

# Planning Level CMFs in KY

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- Background/History
- SHIFT - KY's Formula for Project Prioritization
- Improving SHIFT via Planning Level CMFs
- Additional Uses

# Background/History

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- Late 90s - 2016
  - Over Programming of State Funded Portion of Six Year Highway Plan (SYP)
- Early 2016 - Cash Flow Analysis revealed:
  - Road Fund Revenues - Lower Than Expected
  - Projected to hit \$0 in mid-August 2016 if action not taken

# Background/History

- Immediate Response:
  - “Pause 50” - Delay Most State Funded Projects
- Comprehensive Response:
  - Develop a data-driven approach to set transportation priorities
- 2016-2017
  - SHIFT Developed

# SHIFT

Strategic  
Highway  
Investment  
Formula for  
Tomorrow

# SHIFT

- Formula's Key Priorities:
  - Safety performance (25%)
  - Reduce congestion (20%)
  - Promote economic growth (20%)
  - Manage existing assets (15%)
  - **Benefit/Cost (20%)**

# SHIFT

- Benefit/Cost Calculations:
  - Travel Time Savings
  - Safety Benefit
    - SHIFT 2018 - very similar to NCDOT's model



# SHIFT

- Safety Benefit Formula (2018)

$$B_{SAF} = SBF_{PROJ} * ( N_{KAB} * C_{KAB} + N_{CO} * C_{CO} )$$

$SBF_{PROJ}$  = Safety Benefit Factor for Project Type

$N_{KAB}$  = Number of K, A, B Crashes

$C_{KAB}$  = Avg Cost of K, A, B Crashes

$N_{CO}$  = Number of C, O Crashes

$C_{CO}$  = Avg Cost of C, O Crashes

# Improving SHIFT via Planning Level CMFs



# Improving SHIFT via Planning Level CMFs

- Safety Benefit Formula (2020)

$$B_{SAF} = (1 - CMF_{PROJ}) * ( N_{KAB} * C_{KAB} + N_{CO} * C_{CO} )$$

$CMF_{PROJ}$  = Crash Modification Factor for Project Type

$N_{KAB}$  = Number of K, A, B Crashes

$C_{KAB}$  = Avg Cost of K, A, B Crashes

$N_{CO}$  = Number of C, O Crashes

$C_{CO}$  = Avg Cost of C, O Crashes

# Improving SHIFT via Planning Level CMFs

- KY's Planning Level CMF List covers 70+ project types
- SHIFT 2018 incorporated 22 project types
- Will not be able to use all 70+ CMFs right away
  - 1,000s of projects in our database
  - Will be difficult to re-code
  - Focus on project types with biggest change

SBF Project Type	Definition	SBF	CMF Project Type	CMF
Improve Intersection	Add left turn lane, Add right turn lane, Roundabout Installation, Horizontal Realignment	25	Convert Stop or Yield Control Intersection to Signalized Intersection	0.65
			<del>Convert Minor Stop or Yield Control to All-Way Stop Control</del>	<del>0.25</del>
			Convert Stop or Yield Control Intersection to Roundabout	0.20
			Convert Signalized Intersection to Roundabout	0.40
			New Left Turn Lane	0.72
			New Right Turn Lane	0.84
			Offset Left Turn Lane	0.65
			Eliminate Minor Approach Left Turns (Right Turn and Downstream U-Turn)	0.57
			Install Adaptive Traffic Signal Control	0.92
			<del>Protect/Permit Left Turn to Protect/Permit Flashing Yellow Arrow</del>	<del>0.85</del>

SBF Project Type	Definition	SBF	CMF Project Type	CMF
Improve Intersection	Add left turn lane, Add right turn lane, Roundabout Installation, Signal Installation	25 <b>0.71</b>	Convert Stop or Yield Control Intersection to Signalized Intersection	0.65
			Construct Roundabout	0.30
			Turn Lane(s) Improvements	0.74
			Eliminate Minor Approach Left Turns (Right Turn and Downstream U-Turn)	0.57
			Install Adaptive Traffic Signal Control	0.92



# Additional Uses

- Planning Studies
- Preliminary Engineering
- Evaluation of Operations/Maintenance Improvements

