

Embedded Links and Cost References

For your reference, here is a list of the full web addresses for the resource links and references in the fact sheets.

CC1: Animal Warning Systems

Examples of Implementation Section

1. Minnesota's Experience with Deer Warning Systems, Passive Infrared Devices, <http://www.dot.state.mn.us/trafficeng/signing/doc/deer-crossing-signs-informational-sheet.pdf> and http://www.dot.state.mn.us/guidestar/2006_2010/deer_detection_and_warning_system.html
2. Roadside Animal Detection System (Florida), RADS, <http://www.govtech.com/public-safety/Roadside-Systems-Detect-Wildlife-to-Prevent-Collisions.html>
3. Wildlife Detection System (Colorado), sensors, <http://www.govtech.com/public-safety/Roadside-Systems-Detect-Wildlife-to-Prevent-Collisions.html>
4. Animal Detection & Driver Warning System; Durango and Bayfield, Colorado, not, <https://www.codot.gov/programs/research/pdfs/2012/avc/view>
5. Smartphone Application Helps to Protect Reindeer (Finland), Reindeer Bell, <https://www.usnews.com/news/world/articles/2016-12-24/finnish-phone-app-finds-reindeer-helps-to-avoid-road-kill>

Opportunities for Future Expansion Section

1. Volvo, <https://www.wired.com/2017/01/volvos-cars-now-spot-moose-hit-brakes/>

References for Cost Section(s)

1. Minnesota's Experience with Deer Warning Systems, http://www.dot.state.mn.us/guidestar/2006_2010/deer_detection_and_warning_system.html
2. Animal Detection System, <https://www.ecologyandsociety.org/vol14/iss2/art15/>

CC2: Automated Visibility Warning Systems

Examples of Implementation Section

1. Idaho Department of Transportation, I-84 Visibility Warning System, <https://ops.fhwa.dot.gov/weather/Publications/Case%20Studies/08.pdf>
2. Tennessee Department of Transportation, I-75 Fog Detection Warning System, https://ops.fhwa.dot.gov/publications/fhwahop12046/rwm24_tennessee1.htm
3. Arizona Department of Transportation, DUST Warning System, https://ops.fhwa.dot.gov/publications/fhwahop12046/rwm04_arizona.htm

References for Cost Section(s)

1. Maryland, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/D7E73D3356D8CD0185256FD4004A1104?OpenDocument&Query=Home>
2. New Mexico, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/CAAC83EC885FD09585257CAC005B8DC4?OpenDocument&Query=Home>

CC3: Bicycle Safety Systems

Examples of Implementation Section

1. Protected-Yet-Concurrent Phasing, <https://cpb-us-w2.wpmucdn.com/sites.northeastern.edu/dist/e/618/files/2020/07/2014-Mitigating-RT-Conflict-w-Protected-yet-Concurrent-Phasing.pdf>
2. Bicycle Tunnel Warning System, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/15601FCB13BA414785256DFA004A67DF?OpenDocument&Query=Home>
3. Bridge Bicycle Warning System, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/global_benchmarking/global_benchmarking.pdf
4. Northfield, Minnesota Bicycle Detection, <http://www.govtech.com/fs/Bike-Detection-Sensors-Installed-in-Minnesota-Intersections.html>
5. Pleasanton, California Radar Bicycle Detection, <http://www.cityofpleasantonca.gov/gov/depts/cd/traffic/information/intersector.asp>
6. Portland Springwater Corridor Trail, http://www.pedbikesafe.org/BIKESAFE/casestudies_detail.cfm?CM_NUM=36&CS_NUM=601
7. Bikescout, <https://fourtress.nl/en/cases/bikescout/>

Opportunities for Future Expansion Section

1. Connected Bicycles, <http://readwrite.com/2015/02/02/smart-cars-meet-smart-bikes-cyclist-detection-collision-avoidance/>
2. Prototype Instrumented Bicycles, <http://openaccess.city.ac.uk/6246/>
3. How will New Technology Affect Bike Safety, <http://bikeleague.org/content/how-will-new-technology-affect-bike-safety-congress-wants-know>
4. Info Cycle, <https://www.citylab.com/transportation/2015/07/ford-tries-to-figure-out-bicycles/397844/>
5. Bike Sense, <https://www.landover.com/experiences/news/jlrs-bike-sense-research.html>

References for Cost Section(s)

1. Pedestrian and Bicycle Information Center, http://www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf
2. Pleasanton, California, <http://www.cityofpleasantonca.gov/gov/depts/cd/traffic/information/intersector.asp>
3. Tunnel Warning System, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/15601FCB13BA414785256DFA004A67DF?OpenDocument&Query=Home>

CC4: Connected Vehicles

Examples of Implementation Section

1. I-80 Corridor Connected Vehicle Pilot, <https://www.its.dot.gov/pilots/wave1.htm>
2. Tampa-Hillsborough Expressway Authority (THEA) Pilot, https://www.its.dot.gov/pilots/pilots_thea.htm
3. Minnesota Department of Transportation Connected Vehicles Test, <http://www.dot.state.mn.us/mileagebaseduserfee/pdf/EvaluationFinalReport.pdf>

References for Cost Section(s)

1. V2I at a signalized intersection, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/26D0D89DC2F1144185257BB40064D1B6?OpenDocument&Query=Home>

CC5: Wrong Way Driver Detection & Warning System

Examples of Implementation Section

1. Doppler-Radar-Enhanced LED, <http://www.thruway.ny.gov/oursystem/maintenance/innovation.html>
2. Lonestar Software, http://sunguidesoftware.com/sunguidesoftware/documentlibrary/DragAndDropFTP/SunGuide_and_Lonestar_Review.pdf
3. SunGuide Software, http://sunguidesoftware.com/sunguidesoftware/documentlibrary/DragAndDropFTP/SunGuide_and_Lonestar_Review.pdf
4. Arizona, Wrong-Way Detection with Radar and LED Warning System, https://apps.azdot.gov/ADOTLibrary/publications/project_reports/PDF/az741.pdf
5. San Antonio, Radar & LED Warning Lights, <http://www.itsbenefits.its.dot.gov/ITS/benecost.nsf/ID/C2479CAB281B3CCE85257D6B00656EE9?OpenDocument&Query=BApp>
6. Rhode Island, Wrong-Way Detection & Warning System, <http://boston.cbslocal.com/2016/02/26/i-team-massachusetts-prevent-wrong-way-crashes/>

References for Cost Section(s)

1. Texas, <https://static.tti.tamu.edu/conferences/tsc13/presentations/design/gianotti.pdf>
2. Rhode Island, <http://boston.cbslocal.com/2016/02/26/i-team-massachusetts-prevent-wrong-way-crashes/>

CC6: Highway-Rail Crossing Safety Systems

Examples of Implementation Section

1. Low-Cost Highway-Rail Intersection Active Warning System Field Operational Test, http://www.dot.state.mn.us/guidestar/2001_2005/hri/HRI_Evaluation_Report_Final.pdf
2. Texas Department of Transportation Advanced Warning to Avoid Railway Delay (AWARD), <https://rosap.ntl.bts.gov/view/dot/62383>
3. German Railways KOMPAS Project, <http://ieeexplore.ieee.org/document/1212905/>
4. Connecticut Department of Transportation Four-Quadrant Gates, <https://www.fra.dot.gov/eLib/Details/L01587>

References for Cost Section(s)

1. Texas Department of Transportation Advanced Warning to Avoid Railway Delay (AWARD), <https://rosap.ntl.bts.gov/view/dot/62383>

CC7: Intersection Collision Warning System (ICWS)

Examples of Implementation Section

1. Minnesota Department of Transportation, <http://www.dot.state.mn.us/trafficeng/signals/conflictwarning.html>
2. M-44 & Ramsdell Drive; Michigan, <https://conservancy.umn.edu/handle/11299/642>
3. Intersection Collision Warning System in Georgia, <https://www.lrrb.org/media/reports/200728.pdf>
4. Olmsted County, Minnesota, https://safety.fhwa.dot.gov/local_rural/training/fhwasa12017/

References for Cost Section(s)

1. Minnesota, Missouri, and North Carolina, <https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/8bf13d916a5a205d8525822500536cae>
2. Minnesota Department of Transportation, <http://www.dot.state.mn.us/trafficeng/signals/conflictwarning.html>

CC8: Pedestrian Safety Systems

Examples of Implementation Section

1. Lumni Nation Haxton Way Pedestrian Path and Lighting Project, <https://www.youtube.com/watch?v=ltR2oiQ3R9Q>
2. Pedestrian Countdown Signals; Pinellas County, Florida, <https://www.fhwa.dot.gov/publications/publicroads/12janfeb/03.cfm>

CC9: Road Geometry Warning System

Useful Tips Section

1. Light Emitting Diodes, https://safety.fhwa.dot.gov/intersection/conventional/unsignalized/tech_sum/fhwasa09006/fhwasa09006.pdf

Examples of Implementation Section

1. Dynamic Curve Warning System, <https://www.fhwa.dot.gov/hfl/partnerships/tapco/hif13040/chap04.cfm> and <https://rosap.ntl.bts.gov/view/dot/29695>
2. Truck Tip-Over Warning System, <http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/4BB9C5BC5DBE3190852573ED00506C4C?OpenDocument&Query=CApp>
3. Overheight Warning System, http://www.syracuse.com/news/index.ssf/2011/10/state_department_of_transporta_2.html, http://www.syracuse.com/news/index.ssf/2016/07/state_meeting_tonight_on_onondaga_lake_parkway_improvements.html, and <https://2z5ifp15gecb2z5r2a2w9r8x-wpengine.netdna-ssl.com/wp-content/uploads/2019/05/2015-LRTP-2050-Report.pdf>
4. Narrows Oversize Vehicle Identification System, https://westerntransportationinstitute.org/research_projects/narrows-oversize-vehicle-identification-system-showcase-evaluation-13/

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References for Cost Section(s)

1. Overheight Warning System, https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C_07_10_final%20report.pdf
2. Michigan DOT, <https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/8ec22abb6993dc2f852573e8006f4504>
3. Maryland State Highway Administration, <http://www.itsbenefits.its.dot.gov/ITS/benecost.nsf/ID/98236BA2575978D9852578E300609565?OpenDocument&Query=BApp>
4. NY State DOT, http://www.syracuse.com/news/index.ssf/2011/10/state_department_of_transporta_2.html
5. Colorado Truck Tip-Over Warning System, <http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/4BB9C5BC5DBE3190852573ED00506C4C?OpenDocument&Query=CApp>
6. Overheight Vehicle Detection System, <https://rosap.ntl.bts.gov/view/dot/31978>

CC10: Smart Trucks

Examples of Implementation Section

1. Smart Truck Parking, <https://tsrc.berkeley.edu/smart-truck-parking-forecasting-parking-availability-truck-stops>
2. Drowsy Driver Warning System, https://www.nhtsa.gov/sites/nhtsa.gov/files/811886-assess_veh-based_sensors_4_drowsy-driving_detection.pdf
3. Blind Spot Assistance, <https://www.mercedesbenzofeaston.com/mercedes-benz-blind-spot-assist/>
4. Texas Two-Truck Automated Platoon Testing, <https://tti.tamu.edu/2016/12/01/follow-the-leader-two-truck-automated-platoon-test-is-a-winner-2/>

References for Cost Section(s)

1. DRSC, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/26D0D89DC2F1144185257BB40064D1B6?OpenDocument&Query=Home>
2. Safety System for HAZMAT, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/1ECB8913DD1DD4D98525717F006727CD?OpenDocument&Query=Home>
3. Infrared Camera and Image Processing System, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/EACB429BED05AB8D85257B11005DA20B?OpenDocument&Query=Home>

CC11: Speed Warning Systems

Examples of Implementation Section

1. Speed Warning Systems to Assist Buses in Rural School Zones, <https://rosap.ntl.bts.gov/view/dot/23211/>
2. Sequential Dynamic Curve Warning System, <https://intrans.iastate.edu/research/completed/evaluation-of-the-sequential-dynamic-curve-warning-system/>
3. Oregon's Dynamic Advanced Curve Warning System, https://www.researchgate.net/publication/229052180_Measuring_the_Impacts_of_Speed_Reduction_Technologies_A_Dynamic_Advanced_Curve_Warning_System_Evaluation

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Opportunities for Future Expansion Section

1. Investigation of the Use of an Feasibility of Speed Warning Systems, <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/811997-investusefeasspeedwarnsystt.pdf>
2. Investigation of the Use and Feasibility of Speed Warning Systems, <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/811996-investusefeasspeedwarnsys.pdf>

References for Cost Section(s)

1. Dynamic Speed Warning Feedback Signs, <https://www.fhwa.dot.gov/publications/publicroads/16marapr/04.cfm>
2. LEDs, https://safety.fhwa.dot.gov/intersection/conventional/unsignalized/tech_sum/fhwasa09006/fhwasa09006.pdf

CC12: Work Zone Safety Systems

Examples of Implementation Section

1. Michigan Department of Transportation, <https://aia.transportation.org/Documents/VSEntireFinalReport.pdf>
2. New Hampshire Department of Transportation, <http://rebuildingi93.com/>
3. Illinois Department of Transportation, <https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/dad03f2a5f203f228525730200634079>
4. Pennsylvania Department of Transportation, <https://www.roadbridges.com/case-fire>
5. Texas Department of Transportation, <https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/13326a2828c33693852581280063a477>
6. Mandated Use of Queue Warning Systems (IDOT), https://intrans.iastate.edu/app/uploads/2020/07/wz_back_of_queue_driver_behavior_assessment_w_cvr.pdf
7. Arkansas Highway and Transportation Department, https://ops.fhwa.dot.gov/wz/its/wz_comp_analysis/little_rock_ark.htm

Opportunities for Future Expansion Section

1. Netherlands, <http://www.mercurynews.com/2016/12/28/video-shows-teslas-new-radar-detect-accident-and-avoid-it/>

References for Implementation and Cost Section(s)

1. Ohio Department of Transportation, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/E1EAADABA5346DDD85256E00004811EF?OpenDocument&Query=Home>
2. Utah Department of Transportation, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/E6936952DD735F8385257D9A006E2792?OpenDocument&Query=Home>
3. Michigan, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/7BCF6AF201D9034185257C290071C972?OpenDocument&Query=Home>
4. North Carolina Department of Transportation, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/18C3C80CE95F9F1D85257253005B7D38?OpenDocument&Query=Home>
5. University of Minnesota, <https://cts-d8resmod-prd.oit.umn.edu/pdf/cts-11-02.pdf>

TM1: Access Control Gates

Examples of Implementation Section

1. WY-22 Teton Pass Closure Gates, https://westerntransportationinstitute.org/wp-content/uploads/2016/08/427972_Incident_Management_Guide.pdf
2. Minnesota Department of Transportation Automated Gate Testing, https://ops.fhwa.dot.gov/Weather/best_practices/1024x768/transform_param2.asp?xslname=pub.xsl&xmlname=publications.xml&keyname=146
3. Rocky Mountain National Park Entrance Gates, https://www.nps.gov/transportation/pdfs/NP_Entrance_Stations_Study.pdf
4. Iowa Department of Transportation Interstate Closure Gates, <http://www.news.iowadot.gov/newsandinfo/2010/10/new-mainline-interstate-closure-gates-to-be-tested-this-winter-.html>

References for Cost Section(s)

1. Minnesota Department of Transportation, here, http://www.dot.state.mn.us/guidestar/1996_2000/i90_i94_gate_operations/gatejackson01.pdf
2. South Dakota Department of Transportation, here, http://www.sddot.com/business/research/projects/docs/SD2001_08_Final_Report.pdf

TM2: Variable Speed Limit

Examples of Implementation Section

1. Elk Mountain Corridor, I-80, Wyoming, <https://rosap.ntl.bts.gov/view/dot/23969>
2. Fog, I-10; Mobile, Alabama, https://ops.fhwa.dot.gov/weather/best_practices/casestudies/001.pdf
3. Greenville County; South Carolina, US25, https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa12022/
4. Snoqualmie Mountain Pass, I-90, https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa12022/

References for the Cost and Implementation Section(s)

1. Annual Safety Benefit, <https://trid.trb.org/view.aspx?id=1288248>
2. Utah, <https://ops.fhwa.dot.gov/publications/fhwahop14008/fhwahop14008.pdf>
3. Snoqualmie Pass, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/ID/C2F9983AD6C6E78E85256DB100458933?OpenDocument&Query=CApp>

TM3: Geographic Information Systems (GIS)

Useful Tips Section

1. Free and Open-source GIS options, click here, http://www.giscorps.org/index.php?option=com_content&task=view&id=13&Itemid=48

Examples of Implementation Section

1. GIS Mapping to Match Workers with Transit and Jobs (Maryland), <http://www.trb.org/Main/Blurbs/153788.aspx>
2. Alabama Department of Transportation Rural Transit Asset Management System, <https://rosap.ntl.bts.gov/view/dot/16145>
3. Effects of Roadway Characteristics on Farm Equipment Crashes: A GIS Approach, https://iro.uiowa.edu/esploro/outputs/graduate/The-effects-of-roadway-characteristics-on/9983777230802771?institution=01IOWA_INST
4. Delaware Valley Regional Planning Commission, GIS Incorporated Safety Assessment, <http://www.dvrpc.org/reports/09020.pdf>
5. Idaho Transportation Department, IPLAN, https://www.gis.fhwa.dot.gov/documents/Cloud_Technologies_for_GIS.htm#idaho and <http://data-iplan.opendata.arcgis.com/>

TM4: Interconnected Signal System

Examples of Implementation Section

1. Green Light-Go: Pennsylvania's Municipal Signal Partnership, <http://www.dot.state.pa.us/Portal%20Information/Traffic%20Signal%20Portal/FUNDGLG.html>
2. Mountain View (SR-85) and Daybreak Parkway, <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1027&context=atspmw>

References for Cost Section(s)

1. Signal System Upgrade, http://www.dot.state.mn.us/guidestar/2001_2005/its_scoping_studies/d4/D4ITSScoping%20Report_final_April_2004.pdf
2. Interconnected Signal System Operation and Maintenance Costs, http://www.dot.state.mn.us/guidestar/2001_2005/its_scoping_studies/d4/D4ITSScoping%20Report_final_April_2004.pdf

TM5: Vehicle Detection

Examples of Implementation Section

1. Arizona Department of Transportation Wrong Way Detection, https://apps.azdot.gov/ADOTLibrary/publications/project_reports/PDF/AZ741.pdf
2. Texas Department of Transportation Advanced Dilemma-Zone Detection System, https://safety.fhwa.dot.gov/intersection/conventional/signalized/tech_sum/fhwasa09008/fhwasa09008.pdf
3. Low-Cost Portable Video-Based Queue Detection for Work-Zone Safety, <https://www.cts.umn.edu/publications/report/low-cost-portable-video-based-queue-detection-for-work-zone-safety>
4. Rhode Island Wrong Way Driving Detection, <https://www.roadsbridges.com/traffic-safety-wrong-way-driving-detection-system-effective-stopping-crashes-rhode-island>
5. I-35 Corridor Management, https://itsheartland.org/wp-content/uploads/2018/09/MCOMPRequirements_March2017.pdf

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References for Implementation Consideration and Cost Section(s)

1. A Summary of Vehicle Detection and Surveillance Technologies Use in Intelligent Transportation Systems, <https://www.fhwa.dot.gov/policyinformation/pubs/vdstits2007/index.cfm>
2. Microwave detector, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/82C7681AA5B85AD085257B1E005E1360?OpenDocument&Query=Home>
3. Video detector, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/D1839379FED7E96A85257B1E005DFC5F?OpenDocument&Query=Home>
4. Infrared detector, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/AEEA0B5614C83AFF85257B1E0052E433?OpenDocument&Query=Home>

TM6: Monitoring Travel Times and Speeds

Examples of Implementation Section

1. Anonymous Wireless Address Matching; College Station, Texas, <https://tti.tamu.edu/news/ttis-awam-getting-deployed-worldwide/>
2. Real-Time Travel Times During Construction, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
3. Sidefire Microwave Detectors in Wisconsin, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
4. Hurricane Evaluation Route in Texas, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
5. State Route 520 in Orange County, Florida, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
6. Snoqualmie Pass, Washington State, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
7. Real Time Modification of Variable Speed Limits in Maine, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
8. Automatic License Plate Reader, Arizona DOT, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>

References for Implementation and Cost Section(s)

1. Rural Data Collection Technology, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>
2. iFlorida, <https://ops.fhwa.dot.gov/publications/fhwahop13029/fhwahop13029.pdf>

TM7: Parking Management Systems

Examples of Implementation Section

1. Commercial Truck Parking Detection Study, <https://rosap.ntl.bts.gov/view/dot/31706>
2. Michigan Department of Transportation Smart Truck Parking, http://www.acecmi.org/uploads/4/2/3/0/42305689/smart_truck_parking.pdf
3. Billings, MT Parking Meter Upgrades, <https://ipsgroupsrl.eu/billings-considers-adding-smart-parking-meters-downtown-board-proposes-rate-increase/>
4. Yosemite National Park Day-Use Parking Reservation System, <https://www.nps.gov/yose/learn/news/yosemite-national-park-announces-pilot-program-for-day-use-parking-reservations.htm>
5. Mid America Association of State Transportation Officials (MAASTO) Truck Parking Information Management System, <https://trucksparkhere.com/>

TM8: Planned Special Event Management

Examples of Implementation Section

1. Sturgis Motorcycle Rally Traveler Information Coordination, <https://www.nwpassage.info/projects/downloads/6-1-event-summary-sturgis.pdf>
2. Montana State University Football Game Traffic, https://westerntransportationinstitute.org/wp-content/uploads/2016/08/4W1896_Final_Report.pdf
3. Purdue Football Commercial Cloud Navigation and Maps, <http://docs.lib.purdue.edu/roadschool/2015/posters/1/>
4. Washington State Fair, <http://www.thenewstribune.com/news/local/article25882570.html>

References for Cost Section(s)

1. Portable CCTV cameras, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/8611CCDEEF00F01985257C710054FB6F?OpenDocument&Query=Home>

TM9: Rural Traffic Management Center (TMC)/Traffic Operations Center (TOC)

Examples of Implementation Section

1. Traffic Management Center for Snoqualmie Pass; Washington State, <https://wsdot.wa.gov/travel/operations-services/traffic-management-centers-tmcs>
2. New Hampshire Traffic Management Center, <https://ops.fhwa.dot.gov/Publications/fhwahop14016/fhwahop14016.pdf>
3. District 2, Caltrans, http://westernstatesforum.org/Documents/2012/presentations/CaltransD2_Turnbull_FINAL_FEN-TMCPrequel.pdf

References for Cost Section(s)

1. (Defunct) Small Area Capital Costs, [http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCosts?ReadForm&Subsystem=Transportation+Management+Center+\(TM\)](http://www.itscosts.its.dot.gov/its/benecost.nsf/SubsystemCosts?ReadForm&Subsystem=Transportation+Management+Center+(TM))

TM10: Adaptive Signal Control Technologies (ASCT)

Examples of Implementation Section

1. Michigan Department of Transportation (MDOT), <https://www.michigan.gov/mdot/about/commissions-councils-committees/fhwa-partnership/edc/edc-1>
2. Virginia Department of Transportation (VDOT), http://www.virginiadot.org/vtrc/main/online_reports/pdf/15-r24.pdf
3. Colorado Department of Transportation (CDOT), <https://www.codot.gov/programs/research/pdfs/2012/adaptivesignaltiming.pdf>

References for Implementation and Cost Section(s)

1. Signal System Upgrade, https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/asct_brochure.pdf
2. ASCT Costs, <https://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/OD2A574BFB65316985257ABB00495C44?OpenDocument&Query=Home>

OM1: Weigh-in-Motion (WIM) Systems

Examples of Implementation Section

1. Indiana Department of Transportation's Virtual Weigh-in-Motion, <https://aii.transportation.org/Documents/VWIMV4011907.pdf>
2. New York Department of Transportation Thruway Authority, <http://www.thruway.ny.gov/oursystem/maintenance/innovation.html>
3. Florida's Virtual Weigh Station, <https://aii.transportation.org/Documents/VWIMV4011907.pdf>
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2. North Dakota Virtual Weigh-in-motion, <https://aii.transportation.org/Documents/VWIMV4011907.pdf>

OM2: Site Management During Avalanches

Examples of Implementation Section

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2. Avalanche Monitoring System, https://www.nationalruralitsconference.org/downloads/Presentations09/G2_Nepstad.pdf
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OM3: Global Positioning System (GPS) Data

Description Section

1. Third party GPS data, <https://www.nap.edu/read/23436/chapter/5>

Examples of Implementation Section

1. Roadkill Observation Collection System – Montana, https://westerntransportationinstitute.org/wp-content/uploads/2016/08/4W1039_Final_Report.pdf
2. Iowa Department of Transportation's Real-Time Traffic Conditions, <http://inrix.com/case-studies/iowa-dot/>
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2. Mariposa Association of Governments, https://azmag.gov/Portals/0/Documents/ITS_2011-10-27_Private-Probe-Vehicle-Data-for-RealTime-Applications-Final-Report.pdf?ver=2017-04-06-111211-720

OM4: Fixed Automated Spray Technology (FAST)

Examples of Implementation Section

1. Buxton Bridge, North Dakota, <http://library.nd.gov/statedocs/UGPTI/DP21920091214.pdf>
2. I-90, Washington State, <https://www.codot.gov/programs/research/pdfs/2014/benefit-cost-analysis-of-cdot-fixed-automated-spray-technology-fast-systems/view>
3. I-215, Utah, <https://www.codot.gov/programs/research/pdfs/2014/benefit-cost-analysis-of-cdot-fixed-automated-spray-technology-fast-systems/view>
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ES1: Next Generation 911

Description Section

1. States that have implemented NG911, http://www.nena.org/?page=NG911_StateActivity

Examples of Implementation Section

2. Rural Illinois NG911, <http://www.rmediagroup.com/Features/FeaturesDetails/FID/385>
3. Hardin County, Tennessee NG911, <https://www.prnewswire.com/news-releases/hardin-county-dials-att-for-next-gen-9-1-1-services-140859323.html>
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1. Estimated Capital Costs, https://apps.fcc.gov/edocs_public/attachmatch/DOC-309744A1.pdf

ES2: Smartphone Applications for First Responders

Examples of Implementation Section

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2. CrashHelp, <https://www.cts.umn.edu/research/project/minnesota-field-test-of-crashhelp>
3. Life Source Health, <https://www.businesswire.com/news/home/20160713006340/en/Lifesource-Health-Inc.-Launches-At-The-Scene-Mobile-EMS-Application>

ES3: Crash Reporting

Examples of Implementation Section

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2. North Carolina State Highway Patrol, GPS Tracking and Event Capture to Document Enforcement Activities, <http://www.trb.org/Publications/Blurbs/159135.aspx>
3. ReportWISE (Ohio), <http://www.noris.org/law-enforcement/fieldin-car-reporting/>

References for Cost Section(s)

1. Illinois Mobile Capture and Reporting (MCR) System, <http://www.trb.org/Publications/Blurbs/159135.aspx>

ES4: Automatic Crash Notification System

Examples of Implementation Section

1. SOSMART Smartphone Application, <http://www.sosmartapp.com/>
2. Minnesota Department of Transportation, Mayday Plus, http://www.dot.state.mn.us/guidestar/1996_2000/mayday_plus.html
3. Erie County, NY, <http://www.itsbenefits.its.dot.gov/ITS/benecost.nsf/ID/7A0A47F40911538E85256CB40057579D?OpenDocument&Query=Home>

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2. Aftermarket Automatic Crash Notification System Cost, <http://www.itscosts.its.dot.gov/its/benecost.nsf/ID/77CCD7BBA14039BC852573EC004F8DD5?OpenDocument&Query=Home>

ES5: Emergency Vehicle Traffic Signal Preemption

Examples of Implementation Section

1. City of Savannah, Georgia, <http://www.itsbenefits.its.dot.gov/ITS/benecost.nsf/ID/683105242E3289FB852578F400682B86?OpenDocument&Query=BMeasure>
2. City of Bismarck, North Dakota, http://bismarcktribune.com/news/local/govt-and-politics/snow-plow-drivers-to-be-allowed-to-control-traffic-signals/article_bf41e430-54b9-11e4-a6d0-3bbb76ce0926.html

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2. Signal Preemption Emitter, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/71861BA0698DD3F285257AD0007B0D4D?OpenDocument&Query=Home>

ES6: Unmanned Aerial Systems (UAS)

Examples of Implementation Section

1. Lancashire Fire and Rescue, <https://www.airmedandrescue.com/latest/news/lancashire-fire-and-rescue-shows-new-drone>
2. Healthcare Integrated Rescue Operations (HiRO), <https://www.wmcarey.edu/news/carey-medical-college-develops-fully-equipped-telemedical-drone>
3. Ambulance Drones, <https://www.tudelft.nl/en/ide/research/research-labs/applied-labs/ambulance-drone/>
4. Michigan Tech Research Institute (MTRI) UAS Study, <http://www.mtu.edu/news/stories/2014/january/michigan-tech-researches-feasibility-drone-use-transportation.html>
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2. Montgomery County, TX, <http://www.governing.com/topics/public-justice-safety/gov-rise-and-fall-of-drones.html>

STW1: Integrated Weather Monitoring/Prediction Systems

Examples of Implementation Section

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2. Idaho Department of Transportation (IDT) Winter Maintenance, http://www.ops.fhwa.dot.gov/publications/fhwahop12046/rwm10_idaho1.htm
3. Minnesota Department of Transportation, http://denethor.wlu.ca/pc300/projects/library/anti_icing10.pdf
4. Iowa Department of Transportation, https://intrans.iastate.edu/app/uploads/2018/09/dynamic_advisory_messaging_analysis_phase_II_w_cvr.pdf

Useful Tips

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References for Cost Section(s)

1. Abilene, TX, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/D27480A34665479585256E0B004B3CE7?OpenDocument&Query=Home>
2. Anchorage, AK, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/D88CAD0E224F8DD685257693007544F3?OpenDocument&Query=Home>

RTM1: Coordinated Rural Transit Service

Examples of Implementation Section

1. Liberty, <https://www.citylab.com/navigator/2016/07/how-an-uber-copycat-can-fill-the-transportation-gap-in-rural-nebraska/490769/>
2. Via and RTD (Colorado), <https://onlinepubs.trb.org/onlinepubs/conferences/2014/Paratransit/Presentations/RichBurns.pdf>
3. Menominee Regional Public Transit, <https://www.mitwbus.com/MRPT.html>
4. Capital Area Rural Transportation System (CARTS), <http://www.ridecarts.com/>
5. Lower Savannah Aging, Disability & Transportation Resource Center (Aiken, South Carolina), https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA_Report_No._0065.pdf

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RTM2: Automated Stop Announcement Systems

Examples of Implementation Section

1. Island Explorer Shuttle, <https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/d0ca6a4f4b8404998525733a006d5751>
2. Halifax Transit, <https://www.halifax.ca/transportation/halifax-transit/transit-technology/automated-stop-announcements>
3. Metro Transit, <https://bringmethenews.com/minnesota-news/metro-transit-buses-will-automatically-announce-stops-route-info>

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RTM3: Automatic Vehicle Location (AVL) on Agency and Public Vehicles

Examples of Implementation Section

1. METropolitan Special Transit, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/ID/5B58808168DD787E852573E9005C7F3F?OpenDocument&Query=CApp>
2. Pennsylvania Department of Transportation, http://www.penndot.gov/TravellnPA/Documents/Automated%20Vehicle%20Location%20System_October%20kickoff%20press%20event.pdf

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TTI1: Highway Advisory Radio (HAR)

Useful Tips Section

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Examples of Implementation Section

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2. Grand Canyon National Park, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/ID/AC4B3EEEE1277C9E852578550053AB97?OpenDocument&Query=CApp>
3. Florida Department of Transportation, <https://rosap.ntl.bts.gov/view/dot/39562>

TTI2: Crowdsourced Data

Examples of Implementation Section

1. Iowa Department of Transportation Waze Connect Citizen Program, <http://www.news.iowadot.gov/newsandinfo/2015/08/iowa-dot-joins-waze-connected-citizens-program-to-give-motorists-in-iowa-access-to-more-real-time-tr-1.html>
2. Citizen Reporting Programs for Winter Weather, https://ops.fhwa.dot.gov/weather/best_practices/citizenreportingcrc/index.htm
3. Idaho Transportation Department Citizen Reporting, <http://511.idaho.gov/>
4. California Roadkill Observation System (CROS), <http://www.wildlifecrossing.net/california/>
5. Safe Routes Portland App, <https://www.oregonmetro.gov/news/taking-streets-communities-inform-where-invest>
6. Crowdsourced Bicycle Data, http://ppms.trec.pdx.edu/media/project_files/NITCN-RR-857_Final_Report.pdf

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1. FHWA Pooled Fund North/West Passage project, <https://www.nwpassage.info/projects/downloads/10-3-citizen-reporting-final-summary-report.pdf>

TTI3: Dynamic Message Signs (DMS)

Useful Tips Section

1. Public Opinions of DMS Safety Messages, <https://ruralsafetycenter.org/wp-content/uploads/2016/10/fhwahop16048.pdf>

Examples of Implementation Section

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2. Kansas DOT, <http://www.kandrive.org/kandrive>
3. Grand Canyon National Park (Arizona), https://westerntransportationinstitute.org/research_projects/grand-canyon-natl-park-variable-message-sign/
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TTI4: Integrated Traveler Information Systems

Examples of Implementation Section

1. One Stop Shop, <http://oss.weathershare.org/>
2. Regional Integrated Traveler Information System, <https://transportationops.org/publications/regional-integrated-transportation-information-system-ritis>
3. I-95 Corridor Coalition Traveler Information, <https://rosap.ntl.bts.gov/view/dot/3823>

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3. 511 Annual Cost Examples, <http://www.itscosts.its.dot.gov/its/benecost.nsf/ID/DE036516C6B910C3852572DD0064D08C?OpenDocument&Query=Home>

TTI5: Social Media

Description Section

1. Social Norming in Montana, <https://www.ncbi.nlm.nih.gov/pubmed/20619177>

Examples of Implementation Section

1. North Central Regional Transit District – New Mexico Facebook, <https://www.facebook.com/ridethebluebus/>
2. North Central Regional Transit District – New Mexico Twitter, https://twitter.com/Ride_TheBlueBus
3. Montana Department of Transportation Facebook, <https://www.facebook.com/montanadot/>
4. Montana Department of Transportation Twitter, <https://twitter.com/mdtroadreport>
5. Alaska Department of Transportation, https://www.instagram.com/alaska_dotpf/

TTI6: Public Transportation Trip Planner

Examples of Implementation Section

1. Mountain Line Bus – Missoula, Montana, <http://www.mountainline.com/rider-services/trip-planner/>
2. Transit and Trails, www.transitandtrails.org

References for Cost Section(s)

1. Custom Software, <http://www.itscosts.its.dot.gov/ITS/benecost.nsf/0/DDD081474191C87C852578CD00622144?OpenDocument&Query=Home>
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This material is based upon work supported by the U.S. Department of Transportation under Cooperative Agreement No. DTFH6114H00021. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author(s) and do not necessarily reflect the view of the U.S. Department of Transportation.