

# **SMALL THINGS THAT MAKE A BIG DIFFERENCE**

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## EXPERIENCE

Experience is the best teacher, but the tuition is high.

Norwegian Proverb

Only he who has travelled the road, knows where the holes are deep.

Chinese Proverb

Experience is not the best teacher, other people's experience is the best teacher.

Andy Andrews

# PRESENTATION TOPICS

1. Speed Limits
2. Construction Area Traffic Control
3. Traffic Signals
4. Yikes, I was Wrong all those Years!
5. One Man's Opinion of The Worst Roadway  
Safety Problem in Tennessee

(My apologies for a few rabbit trails and some of Alan's pet peeves worked in as well)

## RABBIT TRAIL #1:



How is this for the application of traffic control devices?  
Would the word "overuse" apply here?

# SPEED LIMITS – UNIFORMITY?





# SPEED LIMITS – UNIFORMITY?



# SPEED LIMITS – UNIFORMITY?





# SPEED LIMITS – UNIFORMITY?





# SPEED LIMITS – UNIFORMITY?



# SPEED LIMITS – UNIFORMITY?

The Winner!



# SPEED LIMITS – RESIDENTIAL AREAS

Many agencies in Tennessee seem to be moving towards 25 mph as the typical or statutory speed limit, especially in residential areas.





# SPEED LIMITS – RESIDENTIAL AREAS

Complete Streets standards, on the other hand, recommend 20 mph in residential areas.



Residential Speed Limit in Portland, Oregon. This is essentially a bicycle boulevard, although they call it a greenway.

# SPEED LIMITS – RESIDENTIAL AREAS

What I observed as a typical Portland residential street:



They lack off-street parking and have a lot of speed humps.



# SPEED LIMITS – RESIDENTIAL AREAS

What we typically think of as a residential street in Tennessee:



Maybe the Portland Street should have a lower limit.



# SPEED LIMITS

The moral of the story is that in addition to speed distribution, other factors should be seriously considered when setting speed limits. In fact, NCHRP research is coming to this conclusion and changes are pending to the *MUTCD*. An article in the April 2019 *ITE Journal*, entitled "*Speed Limits: Leading to Change*" provides a good summary discussion of this matter.

- Factors being considered for use in setting speed limits include:
- speed distribution of free flowing vehicles (85<sup>th</sup> percentile and 10 mph pace speeds)
  - crash experience for at least a 12 month period
  - road characteristics (lane widths, curb/shoulder condition, grade, alignment, median type, sight distance)
  - road context (roadside development, number of driveways, land use, functional classification, parking practices, presence of sidewalks/bicycle facilities)
  - road users (ped. activity/bike activity). (What about age?)

Illustrate/discuss with the next slide.

# SPEED LIMITS

Good Example – Kingston Pike through Sequoyah Hills area  
(Mention NYDOT method)



# SPEED LIMITS

## Other Speed Limit Related Matters/Pet Peeves

1. New curb & gutter major streets always getting 40 mph speed limit. (Example – Parkside Drive in West Knoxville at 40 mph, with nearby Kingston Pike at 45 mph despite many more driveways and overall conditions not as favorable)
2. Construction area speed limits lowered throughout the entire period of construction even when work is having no impact on traffic.  
(see next slide)



## SPEED LIMITS/CONST. AREA TRAFFIC CONTROL



My congratulations to TDOT and whoever was responsible!

# CONSTRUCTION AREA TRAFFIC CONTROL

Providing good clear, positive guidance and reasonable levels of traffic operations through temporary construction areas can be a challenge. The following are some examples where better practice could have been applied.

# CONSTRUCTION AREA TRAFFIC CONTROL



Temporary pavement arrows would be helpful!



# CONSTRUCTION AREA TRAFFIC CONTROL



The Message Board is dim. The next slide is what drivers tend to see.

# CONSTRUCTION AREA TRAFFIC CONTROL

A street name plate over this sign would be very helpful!



## CONSTRUCTION AREA TRAFFIC CONTROL

A survey by Nebraska DOT showed these “tabs” being used as the primary temporary line marking in 1 of 20 states that responded to the survey. This may well have been Oregon. What I saw with these was often quite confusing, especially when they had been down a while and had been hit a few times, bent and knocked around!

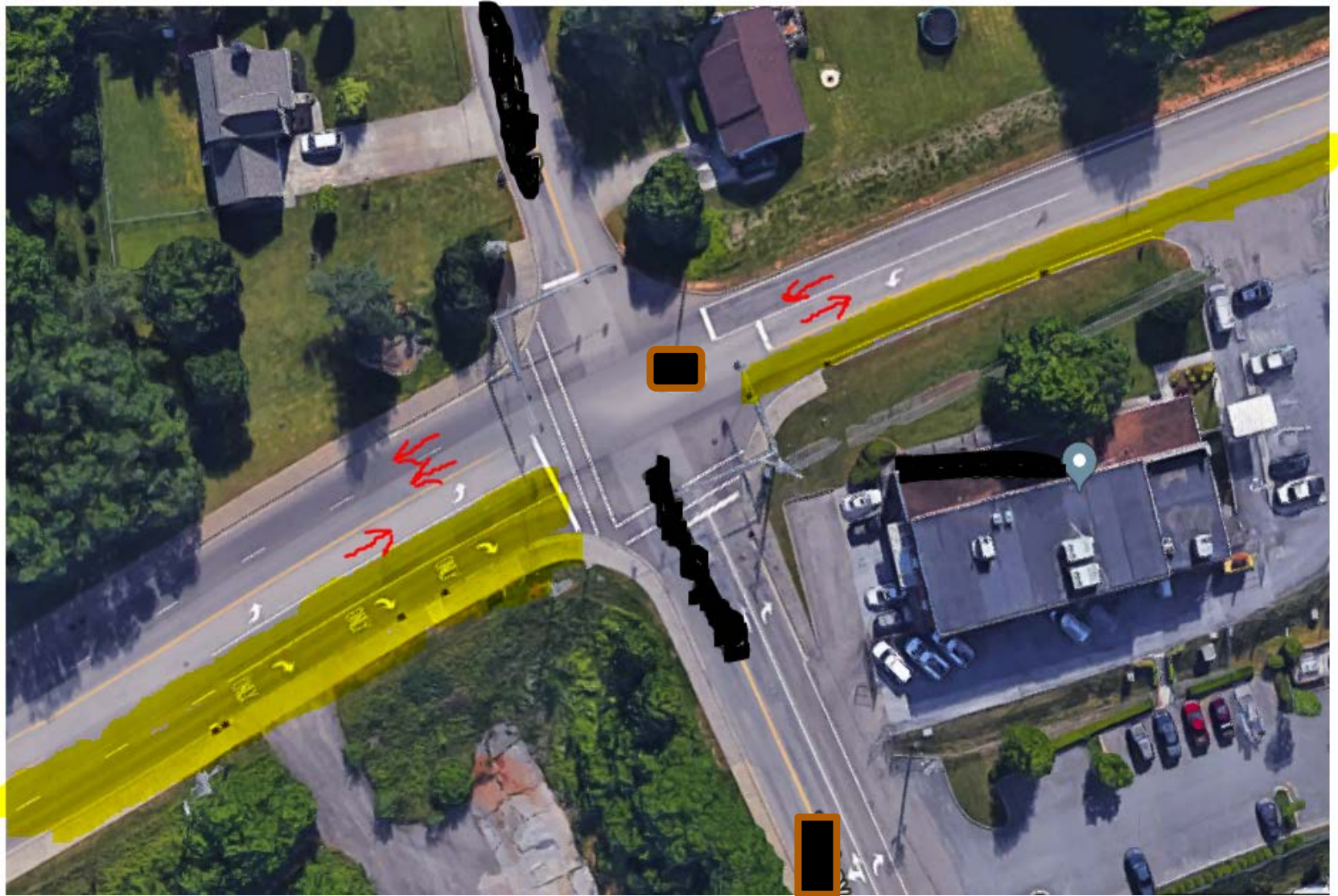
(My wife said they looked like post-it notes.)



**Figure 1. Temporary Plastic Tab**



# CONSTRUCTION AREA TRAFFIC CONTROL



# TRAFFIC SIGNALS

## Pet Peeve # 1

- Putting bad detection on Max Recall without thinking about the consequences on operation and whether or not some temporary timing adjustments might be appropriate.
- Shopping area example
- Remember, if all the detection is bad, you have a fixed time operation. You would not run a fixed time signal on one dial would you? Even if multiple patterns exist like with a signal system, you would carefully evaluate and set timing settings for each pattern, especially for fixed time operation, would you not?

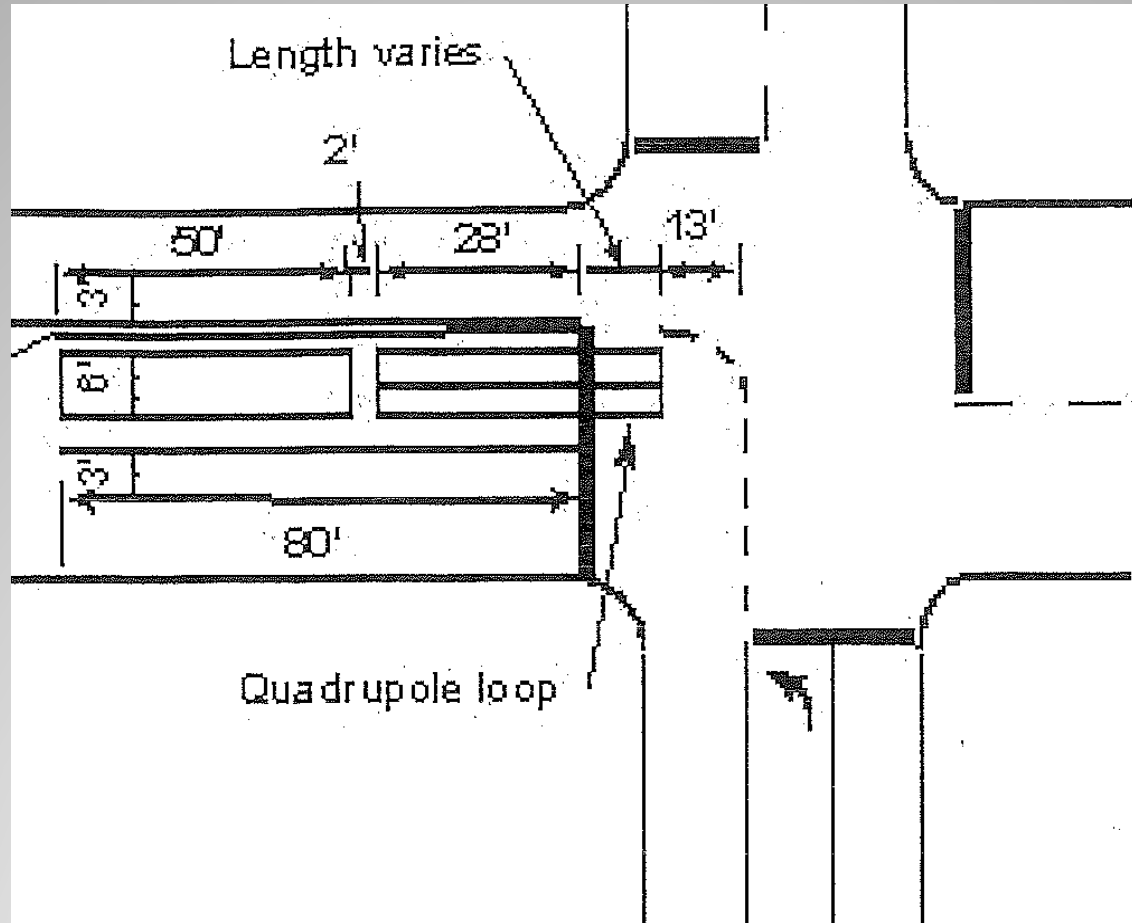
# TRAFFIC SIGNALS

## "Large Area" Detection for Left-turn Lanes

- The TDOT standard detection area for stop bar detection is 6' wide by 50' long. This arrangement typically utilizes an vehicle extension setting of 3 seconds or so, resulting in some lost time at the end of each phase.
- Why not a longer detection area with a shorter extension, especially now that video and radar detection are prevalent? There will be no increase in cost, unless you are using an induction loop.
- The FHWA suggests a minimum 80 foot long detection area with a one second extension. (see the Traffic Control Systems Handbook, page 15, and the next slide)



# TRAFFIC SIGNALS



Illinois Left-turn Detection Example  
(From IDOT "Design of Detection Loops Specifications")

Explain the above and discuss my experience.

# TRAFFIC SIGNALS

## Example of a Walk Signal Trap

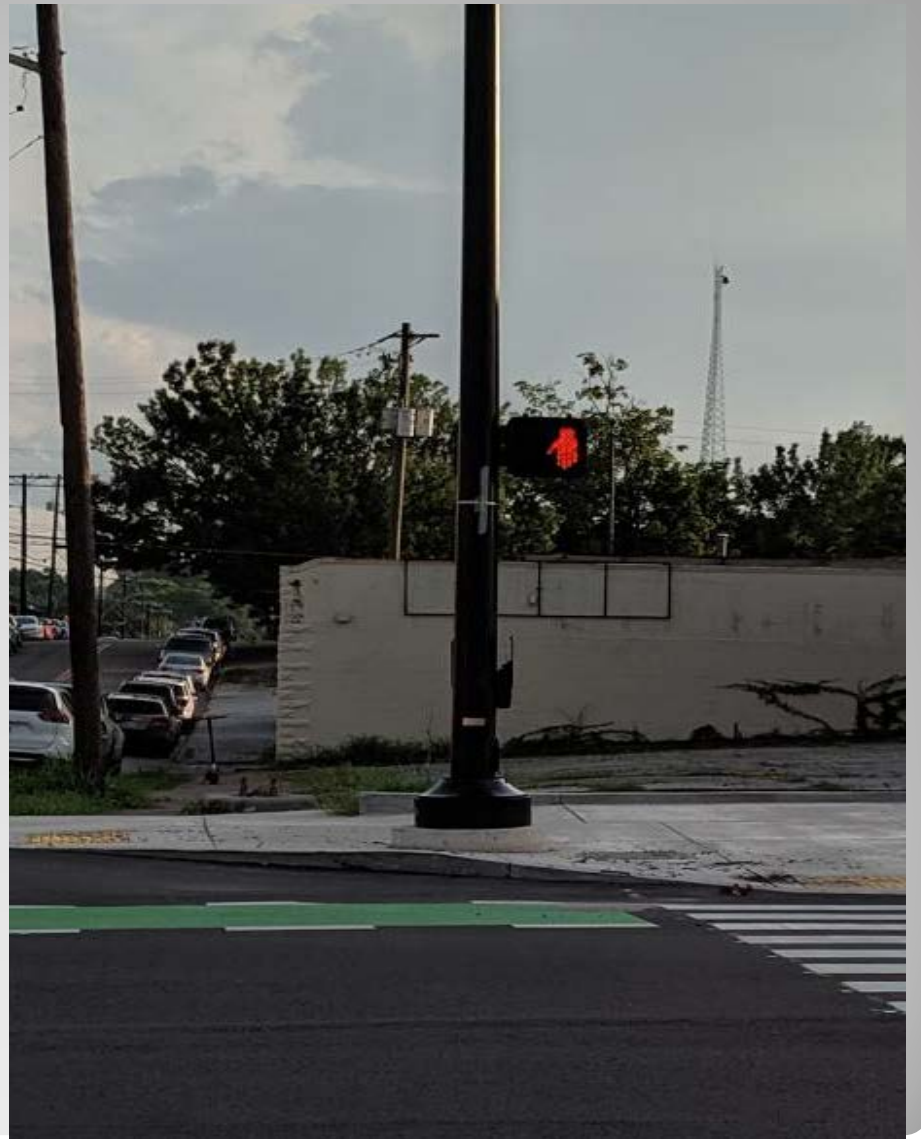
(Using Rest in Walk or CNA + Walk Rest Modifier Features)



# TRAFFIC SIGNALS

Inspect new signals thoroughly, including watching them operate in all situations. Push all pedestrian buttons, put calls on all phases, etc.

It can get much worse than this photo!  
(my examples)





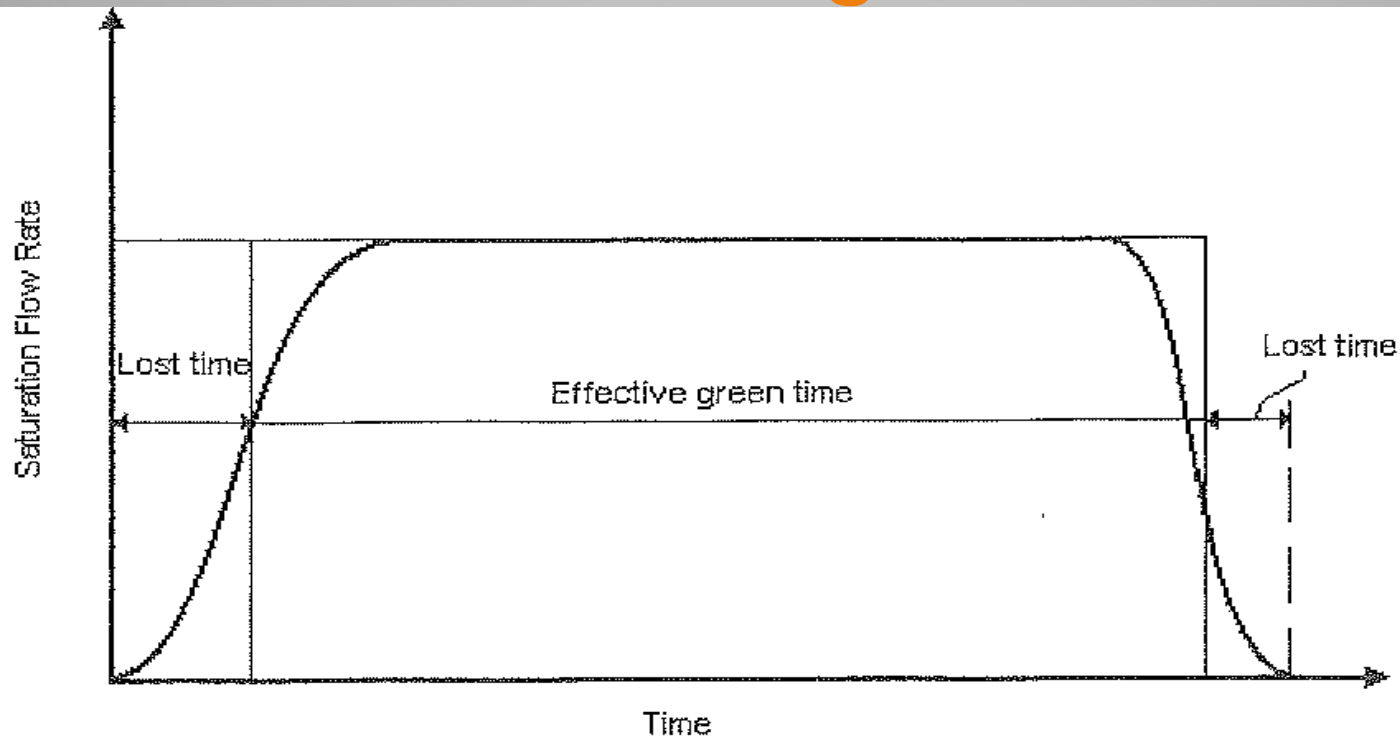
# TRAFFIC SIGNALS

## Other Traffic Signal Related Matters

1. Consider driver expectancy in regards to the length of yellow change intervals.
2. Flashing Yellow Arrows – Why not make them the statewide standard for protected-permissive control?
3. Flashing Yellow Arrows – Discuss an idea to improve pedestrian safety.



# Yikes, I was Wrong all Those Years!



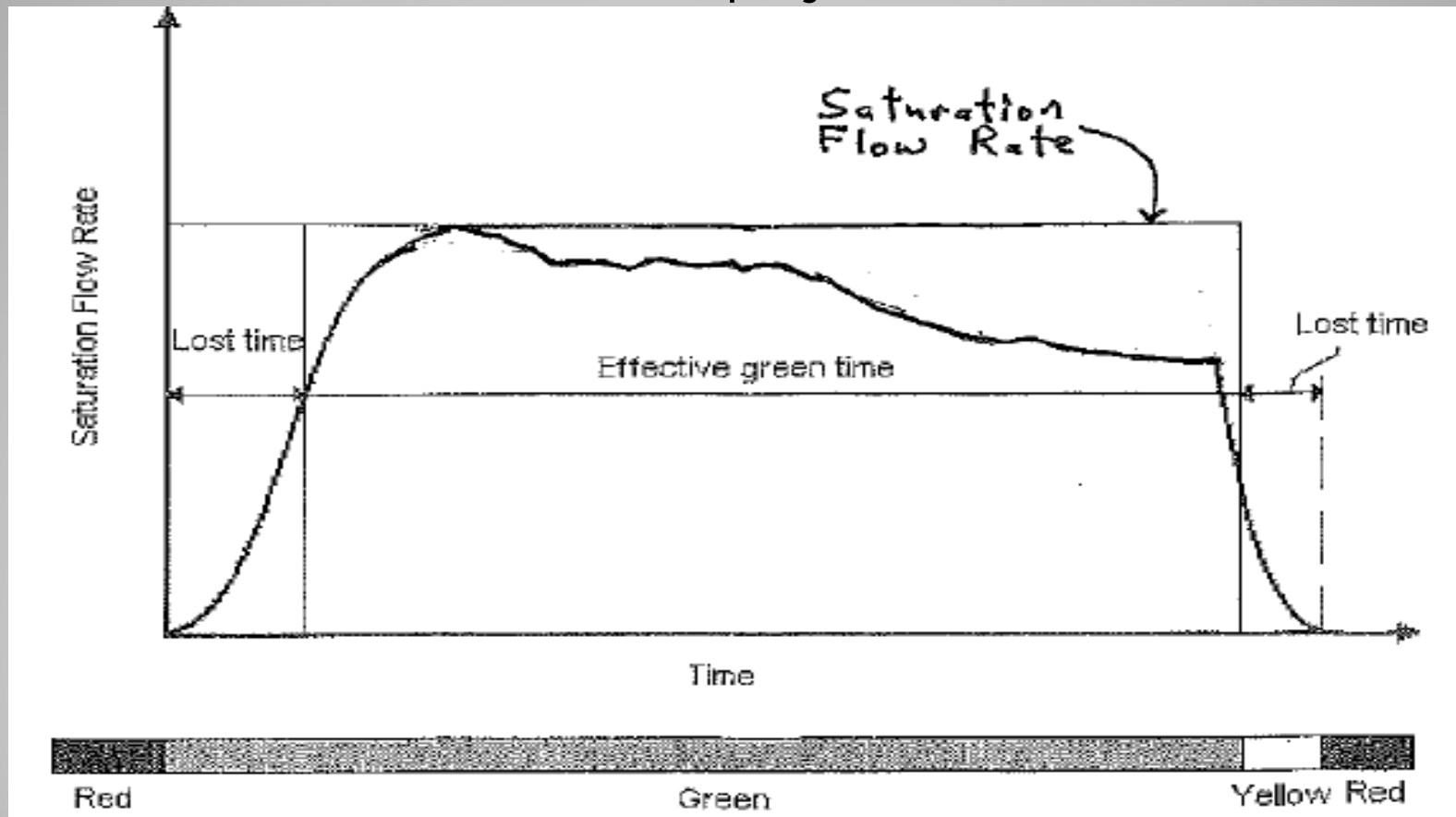
The flow of traffic during the green period from a saturated approach

Saturation Headway vs. Saturation Flow Rate: (vehicles / hour of green)  
h of 2.1 = 1714, h of 2.0 = 1800, h of 1.9 = 1895, h of 1.8 = 2000



# Yikes, I was Wrong all Those Years!

More like what we found on a project.



At around 50 seconds of green, average headways began to grow significantly longer, meaning the flow rate became less and less.

# The Worst Roadway Safety Problem in TN?



Image capture: Dec 2007



## The Worst Roadway Safety Problem in TN?



Standard speed limit sign assembly for one County in Tennessee, the same County as the photos on the previous slide.

So much for the MUTCD!

So, what do you think I think is the worst roadway safety problem in Tennessee?



## The Worst Roadway Safety Problem in TN?



The lack of technical expertise and resources in our rural counties and small towns!

What might the solution be?

## Final Thoughts from 40 years of Experience:

1. Almost everything we do involves some sort of tradeoff.
2. Be willing to listen to others, even those not educated in what we do.
3. Theory does not always apply to the real world.  
(That is why it is theory)
4. Common sense goes a long way in this business.

QUESTIONS OR COMMENTS?

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