Realities

- Limited state funds
  - 2008 road fund down $80+ million
- Need for roadway improvements
  - Safety
  - Mobility
- Unfunded short term needs
- More projects than funds
Objective and Goal

- Use available funds more efficiently
  - Address more needs faster
  - Complete more projects
  - Opportunities for balancing priorities system-wide

- Deliver an improved system with limited resources
Basic Needs-Road Costs

- 2 lane
  - $5.7-8.7 million/mile
- 4 lane
  - $18.9-23.9 million/mile
Basic Needs - Mobility

- Estimates of mobility
  - Delay
  - Speed
  - Time
  - Level of Service (rating of congestion)
Speed and Road Width

(4 Lane 12'/2')
Basic Needs - Safety

- Crashes happen with every roadway design
- Goal: Safety improvement
Safety Tradeoffs

- Practical (2 Lane 12'/8')
- Typical (4 Lane 12'/8')

Graph showing the relationship between crashes/year and roadway width (ft).
<table>
<thead>
<tr>
<th>Existing Cross Section</th>
<th>Crashes per Year</th>
<th>Travel Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Lane, 10 ft L, 2 ft S</td>
<td>5.4</td>
<td>41.4</td>
</tr>
<tr>
<td>Cross Section</td>
<td>Crashes per Year</td>
<td>Cost/Mile (millions)</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>2 Lane 12 ft L, 8 ft S</td>
<td>2.9</td>
<td>$7.2</td>
</tr>
</tbody>
</table>

4/2/2008
<table>
<thead>
<tr>
<th>Cross Section</th>
<th>Crashes Per Year</th>
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<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Lane 12 ft L, 8 ft S</td>
<td>2.4</td>
<td>$21.5</td>
<td>55.9</td>
<td>23.3</td>
</tr>
</tbody>
</table>

Miles improved w/$500 m
## Road Improvement Example

### Available budget $500 m to improve 2 lane roads

<table>
<thead>
<tr>
<th>Cross Section</th>
<th>Crashes per Year</th>
<th>Cost (millions)</th>
<th>Speed (mph)</th>
<th>Miles</th>
<th>Total Reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Lane, 10 ft/2 ft</td>
<td>5.4</td>
<td>--</td>
<td>41.4</td>
<td>--</td>
<td>173.5 367.8</td>
</tr>
<tr>
<td>2 Lane, 12 ft/8 ft</td>
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<td>$7.2</td>
<td>46.7</td>
<td>69.4</td>
<td>69.9 337.9</td>
</tr>
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</tbody>
</table>

**More miles, fewer crashes and fewer delays for same budget!**
KY Practical Solutions Principles-1

- Target the goals/objectives of the Purpose and Need Statement

Diagram:
- Target
- Alternatives
- Practical
KY Practical Solutions Principles-2

- Meet anticipated capacity needs

**Typical (4 Lane; LOS B)**

**Practical (2 Lane; LOS D)**

15,000 Vehicles per day
KY Practical Solutions Principles-3

- Evaluate safety compared to the existing conditions
KY Practical Solutions Principles-4

- Develop and evaluate design options and alternatives
KY Practical Solutions Principles-5

- Maximize design to the point of diminishing return
KY Approach

- Re-evaluate all projects
- Consider size/budget
- Cost savings
- Backlog shortened
- Safety/mobility improvements
Example 1

- Madison Pike (KY 17)
  Intersection Improvement Study
- Comprehensive plan for intersection improvements
- Current LOS F
Example 1

Traditional designs $5-$5.8 m
Example 1

Practical Design

Real issues:
Delay from side street;
no need for widening

Cost: $275,000

Budget gains $5 million
Example 2

- Bridge replacement over Lake Barkley and Kentucky Lake
- 1.8 miles
- High truck traffic
Example 2

Kentucky Lake (Looking East)

Lake Barkley (Looking East)

EXISTING TYPICAL SECTION
(Looking East)
Example 2

(3/3)

Budget gains $80 million
KY Next Steps

- Apply process
  - New projects
  - Planning
- Refine principles
- Develop tools
Summary

- More projects with same funds
  - Decreased traffic delays
  - Improved safety
- Potential for setting system-wide approach and priorities
- Appropriate and contextual design
Final Thoughts

- **Purpose and need**
  - Establish targets
  - Do not exceed them
- **Identify true problems**
- **Think beyond the standards**
- **Documentation**