School Zone Flashers in Indianapolis, Indiana

March 7, 2018
Today’s Presentation

• Case Study
  • Project Initiation
  • Design
  • Construction
  • Maintenance

• Lessons Learned
Project Initiation

• Outdated & Conflicting Legislation
  
  • Original 1975 ordinance with minor revision in 2001
  
  • Reduced speed zone in effect from 7:00AM to 4:30PM School Days
  
  • Exact dimensions of zones based upon school property lines and posted speed limits
Project Initiation

• Outdated & Conflicting Signs
  • Many school zone signs did not use the fluorescent yellow/green placard
  • How the Department addressed the end of school zones was inconsistent
Project Initiation

• Observed non-compliance of motorists
  • General disregard to school zones
  • Motorists unsure of year round or balanced calendars
  • 9.5 hours per day of reduced speeds many of which there were no children present
Project Initiation

• How did we solve these problems?

  • Total revamp of school zone infrastructure
  
  • Applied for Highway Safety Improvement Program (HSIP) funds
  
  • Hired Shrewsberry & Associates to help evaluate need of nearly 400 schools.
School Flashers

- School Zone Speed Reduction Flashers
- Rectangular Rapid Flashing Beacons (RRFB)
Design Phase

- Design Procedure
  - IMAGIS base maps
  - Field measurements
  - Placement of flashers per ordinance
  - Detail and specifications for RRFB
Design Phase

• Design Challenges
  • Schools closing, temporary schools, schools for adults
  • ROW constraints
  • Posted speed is 25 mph
  • ADA
  • Constructability issues
  • Schedule/funding
Contract Documents

- Plans, quantities, estimates
- PCE for phase 1,2
  - PCE + RFI for phase 3
- Plat maps for phase 1,2
  - ROW cert for phase 3
- Proprietary materials phase 3
- Unique Special Provisions:
  - Speed flasher specs
  - RRFB specs package
  - “Modification” of speed flasher
  - Spare parts package
## Metrics

<table>
<thead>
<tr>
<th></th>
<th>Speed</th>
<th>RRFB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>166</td>
<td>32</td>
<td>198</td>
</tr>
<tr>
<td>Phase 2</td>
<td>240</td>
<td>20</td>
<td>260</td>
</tr>
<tr>
<td>Phase 3</td>
<td>110</td>
<td>24</td>
<td>134</td>
</tr>
<tr>
<td>Total</td>
<td>516</td>
<td>76</td>
<td>592</td>
</tr>
</tbody>
</table>

**Final Cost:**
- **CN** $4,490,000
- **PE** 4.2%
- **INSP** 12.7%
- **Total** $5.25 M
- **$8,871/flasher**
Construction Phase

- 3 separate projects were bid through INDOT using HSIP funds

- With 1 design firm, 2 contractors, and 2 inspection firms we have installed nearly 600 flashing beacons to date.

- Different methods of construction utilized
  - Traditional on-site foundation pour
  - Off-site foundation construction
Remote Programming & Monitoring

Issues:

• Programming requires site visit x 516 each year
• No way to adjust for weather events
• Rely on reports of malfunctions
Remote Programming & Monitoring

Solutions from RTC:
- AP22 Time Switch
- M2M Cellular Modem
- Guardian
- RTC Connect
RTC Connect Edit School Calendar

Select A Group
Bishop Chatard  Christ The King
International School of Indiana
Northview Middle School (8,3)
Park Tudor School (8,4)
St. Thomas Aquinas (8,5)
Flor Torrence School (8,6)
Nora Elementary School (8,7)
North Central High School (8,8)
Allisonville Elementary School
Spring Mill Elementary (8,10)
Greenbrier Elementary (8,11)
Westlane Middle School (8,12)
Indiana School for the Blind (8)
Indiana Math and Science Academy
St. Pius X Catholic School (8,1)
Colonial Christian School (8,16)
Eastwood Middle School (8,7)
St. Matthew Catholic School (8)
Sidener Academy for High Ability
John Strange Elementary School
Crooked Creek Elementary School
St. Monica Catholic School (8)
Tindley Renaissance Academy
Center for Inquiry & Immaculate
Eliza A Blaker School (8,21)
Fox Hill Elem School (8,26)
Hasten Hebrew Academy (8,2)
Indiana School for the Deaf (8)
International School of Indiana
Mary E. Nicholson School 70
The Orchard School (8,31)
Rousseau McClellan School 9

Master Group Selection
MG 8 Washington Towns

Dayplans for Bishop Chatard Christ The King School (8,1)

Holiday
Vacation
Normal
Monday Plan
Friday Plan
Early Dismissal/BCHS Mon
Early Dismissal/BCHS Normal
Early Dismissal/BCHS Fri
Good Friday
Unassigned
Override

Typical School Week
Sunday None
Monday Monday Plan
Tuesday Normal
Wednesday Normal
Thursday Normal
Friday Friday Plan
Saturday None

Select View
Previous Calendar
Show 9 Months

Select Date Range
2/1/2018

Next Calendar

Copy Paste
Clear Calendar
Undo
Finished
Lessons Learned

Project Initiation:
• Calendar research/programming
• Coordination with Council re: ordinance
• Communication with schools
Lessons Learned

Design Phase:
• Cost estimating
• 2\textsuperscript{nd} beacon was optional
• Submittal document changes – ROW, PCE
• RRFB approval revoked
Lessons Learned

Construction Phase:
  • Ensure contractors and inspectors have correct equipment
    • Laptops w/ internet access

  • Solar Limitations
    • Unobscured view of sky

  • Neighborhood complaints
    • NIMFY
Lessons Learned

Maintenance Phase:
- Adequate replacement parts
  - Improvement Rich -vs- Maintenance Poor

- “Manual mode” access switch placement
  - Unintended consequences of standards modification

- Stolen equipment (LED’s, visors, etc…)
  - Location has had 3 separate LED’s “borrowed”

- Knockdowns (intentional and non-intentional)
  - 36 incidents in less than 2 years
Contact Us

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