The Design of a Practical Context

2015 Indiana MPO Conference

Tuesday, October 13, 2015

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A little KYTC history…

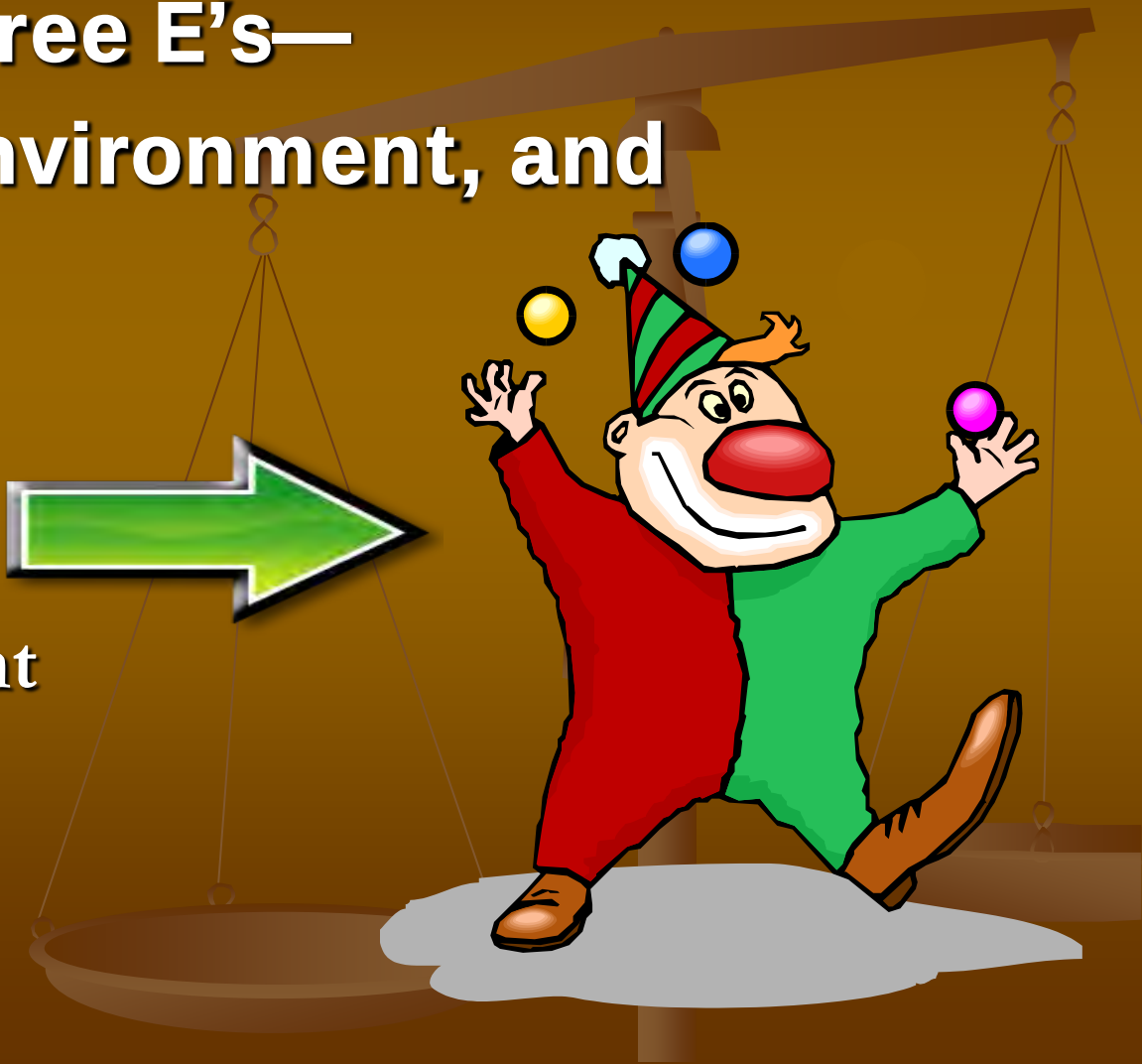
Context Sensitive Design / Solutions

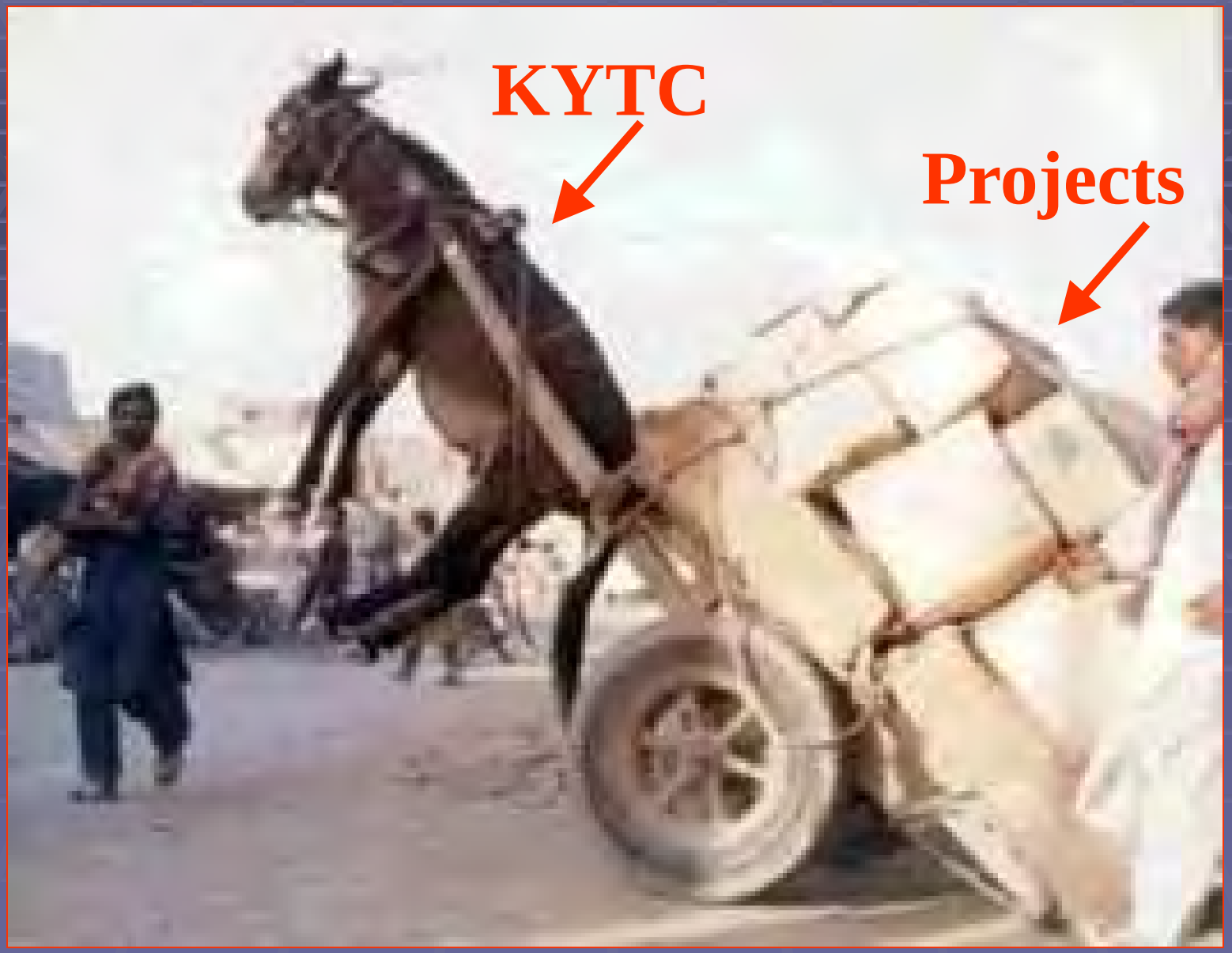
Project Development Philosophy

Juggling the three E's—

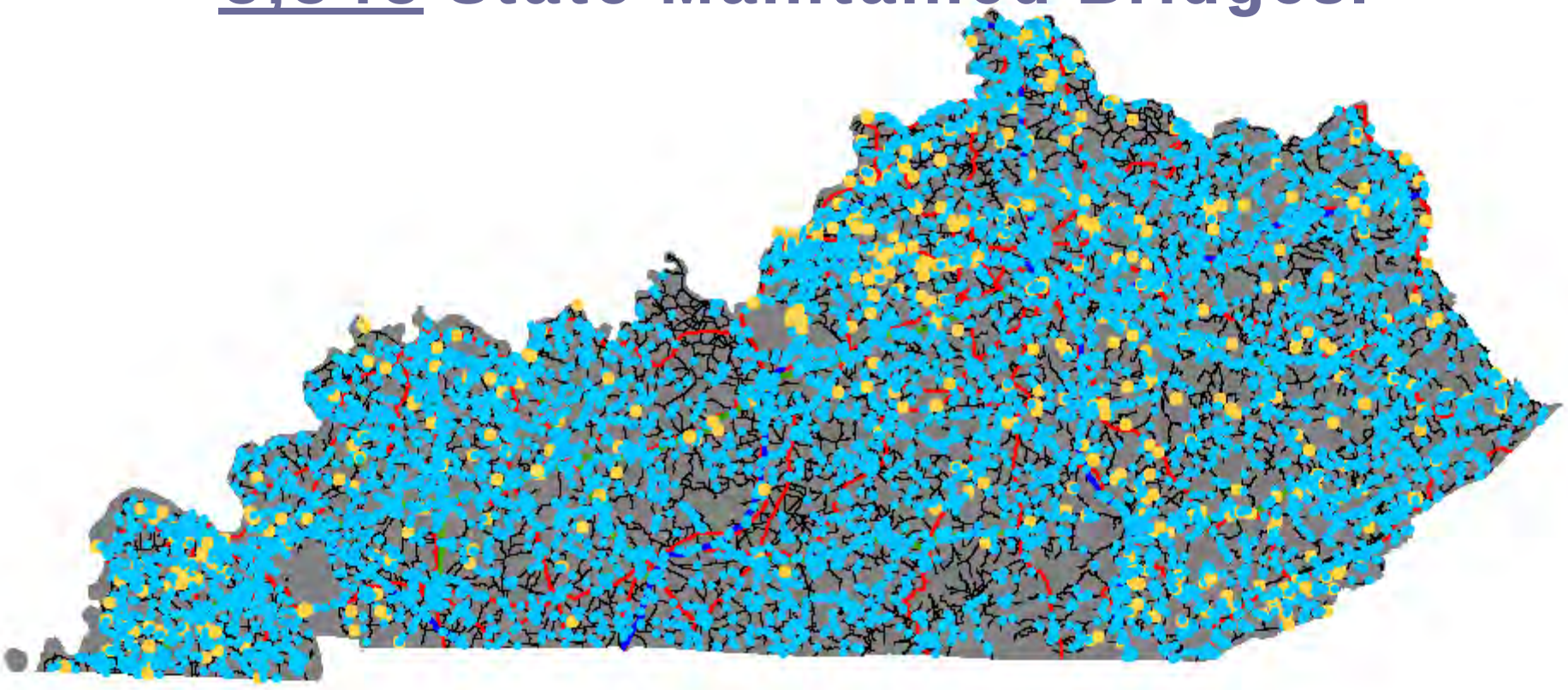
Engineering, Environment, and Economics

The Project Manager & Development Team




KYTC
Projects

Kentucky has approximately
22,600 miles of State Route Highways &
8,843 State Maintained Bridges.

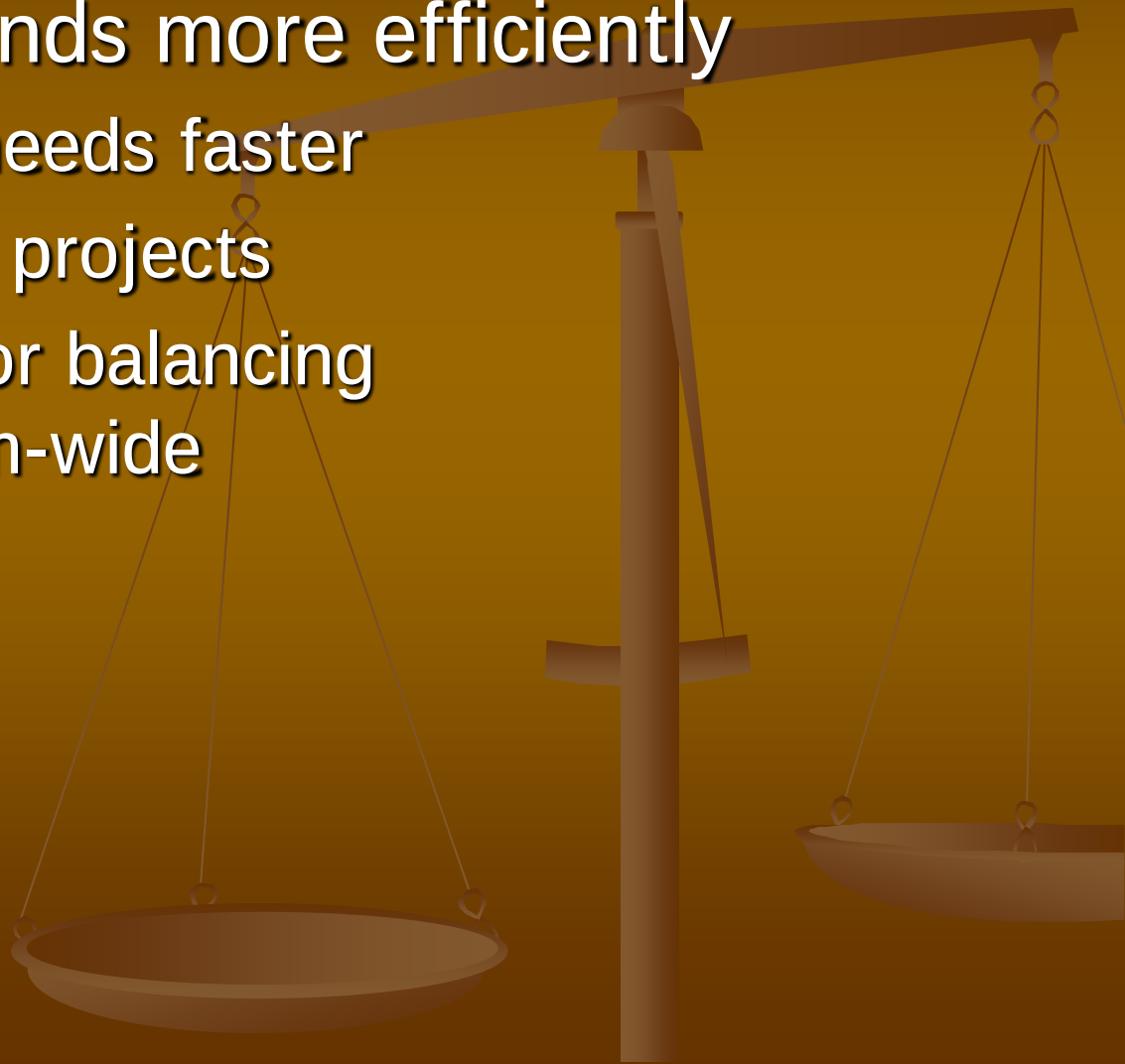


Realities

- Limited budget
- Need for roadway improvements
  - Safety
  - Mobility
- Unfunded short term needs
- More projects than funds

Objective

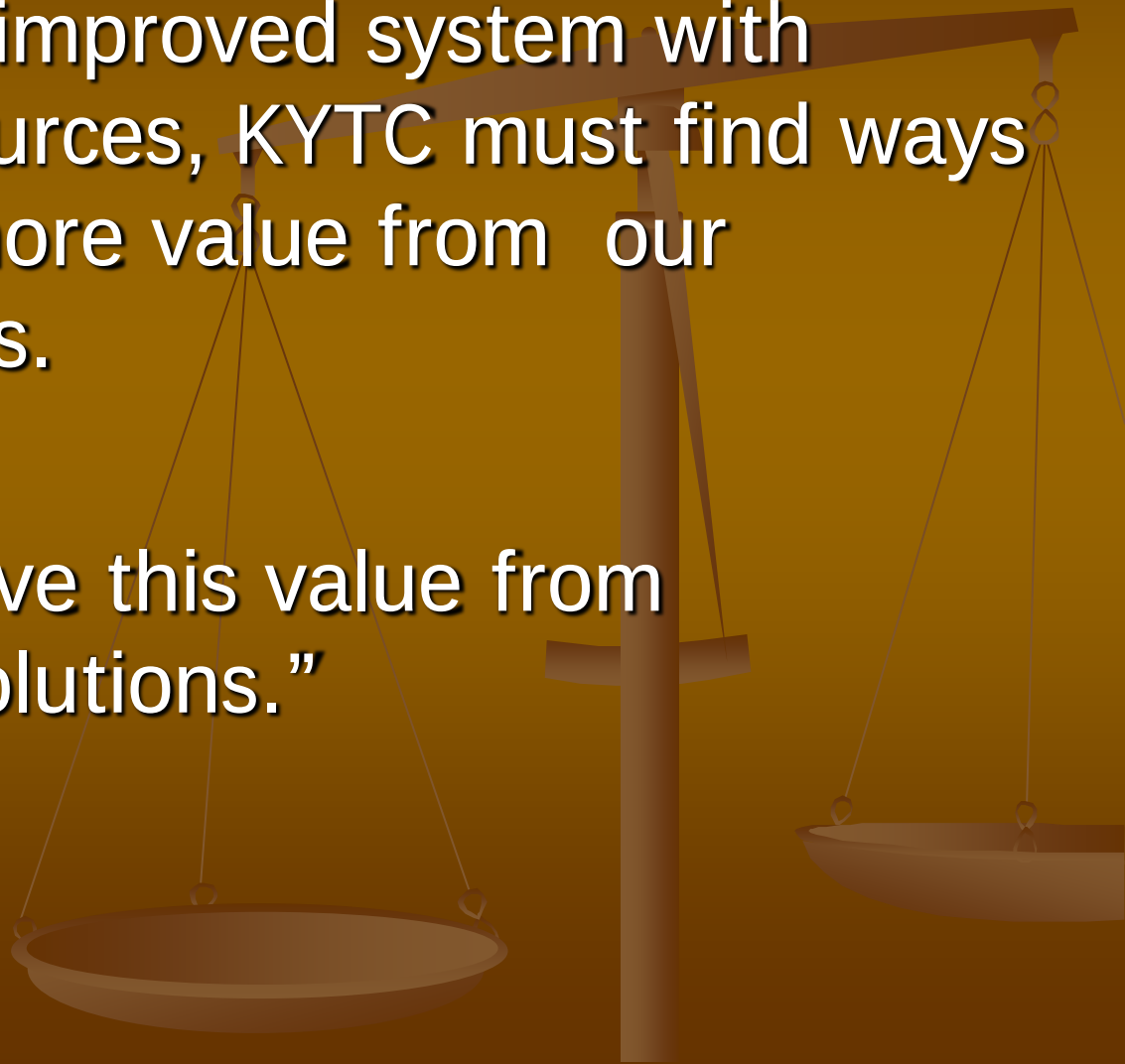
- Use available funds more efficiently
  - Address more needs faster
  - Complete more projects
  - Opportunities for balancing priorities system-wide



The Approach

To deliver an improved system with limited resources, KYTC must find ways to extract more value from our expenditures.

KYTC will derive this value from "Practical Solutions."



What are Practical Solutions?

TECHNICAL DEFINITION

prac●ti●cal so●lu●tions (prăk´tĭ-kəl sə lóosh'ns) n.

1. A process by which the value of a project is maximized.

KENTUCKY TRANSPORTATION CABINET

What are Practical Solutions?

TECHNICAL DEFINITION

prac●ti●cal so●lu●tions (prăk´tĭ-kəl sə lóosh'ns) n.

2. Ensuring that a project is the correct solution for it's surroundings: RIGHT SIZING.

KENTUCKY TRANSPORTATION CABINET

What are Practical Solutions?

TECHNICAL DEFINITION

prac●ti●cal so●lu●tions (prăk´tĭ-kəl sə lóosh'ns) n.

3. An approach to transportation in which an improvement is considered on the basis of its contribution to the entire system instead of its individual perfection.

KENTUCKY TRANSPORTATION CABINET

What are Practical Solutions?

NOT SO TECHNICAL DEFINITON:

"Why pay for the Cadillac when the Chevy will get you where you're going?"

KENTUCKY TRANSPORTATION CABINET

The "Basics" of a Roadway Project

- Project Costs
- Mobility Increased
- Safety Improved

KENTUCKY TRANSPORTATION CABINET

Basic Road Costs

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

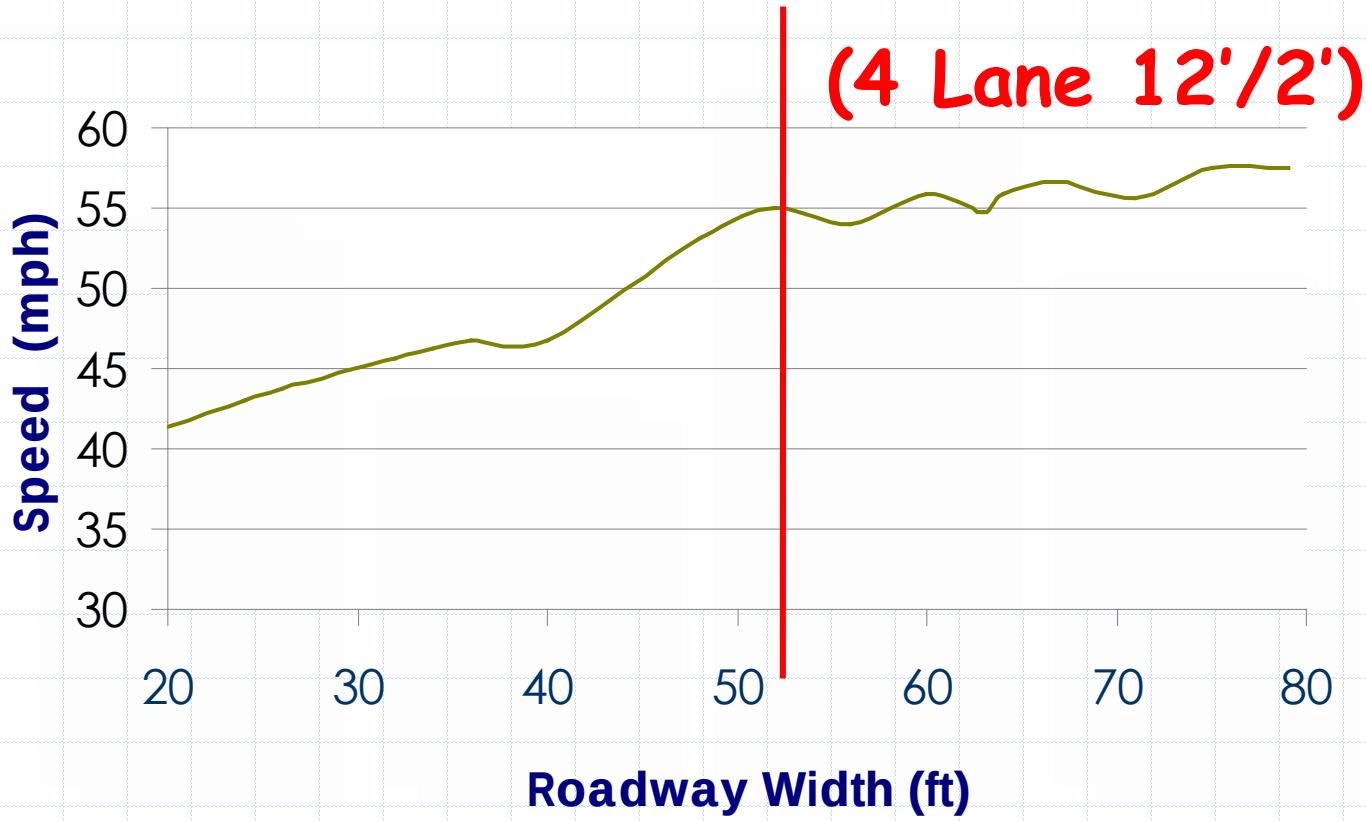
KENTUCKY TRANSPORTATION CABINET

Basic Needs-Mobility

- Estimates of mobility
  - Delay
  - Speed
  - Time
  - Level of Service (Rating of congestion)

KENTUCKY TRANSPORTATION CABINET

Speed and Road Width



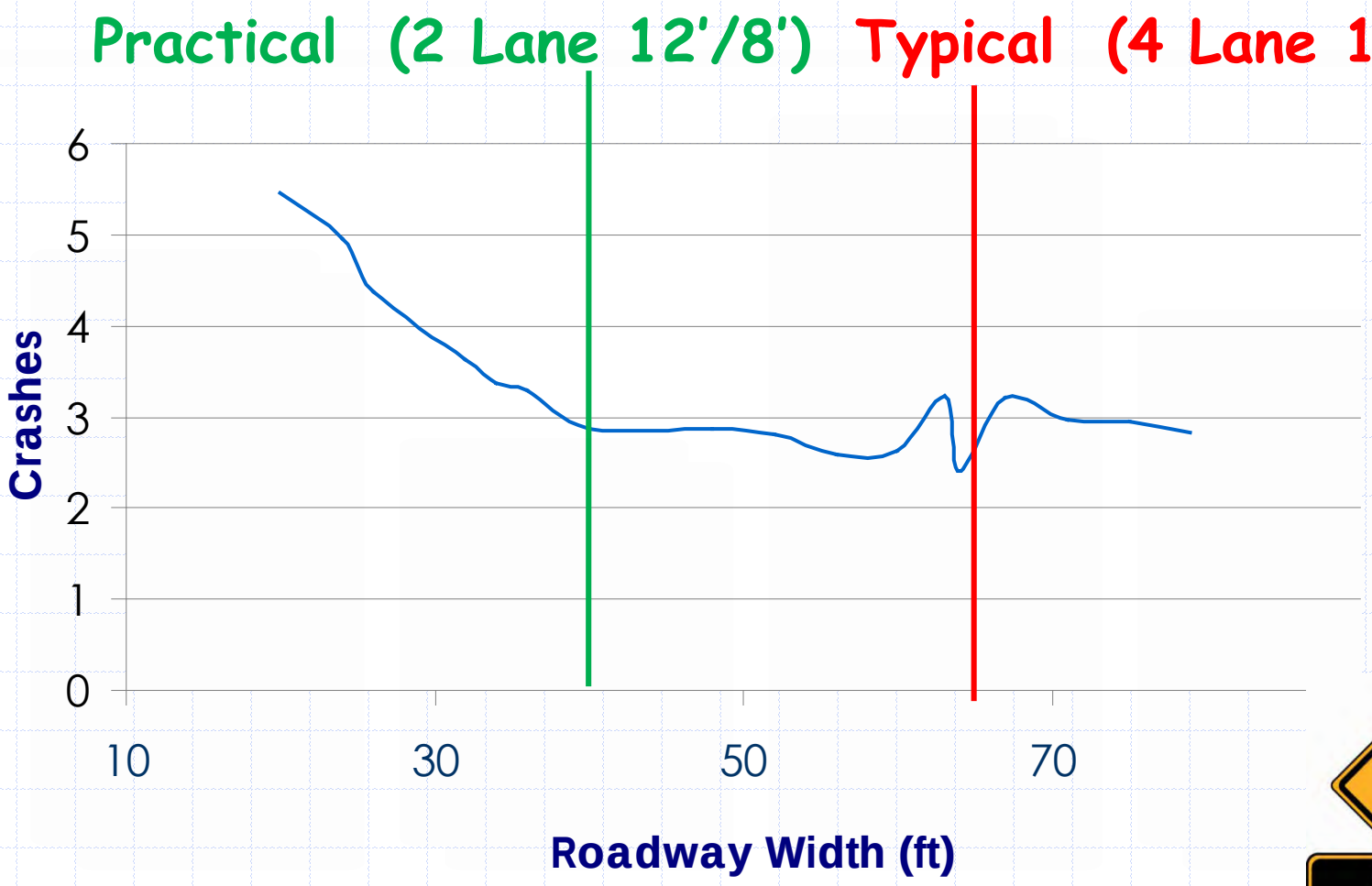
KENTUCKY TRANSPORTATION CABINET

Basic Needs-Safety

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

KENTUCKY TRANSPORTATION CABINET

Safety Tradeoffs



KENTUCKY TRANSPORTATION CABINET

Existing Cross Section	Crash Rate	Travel Speed (mph)
2 Lane, 10 ft L, 2 ft S	5.4	41.4

Cross Section	Crash Rate	Cost / Mile (millions)	Travel Speed (mph)	Miles
2 Lane 12 ft L, 8 ft S	2.9	$7.2	46.7	69.4

Miles improved w/$500 m

4/2/2008

Cross Section	Crash Rate	Cost / Mile (millions)	Travel Speed (mph)	Miles
4 Lane 12 ft L, 8 ft S	2.4	$21.5	55.9	23.3

Miles improved w/$500 m

Road Improvement Example

Design	Miles Improved w/ $500 m	Crash Rate Reduction	Travel Speed Increase	Total Gains w/ $500 m Crash Reduction	Total Gains w/ $500 m Travel Time Reduction
Practical	69.4	2.5	5.3	173.5	367.8
Typical	23.3	3.0	14.5	69.9	337.9

More miles, fewer crashes and fewer delays for same budget!

KENTUCKY TRANSPORTATION CABINET

THE GROUND RULES:

"Practical Solutions" is NOT:

- Cutting Corners

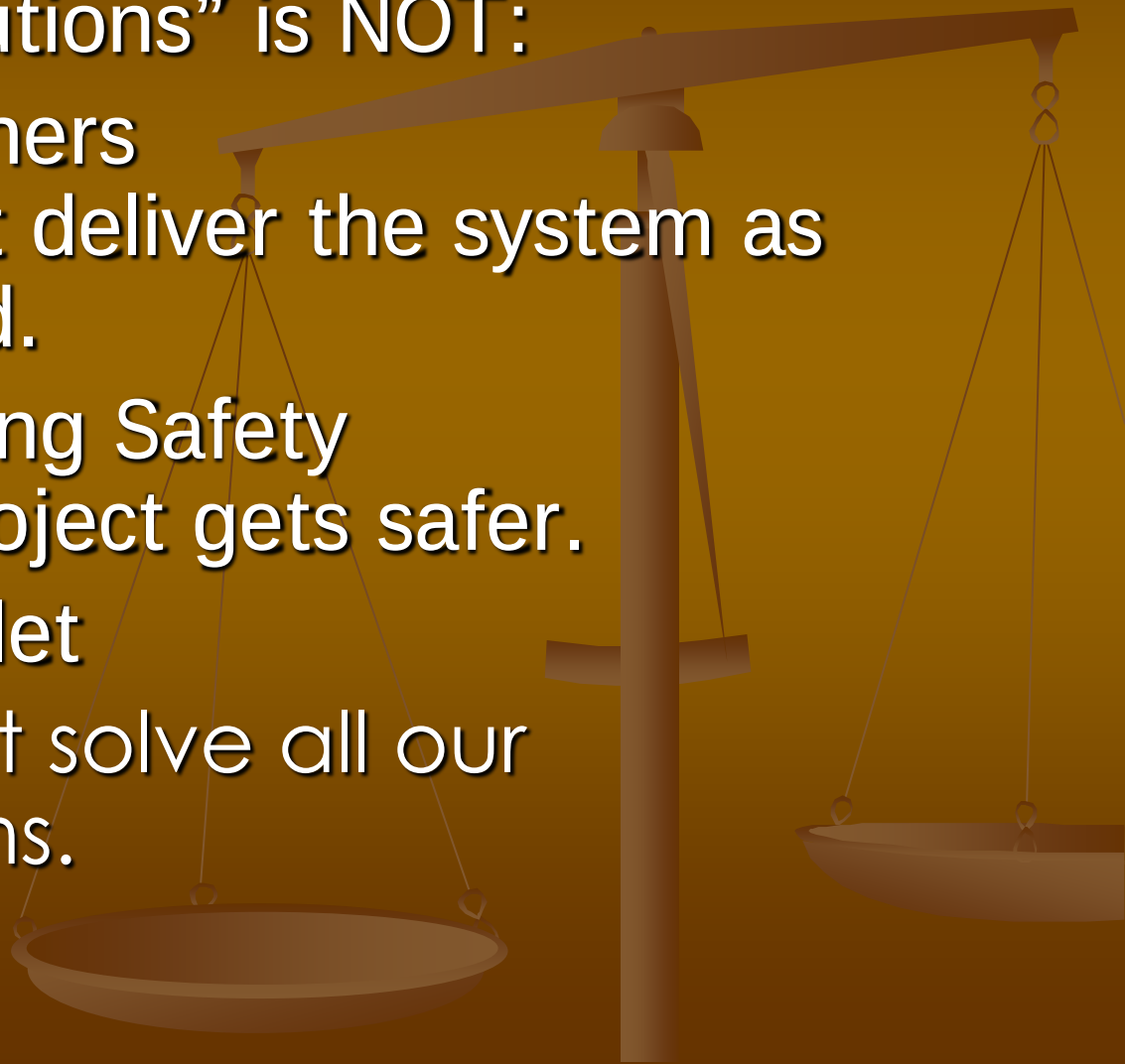
  We must deliver the system as promised.

- Compromising Safety

  Every project gets safer.

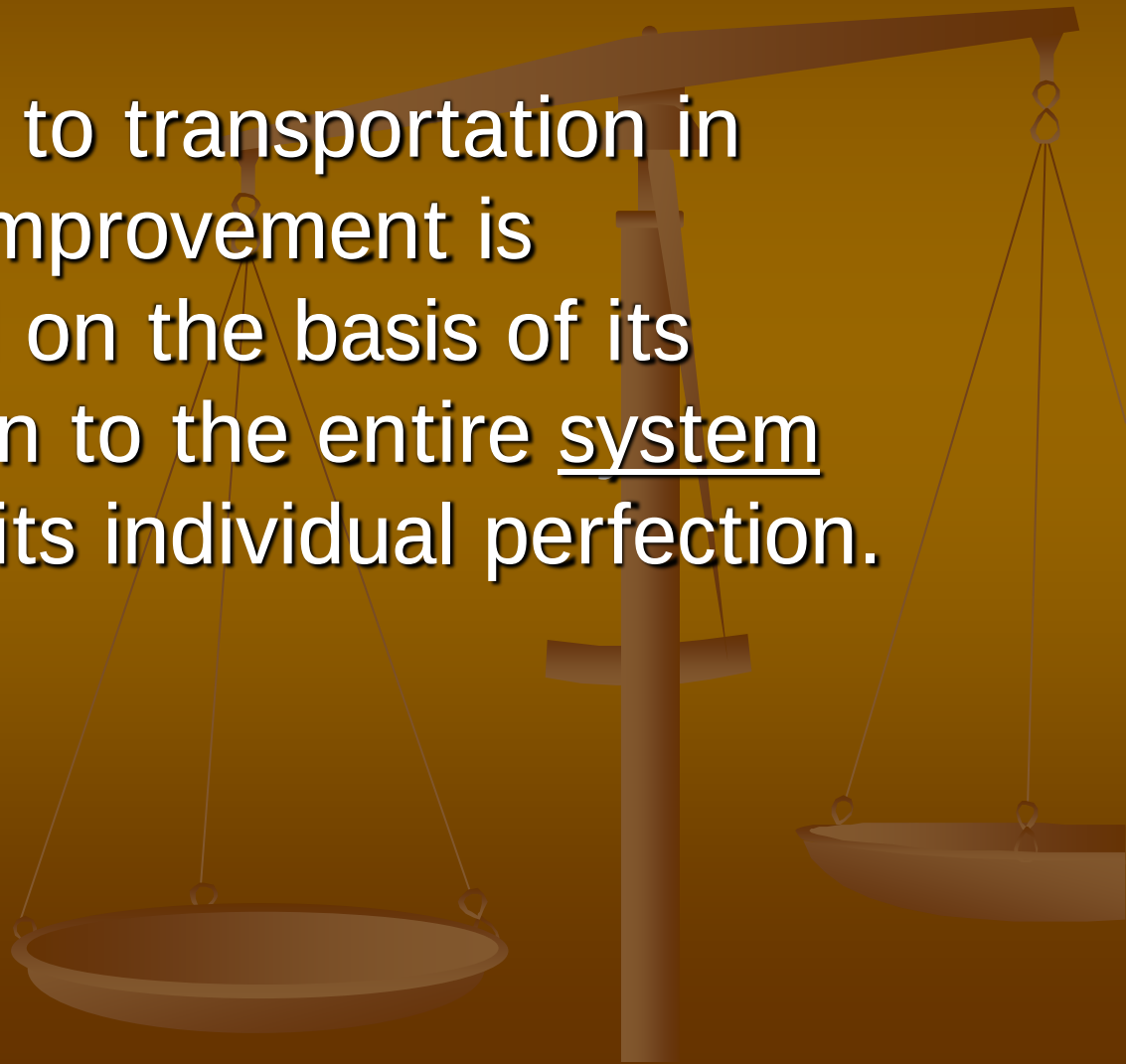
- A Magic Bullet

  It will not solve all our problems.



What “Practical Solutions” has added to our philosophy?

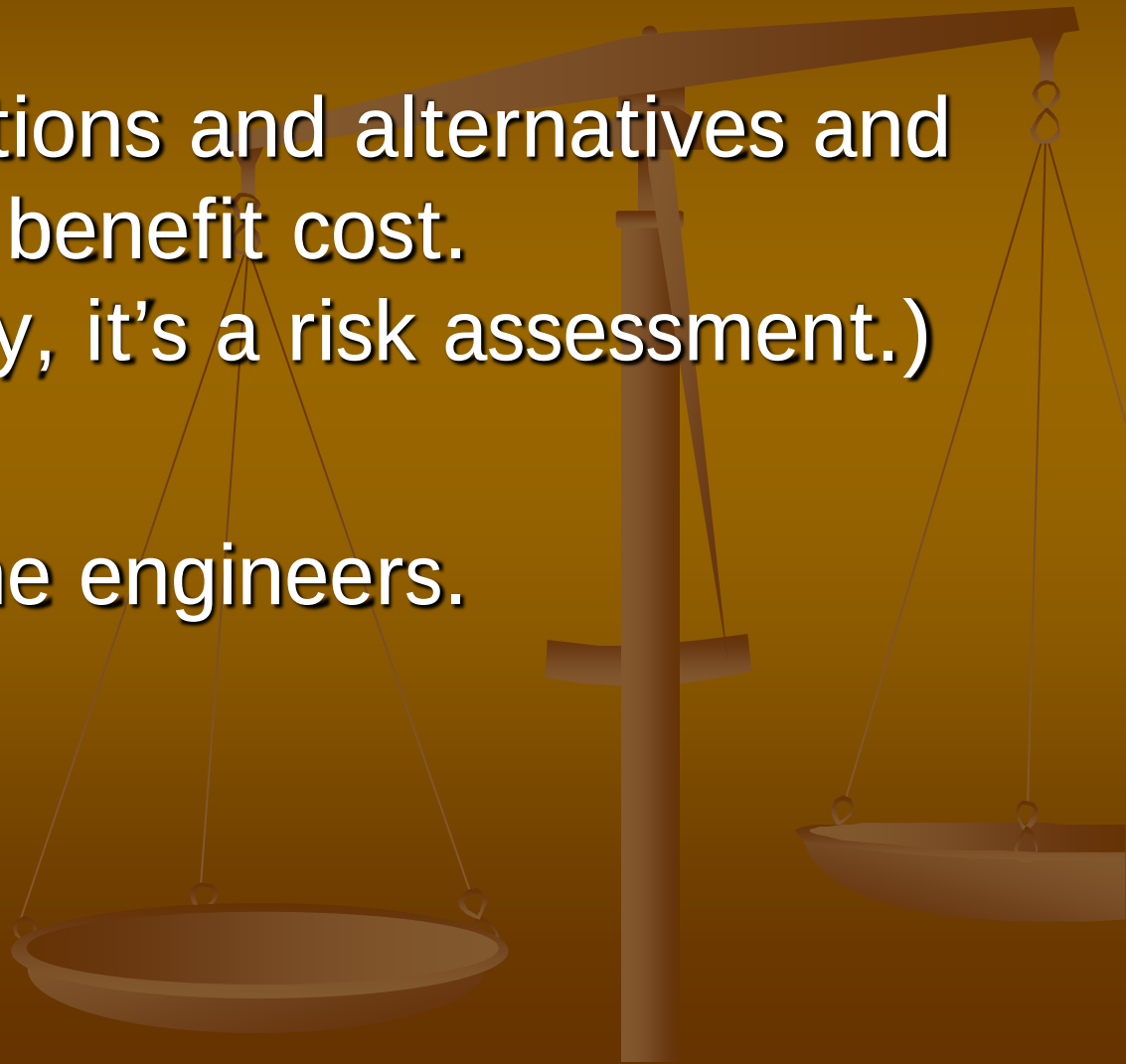
An approach to transportation in which an improvement is considered on the basis of its contribution to the entire system instead of its individual perfection.



What “Practical Solutions” has added to our philosophy?

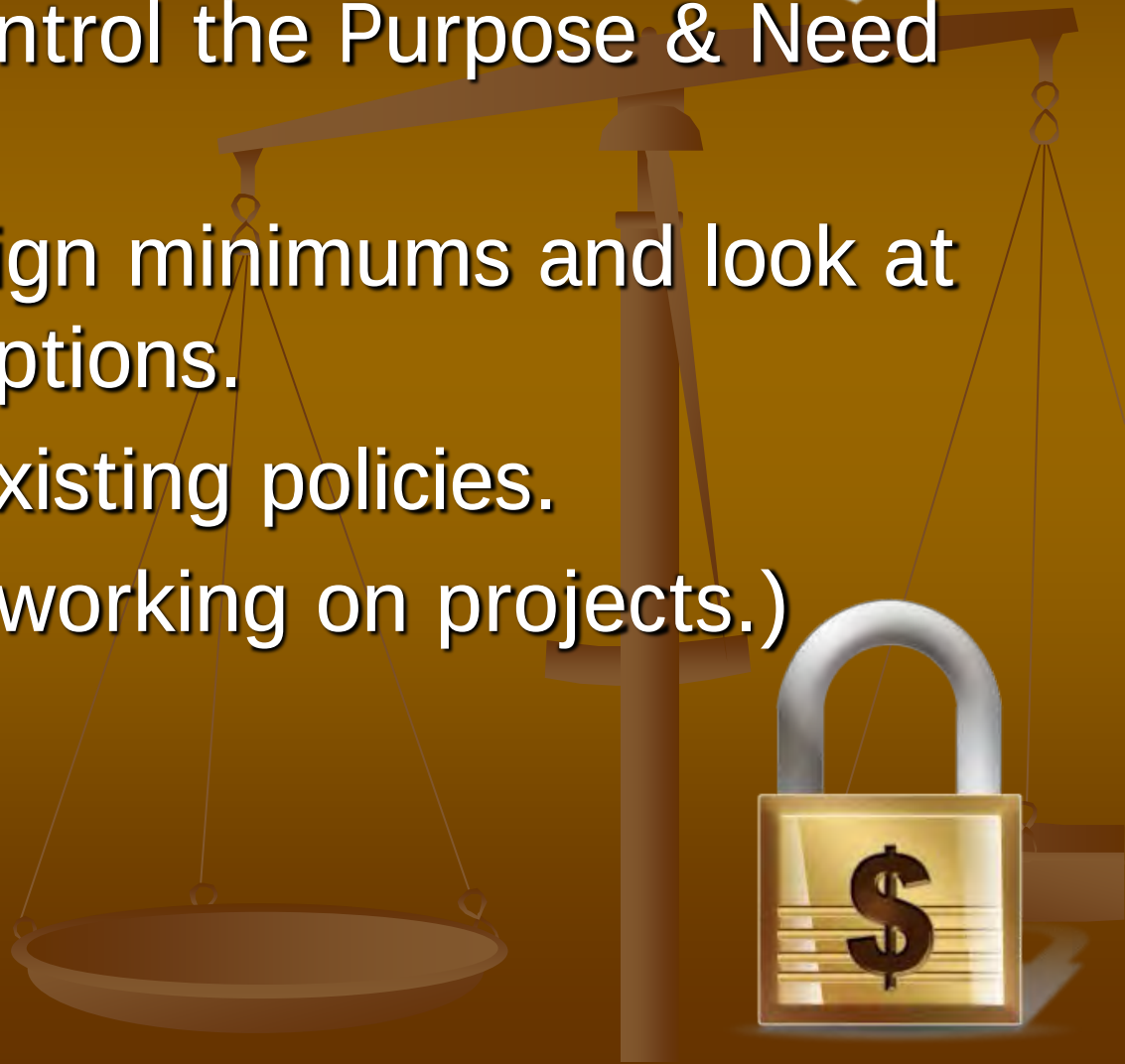
Consider options and alternatives and weigh the benefit cost.
(Essentially, it’s a risk assessment.)

Challenge the engineers.



The Keys to Success for our Practical Context

- Aggressively Control the Purpose & Need of our Projects.
- Start at the design minimums and look at the design exceptions.
- Challenge our existing policies.
- You! (The staff working on projects.)



Practical Definition...

Examples of Success!!

Success!! Example #1

KY 172 in Morgan County

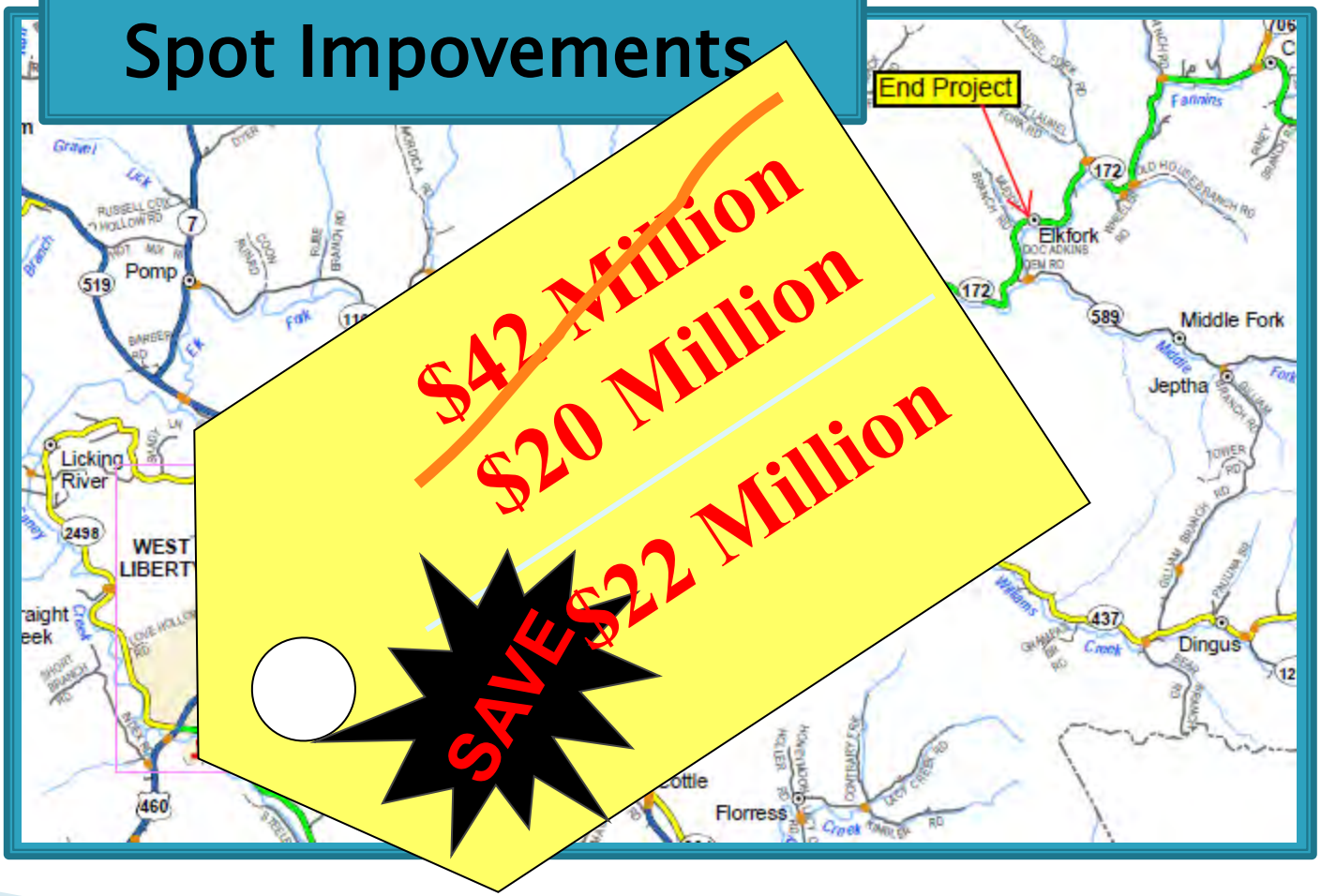
SYP description: “reconstruct KY 172 from the 2 mile marker to the 10.4”

Functional class =rural collector

Current ADT of 2500 vpd (m.p. 2) and 900 vpd (m.p.10)

Residential/small farms .

Success!! Example #1

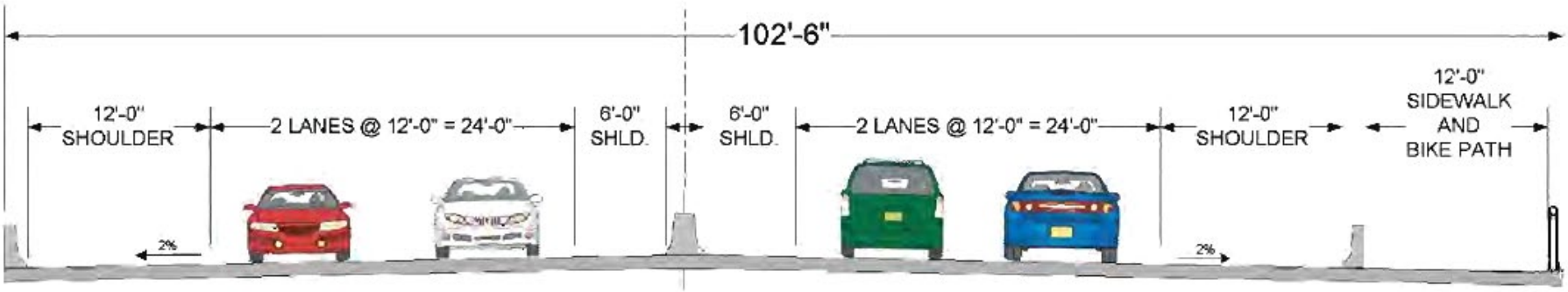


Success!! Example #2

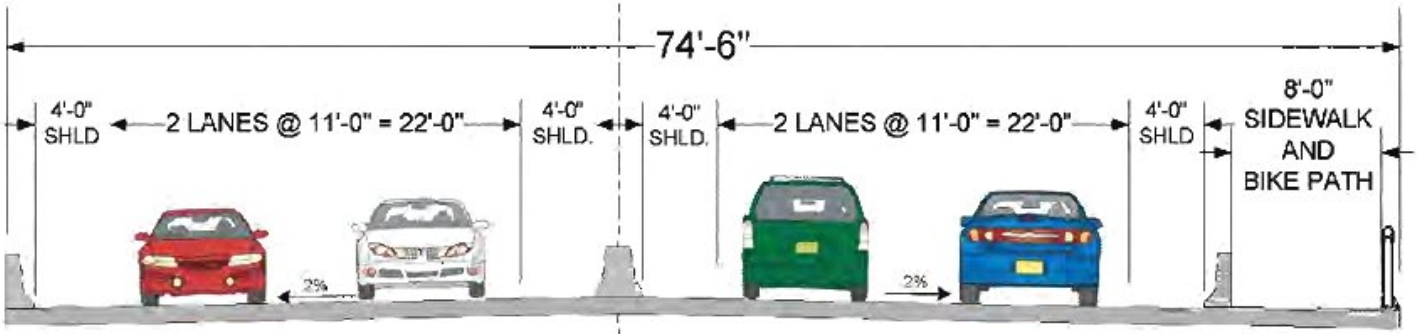
New Bridges Over Lake Barkley & Kentucky Lake; US 68 / KY 80

LAKE BRIDGES
Over Kentucky Lake & Lake Barkley

Bridge Cross Section Options



ORIGINAL TYPICAL SECTION



REDUCED SECTION

LAKE BRIDGES
Over Kentucky Lake & Lake Barkley

Alternative 6
Basket-Handle Tied Arch

Success!! Example #3

The KY720/Horseshoe Bend Road project was to improve the capacity and safety of the intersection.

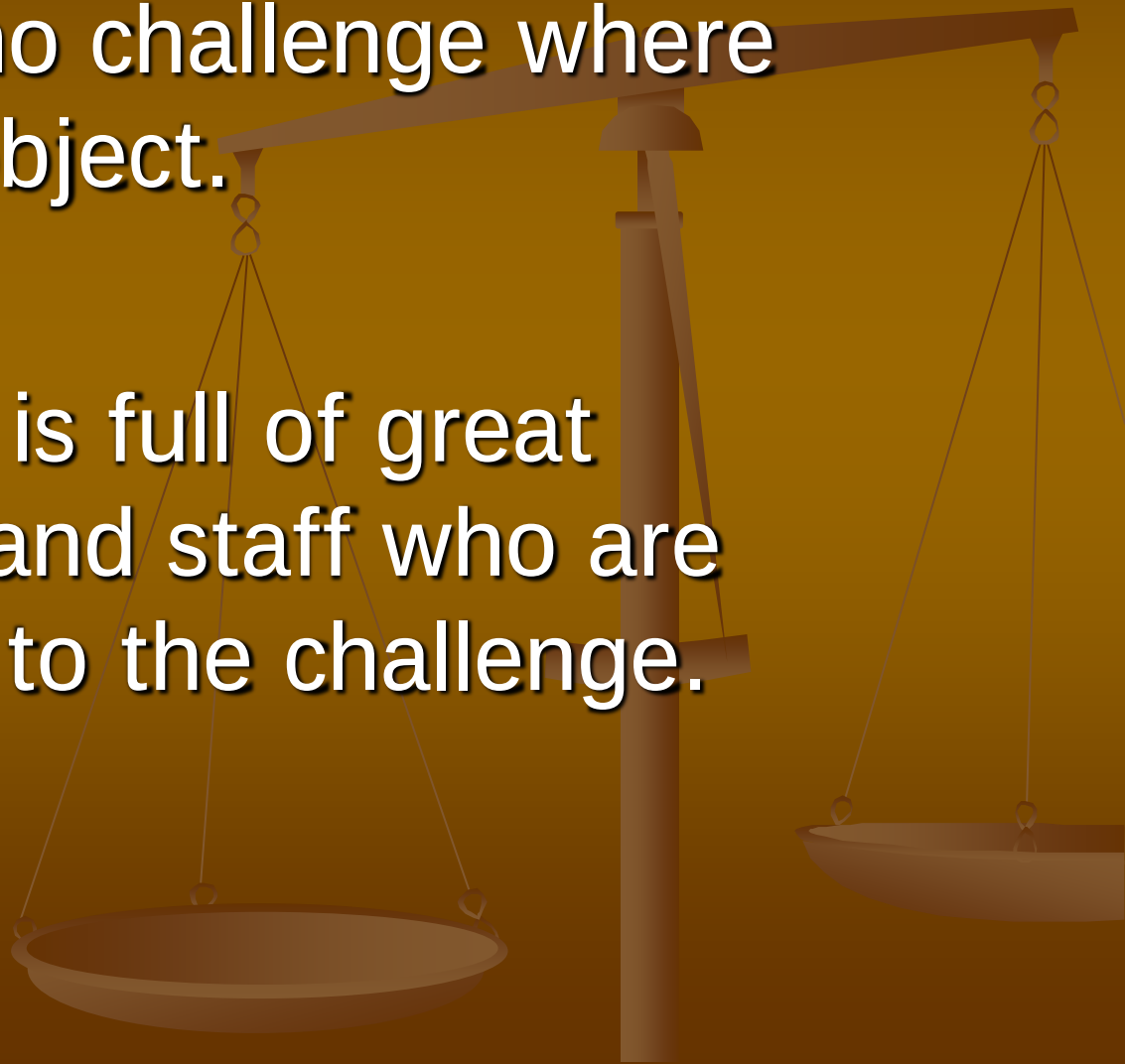
The problem was limited visibility through the intersection area.


$ 780,000
$ 13,500
$ 766,500
SAVE$

Context Sensitive and Practical

Engineering is no challenge where money is no object.

Our community is full of great professionals and staff who are more than up to the challenge.



Project Development Philosophy

That equals…

Good Design

Project Development Philosophy

And the key to success is…

You!