HNTB Platinum Session 3A
Room 207

Session Title:
The Past, Current and Future in Transportation

Highway Safety Improvements
The Past, Present, & Future

Presenters:

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Agenda

- Project Overview
- HSIP and Low Cost Safety
- PennDOT D-06 Project Selection Process
- Typical Low Cost Treatments
- Benefits/Challenges
- Case Study
- Wrong Way Driving Program

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Project Overview

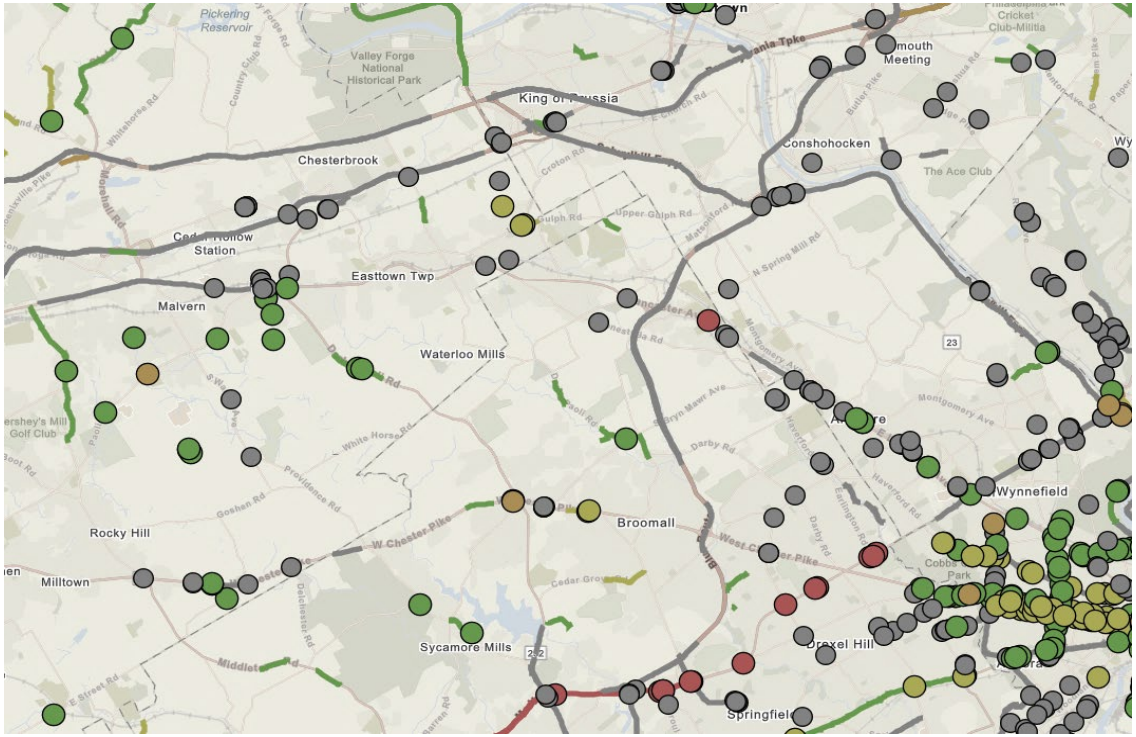
- Client: PennDOT District 6-0, King of Prussia, PA
- Low Cost Safety Improvements Project (Case Study 35% Crash Reduction)
- Highway Safety Improvement Program (HSIP)
- On-Demand Design and Construction

HSIP and Low Cost Safety?

- Definition: Implementation of effective low cost countermeasures with purpose to reduce the numbers of crashes, injuries and fatalities across the district.
- $1,000 to $50,000 per intersection
- Treatments Include:
  - Signing
  - Pavement Markings
  - Delineation
  - Edge Line, Centerline, and Traverse Rumble Strips
  - High Friction Surface Treatment
  - Guide Rail

PennDOT's Project Selection Process

- Crash Clusters
  - Definition: an intersection or roadway segment which experiences a high frequency of crashes
- GIS Mapping



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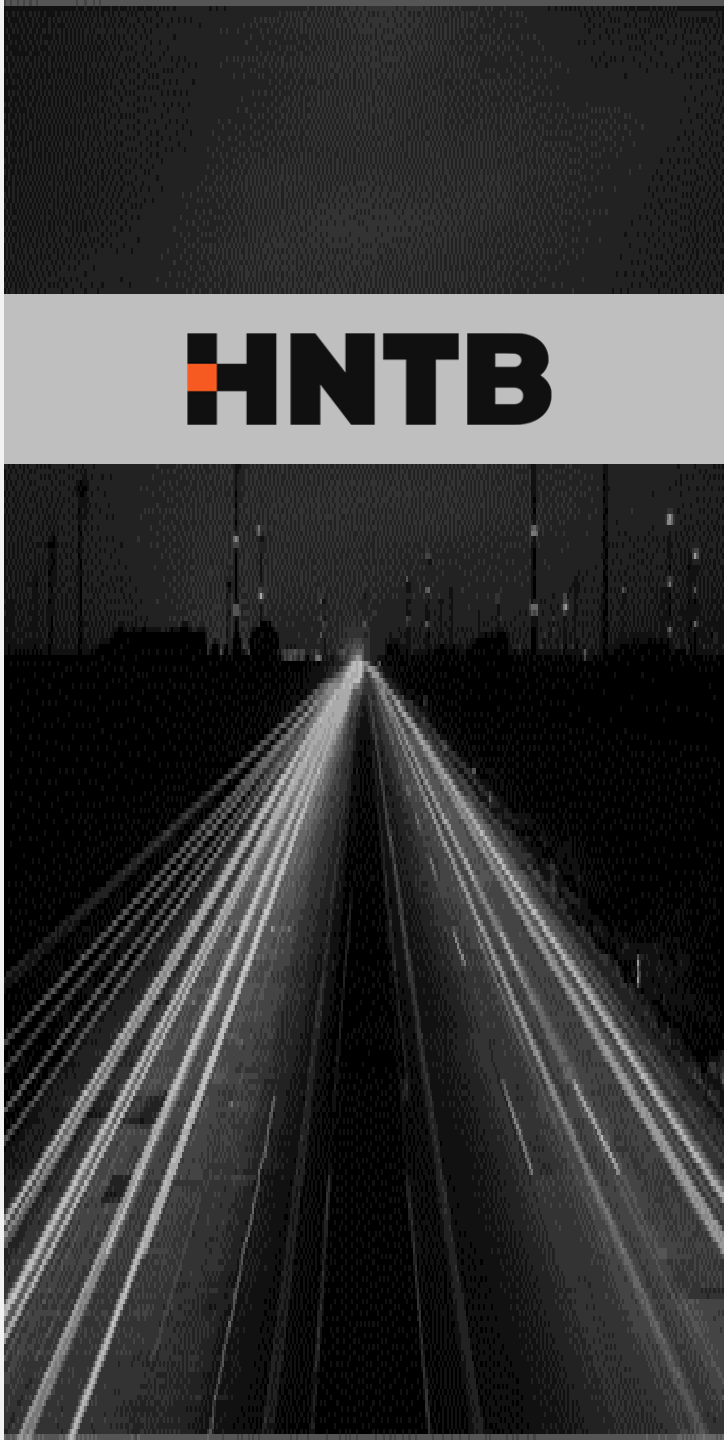
Existing Conditions and Plan Production

- Pennsylvania Spatial Data Access (PASDA)
- Google
- Field View
  - Sight Distance
  - Ball Banking
  - Widths, Offsets, Slopes
  - Go-Pro Video Log
- Lidar

What Are The “Typical” Treatments?



Curve Improvements

- Advance Warning Signs
  - 10 Times Posted Speed (Example: 35 mph we would space 350’ in advance)
  - Larger Signs 36” x 36”
  - Retroreflective Stripes
  - “Double-Up” Signs
  - Curve advisory
- Chevrons and Arrows
- Pavement Marking Legends
- Delineation
- High Friction Surface Treatment
- FHWA Evaluations of Low Cost Safety Improvements Study – Curve Improvements
  - 18% reduction in injury and fatal crashes
  - 27.5% reduction of crashes in dark conditions

Curve Improvements

BEFORE:

AFTER:

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Curve Improvements

- Innovative/Experimental Treatments
  - Optical Speed Bars – Transverse stripes spaced at gradually decreasing distance which rationale is to increase drivers' perception of speed and cause them to slow.

Example Spacing Between Sequential Pairs of Optical Speed Bars.

Bars	Spacing (ft)	Bars	Spacing (ft)	Bars	Spacing (ft)
1-2	24	11-12	19	21-22	15
2-3	23	12-13	19	22-23	15
3-4	23	13-14	19	23-24	15
4-5	23	14-15	18	24-25	14
5-6	22	16-17	18	26-27	13
6-7	22	16-17	18	26-27	13
7-8	21	17-18	17	27-28	13
8-9	21	18-19	16	28-29	12
9-10	21	19-20	16	29-30	12
10-11	20	20-21	16	30-31	12

Intersection Improvements

- Advance Intersection Warning Signs
  - Name Plaques
- Advance Stop Ahead and Stop Signs
  - All-Way, “Cross Traffic Does Not Stop”, or Other Appropriate Plaques
- Pavement Marking Legends
- Dotted Extension Lines
- Minor Intersection Realignments
- Additional Turn Lanes
- Tree Trimming

Intersection Improvements

BEFORE:

AFTER:

Pedestrian Safety Improvements

- Pedestrian Signing
  - Downward pointing arrows and ahead plaques
- Continental Crosswalks
- Pavement Marking Legends

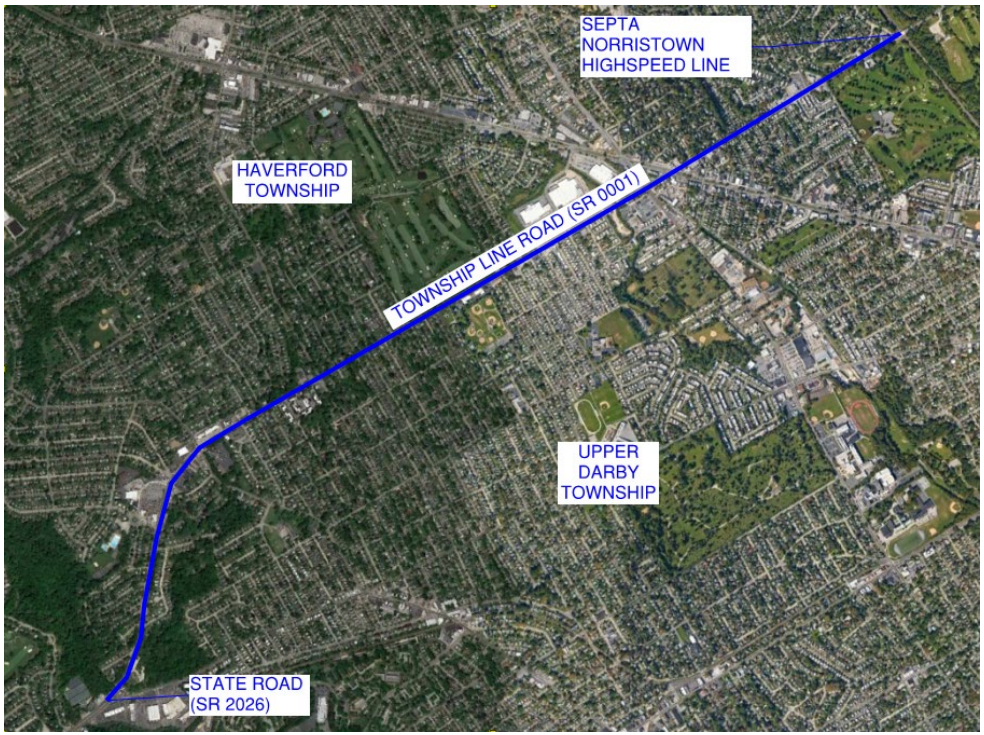
Benefits/Challenges

- Benefits
  - Increased Safety
  - Cost
  - Construction Timeline

- Challenges
  - Right-of-Way
  - Utilities
  - No Survey

Case Study

- Township Line Road (SR 0001), Haverford and Upper Darby Townships, Delaware County, PA
- Length = Approx. 3 Miles Corridor
- Cost – Approximately $1 Million
- Existing Issues include speeding and crashes due to left turns



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Case Study

- Traffic Calming
  - Reduced Lane and Shoulder Widths
  - Two-Way Left Turn Lane
- Signing Improvements – Included four radar display speed signs
- Paving – Included High Friction Surface Treatment
- Crash report reduction of 35% over two year period
- Two fatalities prior to treatments
- Reduction in crashes with injuries

BEFORE:

AFTER:

Wrong Way Driving Program