



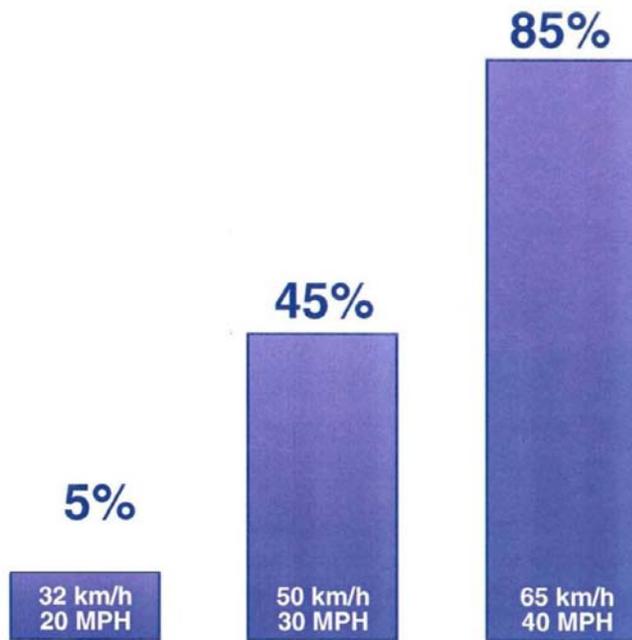
# The Use of ‘Your Speed’ Changeable Message Signs in School Zones

Sarah O’Brien and Carrie Simpson

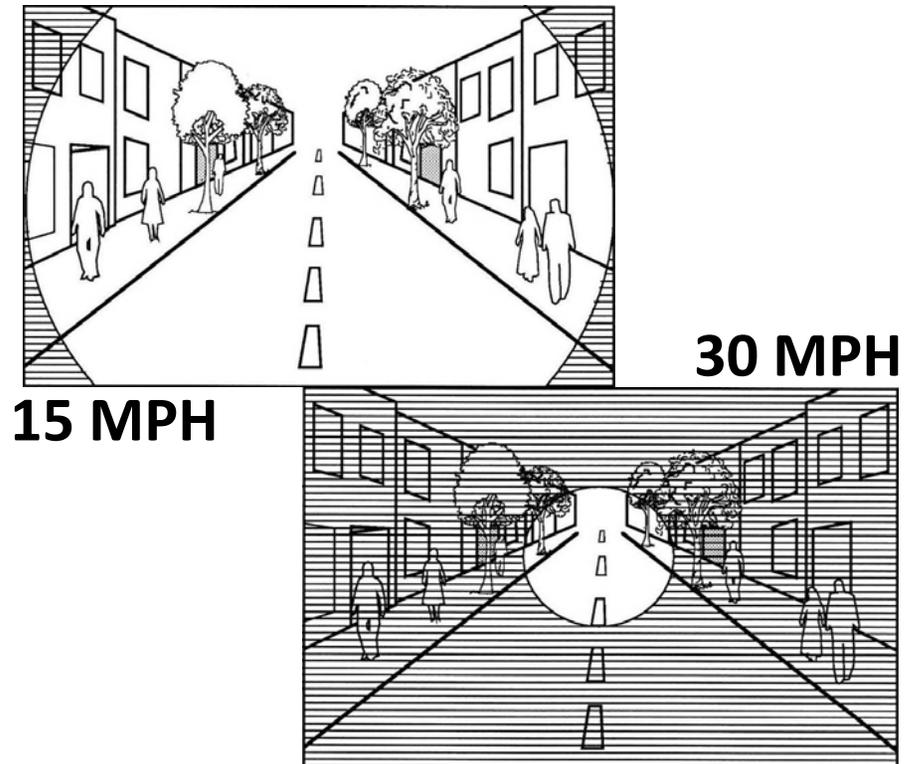
# Introduction – Speed Affects:



- Driver's ability to react, braking distance
- Crash Severity or potential to avoid a crash
- Driver's field of vision



Pedestrians' chances of death if hit by a motor vehicle  
SOURCE: *Killing Speed and Saving Lives*, UK Department of Transportation



# Introduction – Why School Zones?

---

- **Lower Speed Limits Around Schools = GOOD**
  - Increased pedestrian activity
  - More traffic
  - More turning vehicles
  - Potentially longer queues

# Introduction – Do They Work?



- **Effectiveness of School Speed Zones = POOR**
  - No change roadway characteristics
  - No change in environmental setting
  - Reduced speed ‘feels’ unnatural
  - Child walkers/bikers are MIA
    - 48% walked or biked in 1969
    - 12% walked or biked in 2009



www.pedbikeimages.org / Dan Burden

# Safe Routes to School Goals



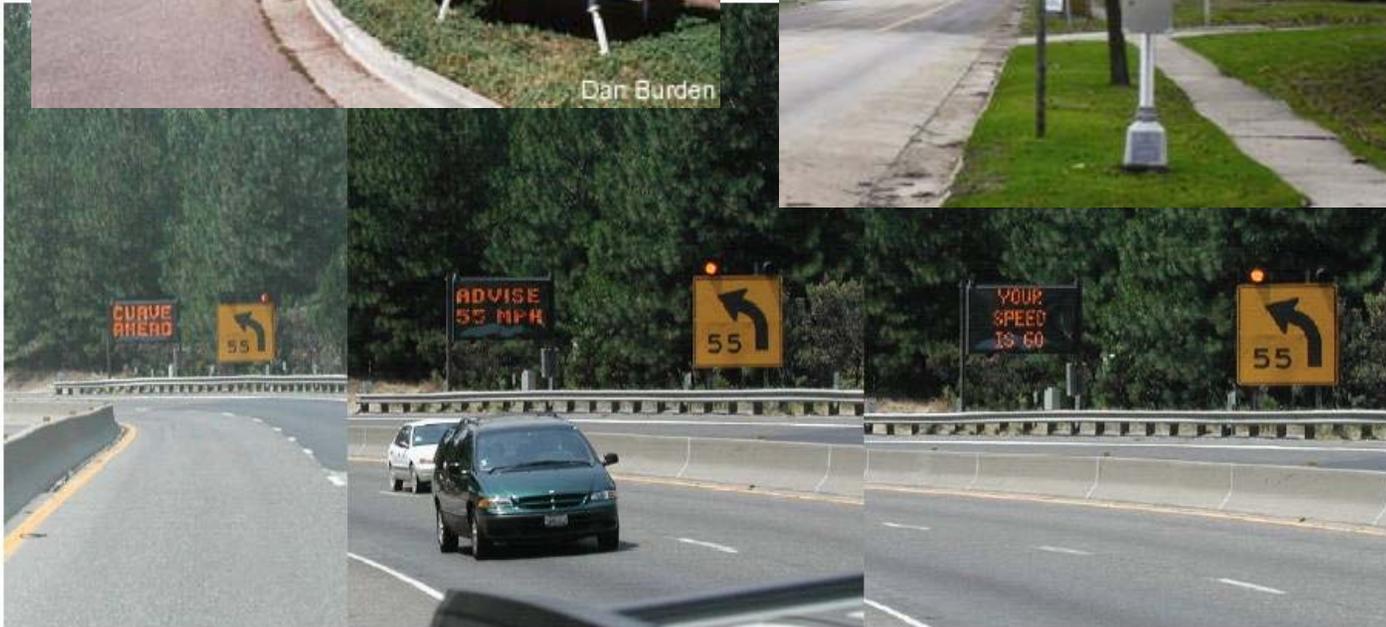
- **Enable and encourage children to walk and bicycle to school**
- **Make walking and bicycling to school safer**
- **Implement projects to:**
  - Improve safety
  - Reduce traffic
  - Reduce fuel consumption
  - Reduce air pollution



# Speed Feedback Sign Types



Dan Burden



Images clockwise: Dan Burden, FHWA-HRT-08-067, Dan Burden, and Caltrans via FHWA-SA-07-002



<http://www.itre.ncsu.edu>



# Study Objectives



- Do YOUR SPEED signs reduce speeding and increase compliance?
- School time vs. non-school time comparison
- Lessons learned and future recommendations

# SRTS Project Overview

---



- CM Eppes Middle School Site Description
- SRTS at CM Eppes
- YOUR SPEED Sign Assembly & Operation



<http://www.itre.ncsu.edu>

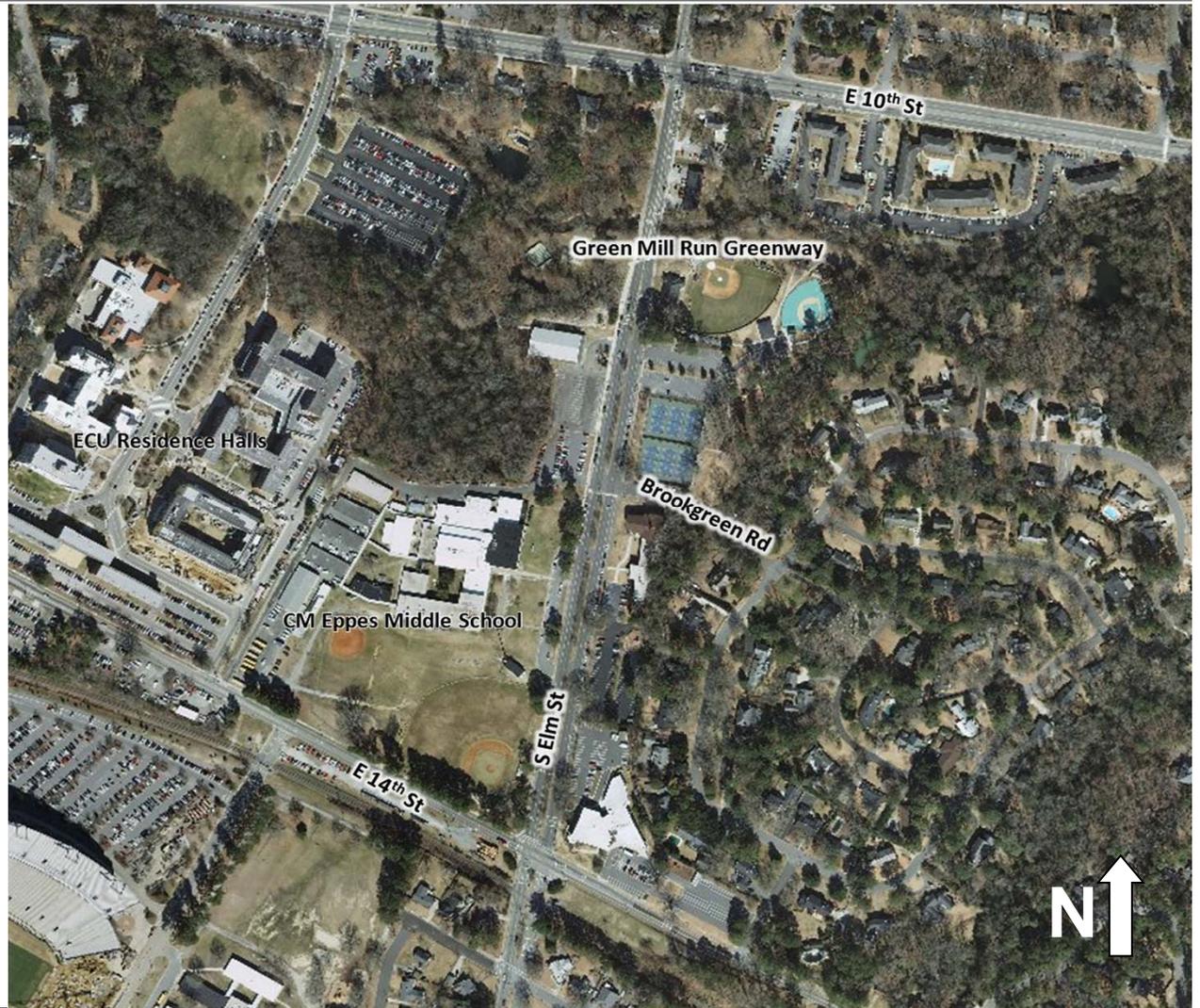


# CM Eppes Middle School



## S. Elm St. School Zone

- 11,000 vpd
- 1,500 ft zone
- 35 mph, non-ST
- 25 mph, ST



<http://www.itre.ncsu.edu>



# CM Eppes SRTS Project

---



- **Identify unsafe pedestrian scenarios**
- **Participate in International Walk to School Day**
- **Start a frequent walker/cyclist program**
- **Conduct citation study with local police dept.**

# Sign Assembly



## Features and Operations

- **Steady Number**  
0 < Speed Limit ≤ 5 mph
- **Flashing Number**  
Speed Limit ≤ 6 – 20 mph
- **Flashing Pattern**  
Speed Limit ≤ 21 mph+
- **Operate during school times**
- **Breakaway compliant**
- **Collect speed data**

# Data Collection



- **Pre-installation; 1, 3, 6 and 12 months post**
- **During school time (morning and afternoon)**
- **During non-school time (morning and afternoon)**
- **Both directions of travel**

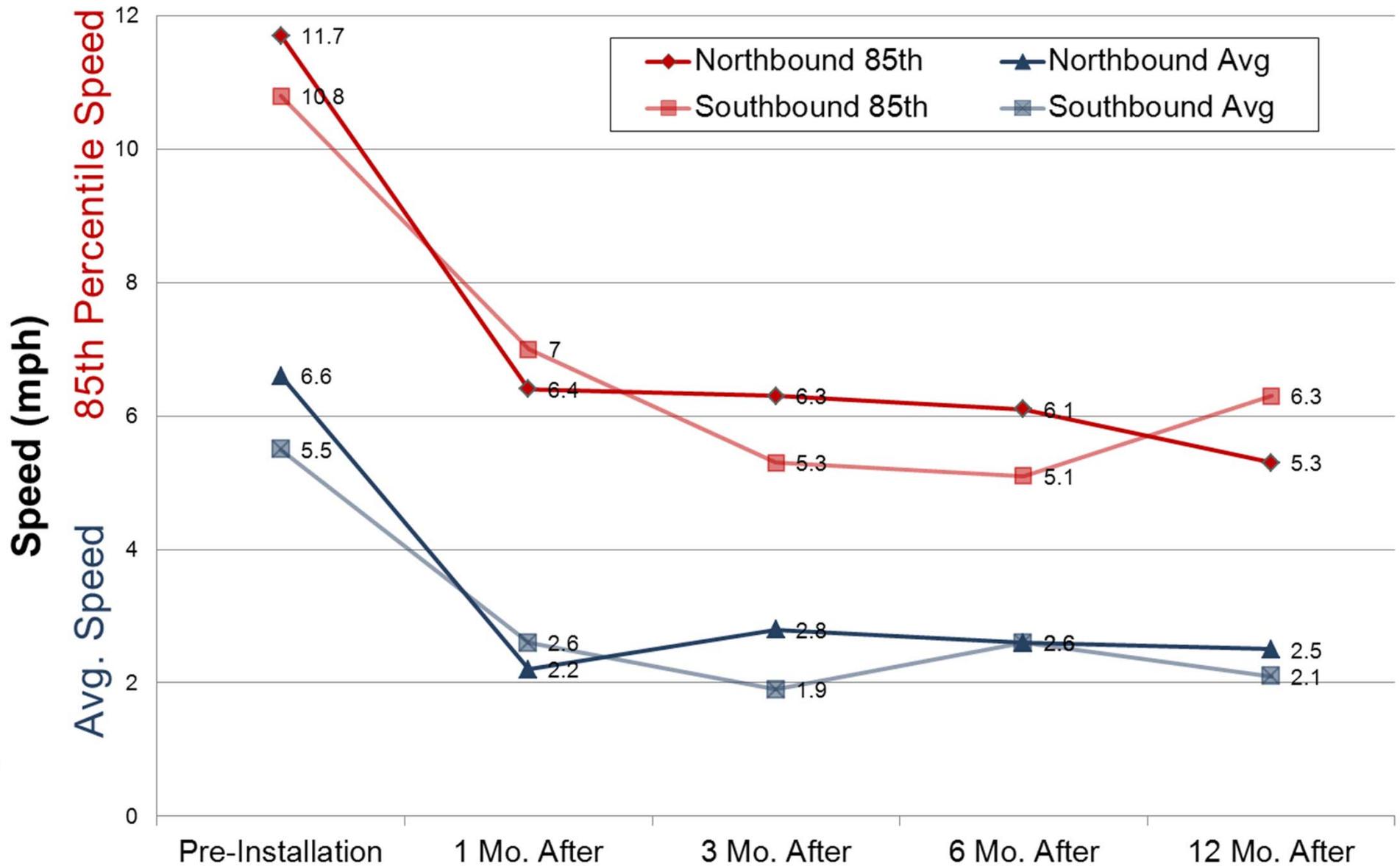


# Data Analyzed



- **% exceeding the speed limit**
  - **Average speed**
  - **85<sup>th</sup> percentile speed**
  - **Standard deviation**
  - **Pace speed**
- 
- **Data grouped by school time, non-school time, and direction of travel**

# Results – School Time



# Results – School Time



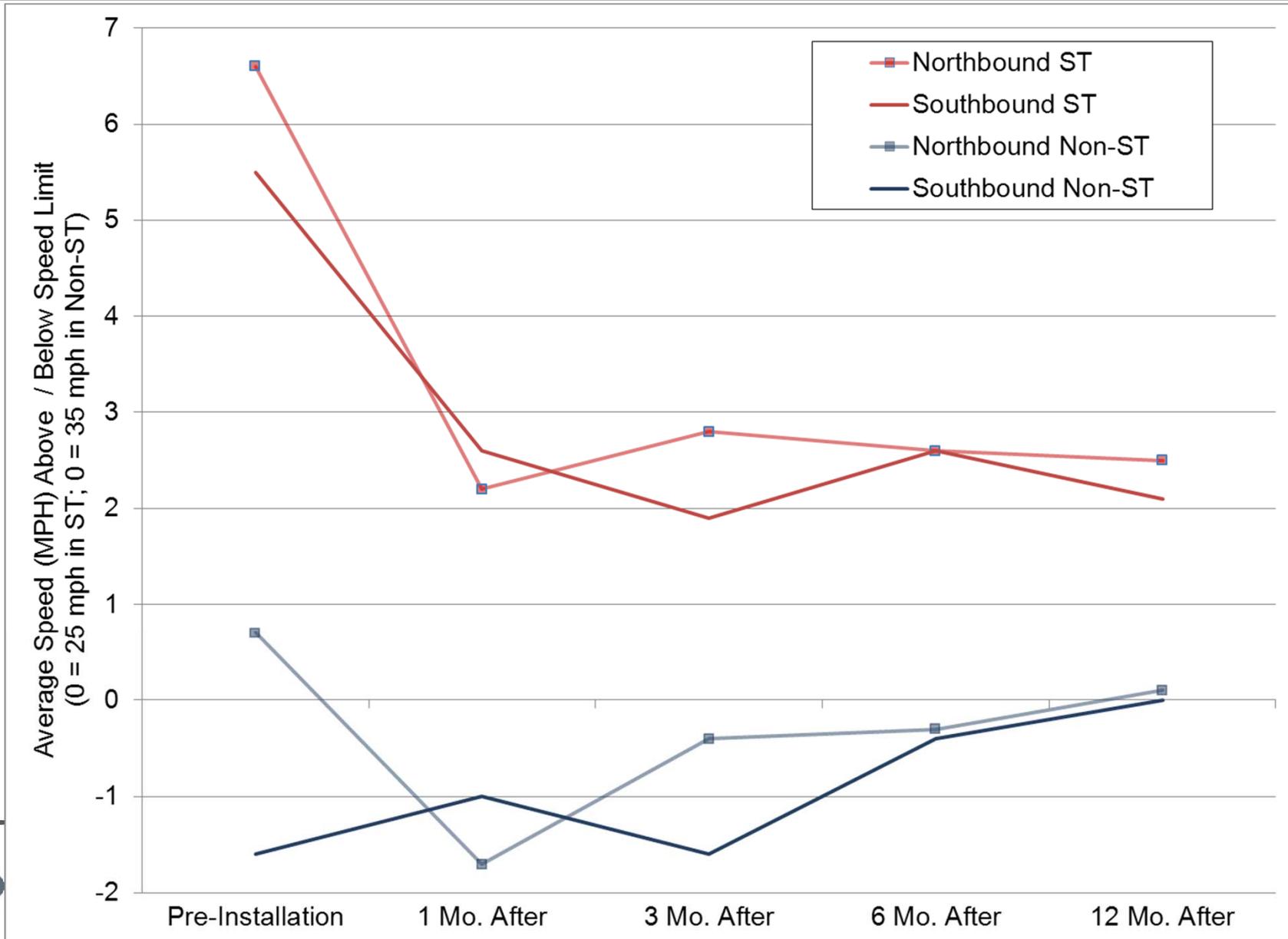
	Northbound			Southbound		
	Sample #	% Exceeding SL	% w/in Pace Speed	Sample #	% Exceeding SL	% w/in Pace Speed
Pre-Install	292	89	67	255	85	72
1 Mo. After	207	64	74	201	62	76
3 Mo. After	207	67	84	218	59	82
6 Mo. After	240	66	83	227	76	92
12 Mo. After	240	65	77	213	62	86



<http://www.itre.ncsu.edu>



# Results – Average Speed



# Results – Non-School Time



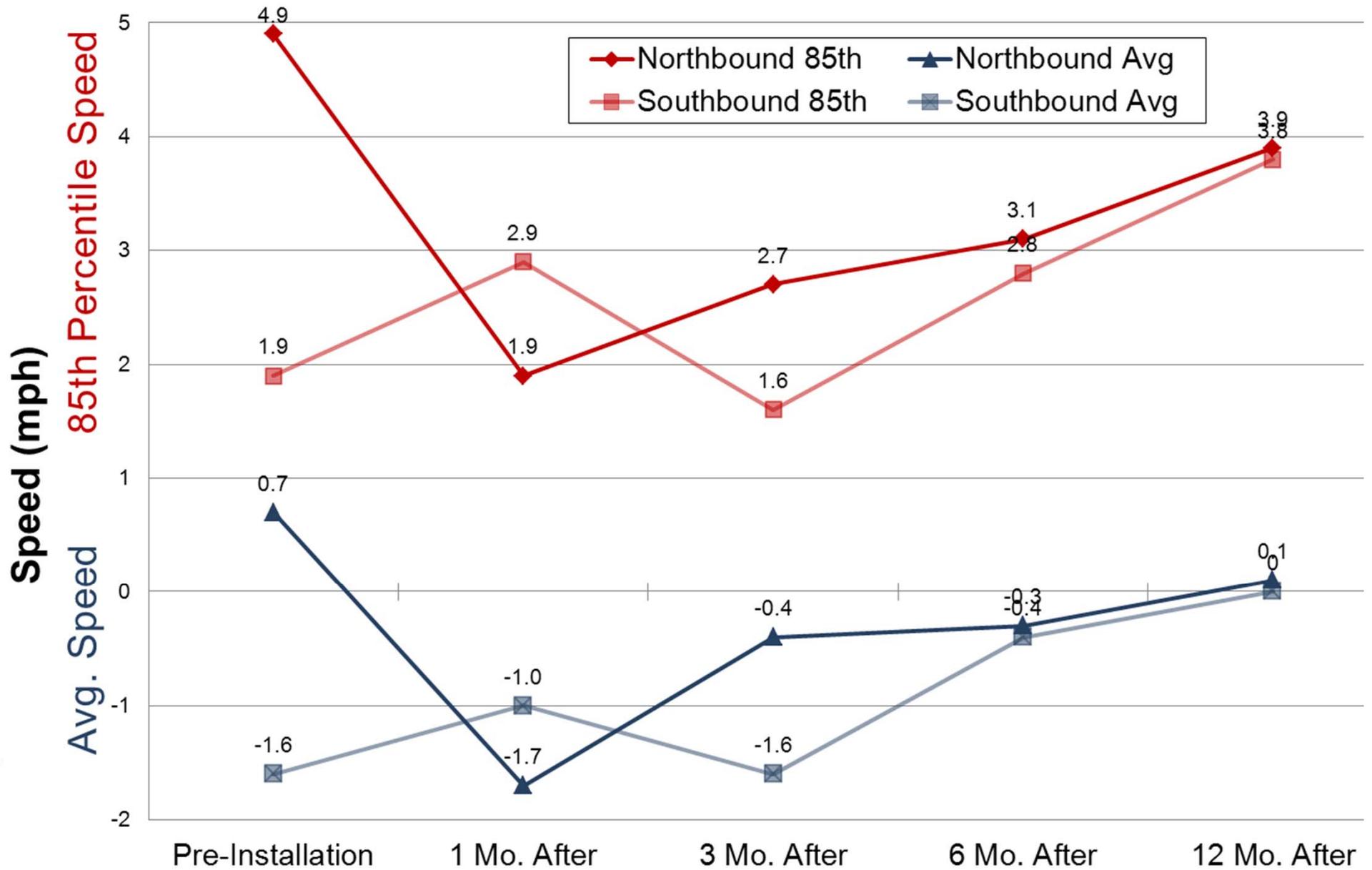
	Northbound			Southbound		
	Sample #	% Exceeding SL	% w/in Pace Speed	Sample #	% Exceeding SL	% w/in Pace Speed
Pre-Install	287	47	76	267	29	79
1 Mo. After	228	29	78	240	35	76
3 Mo. After	324	39	87	349	29	81
6 Mo. After	209	40	86	207	43	84
12 Mo. After	214	42	80	234	42	79



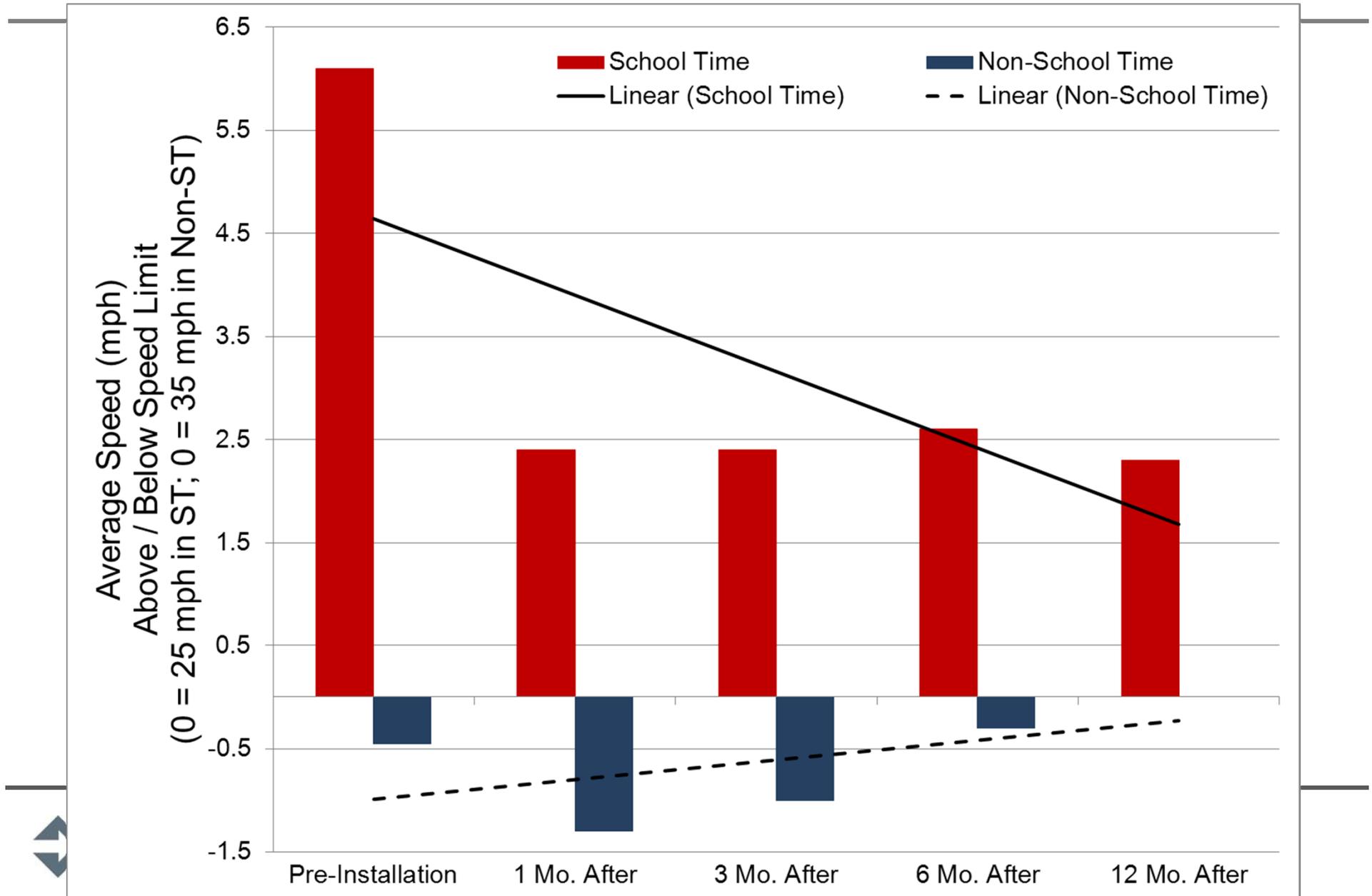
<http://www.itre.ncsu.edu>



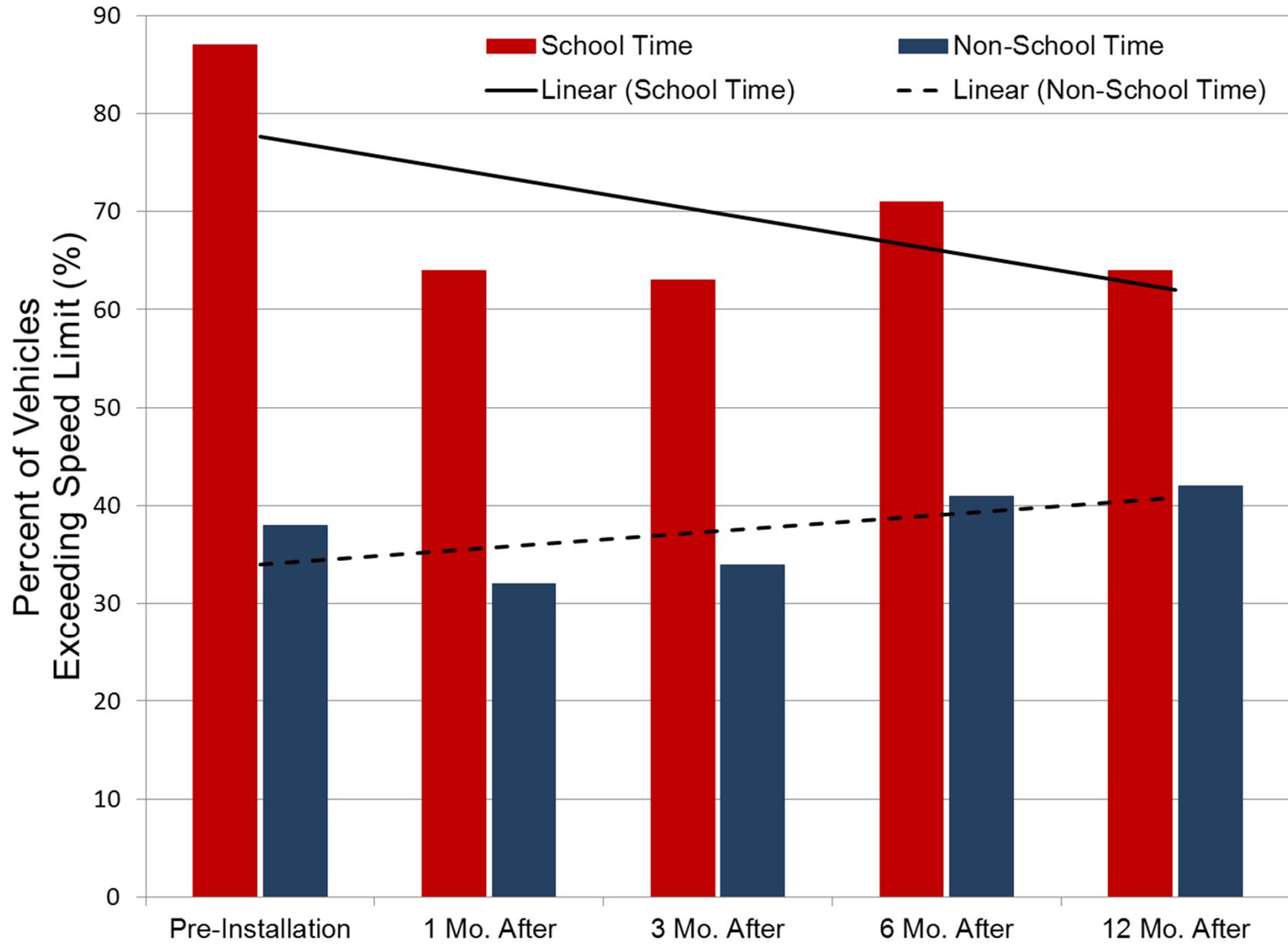
# Results – Non-School Time



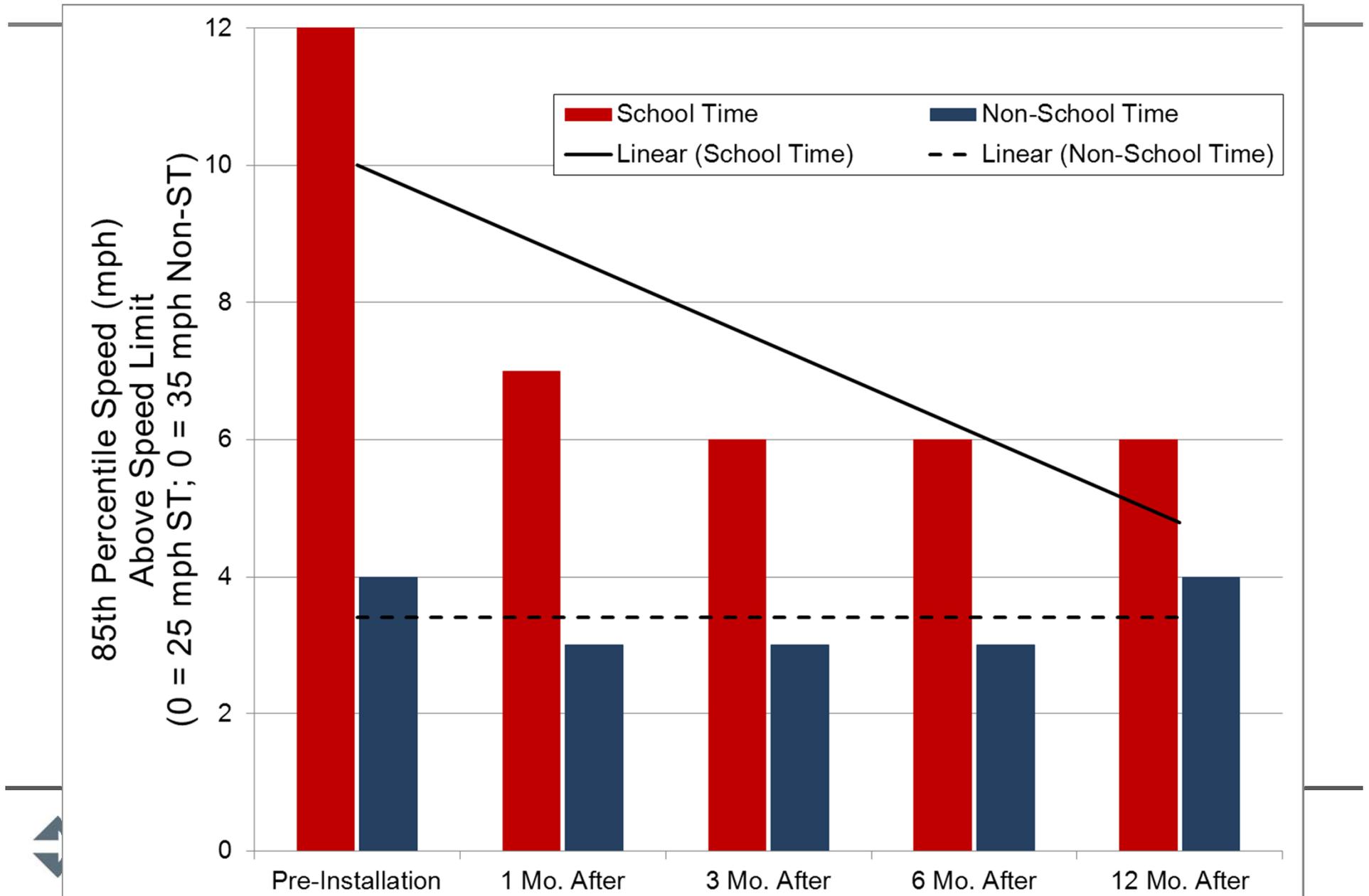
# Results – Average Speed



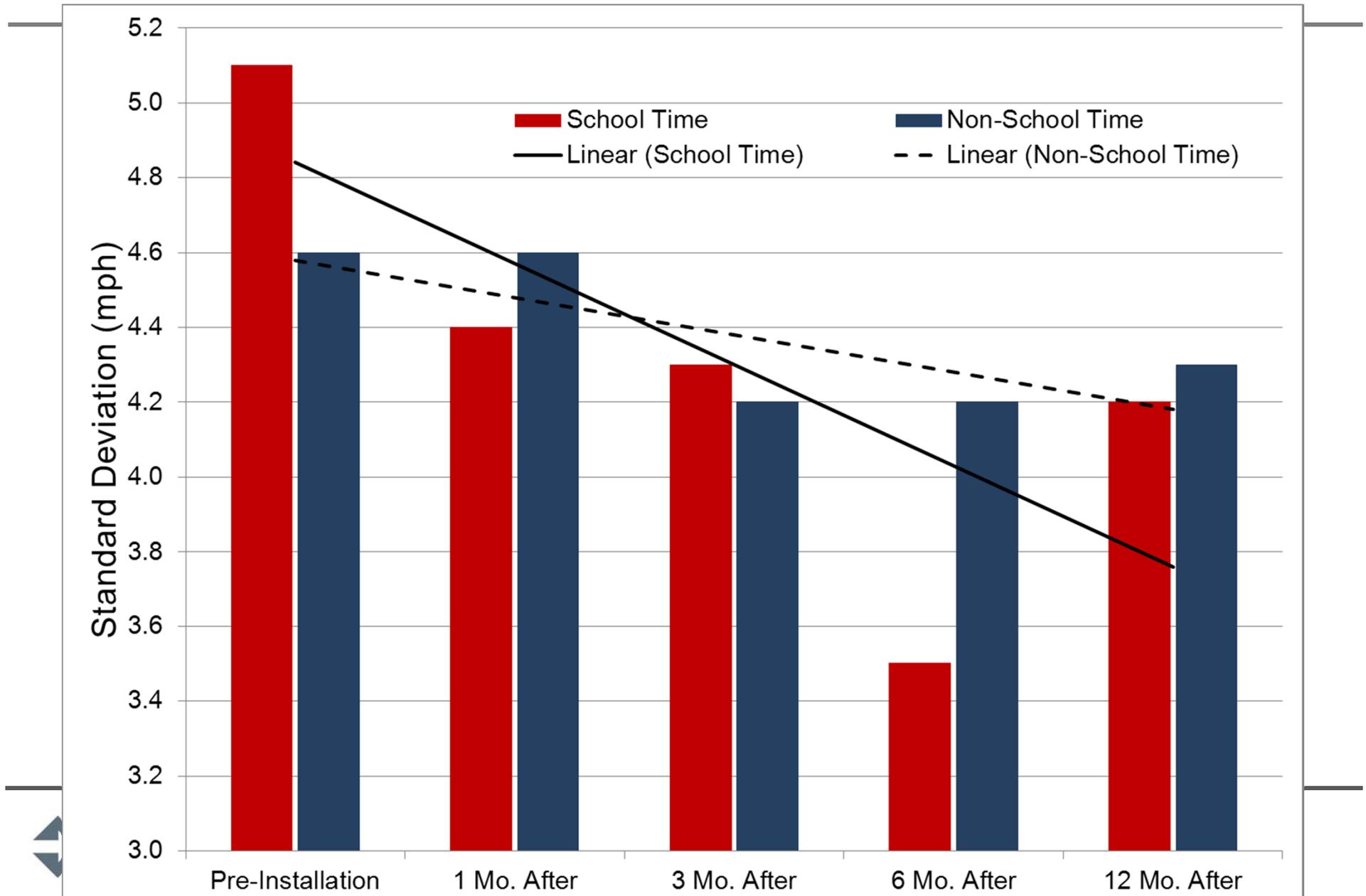
# Results - % Exceeding Speed Limit



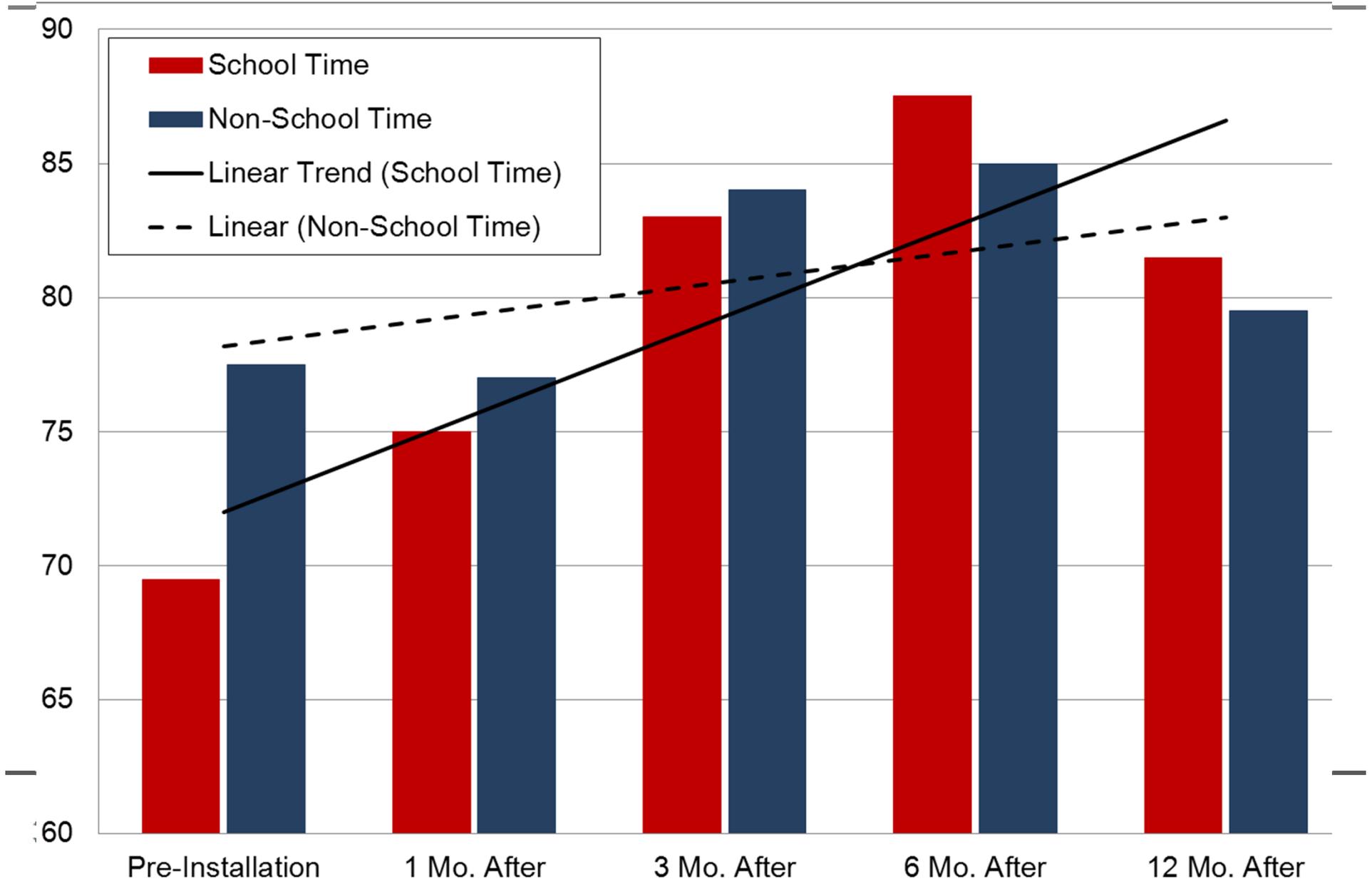
# Results – 85<sup>th</sup> Percentile Speed



# Results – Standard Deviation



# Results - % Within Pace Speed



# Conclusions



- **Yes, YOUR SPEED signs worked!**
  - Significant, sustained reductions in speed
  - Avg. speed was 12% lower 1 yr after install
- **Enhance Effectiveness:**
  - Periodic police presence
  - Active SRTS Program  
(encouragement/education)

# Conclusions



- **Additional Research Needs**
  - Context sensitivity: Do they work in all school settings?
  - Optimal speed enforcement strategy (frequency of police presence with use of sign)
  - Comparison to other possible traffic calming techniques

# Contact Information



[www.itre.ncsu.edu](http://www.itre.ncsu.edu)

**Sarah Worth O'Brien**

Institute for Transportation Research  
and Education

[skworth@ncsu.edu](mailto:skworth@ncsu.edu)

919-515-8703



**Carrie L. Simpson**

NC Department of Transportation –  
Safety Evaluation Group

[clsimpson@ncdot.gov](mailto:clsimpson@ncdot.gov)

919-662-4067



[www.ncdot.gov](http://www.ncdot.gov)