Capital Needs:
Mechanical
Coach Cars

- Deteriorating Conditions Widespread

Worn & Patched Seating

Floor Bulges & Patch Repairs

End Door Area

Patch Under Seating Area

Corrosion Damage
Coach Car Maintenance Needs

- This is an example of Metra’s schedule for the life of their coach cars.

<table>
<thead>
<tr>
<th></th>
<th>New Car</th>
<th>Mid-Life Rehab</th>
<th>Life-Extension Rehab</th>
<th>2nd Mid-Life Rehab</th>
<th>Car Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2000</td>
<td>Year 2000</td>
<td>Year 2012</td>
<td>Year 2024</td>
<td>Year 2036</td>
<td>Year 2048</td>
</tr>
</tbody>
</table>

Total Lifespan 48 Years
Coach Car Maintenance Cost

839 total cars ÷ 12 years per FTA guidelines = 70 cars eligible for rehab or replacement each year

53 Cars Rehabbed x $650K / Car = $34.45M / Yr
17 Cars Replaced x $2.75M / Car = $46.75M / Yr

Total Annual Cost = $81.2M / Yr
Locomotive Engine Failure

- Catastrophic failure @ 10+ years’ service
- Estimated repair costs $250k + labor hours

EXPLOSIVE FORCE EJECTED PARTS FROM ENGINE

Engine Block Damaged

Top of Piston Blown Away

DISINTEGRATED PISTON

BROKEN CYLINDER ASSEMBLY PARTS STREWN THROUGHOUT

CRANKSHAFT DESTROYED
Locomotive Corrosion Damage

- Cab Ceiling Over High-Voltage Cabinet
- Windshield Supporting Framework (Water Leaks)
- Cab Floor (above)
- Cab Sidewall (below)
## Locomotive Maintenance Needs

- This is an example of Metra’s schedule for the life of their locomotives.

<table>
<thead>
<tr>
<th></th>
<th>New Locomotive</th>
<th>Mid-Life Rehab</th>
<th>Life-Extension Rehab</th>
<th>Locomotive Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2000</td>
<td></td>
<td>Year 2012</td>
<td>Year 2024</td>
<td>Year 2036</td>
</tr>
</tbody>
</table>

Total Lifespan 36 Years
Locomotive Maintenance Cost

146 total locomotives ÷ 12 years per FTA guidelines = 12 locos eligible for rehab or replacement each year

8 Locos Rehabbed x $950K / Loco = $7.6M / Yr
4 Locos Replaced x $5M / Loco = $20M / Yr

Total Annual Cost = $27.6M / Yr
State of Good Repair

This is what a replacement and rehab program would need to look like, at a bare minimum, to keep us in a state of good repair.

Coach Cars
- Rehabilitate 53 cars per year - $650K x 53 = $34.45M / Yr
- Replace 17 cars per year - $2.75M x 17 = $46.75M / Yr

Locomotives
- Rehabilitate 8 locos per year - $950K x 8 = $7.6M / Yr
- Replace 4 locos per year - $5M x 4 = $20M / Yr

Total SOGR Annual Cost: $108.8M
FY13 Budget: $33.7M
Capital Needs: Engineering
Bridges

• There are 820 bridges in the Metra system that need periodic rehab and replacement.

\[
\frac{8.2 \text{ per year}}{100 \text{ yrs}} \int 820 \text{ Bridges}
\]

Cost = 8.2 X $7M / Bridge = $57M / yr

Actual Practice:

3 Bridges / yr X $7M = $21M

*FTA completely depreciates a bridge after 50 years.
Ties
Ties

- There are 3.8 million ties currently installed systemwide. Average lifespan is 25 – 35 years.

- Current Practice: 50k – 80k ties per year
  - $65k \times $155 \text{ / tie} = $10M per year

- Best Practice: 110k per year
  - $110k \times $155 \text{ / tie} = $17M per year
Grade Crossings
Grade Crossings

• There are 1,259 single track grade crossings systemwide. Average lifespan is 10 – 12 years. Current replacement cost is $125k per crossing.

Preferred 12 year replacement cycle:

\[
\frac{1,259 \text{ crossings}}{12 \text{ years}} = \frac{105}{\text{Yr}} \times $125K = $13.1M
\]

Actual replacement cycle:

45 per year \times $125K = $5.6M
Platforms
Platforms

- To rehabilitate platforms on a regular schedule:

  20 year rehab cycle:

  \[
  \frac{241 \text{ Station Platforms}}{20 \text{ per year}} = 12 \text{ / Yr} \times 750\text{K} = 9\text{M}
  \]

Current practice:

4 platforms / Yr \times 750\text{K} = 3\text{M} / \text{Yr}
There are 240 stations in the Metra system including the downtown stations.

Preferred Practice:

\[
\text{5 per year} \\
50\text{yrs} \quad \sqrt{241 \text{ Stations}}
\]

Cost = \(5 \times \$6M / \text{Station} = \$30M / \text{Yr}\)

Current Practice:

2 Stations / Yr \times \$6M = \$12M / \text{Yr}
Summary

• These are representative examples of the Engineering Department’s Capital needs and do not include the many other areas of assets that need funding such as the electrical, building and signal systems. The assets that the Engineering Department maintains are valued at roughly $13.8 billion and many of these assets, while safe, are past their useful lives.