

Road Safety Research & Practice

In a perfect world

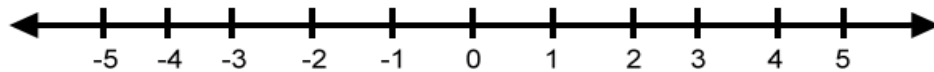


But the world is not perfect



How exactly does research influence practice?

How much of what is published usable and how much is used?



What are the imperfections?



The Imperfections



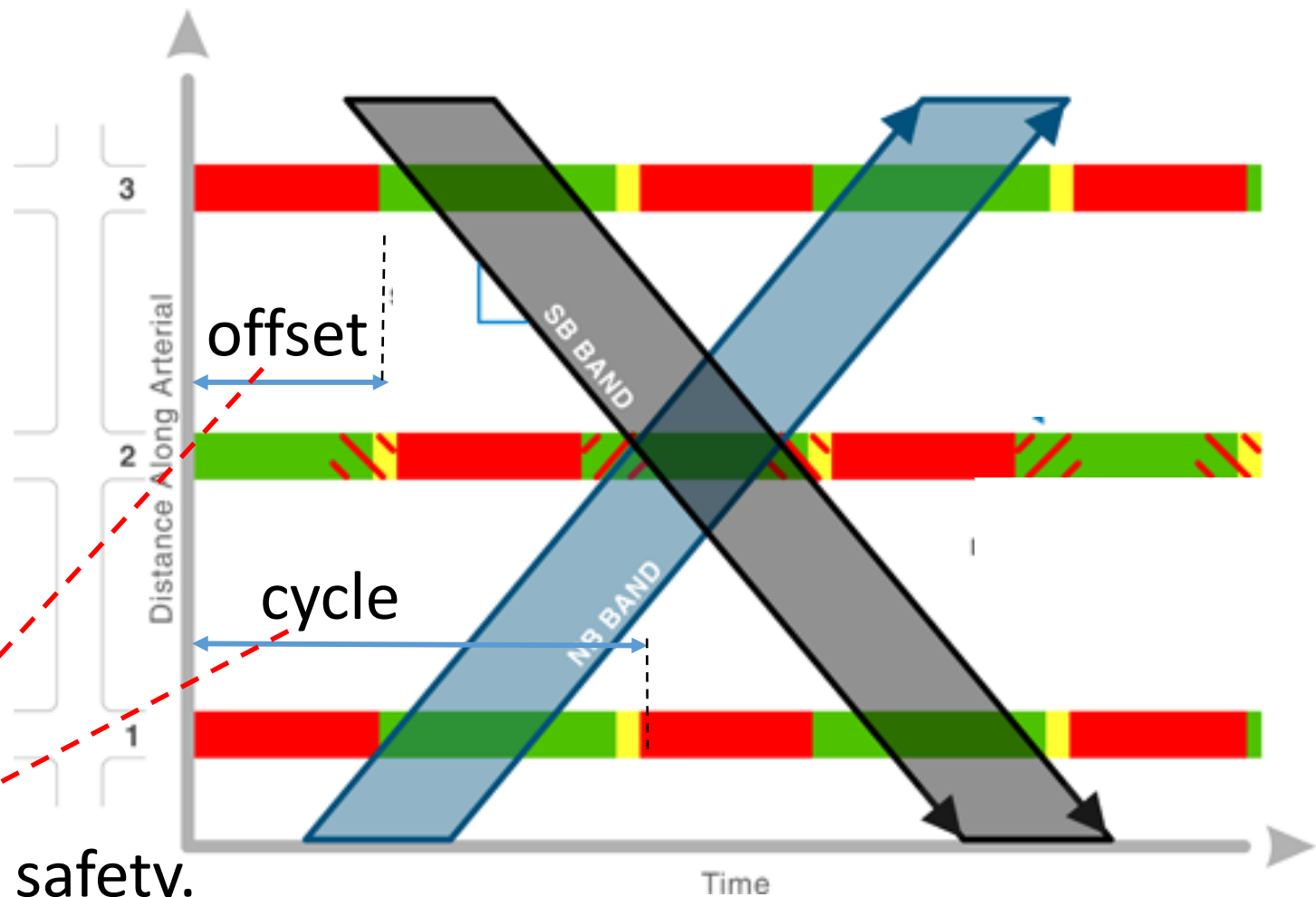
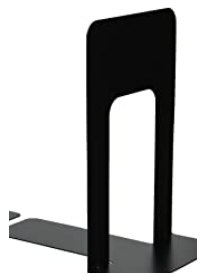
My strategy: (a) Tell stories
(b) Raise questions

Weakness: Are my stories 'representative'?



You decide!

A current story



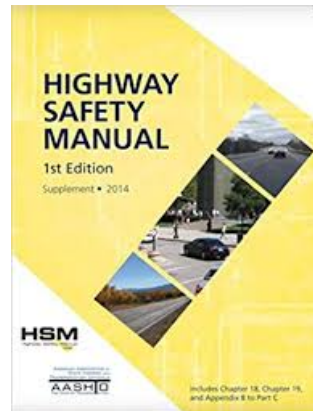
Belief: Both affect safety.

Belief: Current practice is safest; change it → more crashes

NCHRP
REPORT 812

Signal Timing Manual

Second Edition

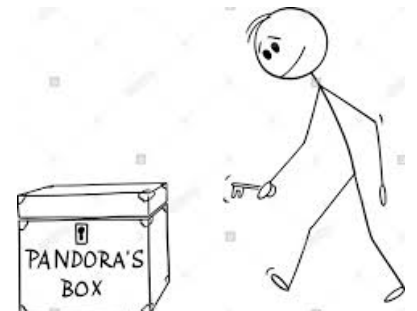


Nothing

Few papers, contradictory findings

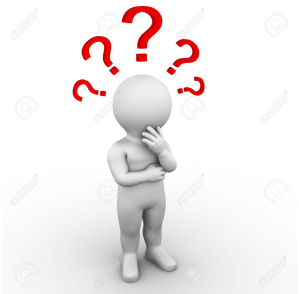
Belief without evidence

Dialogues, 2020



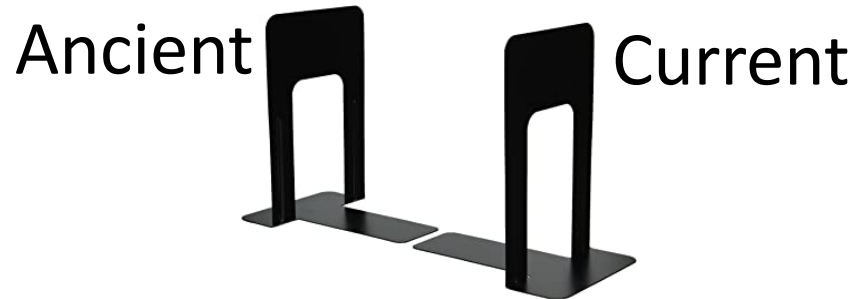
Questions arising

1. Coordination affects safety. Experience is plentiful. So how come we still do not know?
2. Who is supposed to find out?
3. Why are the findings contradictory?
4. Can traffic engineers balance mobility and safety?
5. ...



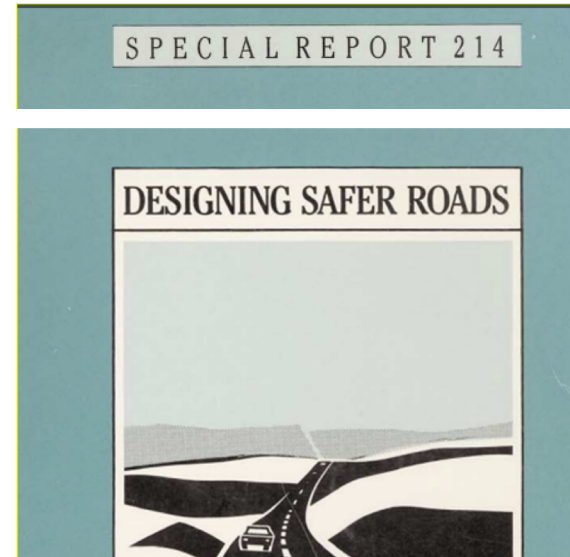
One Of, or General?

Back in time



I have been asking myself such question since about 1986.

1986 and we did not know?



Opinion sufficient,
Research not organized,
Influenced by interests,
Knowledge polluted ...

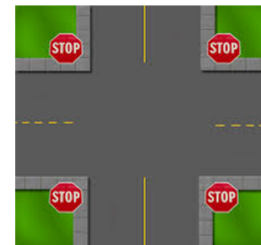


History is simply one
damned thing after another.

- Winston Churchill



Assorted stories:



etc, etc

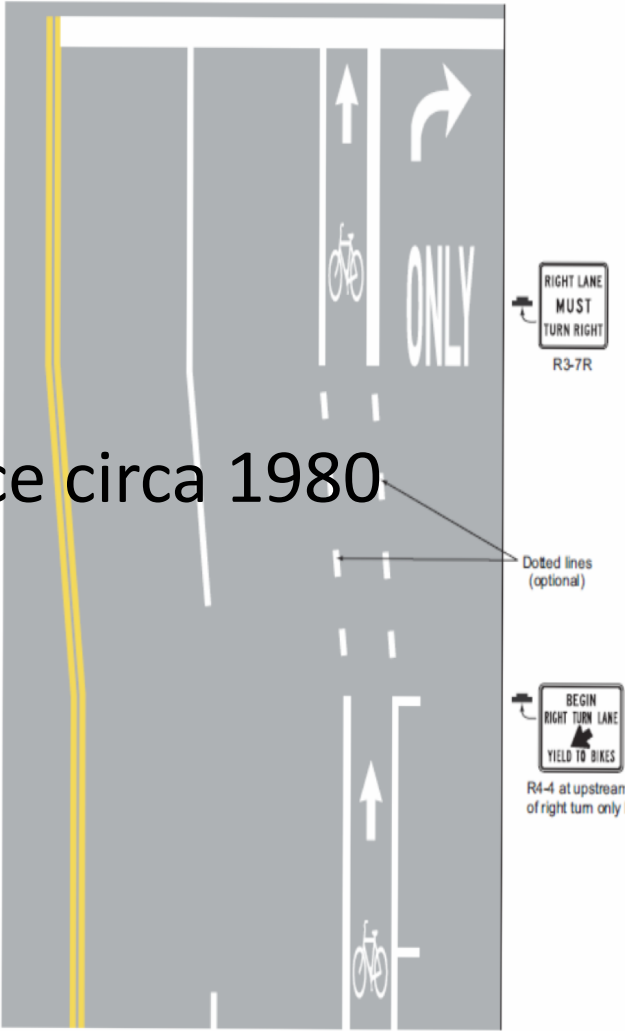
An MUTCD* story



But is it safe?
So I asked around ...

* Manual on Uniform Traffic Control Devices

Figure 9C-5. Example of Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane



Since circa 1980

Questions arising

1. How do things get into the MUTCD
(a National Standard) generally?
What evidence is required?

Opinion sufficient,
Research not organized

One Of, or General?

Another 'damn' story



Is it harmful?

I asked: Why is it now an MUTCD 'requirement'?

In the Federal Register (2009) the FHWA asks to:
“...change ‘option’ to ‘requirement’”

Their justification? “...a multi-year project
... hundreds of locationssignificant safety benefits”

The sole reference: Markowitz et al. 2006

What did Markowitz et al. find?



	7 treated with 2+ injury crashes	185 untreated with 2+ injury crashes
Before	26	507
After	11	282

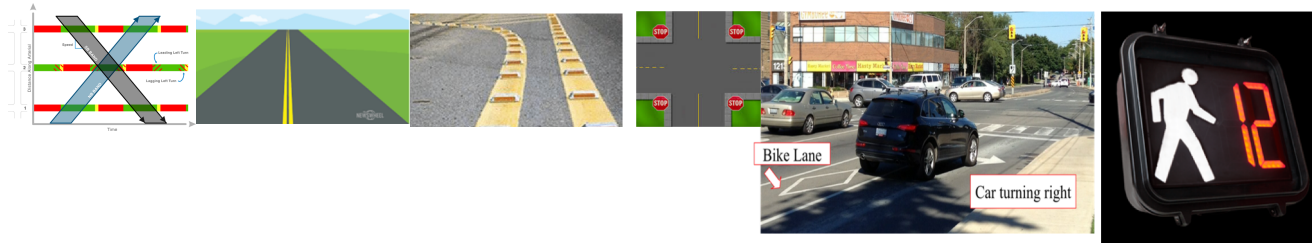
- Not “hundreds of locations”, only 7 (actually 9)
- $11/26=0.42$. True, it is a big reduction
- But since $282/507=0.40$, is equally a big reduction without treatment, **no effect**.

Markowitz et al. recognized RTM,
The MUTCD & FHWA did not

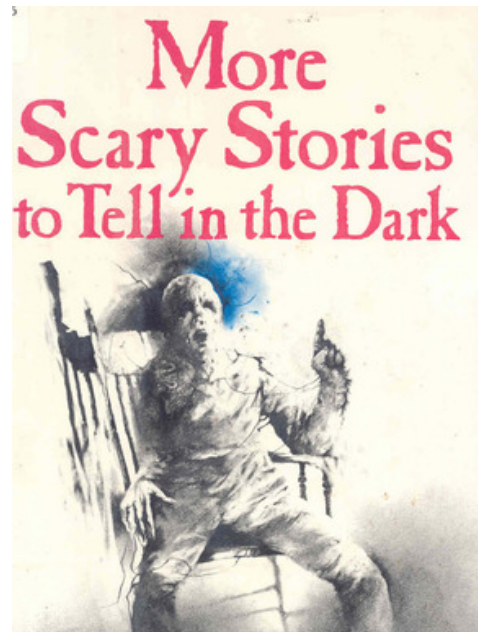
Questions arising

1. How come the persons on the MUTCD technical committee and in the FHWA did not recognize RTM?
2. What was the rush? Should one not come to defensible conclusions before coining a National Standard?
3. Should there be no procedure to ensure that there sufficient benefits and not much harm?

One Of, or General?



There are



Here is a long one ...

Chapter 1 of a long saga (1954-2020)

No evidence
but judged 'promising'



In a few
States

▲
1954

Program starts
Kansas & Ohio

▲
1957

RCTs*
begin

▲
1959

HRB
papers

▲
1962

*Randomized controlled trials

Early questions →

Early questions arising

1. What were the RCT for?
2. What is the role of evaluation-research in operating agencies?

Note: Opinion sufficient,
Research was not organized



One Of, or General?

Chapter 2: Surprise, surprise...

RCT Results

Ohio	At T	Between T
% Change	-63%	+15%
Total crashes	177	371

Kansas	At T	Between T
% Change	-46%	+27%
Total crashes	186	499

T = intersections and access points

- crashes diminished at access points (where there are no edgelines). How come?
- Between access points, unexpectedly, crashes increased. How come?



Questions arising

1. What should have been done?
2. What was done?

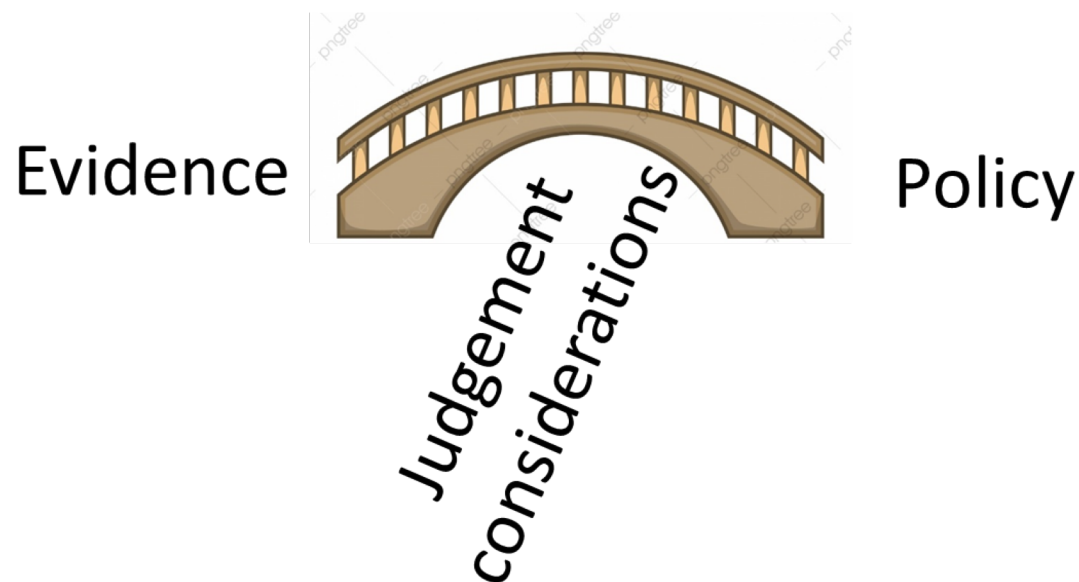


Too naive?



Perhaps the bridge image is better ...

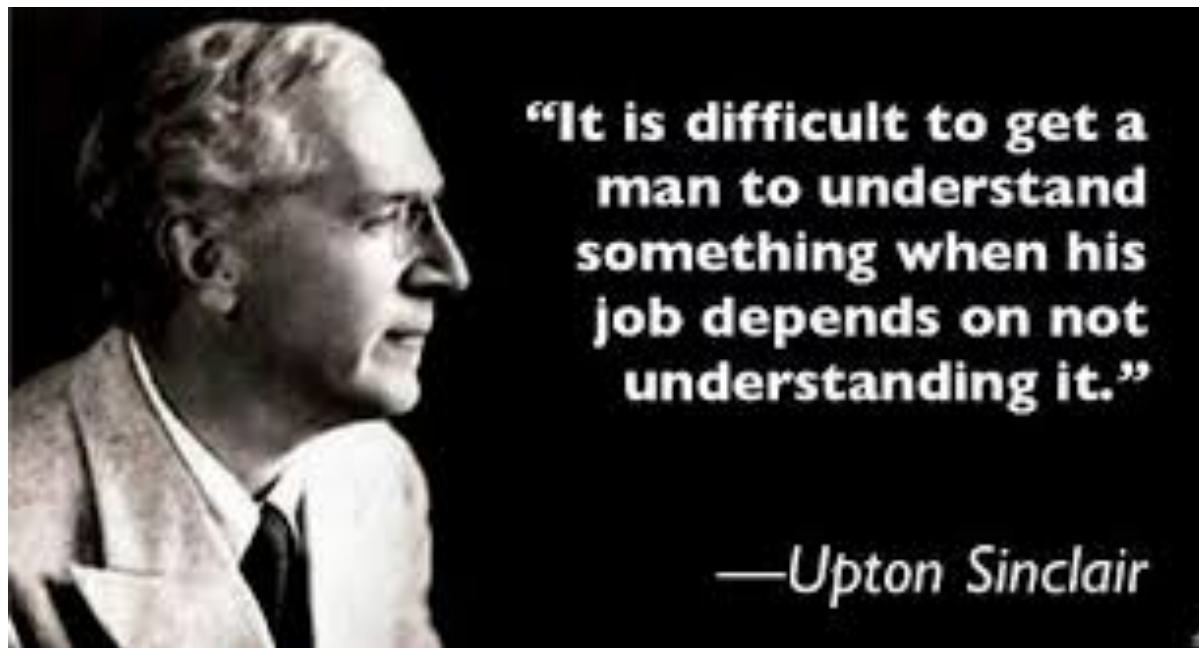
J. Drèze: “Evidence is about facts, policy is a political decision. There is a long bridge between the two.”



Chapter 3: Publication

Both published papers said: “...significant reduction...”.

Can one get ‘evidence’ when the researcher depends on the operating agency?



One Of, or General?

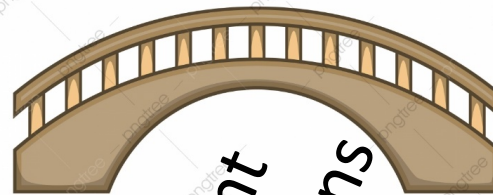
Which are we getting?

Evidence-based practice
or
Practice-based evidence



Would work when

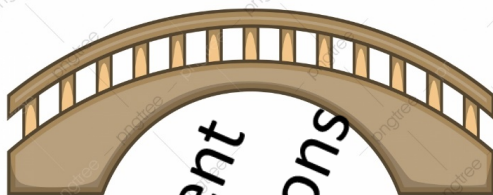
Evidence



Policy

But will **not** work when

Evidence
Judgement
considerations



Policy

For research to be useful
it has to be independent

Chapter 4, ... and the saga goes on

In 1981 Congress gives (\$400 million for PMDP*)

The FHWA is the Steward who 'evaluates' and reports back to Congress.

Experience is plentiful but we still do not know.

The Steward has an interest in the outcome.

Body of knowledge is polluted



*Pavement Marking Demonstration Project

Chapter 5. Into modern times ...

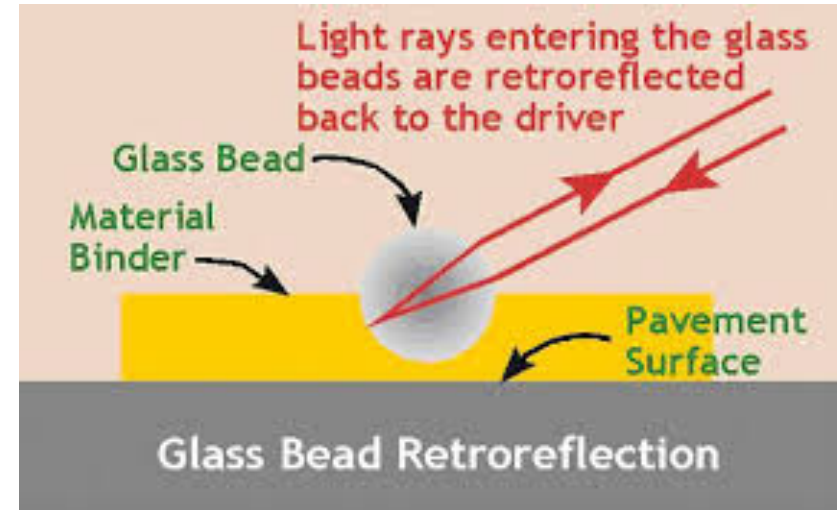
Congress tells FHWA: Make sure ...



How to do that
when no evidence?

Answer:

Pollute some more:



“In 2008, the FHWA developed a synthesis of the benefits of pavement markings, including safety studies.” (Federal Register)

The consequence:

Mission: show that edgelining saved lives, 1962

Mission: show that \$400 million was well spent, 1982

Mission: justify minimum retroreflectivity, 2008

Research not separate from policy

Polluted knowledge base

Practice not evidence-based

Reform →



The right of road users:

Decisions affecting road user safety should take into account the fact-based expectation of their consequences.

Issues noted

- Gaps remain unfilled
- Findings disregarded;
- Influenced by external interests;
- Body of knowledge polluted;
- Research-to-practice system unplanned.

These, I think, needs fixing.

On the relationship between road safety research and the practice of road design and operation

Ezra Hauer

[Accident Analysis and Prevention 128 \(2019\) 114–131](#)

Or ask me for copy through

