Special Committee to Study and Make Recommendations Regarding Truck Traffic & Freight Movements Along SR 41, SR 48 & SR 7

## **SAFETY DATA**

Jim Burnett, P.E., PTOE August 9, 2017

## Crash Data 101

- All crash data based on crash reports from responding police agency
  - Individual crash reports completed by responding officer(s)
  - Not reported? → Not in data
  - Police entry of "non-reportable" → Not in data
- Crash Analysis Reporting System (C.A.R.S.)
  - Data entered by Police
  - Quality Control of data by DelJIS
  - Data access/analysis by DelDOT



### SR 7/41/48 Crash Analysis



Focused on Total Crashes and Truck Crashes

## Heavy Vehicle Definition – Volume



### Truck Definition – C.A.R.S. Data



#### **Crash Data Segments**





#### Truck-related crash trends

- Five crashes resulted in injuries (13%) and<sup>•</sup> there were zero fatalities
- Rear-end crashes were the most common (53%)
- Sideswipe, same direction crashes were

- 48% of crashes occurred between 12:00 noon and 5:00 pm
- 90% of crashes occurred during daylight hours

7

 65% of crashes occurred between Tuesday and Thursday

# Short-Term Crash Data: Use With Caution!







Source: AASHTO Highway Safety Manual, 1<sup>st</sup> Edition, 2010

#### Crash Data Summary – SR 7

"Before"
January 2013 – June 2016
Daily Traffic: 29,196
3.5-yr Total Crashes: 748
3.5-yr Truck Crashes: 40

Crashes per year: 214 Truck Crashes per year: 11

Total Crash Rate:3.38Crashes per millionvehicle miles traveled

#### Truck Crash Rate: 0.18 Truck crashes per million vehicle miles traveled

"During"
August 2016 – December 2016
Daily Traffic: 30,263
4-mo Total Crashes: 64
4-mo Truck Crashes: 3

Crashes per year: 199 Truck Crashes per year: 9

Total Crash Rate:3.03Crashes per millionvehicle miles traveled

Truck Crash Rate: 0.14 Truck crashes per million vehicle miles traveled

#### Crash Data Summary – SR 41 North of SR 41/SR 48 Split



#### Truck-related crash trends

- 12 crashes resulted in injuries (36%) and there was one fatality
- Rear-end crashes were the most common (42%)
- Sideswipe, same direction crashes were

- 30% of crashes occurred between 3:00 pm and 6:00 pm
- 73% of crashes occurred during daylight hours
- 73% of crashes occurred between 10
   Wednesday and Eriday

Crash Data Summary – SR 41 North of SR 41/SR 48 Split				
"Before"	"During"			
January 2013 – June 2016	August 2016 – December 2016			
Daily Traffic: 18,683	Daily Traffic: 19,197			
3.5-yr Total Crashes: 292	4-mo Total Crashes: 35			
3.5-yr Truck Crashes: 33	4-mo Truck Crashes: 6			
Crashes per year: 83	Crashes per year: 109			
Truck Crashes per year: 9	Truck Crashes per year: 19			
<b>Total Crash Rate:</b> 4.45 Crashes per million vehicle miles traveled	<b>Total Crash Rate:</b> 5.63 Crashes per million vehicle miles traveled			
Truck Crash Rate: 0.50	Truck Crash Rate: 0.97			

Truck crashes per million vehicle miles traveled

Truck Crash Rate: 0.50 Truck crashes per million vehicle miles traveled

#### Crash Data Summary – SR 41 South of SR 41/SR 48 Split



#### Truck-related crash trends

- Five crashes resulted in injuries (16%) and there were zero fatalities
- Rear-end crashes were the most common (50%)
- Sideswipe, same direction crashes were also common (25%)
- 28% of crashes occurred mid-day between 11:00 am and 1:00 pm
- 81% of crashes occurred during daylight hours
- 34% of crashes occurred on Tuesdays <sup>12</sup>

#### Crash Data Summary – SR 41 South of SR 41/SR 48 Split

"Before""During"January 2013 – JuneAugust 201220162016Daily Traffic:13,264Daily Traffic:Daily Traffic:

Daily Traffic:13,2643.5-yr Total Crashes:2693.5-yr Truck Crashes:32

Crashes per year: 77 Truck Crashes per year: 9

## Total Crash Rate:4.61Crashes per millionvehicle miles traveled

#### Truck Crash Rate: 0.55 Truck crashes per million vehicle miles traveled

August 2016 – December 2016 Daily Traffic: 13,517 4-mo Total Crashes: 29

4-mo Truck Crashes: 3

Crashes per year: 90 Truck Crashes per year: 9

Total Crash Rate:5.30Crashes per millionvehicle miles traveled

Truck Crash Rate: 0.55 Truck crashes per million vehicle miles traveled



#### Truck-related crash trends

- Two crashes resulted in injuries (33%) and<sup>•</sup> there were zero fatalities
- Four crashes (67%) were rear-end crashes
- One crash was an angle collision

- One crash was a sideswipe, same direction collision
- All six crashes occurred between 8:00 am and 6:00 pm
- Crashes were evenly split on Mondays 14 and Wednesdays

#### Crash Data Summary – SR 48

"Before" January 2013 – June 2016

Daily Traffic:22,7383.5-yr Total Crashes:1983.5-yr Truck Crashes:6

Crashes per year: 57 Truck Crashes per year: 2

Total Crash Rate:1.78Crashes per millionvehicle miles traveled

#### Truck Crash Rate: 0.05 Truck crashes per million vehicle miles traveled

"During" August 2016 – December 2016

Daily Traffic:23,3984-mo Total Crashes:23

4-mo Truck Crashes: 1

Crashes per year: 71 Truck Crashes per year: 3

Total Crash Rate:2.18Crashes per millionvehicle miles traveled

Truck Crash Rate: 0.09 Truck crashes per million vehicle miles traveled

## **Crash Data Comparison**

Segment	Total Crash Rate (Crashes per million vehicle miles traveled)		<b>Truck Crash Rate</b> (Truck crashes per million truck miles traveled)	
	Jan '13 – Jun'16 3.5 years	Aug '16 – Nov '16 4 months	Jan '13 – Jun'16 3.5 years	Aug '16 – Nov '16 4 months
SR 41 North of SR 41/SR 48 Split	4.45	5.63	0.50	0.97
SR 41 South of SR 41/SR 48 Split	4.61	5.30	0.55	0.55
<b>Statewide Average</b> Two-Lane Arterial	4.71			-
SR 7	3.38	3.03	0.18	0.14
SR 48	1.78	2.18	0.05	0.09
<b>Statewide Average</b> Multilane Arterial	4.02			-

## DelDOT Highway Safety Improvement Program (HSIP)

## Hazard Elimination Program (HEP)

- High crash locations selected annually using the Critical Ratio method
  - Determine whether crash rate is higher than the average crash rate for locations with similar characteristics (3/10 mile segments)
  - Critical Ratio > 1 means crash rate is statistically significantly higher than the
     statewide average for similar roadways

statewide average for similar roadways

- DelDOT ranks sites with Critical Ratio > 1
- DelDOT selects the top 15 HEP segments (not part of an ongoing project or studied recently) for additional safety study each year
- 2017 HEP Sites based on January 2013 December 2015 crash data
- SR 7/41/48 HEP Sites
  - 10 sites with Critical Ratio >1

#### SR 41, SR 48 & SR 7 HEP Sites



#### **HEP Studies Since 2010**



### Strategic Highway Safety Plan (SHSP)

- Statewidecoordinated safety plan
- Looks at crashes systemically
- Integrates the four E's
  - Engineering
  - Education
  - Enforcement
  - Emergency Medical Services (EMS)
- Proactive, rather

- Current priorities
  - Intersections
  - Roadway departure
  - Impaired driving
  - Unrestrained motorists
  - Motorcycles
  - Speeding
  - Pedestrians
  - Traffic records

## Summary

- No HEP locations on SR 7, 41 or 48 on DelDOT's selected list for 2017
- Similar truck crash types (rear-end, sideswipe)
- Most truck crashes → weekdays during daylight hours
- "Before" Period
  - Non segments had crash rates higher than statewide averages for similar roadways
  - SR 41 and SR 7 had similar total crash rates
  - SR 48 had lower total crash rate
  - SR 41 & SR 7 truck crash rates notably greater than the SR 48 truck crash crate
- "During" Period
  - Use results with caution!
  - SR 7: Both total and truck crash rates went down
  - SR 41 (south of split): Total crash rate down slightly, truck crash rate the same
  - SP 18: Both total and truck crash rates went up: rates still lower