34 | Traffic Metering | | | | | | | × | | | | | | | | | | | | | | | | | | | | \perp | |
| tegi | 35 | Speed Harmonization | | | | | | | × | | | \Box | | | \top | | | | | \top | | | | | | \top | | | | \Box |
| 25 | 36 | Dynamic Lane Management and Shoulder Use | | | | | | | × | | | | | | | | | | | | | | | | | | | | | |
| 13 St | 37 | Railroad Operations Coordination | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 38 | Advanced Railroad Grade Crossing | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 39 | Standard Railroad Grade Crossing | | | | | | | | | | | | | | | | | | | | | | | | T | | | | |
| | 40 | Vehicle-Based Traffic Surveillance | | | | | | | | | | | | | | | | | | \top | | | | | | \top | | | | |
| | 41 | Roadway Closure Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 42 | Variable Speed Limits | | | | | | | | | | \Box | | | | | | | | \top | | | | | | \top | | | | |
| | 43 | Routing Support for Emergency Responders | | | | | | | | × | | | | × | | | | | | | | | | | x | | | | | |
| | 44 | Vehicle Emergency Response | | | | | | | | × | | \Box | | × | \top | | | \Box | | | \neg | | | | x | | | | | \Box |
| | 45 | Emergency Call-Taking and Dispatch | | | | | | | | | | \Box | x | × | | | | | | | | | | | х | | | | | \top |
| 1 | 46 | Roadway Service Patrols | | | | | | | | | | П | | × | | | | | | \neg | | | | | | | | | T | \Box |

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| | | | or dinate timed transfers between routes, providers and odes | and coverage of environmental/weather/road conditions ection/monit oring systems | elop mobile apps to provide static and real-time transit | lement regional smart card for transit fare payment | and/enhance/upgrade computer aided dispatch (CAD) em | vide roadway flood warnings | vide transit information using social media | uce traffic congestion during incidents | d email alerts of major incidents to major employers | ilement a central information/data clearinghouse | ance 5.1.1 to provide static and real-time transit rmation | grade signal hardware | and emergency vehicle preemption | nhance web-based trip pl | x dinate arterial and freeway management strategies | vide real-time transit arrival/departure information on web and at bus stops | rove/implement ability to remotely modify signal timing | wide/enhance mobile data terminals for emergency icles | and/enhance/upgrade automatic vehicle location (AVL) | wide better vehicle restrictions and roadway closure irmation to commercial vehicles | and security cameras on transit vehicles, at transit clons/stops and park-and-ride facilities | vide freeway/expressway travel times and Provide arterial vel times (on major arterials) | lement transit signal priority technology | lement intersection collision warning/avoidance systems | vide tracking of HAZMAT vehicles rove ridesharing program/website | resurveillance video and data with PSAPs/emergency | wide target enforcement at locations with history of ations | and CCTV camera coverage on arterials and |
| | | | 8 8 | g de | e de | Ē | Syst Syst | Pro | Pro | Red | Š | ğ. | Enh | ď | å | di t | Š | Pro | ğ. | Pro | Exp syst | Pro | E Start | Pro | dwl | lmp | Pro Im | Sha | Pro lo | Egg Fee |
| | 25 | User Priority Points Traffic Information Dissemination | 88 | 88 | 87 | 86 | 86 | 86 | 85 | 85 | 85 | 84 | 84 | 82 | 82 | 81 8 | \neg | 79 | 79 | 78 | 76 | 75 | 75 | 75 | 74 | 73 | 72 71 | $\overline{}$ | 69 | 69 |
| | 26 | Personalized Traveler Information | | | | ++ | | × | $\vdash \vdash$ | $\vdash \vdash$ | × | + | | $\vdash \vdash$ | $\vdash \vdash$ | | + | \vdash | + | | | | | x | ++ | $\vdash \vdash$ | + | х | +- | +- |
| | 27 | Dynamic Route Guidance | | | | + | | + | $\vdash \vdash$ | \vdash | - | + | | $\vdash \vdash$ | $\vdash \vdash$ | \dashv | + | \vdash | + | | | | | | ++ | $\vdash \vdash$ | + | +- | +- | +- |
| | 28 | Traffic Incident Management System | | | | + | | + | Н | × | \dashv | \dashv | | $\mid \mid \mid$ | $\vdash \vdash$ | | x | | + | | | | | | $\forall \exists$ | $\vdash \vdash$ | + | × | + | + |
| | 29 | Regional Traffic Management | | | | + | | + | Н | × | \dashv | \dashv | | $\mid \mid \mid$ | $\vdash \vdash$ | - | x x | \vdash | + | | | | | | + | $\vdash \vdash$ | + | | +- | +- |
| | 30 | Traffic Signal Control | | | | + | | | Н | | \dashv | \dashv | | x | \vdash | _ | + | | x | | | | | | + | \vdash | + | 1 | + | + |
| | 31 | Connected Vehicle Traffic Signal System | | | | + | | | Н | \vdash | \dashv | \dashv | | × | \vdash | \dashv | + | | + | | | | | | + | x | + | T | +- | +- |
| | 32 | Infrastructure-Based Traffic Surveillance | | | | $\dagger \dagger$ | | \top | Н | \Box | \dashv | \top | | \square | \Box | \top | \top | | × | | | | | | \forall | | \top | | + | x |
| | 33 | Speed Warning and Enforcement | | | | $\dagger \dagger$ | | \top | Н | \Box | \dashv | \top | | | \Box | \top | \top | | \top | | | | | | $\forall \exists$ | | \top | 1 | + | <u> </u> |
| 22 | 34 | Traffic Metering | | | | \top | | \top | П | \Box | \dashv | o | | П | \Box | \top | \top | | T | | | | | | † | \Box | $\neg \vdash$ | | \top | |
| tegi | 35 | Speed Harmonization | | | | \Box | | | П | | \neg | \neg | | П | | | | | | | | | | | П | \Box | \top | | | 1 |
| ITS Strate | 36 | Dynamic Lane Management and Shoulder Use | | | | \top | | | П | \Box | \dashv | o | | П | \Box | \top | | | Τ | | | | | | П | \Box | $\neg \vdash$ | | \top | 1 |
| Ē | 37 | Railroad Operations Coordination | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 38 | Advanced Railroad Grade Crossing | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 39 | Standard Railroad Grade Crossing | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 40 | Vehicle-Based Traffic Surveillance | | | | | | | | | \top | | | | | | | | | | | | | | | | | | | |
| | 41 | Roadway Closure Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 42 | Variable Speed Limits | | | | | | | | | \top | \top | | | | | | | | | | | | | | | | | | |
| | 43 | Routing Support for Emergency Responders | | | | | | | | | | | | | | | | | | × | | | | | | | | | | |
| | 44 | Vehicle Emergency Response | | | | | | | П | | \neg | \neg | | П | | | | | | × | | | | | П | | \top | | | |
| | 45 | Emergency Call-Taking and Dispatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 46 | Roadway Service Patrols | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | | | П | | | | | Τ | П | | П | | | | | | | | | | | | | Т | \top | \Box | \top | \top |
| | | | nplement/improve incident detection capabilities | plement Smart Work Zone technology | riplement/enhance remote monitoring of transit vehicle nechanical condition | evelop/implement system-wide arterial management rategies | onitor/collect air quality data | ovide on-line reservation system for demand-responsive orsit services | ovide curve speed warning | ovide on-board automated enunciators | sduce vehicle delays at rail grade crossings, Provide health onitoring of traffic signal equipment at intersections and rail crossings | ovide vehicle-over-height detection/warnings | duce commercial vehicle weight, width and height slations | pand/upgrade automated passenger counters | ovide information on commercial vehicle operations (CVO) rmit restrictions | istall/upgrade automatic vehicle location (AVL) on freeway enice patrol vehicles and emergency vehicles | ovide interstate/inter-regional traveler information for mmercial vehicles | plement/expand dynamic message sign (DMS) stallations on arterials and freeways | mplement/improve inter-jurisdictional signal coordination | plement/upgrade computer aided dispatch (CAD) system r freeway service patrol | ovide information on available truck parking facilities | sploy weigh-in-motion/mobile weigh enforcement chnology | prove/expand vehicle detection coverage on seways/expressways | Warn travelers about trucks entering/existing work zones | plement variable speed limits | queue lengths at ramp | pand highway advisory radio (HAR) coverage on xeways/expressways | we ramp metering operati | ack locations of maintenance fleet plement automated/remote control gate systems |
| \vdash | | User Priority Points | - | <u>E</u> | <u>≒ ∈</u> 68 | 68 | - <u>≥</u> | 66 | 66 | 64 | <u>≈ E</u> 63 | 61 | £ '≶ 59 | <u>نة</u> 59 | 58 | <u>≅</u> % | <u>£ 8</u> | <u>트 .</u> 프 54 | 53 | <u>≒ ₽</u> | 53 | 2 2 | 51 | 51 | 50 | ∑ 2 | മ് <u>∓്</u> 45 | - | <u>분</u> 트 43 18 |
| | 25 | Traffic Information Dissemination | 03 | 33 | 00 | 00 | 00 | 00 | 30 | 04 | 03 | 31 | 25 | 73 | 30 | 30 | 34 | 34 X | ,,, | | ,,, | 32 | 31 | 74 | 30 | +3 | x | 77 | 75 10 |
| | 26 | Personalized Traveler Information | | Н | | | Н | | \top | Н | | \Box | | \Box | | | | | П | | \vdash | | | | \top | \top | \neg | \top | \top |
| | 27 | Dynamic Route Guidance | | Н | | | Н | | \top | Н | | \Box | | \Box | | | | | Н | | \vdash | | | Н | \top | \top | \dashv | \top | \top |
| | 28 | Traffic Incident Management System | | П | | × | П | | \top | П | | П | | П | | | | | П | | \vdash | | | П | | \top | \neg | \top | \top |
| | 29 | Regional Traffic Management | | П | | × | П | | \top | П | | П | | П | | | | | x | | \vdash | | | П | 十 | \top | \neg | \top | \top |
| | 30 | Traffic Signal Control | | П | | | П | | | П | | \Box | | | | | | | x | | | | | | \top | \top | \neg | \top | \top |
| | 31 | Connected Vehicle Traffic Signal System | | | | × | П | | | П | | | | | | | | | | | | | | | \top | \top | | \top | |
| | 32 | Infrastructure-Based Traffic Surveillance | x | | | | | | | П | | | | | | | | | | | | | × | | | \top | \Box | \top | |
| | 33 | Speed Warning and Enforcement | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S S | 34 | Traffic Metering | | | | | | | | | | | | | | | | | | | | | | | | | | x | |
| Strategi | 35 | Speed Harmonization | | | | | | | | | | | | | | | | | | | | | | | x | | | | |
| Stra | 36 | Dynamic Lane Management and Shoulder Use | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | 37 | Railroad Operations Coordination | | | | | | | | | × | | | | | | | | | | | | | | | | | | |
| | 38 | Advanced Railroad Grade Crossing | | | | | | | | | х | | | | | | | | | | | | | | | | | | |
| | 39 | Standard Railroad Grade Crossing | | | | | | | | | х | | | | | | | | | | | | | | | | | | |
| | 40 | Vehicle-Based Traffic Surveillance | х | | | | | | | | | | | | | | | | | | | | ж | | | | | | |
| | 41 | Roadway Closure Management | | | | | | | | | | | | | | | | | | | | | | | | | | | × |
| | 42 | Variable Speed Limits | | | | | | | | | | | | | | | | | | | | | | | x | | | | |
| | 43 | Routing Support for Emergency Responders | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 44 | Vehicle Emergency Response | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 45 | Emergency Call-Taking and Dispatch | | | | | | | | | | | | | | | | | | х | | | | | | | | | |
| | 46 | Roadway Service Patrols | | | | | | | | | | | | | | x | | | | x | | | | | | | | | |

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| | | | rovide information and routing (detour) information to avelers during incident, construction, weather events, special events, tc. | rovide/enhance road weather conditions information to avelers | nprove signal timing/coordination | nprove information exchange between Caltrans, local arsportation agencies and transit agencies | rovide roadway closure/restriction information | oordinate construction and maintenance project schedules Athin and between agencies | educe recurring traffic congestion | incident and real-ti | crews of errant vehicles | hare congestion information with other agencies | nprove a multi-agency, system-coordinated response to najor incidents | educe incident clearance time | eceive real-time roadway congestion information rowide fembance consection information to travelers | nal ysis and traffic | rovide more timely incident information to travelers and norowe quality, consistency and thoroughness of traveler information | nprove communications in rural areas | nprove response to HAZMAT incidents | riprove incident notification to agencies and improve iteragency communications | rovide information on roadway construction and naintenance activities | fonitor queue lengths in/near work zones and provide dvisory to warn traffic of a stopped queue in/near work zones | nprove data collection capabilities and archiving on | ansporta | nprove incident response | rovide/enhance enforcement in work zones | rovide/enhance speed enforcement at high risk locations to social media for traveler information discomination | ve 511 system/web site, enhance | raffic map, and enhance arterial traffic map hare public safety/computer aided dispatch (CAD) data with | ortation agencies le travel times/delays through work zones |
| | | User Priority Points | 129 | 122 | 118 | 116 | 116 | 113 | 107 | 103 | 102 | 2 99 | 99 | 97 | 96 9 | | 95 | 95 | 93 | 93 | 93 | 93 | 92 | 91 | 91 | 91 | 90 8 | 9 89 | <u> </u> | 89 89 |
| | 47 | Incident Scene Pre-Arrival Staging Guidance for Emergency Responders | | | | | | | | × | | | | × | | | | | | | | | | | х | | | | | $\neg \neg$ |
| | 48 | Emergency Vehicle Preemption | | | П | | | | \top | | T | \sqcap | | × | \top | | | П | \Box | | | | | 十 | х | \Box | \top | | | $\neg \neg$ |
| | 49 | Mayday Notification | | | П | | | | | | | \Box | | \sqcap | | | | П | | | | | | \top | х | | | \top | | $\neg \neg$ |
| | 50 | Transportation Infrastructure Protection | | | | | | | | | | | | | | | | | | | | | | x | | | | | | |
| | 51 | Wide-Area Alert | | | | | | | | | | | | | | | | х | | х | | | | | | | | | | |
| | 52 | Early Warning System | | | | | | | | | | | x | | | | | | | x | | | | | | | | | | |
| | 53 | Evacuation and Reentry Management | | | | | | | | | | | x | | | | | | | | | | | | | | | | | |
| | 54 | Disaster Response and Recovery | | | | | | | | | | | × | | | | | | | x | | | | $oxed{oxed}$ | | | | | | |
| <u>8</u> | 55 | Maintenance and Construction Activity Coordination | | | | | | x | | | | | | | | | | | | | x | | | | | | | | | |
| teg | 56 | Work Zone Management | | | | | | × | | | | | | | | | | | | | | | | | | x | | | | × |
| Stra | 57 | Work Zone Safety Monitoring | | | | | | | | | x | | | | | | | | | | | | | | | | | | | |
| 1 E | 58 | Maintenance and Construction Vehicle and Equipment Tracking | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 59 | Roadway Maintenance and Construction | | | | | | × | | | | | | | | | | | | | | | | | | | | | | |
| | 60 | Curve Speed Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 61 | Road Weather Motorist Alert and Warning | | x | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 62 | Oversize Vehicle Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 63 | Weather Information Processing and Distribution | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 64 | Weather Data Collection | | | | | | | | | | | | | | | | П | | | | | | T | | | | | | |
| [| 65 | Spot Weather Impact Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 66 | Parking Space Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | | | | | П | | П | Т | \Box | \top | Τ | Т | Τ | П | T | | Τ | | | | | | T | | \Box | \top | \top | \sqcap |
| | | | x dinate timed transfers between routes, providers and des | and coverage of environmental/weather/road conditions ection/monit oring systems | relop mobile apps to provide static and real-time transit wration | element regional smart card for transit fare payment | and/enhance/upgrade computer aided dispatch (CAD) tem | vide roadway flood warnings | transit information usin | ce traffic congestion during incide | id email alerts of major incidents to major employers ement a central information/data clearinghouse | ance 511 to provide static and real-time transit | grade signal hardware | and emergency vehicle preemption | element/enhance web-based trip planner | reincident information with other agencies y dinate arterial and freeway management strategies | vide real-time transit arrival/departure inforn and at bus stops | | Provide/enhance mobile data terminals for emergency enicles | Expand/enhance/upgrade automatic vehicle location (AVL) system | wide better vehicle restrictions and roadway closure armation to commercial vehicles | Expand security cameras on transit vehicles, at transit stations/stops and park-and-ride facilities | wide freeway/expressway travel times and Provide arterial vel times (on major arterials) | nent transit signal pric | lement intersection collision warning/avoidance systems | tracking of HA | lance vi | wide target enforcement at locations with history of ations | and CCTV camera coverage on arterials and sways/expressways |
| | | | Š E | de de | e di | <u>j</u> | Bys syst | Pro | Pro | Red | يّ ق | E . | å | å | du l | Š | Pro | lmp | 4 | | Pro | | Pro | -20 | lmg | Pro Pro | Sha | Pro | T S |
| | 47 | User Priority Points Incident Scene Pre-Arrival Staging Guidance for Emergency Responders | 88 | 88 | 87 | 86 | 86 | 86 | 85 | 85 8 | 85 84 | 4 84 | 82 | 82 | 81 8 | 1 80 | 79 | 79 | 78 | 76 | 75 | 75 | 75 | 74 | 73 | 72 7 | 1 71 | 69 | 69 |
| | 47 | | | | | \vdash | | $\vdash \vdash$ | \dashv | + | + | + | + | _ | $\vdash \vdash$ | + | +- | + | | | + | - | | + | $\vdash \vdash$ | + | +- | +- | + |
| | 49 | Emergency Vehicle Preemption Mayday Notification | | | | + | | $\vdash \vdash$ | \dashv | + | + | | + | × | \vdash | + | + | + | | | | | | + | \vdash | + | +- | +- | + |
| | 50 | Transportation Infrastructure Protection | | | | + | | \vdash | \dashv | + | + | | + | + | $\vdash \vdash$ | + | + | + | | | 1 | | | + | \vdash | + | +- | +- | + |
| | 51 | Wide-Area Alert | | | | H | | $\vdash \vdash$ | \dashv | + | + | + | + | + | $\vdash \vdash$ | + | + | + | | | + | | | + | $\vdash \vdash$ | + | +- | +- | +-+ |
| | 52 | Early Warning System | | | | + | | \vdash | \dashv | + | + | | + | + | \vdash | + | + | + | | | | | | + | \vdash | + | +- | +- | + |
| | 53 | Evacuation and Reentry Management | | | | + | | \vdash | \dashv | + | + | | + | + | \vdash | + | + | + | | | 1 | | | + | \vdash | + | +- | +- | + |
| | 54 | Disaster Response and Recovery | | | | + | | \vdash | \dashv | + | + | +- | + | + | $\vdash \vdash$ | + | +- | + | | | + | | | + | \vdash | + | +- | +- | + |
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| 80 | 55 56 | Maintenance and Construction Activity Coordination Work Zone Management | | | | + | | $\vdash \vdash$ | \dashv | + | + | +- | + | + | $\vdash \vdash$ | + | + | + | | | + | | | + | $\vdash \vdash$ | + | +- | +- | + |
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| ITSStr | 57 58 | Work Zone Safety Monitoring Maintenance and Construction Vehicle and Equipment Tracking | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - | 58 | Roadway Maintenance and Construction | | | | | | | - | + | | | + | | \vdash | + | | | | | | | | | | | +- | +- | + |
| | 59 | Curve Speed Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 60 | Road Weather Motorist Alert and Warning | | | | | | | | | | | + | | | + | | | | | | | | | | | +- | + | |
| | 61 | | | | | | | | | | | | + | | | | | | | | | | | | | | | | |
| | 62 | Oversize Vehicle Warning | | _ | | | | | | | | | + | | | | | | | | | | | | | | +- | +- | |
| | 63 | Weather Information Processing and Distribution | | × | | + | | $\vdash \vdash$ | \dashv | + | + | + | + | \vdash | $\vdash \vdash$ | + | + | + | | | | | | + | $\vdash \vdash$ | + | +- | +- | ++ |
| | 64 | Weather Data Collection | | × | | + | | $\vdash \vdash$ | \dashv | + | + | + | + | + | $\vdash \vdash$ | + | + | + | | | 1 | | | + | $\vdash \vdash$ | + | +- | + | + |
| | 65 | Spot Weather Impact Warning | | х | | | | | _ | | | | | | \vdash | + | | | | | | | | | | | \perp | _ | |
| | 66 | Parking Space Management | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | | nplement/improve incident detection capabilities | nplement Smart Work Zone technology | nplement/enhance remote monitoring of transit vehicle nechanical condition | evelop/implement system-wide arterial management rategies | onit | e on-line reserv | diameter | u a | vehicle delays at rail gra | rovide vehicle-over-height detection/warmings | educe commercial vehicle weight, width and height olations | quand/upgrade automated passenger counters | rovide information on commercial vehicle operations (CVO) ernit restrictions | stall/upgrade automatic vehicle location (AVL) on freeway in or epatrol vehicles and emergency vehicles | rovide interstate/inter-regional traveler information for ommercial vehicles | oplement/expand dynamic message sign (DMS) stallations on arterials and freeways | mplement/improve inter-jurisdictional signal coordination | nplement/upgrade computer aided dispatch (CAD) system or freeway service patrol | rovide information on available truck parking facilities | eploy weigh-in-motion/mobile weigh enforcement chnology | nprove/expand vehicle detection coverage on eeways/expressways | Marn travelers about trucks entering/existing work zones | t variable speed lin | ghway ad | eeways/expressways | locations of maintenance if |
| \vdash | | User Priority Points | 69 | 69 | <u>5 E</u> | 68 | 68 | 66 | 5 6 6 | 6 64 | £ 5 | 61 | 59 | 59 | 58 | <u>⊆ %</u> 56 | 54 | 54 | 53 | <u>≡ ₽</u> | 53 | 五 章 52 | <u>=</u> <u>+</u> 51 | - | 50 4 | ≥ a . 19 45 | 44 | 4 43 18 |
| | 47 | Incident Scene Pre-Arrival Staging Guidance for Emergency Responders | | | | | 1 | 1 | + | | | | | | | | | | | | | | | | | | T | |
| | 48 | Emergency Vehicle Preemption | | П | | | \top | | \top | \top | | | | | | | | | П | | | | | П | \top | | | |
| | 49 | Mayday Notification | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | Transportation Infrastructure Protection | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [| 51 | Wide-Area Alert | | | | | | | | \top | | | | | | | | | | | | | | | | | | |
| | 52 | Early Warning System | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 53 | Evacuation and Reentry Management | | | | | | | | | | | | | | | | | | | | | | \Box | | | | |
| | 54 | Disaster Response and Recovery | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 55 | Maintenance and Construction Activity Coordination | | | | | | | | | | | | | | | | | | | | | | | | | | |
| tegi | 56 | Work Zone Management | | | | | | | | | | | | | | | | | | | | | | x | | | | |
| ITS Strate | 57 | Work Zone Safety Monitoring | | х | | | | | | | | | | | | | | | | | | | | x | | | | |
| E | 58 | Maintenance and Construction Vehicle and Equipment Tracking | | ж | | | | | \top | | | | | | | | | | | | | | | | \top | | | x |
| | 59 | Roadway Maintenance and Construction | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 60 | Curve Speed Warning | | | | | | | , | ĸ | | | | | | | | | | | | | | | \top | | | |
| | 61 | Road Weather Motorist Alert and Warning | | П | | | T | | | | | | | | | | | | | | | | | П | | | | |
| | 62 | Oversize Vehicle Warning | | | | | | | | | | x | | | | | | | | | | | | | | | | |
| | 63 | Weather Information Processing and Distribution | | П | | | Т | | \top | Т | | П | | П | | | | | | | | | | П | \top | | T | \top |
| | 64 | Weather Data Collection | П | П | | | \top | | \top | \top | | \Box | | \Box | | | | | П | | | | | П | \top | | \top | \top |
| | 65 | Spot Weather Impact Warning | | П | | | T | | \top | \top | | П | | | | | | | | | | | | П | \top | | | \prod |
| ⊢ | 66 | Parking Space Management | | П | | | | | | | | | | | | | | | | | х | | | | | | | |