Solving Traditional Mobility Challenges with New Technologies

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Smart City Solution Case Studies

- Flooded Roads – Sea Isle City, NJ
- Overheight Vehicles – Augusta, ME
- Wrong-Way Drivers – Austin, TX
- Pedestrian Safety – Orono, ME
Flooded Roads – Sea Isle City, NJ

- Problem: Streets frequently flood around the city, leaving drivers with limited mobility options
  - City is located 7 feet above sea level
  - High tide at night creates flooded roads
  - Drivers are unsure which streets are safe
Flooded Roads – Sea Isle City, NJ

- Traditional Solutions
  - Water height level markers
  - Temporary high water signs
Flooded Roads – Sea Isle City, NJ

- Enhanced Smart City Solutions
  - Sensors to detect current water level
  - LED-enhanced warning signs
  - Only flashes when water is present on road, above a set height threshold
Flooded Roads – Sea Isle City, NJ

- Enhanced Smart City Solutions
  - Real-time notification of affected roads
  - Image verification of alert source
Overheight Vehicle Collisions – Augusta, ME

- Problem: Trucks & trailers travel under an overpass when they exceed the maximum height limit
  - Freeway overpass along I-95
  - Most of the time, overheight vehicles do not stop
  - Collisions damage both the vehicle and the roadway infrastructure
Overheight Vehicle Collisions – Augusta, ME

- Traditional Solutions
  - Upcoming bridge height limit
  - Physical height warning bars
Enhanced Smart City Solutions

- Sensors to detect overheight vehicles
  - Redundant beam-break sensors for increased confidence, vehicle direction detection capability
- Dynamic triggered blank-out warning signs
  - Illuminates “Overheight Vehicle” warning only when sensors detect an overheight vehicle

Overheight Vehicle Collisions – Augusta, ME
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- Enhanced Smart City Solutions
  - Real-time notification with image of overheight vehicle
Overheight Vehicle Collisions – Augusta, ME

- Enhanced Smart City Solutions
  - OCR license plate recognition for vehicle identification
Wrong-Way Drivers – Austin, TX

- Problem: Vehicles turning onto a freeway offramp and entering the expressway traveling in the wrong direction
  - New roadway built, 45SW tollway connects State Loop 1 to FM road 1626
  - Impaired, elderly, and confused drivers are the most frequent wrong-way drivers
  - Several offramps are located on hills and curves, so right-way drivers have little time to see and react to a wrong-way vehicle
Wrong-Way Drivers – Austin, TX

- Traditional Solutions
  - Wrong Way signs posted near end of offramp
  - Guide arrows painted on pavement
Wrong-Way Drivers – Austin, TX

- Enhanced Smart City Solutions
  - Sensors to detect wrong-way vehicles
    - Thermal imaging sensors provide accurate vehicle detection in any condition: day, night, rain, snow, sunlight, even detecting vehicles without headlights
  - LED-enhanced wrong-way alerts
    - Red beacons capture driver’s attention and warn them of mistake
    - LED-enhanced signage emphasizes “Wrong Way” legend printed on sign
Wrong-Way Drivers – Austin, TX

- Enhanced Smart City Solutions
  - Real-time notification of wrong-way driving incident
  - Image verification of wrong-way vehicle
  - Automatic DMS message plans and CCTV camera control through API software integration
Wrong-Way Drivers – Austin, TX

- Enhanced Smart City Solutions
  - Connected Vehicle messages sent to cars and warnings displayed inside vehicles, to wrong-way and right-way drivers
Pedestrian Safety – Orono, ME

- Problem: Pedestrians crossing the street at non-signalized intersections can be struck by inattentive drivers
  - Student parking lot across street from campus buildings, frequently crossing
  - Busy road with pedestrian crossing has curves and obstructing trees, leaving little time for drivers to see pedestrians
Pedestrian Safety – Orono, ME

- Traditional Solutions
  - Static pedestrian crossing signs
  - Crosswalk indicator lines painted on pavement
Pedestrian Safety – Orono, ME

- Enhanced Smart City Solutions
  - Sensors to detect pedestrians crossing street
    - Thermal imaging sensors detect pedestrian location and direction, and can be programmed to only detect in certain zones
  - LED-enhanced pedestrian crossing warnings
    - Rapid Rectangular Flashing Beacons (RRFBs) have been proven to be effective at drawing attention of drivers
    - LED-enhanced pedestrian crossing signs provide increased visibility
Pedestrian Safety – Orono, ME

- Enhanced Smart City Solutions
  - Cell modem connectivity allows real-time monitoring and control
    - Programmable flash schedules based on time-of-day for school zones
    - Status monitoring and alerting of system diagnostics such as battery, temperature, and beacon malfunction
  - Connected Vehicle messages sent to cars and warnings displayed inside vehicles for pedestrians in crosswalk ahead
Questions