

### ROANOKE DRAFT SPEED MANAGEMENT ACTION PLAN

Dr. Bryan Katz, P.E., PTOE, RSP2I Katie Belt

Robert Issem, City of Roanoke, VA

toXcel

# toXcel

Scientific Excellence to Serve Others

# EXPERIENCE

The toXcel team has supported local, state, and tribal jurisdictions on behalf of FHWA and local agencies developing speed management action plans.

Bellevue Speed Management Plan

Oglala Sioux Tribe Speed Management Action Plan

Implementation of Self-Enforcing Roadways and Traffic Calming Measures for Caltrans

Maryland Speed Management Action Plan

FHWA SMAP ePrimer

















**Action Items** and Ongoing

# WHY SPEED MANAGEMENT?

- Speeding accounts for ~1/3 of all traffic fatalities across the country
- Speed impacts crash likelihood and severity
- Managing speed saves lives, especially for vulnerable road users like pedestrians and bicyclists



Source: AAA Foundation, Tefft, B.C. (2011)

# WHAT IS A SPEED MANAGEMENT ACTION PLAN?



Source: FHWA

- Data-driven plan to identify and address speed-related safety issues
- Uses crash, speed, and roadway data to highlight high-risk locations
- Guides agencies in selecting context-sensitive countermeasure
- Prioritizes strategies to reduce speed-related fatalities and serious injury crashes

# THE SAFE SYSTEM APPROACH



- Death and serious injuries are viewed as unacceptable
- Proactively layers protections across road users, vehicles, and infrastructure to minimize crash risks and consequences
- Managing speeds is central to crash severity and survivability
- SMAP operationalizes the "Safe Speeds" principle
- Integrates with other Safe Systems elements (e.g. Safe Roads, Safe People)

# **POLICY & PROGRAM ALIGNMENT**

### **State & Regional Strategy**

- Shifts from 85<sup>th</sup> percentile reliance to contextual factors for setting speed limits
- Virginia SHSP (2022-2026)
- Vulnerable Road User Safety Assessment (VRUSA)
- Safe Routes to School
- Roanoke Valley-Alleghany Regional Commissions

#### **Speed Enforcement in Roanoke**

- Targeted patrols on key corridors
- Speeding fines

### **Local Programs**

- "No Need to Speed" campaign, school zone focus, safety education
- Coordination with: PBSAP, BRITE, Bee City USA, Clean Valley, education centers



Learn more by visiting: roanokeva.gov/visionzero





# **Fatal** and **Serious Injury** crashes across Roanoke have **increased by 36%** steadily between 2016 and 2023.



# **Speeding** is a primary reason for it.



#### Speeding is a factor in **36% of Serious Injury** crashes; Remaining mostly steady since 2016.



### **How** do we reduce speeding?



Speeding contributes to 1/3 of KSI crashes

Higher severe crash rates on arterials and collectors

Need targeted speed reduction plan

# **SAFETY GOALS**

# Targets to achieve zero speeding-related KSI crashes on Roanoke Roadways by 2035:

- Reduce speeding related KSI by 3/year
- Reduce VRU KSI by 3/year
- Reduce VRU speeding related KSI by 1/year
- Improve speed limit compliance
- Implement 20 is Plenty





# **ROADWAY TYPOLOGIES**

5 roadway typologies grouped by land use, roadway context, and speed limit

Used to identify patterns and recommend targeted solutions

#### Downtown Local and Collector & Arterial Roadways - Speed & Classification



# **ROADWAY TYPOLOGIES**



# **ROADWAY TYPOLOGY CRASHES PER MILE**

Crashes were normalized by roadway miles per typology group.



# TYPOLOGY GROUP 1 -DOWNTOWN: LOCAL, 25

Roadways with most speeding-related KSI crashes (8):

- Burrell Street NW (2)
- Melrose Avenue NW (2)





Of the 8 speeding-related KSI crashes:

- 1 (12%) were fatal
- 4 (50%) were angle crashes
- 4 (50%) were during darkness with the road lit
- 6 (75%) were within an intersection
- 2 (25%) were under the influence of drugs or alcohol
- 3 (38%) were distracted
- 1 (12%) involved a pedestrian

# TYPOLOGY GROUP 1 -DOWNTOWN: LOCAL, 25



# TYPOLOGY GROUP 2 – DOWNTOWN: COLLECTOR AND ARTERIAL, 25-35

Roadways with most speeding-related KSI crashes (36):

- Williamson Road NW (9)
- Orange Avenue NE (7)



Of the 36 speeding-related KSI crashes:

- 9 (25%) were fatal
- 15 (42%) were fixed objects off the road crashes
- 20 (56%) were during darkness with the road lit
- 11 (31%) were within an intersection
- 11 (31%) were under the influence of drugs and alcohol
- 13 (36%) were distracted
  - 4 (11%) involved a pedestrian



# TYPOLOGY GROUP 2 - DOWNTOWN: COLLECTOR AND ARTERIAL, 25-35



# TYPOLOGY GROUP 3 -LOCAL, 15-25

Roadways with most speeding-related KSI crashes (49):

- 13th Street NE (2)
- Albemarle Avenue SE (2)





Of the 49 speeding-related KSI crashes:

- 7 (14%) were fatal
- 15 (31%) were fixed object off the road crashes
- 13 (27%) were during darkness with the road lit
- 17 (35%) were within an intersection
- 11 (22%) were on a curve-level roadway
- 16 (33%) were under the influence of drugs or alcohol
- 13 (27%) were distracted
  - 3 (6%) involved a pedestrian

### TYPOLOGY GROUP 3 -LOCAL, 15-25



# TYPOLOGY GROUP 4 -COLLECTOR AND ARTERIAL, 25-35

Roadways with most speeding-related KSI crashes (59):

- Hershberger Road NW (6)
- Orange Avenue NE (4)



Of the 59 speeding-related KSI crashes:

- 8 (14%) were fatal
- 22 (37%) were fixed object off the road crashes
- 6 (10%) were rainy conditions
- 18 (31%) were during darkness with the road lit
- 22 (37%) were within an intersection
- 12 (20%) were on a curve-level roadway
- 9 (15%) were under the influence of drugs or alcohol
- 15 (25%) were distracted
- 4 (7%) involved a pedestrian



# TYPOLOGY GROUP 4 -COLLECTOR AND ARTERIAL, 25-35



# TYPOLOGY GROUP 5 -COLLECTOR AND ARTERIAL, 40+

Roadways with most speeding-related KSI crashes (5):

• Peters Creek Road NW (4)



Of the 5 speeding-related KSI crashes:

- 4 (80%) were fixed object off the road crashes
- 3 (60%) were during nighttime conditions
- 2 (40%) were within an intersection
- 4 (80%) were under the influence of drugs or alcohol



# TYPOLOGY GROUP 5 -COLLECTOR AND ARTERIAL, 40+



# TOOLBOX OF SOLUTIONS

### **Engineering:**

- Speed feedback signs
- Bulb-outs
- Raised crosswalks
- Roundabouts

# **Education:**

- Targeted campaigns
- Community engagement

# **Enforcement:**

- High-visibility patrols
- Speed safety cameras in school/work zones

# Funding opportunities:

- SS4A
- VHSIP
- SMART SCALE

			Roadway Typologies					
Strategy	Countermeasure	1	2	3	4	5	Cost	
Alert Driver to Condition Requiring Reduced Speed	Advance Curve Warning Signs/Advisory Speeds	•	•	•	~	~	Low	
	Signal Backplates with Retroreflective Borders	~	~	✓	✓	✓	Low	
	<u>Bicycle Lane/Bicycle</u> Pavement Markings	~	~	$\checkmark$	✓	•	Low	
	<u>Crosswalk Enhancement</u> <u>Break Out into Individual</u> <u>Items</u>	~	~	~	~	~	Low-Medium	
	Retroreflectivity Strips on Posts	~	~	~	~	~	Low	
	Flashing LED Sign Border – Curve Warnings		•		•	~	Moderate	
	<u>Gateway Treatment -</u> Landscaping	•	•	•	•	•	Vary Widely	
	<u>Gateway Treatment -</u> <u>Signing</u>	•	•	•	•	•	Vary Widely	
	In-Street Pedestrian Crossing Sign	~	~	~	•	•	Low (<\$500 each)	
	Speed Activated Feedback Sign	✓	~	~	~	•	\$5 per lf + \$300 per bike emblem	
	Streetprint Crosswalks	~	•	✓	•		Low	
	Pedestrian Hybrid Beacons		•		•	~	\$21,000-\$57,680 (Avg \$57,680)	
	<u>Rectangular Rapid Flashing</u> <u>Beacons</u>	~	~	~	~	•	\$4,500-\$52,000	
	Transverse rumble strips					$\checkmark$	Low-Medium	
	Vertical Delineators	•	•	•	•	•	Low	
Create Driver Discomfort Above Target Speed	Offset Speed Table	~	•	✓	•		Medium	
	Speed Cushion	~	•	~	•		Low	
	<u>Speed Table/Raised</u> <u>Crosswalk</u>	✓	•	~	•		Medium	
	Intersection/Median Barrier (Arterial Only)		•		•	•	\$1,500-\$20,000	

# **TYPOLOGY-BASED RECOMMENDATIONS**

# Summary of safety issues, high-risk corridors, and recommended countermeasures by typology

#### **Example: Downtown: Local, 25 MPH**

- Problem:
  - High pedestrian activity, especially in intersections.
  - Frequent angle and intersection-related crashes (75% within intersections).
  - Notable risky behaviors: drug/alcohol use and distraction.
- High-risk corridors:
  - Melrose Avenue NW (from Forest Park Blvd NW to 16th St NW 1.5 miles):
    - 2 Speeding-Related KSI Crashes
    - Speed Limit vs 85th Percentile Speed: 9.57 MPH (weekdays) and 10.16 MPH (weekends)
- Solutions:
  - Mini-roundabouts, Rectangular rapid flashing beacons (RRFBs), Road diets, Crosswalk enhancements



#### **Finalize SMAP Action Items Table**

#### **Coordinate with existing maintenance projects for cost efficiency**

#### **Implement early wins**

- Feedback signs
- Crosswalk enhancements

#### Track and evaluation outcomes annually



# **ABOUT US**

#### Dr. Bryan Katz, P.E., PTOE, RSP2I President

540-969-9241 bryan.katz@toxcel.com

# Robert Issem

Complete Streets & Vision Zero Coordinator City of Roanoke, VA - Transportation

540-853-5887 robert.issem@roanokeva.gov