Innovating transportation solutions that strengthen Utah’s economy and enhance quality of life.

- Zero Crashes, Injuries, Fatalities
- Optimize Mobility
- Preserve Infrastructure

LTDOT
Keeping Utah Moving
UDOT Assets

- 85,000 sq mi land area
- 16,000 lane miles
- 1,888 structures
- 1,600 employees
- $30 billion of inventory
- 97,000 signs
I-15 Reconstruction
Congestion Pricing

Layton City
To
Spanish Fork City

~62 miles
Geofoam Embankments
Construction Manager-General Contracting
Continuous Flow Intersection
Diverging Diamond Interchange
ThrU-Turns
Multimodal Projects and Partnerships

- Airport TRAX
- University TRAX / 400 South
- 3500 South/MAX Bus Rapid Transit
- I-15 CORE/FrontRunner South
- Inter-Regional Corridor Alternatives Analysis
- Mountain View Corridor
- Utah Collaborative Active Transportation Study
- I-15 State Street/North-South TRAX
Technical Teams Working Together

Innovation Working Group

Statewide Transportation Innovation Council (FHWA)
Research UTRAC Forum
Communications Division
TRB Attendees
Grant Writing

EDC
Subject Matter Experts at UDOT
SharePoint Team
Solicitation and Communication of Innovations Statewide
National Committee Members
Learning Management

SHRP 2
Annual Conference Awards
Technical/Division Team Meetings
Quarterly Leadership Book Discussions
Innovation Report Timeline

1) REGIONS AND GROUPS
   SUBMIT FACT SHEETS
   • Efficiencies
   • Innovations
   • TRB Idea Implementation
   • SUCCESS Framework initiatives

2) RESEARCH
   COMPILES SUBMITTED FACT SHEETS INTO COMPREHENSIVE EFFICIENCIES LIST

3) LEADERSHIP
   REVIEWS EFFICIENCIES LIST AND SELECTS TOPICS TO BE HIGHLIGHTED IN INNOVATION AND EFFICIENCY REPORT

4) REGIONS AND GROUPS
   PREPARE WRITE-UPS ON SELECTED TOPICS

5) RESEARCH
   COMPILES REPORT

6) COMMUNICATIONS OFFICE
   COORDINATES SHARING OF REPORT WITH:
   • THE PUBLIC
   • KEY STAKEHOLDERS
   • EMPLOYEES
   • INDUSTRY PARTNERS

HOW YOU CAN SHARE UDOT'S STORY
• UDOT's blog
• Social media
• Fact sheets
• Staff meetings
• Share with consultants and contractors
• Mention in meetings with local government/businesses
• Presentations

You can find past reports at this link: udot.utah.gov/go/innovation

SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER | JANUARY-AUGUST

- Hydrodemolition Bridge Rehabilitation
- Flashing Yellow Arrow for Left Turns
- Portable Weather Station
- Variable Speed Limit
- Tow Plows
- Wildlife and Vehicle Safety
- 3D Design and Automated Machine Guidance
- Precast Concrete Pavement Panels
Innovation & Efficiencies Report

- Grate Lifter
- Region Four Water Truck
- Truck and Trailer Electrical Test Box
- Three-Year Maintenance Planning Tool
- Storm Management Dashboard
- Intelligent Design and Construction
- Real-Time Pavement Smoothness
- Unmanned Aircraft Systems
- Moab Adaptive Signal Control
- Wind Mitigation for Signal Mast Arms
- P+T+Quality Bidding
- Electronic Signature Routing
- Statewide Utility License Agreements
- Statewide Access Management Program
- Transportation and Land Use Connection
- Bicycle & Pedestrian Counts Guidebook
Wet Weather, Nighttime, Plowable Markings

- Identified state-of-practice and emerging technologies
- Recessed LED markers
  - Promising technology for high-risk areas
  - Being tested in Washington and United Kingdom
- Areas identified to update UDOT’s Pavement Marking Decision Matrix
Aerial LiDAR to Update Highway Inventory

- Aerial LiDAR acquired to evaluate for asset mgmt use
  - I-84, I-15 and US-191
- Compared to Mandli data
- Pros:
  - Capture features not detected by mobile (e.g., drainage)
  - Less expensive, quicker
- Cons:
  - Lower resolution (miss smaller objects)
Sample Implementation Projects

- Guidebook for local governments
- Working with Active Transportation in Planning to promote it
- Developing a low-shrinkage, high-creep concrete for infrastructure repair
- Grassy Mountain Rest Area Westbound
Measuring Innovation Benefits

**Benefit/Cost** =

\[
\text{Number} \times \text{Value} \times \text{Percentage} / \text{Contract + TAC + PM costs}
\]

Note: Total program B/C includes projects where benefits could not be identified.
## Qualitative Benefits

- Pavement & bridge life extension
- Improved rehab & maintenance methods
- Highway design advancements
- Traffic control enhancements
- More efficient & trained staff
- Reduced materials costs
- More efficient equipment
- Better utilize existing equipment
- Improved management
- Congestion mitigation for commuters
- Crash avoidance
- Crash severity reduction
- Construction zone enhancements
- Noise reduction
- Avoid inefficient highway expenditures
- Modify standards to eliminate poor designs
- Replace specs that are unsuccessful
- Reassign staff where not productive
- Find alternatives to inferior technologies
- Informed staff & stakeholders
- Understanding industry advancements
- Knowledge of future trends & challenges
Innovation Benefits Results

- 2016 – B/C ≈ 14 on 66 projects worth $68.2 million
- 2010 – B/C ≈ 17 on 41 projects
- 2000 – B/C ≈ 12 on 22 projects
- 1995 – B/C ≈ 14 on 18 projects
STIC Projects

$100,000 Award with a 20% State Match
- 2014 Development of a 3D Utility Database
- 2015 3D Engineered Models as legal Documents in Construction
- 2016 Developing a Progressive Design Build RFP
- 2017 Submitted to Purchase a GIS Indexing Software
Accelerated Innovation Deployments

- 2014 Variable Speed Reduction in Active Work Zones - $775K
- 2015 E-Construction to Improve Business Practices - $626K
EDC – 4 Innovations

- Summit held in Sacramento - Dec. 1-2, 2016
  - UDOT pursuing 10 of the 11 Innovations
    - Automated Traffic Signal Performance Measures*
    - Collaborative Hydraulics
    - Community Connections
    - Data-Driven Safety Analysis
    - e-Construction & Partnering*
    - Pavement Preservation
    - Road Weather Management*
    - Safe Transportation for Every Pedestrian (STEP)
    - Ultra-High Performance Concrete Connections for PBES
    - Using Data to Improve Traffic Incident Management
Transportation Research