Building a Practical Solutions Culture at CDOT - Ryan Sorensen
Topics

- About CDOT
- What is Practical Solutions? and why Develop Practical Solutions?
- Background
- Workshops
- CDOT Accomplishment Example - US 160 / US 550
- Next Steps
• Colorado
• Decentralized Design and Construction
## About CDOT

### Purpose
To save lives and make lives better by providing freedom, connection and experience through travel.  

![2017 CDOT Logo](image)

### Values
Safety, people, integrity, customer service, excellence and respect are at the heart of all that we do.

### Summit
The best DOT in the country for all customers by focusing on our people, leading-edge technology and a healthy multi-modal system.

### Peaks

- **Technology**
  - Help Our People with Technology  
  - Big Data  
  - Improve Travel Experience with Technology

- **People**
  - Internal Customer Focus
  - Develop Leaders

- **System**
  - Asset Condition
  - Improve Customer Experience

### Base Camps

- Practical Solutions Tie to CDOT’s 3-Peaks
What

- Practical Solutions is a Pragmatic Way to Develop and Maintain the Highway System, as Opposed to “Building to The Ideal”.
- Focuses on Concepts such as:
  - Taking a Systems Based Approach to Problem Solving, as Opposed to Focusing on One Project
  - Thinking Outside of the Box
  - Quantification of Design Alternatives (PBPD)
  - Good Documentation

Why

- DOT’s Realize That We Will Never, “Build Our Way Out of It”.
- Smart Way of Doing Business.
Background

- Brought Forward by FHWA
- Formed a Committee of Statewide CDOT Design Experts to Review Industry Changes
- Created and Continually Improve a Plan
- Moving from 13 Controlling Criteria to 10 Controlling Criteria and Design Variance Process
Workshops

• 2016 - George Merritt and Hillary Isebrands
  From FHWA - Performance Based Practical Design and Highway Safety Manual - Workshop

• 2017 - Smart Growth America - Workshop

• Target Audience:
  • Planners, Resident Engineers, Designers, and Traffic Engineers
CDOT Practical Solutions Example

- US 550 / US 160 Continuous Flow Intersection
• Concrete Surface was built in 1991 with a projected 30 year lifespan. Pre-Project Condition:
  • Surface Rutting and Irregularities
  • Reduced Skid Resistance
  • General Surface Wear
CDOT Example – US 160 / US 550
Original Plan

- Interchange
- Plan from the 1970’s
- $40M to $60M Estimated for full Interchange Reconstruction
CDOT Example – US 160 / US 550

- Key Features
  - Resurface the Concrete Pavement
  - Construct a Turning Roadway in the Infield / Island Area to Facilitate a Continuous Flow Intersection at 550/160 with Signals Accordingly
  - Improvements at College Dr. Intersection
  - Add in Additional Islands and NCHRP 350 TL-2 Barrier Curb for Enhanced Safety
  - Pedestrian, ADA, and Bike Upgrades to US 550 at the Intersection and North
CDOT Example – US 550 / US 160

- Pre-Project Conditions
CDOT Example – US 550 / US 160

- Post-Project Conditions
CDOT Example – US 550 / US 160
Outcomes

• Concrete rehabilitation added 15 to 20 years of service life to the concrete.
• Project Cost Approximately $6 Million vs. $40 Million to $60 Million
• Increased Roadway Smoothness by 60%
• Restored Skid Resistance
• Improved Striping Including Addition of Bike Lane Striping
• Enhanced Safety for all Users
• Improved Operational Performance
Safety Performance

- Limited 1 Year Crash Data, But Initial Results are encouraging
- 1-Year Before vs. After Project, Intersection Crashes
  - Before = 34
  - After = 20
CDOT Example – US 550 / US 160

Outcomes

• Modeled Performance
• 4% Growth
  • US 160 / US 550
  • US 550 / College Ave.

| Table 5: Threshold PM Peak Hour Analysis – Overall Intersection Delay & LOS |
|---|---|---|---|---|
| **Intersection** | **2011 Existing** | **2011 Improvements to Both** | **2021 Improvements to Both** |
| | **Delay** | **LOS** | **Delay** | **LOS** | **Delay** | **LOS** |
| US 550 / US160 | 42.4 | D | 13.6 | B | 48.2 | D |
| College | 63.5 | E | 29.9 | C | 75.9 | E |

Source: Fehr & Peers, September 2011
CDOT Example – US 550 / US 160

- More Information
CDOT Next Steps

- Region Roadshows
- Bring in More Training and Workshops
- Get Official Support from our Chief Engineer and Executive Management
- Create a Process and Workflow
  - Traffic Safety and Operations
- Currently Updating CDOT’s Design Data Standard Forms
- Update the Variance Process and Other Guidance to Provide Greater Flexibility
  - Investigating Language, Example:
    - “Deviating from Standard” vs. “Sub-Standard”
- Build a Chapter into CDOT’s Roadway Design Guide - Planned for July 2018
- Primary Concerns
Questions / Resources

- US 160 / US 550 Project
- NCHRP Synthesis 443 - Practical Highway Design Solutions
- Smart Growth America
- NCHRP Report 785 Performance-Based Analysis of Geometric Design of Highways and Streets