Autonomous Collection Vehicles: Testing the Equipment, Not the Driver

Mandli Communications – Michael Richardson, PE
About Mandli

• Established in 1983
• Based in Madison, WI
• Worked with over 30 State DOTs
• First pavement collection in 2002
• Michael Richardson, PE, with Mandli for over nine years
Autonomous Data Collection Vehicle
Autonomous Vehicle Adoption Timeline
How Do We Utilize This Technology?
Stage 1: Airports
Stage 1: Airports

San Bernardino International Airport

- LCMS Areas
- LiDAR Areas (Optional) (Shoulder Points)
The Visual Reference
Manual Collection Method
Traces from Manual Collection
Autonomous Collection Method
Autonomous Collection Method
From Manual
To Autonomous
Manual vs. Autonomous

- Increased Safety
- Reduced Collection Time
  - 4 to 6 hours manual
  - 1 to 1.5 hours autonomous
- No gaps, no secondary passes
How Do We Apply This to Roadways?
Stage 2: Validation Sites
Driver Wander is Always a Factor
Test the Equipment, Not the Driver
Hurdles

- **GPS Accuracy**
  - Strong signal required
  - Good visibility
  - Real-time differential
  - System integrity
- **SurPRO Path Alignment**
  - Narrow target
  - Visual vs. measured offset
- **Emerging Technology**
Emerging Technology
Future Development

- Testing on Established Validation Sites
- Integrations with 3D Systems
- Monitor Advancing Technologies