Construction Best Practices

• Deloitte has assisted with benchmarking and establishing construction best practices

• Preliminary recommendations include:
  • Single point accountability for construction projects
  • Use of Design/Build or Construction Manager-at-Risk where appropriate
Challenges

• **Silos impacted project delivery**
  - Engineering, construction, procurement and zoning issues handled by separate departments
  - No one individual responsible/accountable for project execution from conception to completion

• **CTA assumes bulk of project risk**
  - CTA holds contracts with architect/engineer, general contractor, program and construction managers
  - Not fully utilizing Chicago Transit Partners
  - Construction manager has limited authority over general contractor
  - Limited accountability of team members
Challenges

• CTP reporting doesn’t provide assistance for executive level decision-making
  • Difficult to determine on-time, on-budget, safety
• Pre-construction issues result in delays and increased project costs
“Womb to Tomb” Approach

- In September 2007, the CTA reorganized how it performs construction oversight.

- **Facilities**
  - Vice President Pat Taylor

- **Power & Way**
  - Director Chris Bushell
Facilities Maintenance & Construction

Major projects include:

1. Howard Station
2. Brown Line station expansion and modernization
3. New bus and rail washing facilities
Power & Way, Engineering & Construction

Major projects include:

1. Slow Zone elimination:
   - Blue Line O’Hare tie replacement
   - State Street Subway tie replacement
   - Track Department work:
     - North Main (north of Sheridan curve)
     - Dan Ryan (tamping, screw spike and rail replacement)
     - Ravenswood (repairs between Addison and Irving Park)

2. Signal renovations:
   - Blue Line, Congress to Jefferson Park
   - Loop

3. Block 37
Construction Performance Measures

On-Time
Based on original timeline

On-Budget
Baseline budget that doesn’t change

Safety Incidents
Goal of zero accidents
Construction Project Life Cycle

- No one manager accountable
Construction Mngt. Moving Forward

✓ Fully developed Capital planning with operational coordination

✓ One owner for the life of the project

✓ A budget and timeline that is baselined and fixed
CTP Program Manager Role Changes

**Before**
- Supplemental staffing but no direct responsibility
- Provided budgeting, estimating and financial reporting

**Now**
- Responsible for:
  - Construction zone within CTA stations and on right of way
  - Phasing construction work over the length of the project
  - Zoning analysis in planning phase of construction work
  - Coordinating public way and building permits
Chicago Transit Authority

Slow Zones
Slow Zones

✓ State of slow zones
✓ Work completed
✓ Work in progress
✓ Short-term needs: Phase 1
✓ Short-term needs: Phase 2
Slow Zone Removal by Feet & % of Total

- Prioritization of Slow Zones has begun to improve customers’ experience

<table>
<thead>
<tr>
<th>Month</th>
<th>Feet</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>242,018</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>242,018</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>260,328</td>
<td>9.6%</td>
</tr>
<tr>
<td>October</td>
<td>265,253</td>
<td></td>
</tr>
<tr>
<td>November (Mo. to date)</td>
<td>218,891</td>
<td></td>
</tr>
</tbody>
</table>
Slow Zone Removal by Feet & % of Total

- Prioritization of Slow Zones has begun to improve customers’ experience

- **July:** 242,018 FEET (20.5%)
- **August:** 242,018 FEET (20.5%)
- **September:** 260,328 FEET (22.0%)
- **October:** 265,253 FEET (22.5%)
- **November (Mo. to date):** 218,891 FEET (18.5%)

- **Total:** 9.6% decrease
Dearborn Subway

- Grand to Division

- Feet Removed: 18,000
- Timeline: Jul. – Sept. 2007
Red Line

- Southbound Morse to Loyola

Feet Removed: 2,775
Timeline: Aug. – Sept. 2007
Red, Purple and Brown Lines

- Armitage to Diversey

Feet Removed: 2,537
Timeline: May – Nov. 2007
Yellow Line

- Crawford Street crossing

Feet removed: 2,000
Timeline: Oct. to Nov. 2007
Red Line - State Street Subway

- Grand to Clark/Division

- Target: 8,000 ft.
- Timeline: Dec. 31, 2007

Nearly Complete
Red Line Slow Zone

Concrete molds ready for pouring
Red Line Slow Zone

Crews pouring concrete

Concrete half-ties curing in their molds

Old wooden tie
Red Line Slow Zone

Crews performing finishing work on half-ties
Blue Line – O’Hare Tie Replacement

- **Phase 1**: Harlem to Jefferson Park (25,000 ft.)
- **Phase 2**: Remaining areas (86,000 ft.)

**Target**: 111,000 ft.

**Timeline**:
- Phase 1: Dec. 24, 2007
- Phase 2: Oct., 2008
Blue Line Slow Zone

New plastic ties installed on O'Hare Branch
Blue Line Slow Zone

New plastic ties installed on O’Hare Branch
Blue Line Slow Zone

New plastic ties installed on O’Hare Branch
Blue Line Slow Zone

New plastic ties being installed on the O’Hare Branch
Blue Line Slow Zone

New plastic ties being installed on the O’Hare Branch
Blue Line Slow Zone

Ballast excavation on the O’Hare Branch
Blue Line Slow Zone

Rail being reinstalled on the O’Hare Branch
Blue Line Slow Zone

Rail being reinstalled on the O’Hare Branch
Blue Line Slow Zone

Rail being reinstalled on the O’Hare Branch
Red Line

- Southbound Wilson to Sheridan

- Granville
- Thorndale
- Bryn Mawr
- Berwyn
- Argyle
- Lawrence
- Wilson

- Targeted: 3,325 ft.
- Timeline: Dec. 31, 2007

Nearly Complete
Red Line - State Street Subway

- Harrison to North/Clybourn

- Targeted: 43,000 ft.
- Contract awarded: Nov. '07
- Timeline: Jan. – Dec. '08
Short Term Projects: $100 M.

1. Red, Brown & Purple Lines | Wellington/Diversey
2. Loop | Wabash - Lake
5. Green Line/Englewood | Structural Slow Zones
Red, Purple and Brown Lines

- Diversey to Wellington, Tracks 1 - 4

- Target: 5,000 ft.
- Scope: Selected Tie Replacement
- Timeline: Mar. – Dec. ‘08
Loop

- **Wabash to Lake**

  - **Target:** 9,500 ft.
  - **Scope:** Tie replacement to maintain safe conditions on elevated hub
  - **Timeline:** Mar. – Dec. ’08 (evenings/weekends)
Brown Line - Ravenswood

- Western to Southport

- Target: 17,500 ft.
- Scope: Tie/rail replacement, track upgrade, abandoned track removal on Ravenswood Loop
- Timeline: Mar. – Dec. '08
Red, Purple, Brown Lines

- Phase 1: Clark Jct. to Lawrence, Tracks 2 & 3
- Phase 2: Lawrence to Howard, Tracks 2 & 3

- Target: 30,000 ft.
- Timeline: Jan. – Dec. ’08
Green Line -- Englewood Structural Repair

• Scope: Repair structural elements to element slow zones
• Timeline: Jan. – Dec. ’08
### Phase 2 Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dearborn Subway Ties &amp; Rail</td>
<td>Brown Line Substations – Replace Ravenswood, Lincoln, Sedgwick &amp; Illinois; Rehab Kimball</td>
</tr>
<tr>
<td>Brown Line Signals – Replace equipment</td>
<td>(Not required for AC cars)</td>
</tr>
<tr>
<td>Red Line Substation Renewal</td>
<td>State, Princeton and Farwell</td>
</tr>
<tr>
<td>NM Signals</td>
<td>Clark Junction to Howard</td>
</tr>
<tr>
<td>Rehabilitate 3 Loop/Broadway Substations</td>
<td>E. Lake, Franklin &amp; Broadway</td>
</tr>
<tr>
<td>Loop Track</td>
<td>Wells to Van Buren</td>
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<tr>
<td>South Loop Connector Track</td>
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</tr>
<tr>
<td>Ravenswood-Loop Connector Ties</td>
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</tr>
<tr>
<td>Green Line Signals – Replace Equipment</td>
<td>(Not required for AC cars)</td>
</tr>
<tr>
<td>Dan Ryan Track, Ties, Rail &amp; Ballast Work</td>
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<tr>
<td>Evanston Branch</td>
<td>Track, Viaducts &amp; Retaining Walls</td>
</tr>
<tr>
<td>Purple Line</td>
<td>Clark to Howard</td>
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<tr>
<td>Congress Park</td>
<td>Rail</td>
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<tr>
<td>Jackson Park Ties</td>
<td>Rail</td>
</tr>
<tr>
<td>Central Signal Control</td>
<td></td>
</tr>
</tbody>
</table>

**Projects Total = $700 Mil.**