



**PROGRAM DELIVERY WORKSHOP**

JULY 2024 | WASHINGTON, DC

# Fundamentals of a Benefit-Cost Analysis (BCA)

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# Panelist

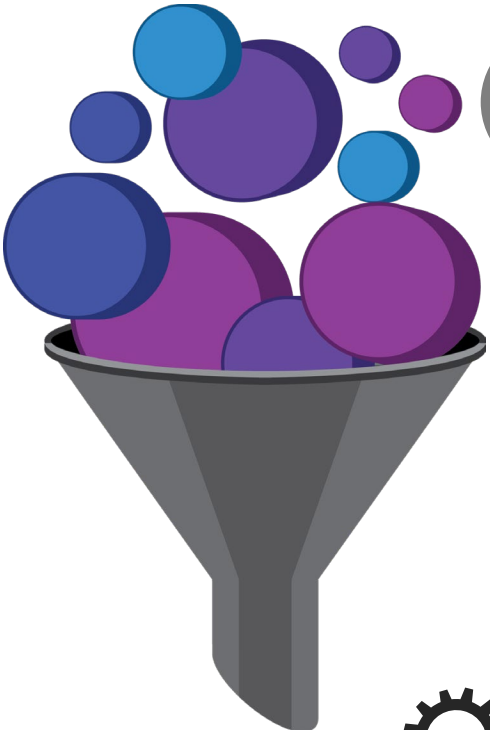


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Data, and Innovation

# Agenda

- Overall Benefit Cost Analysis Creation **Process**
- Entering **Inputs** for No Build and Build Scenarios
- Calculating Appropriate **Benefits**
- Producing the Correct Benefit Cost Ratio **Results**
- Available Online **Resources**

# The BCA Process

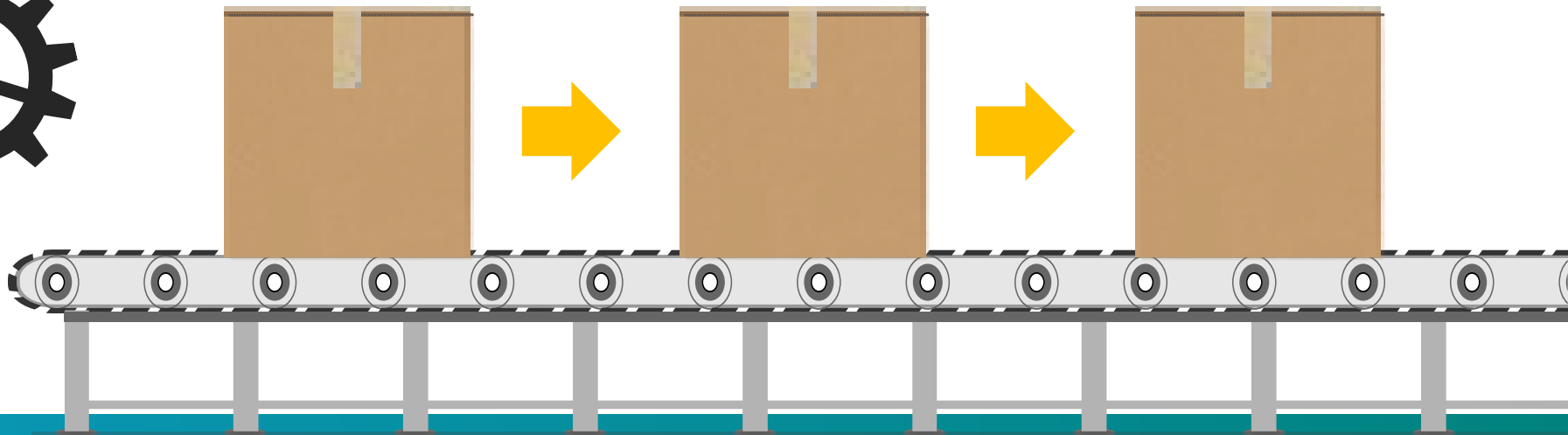


**1** Enter Inputs

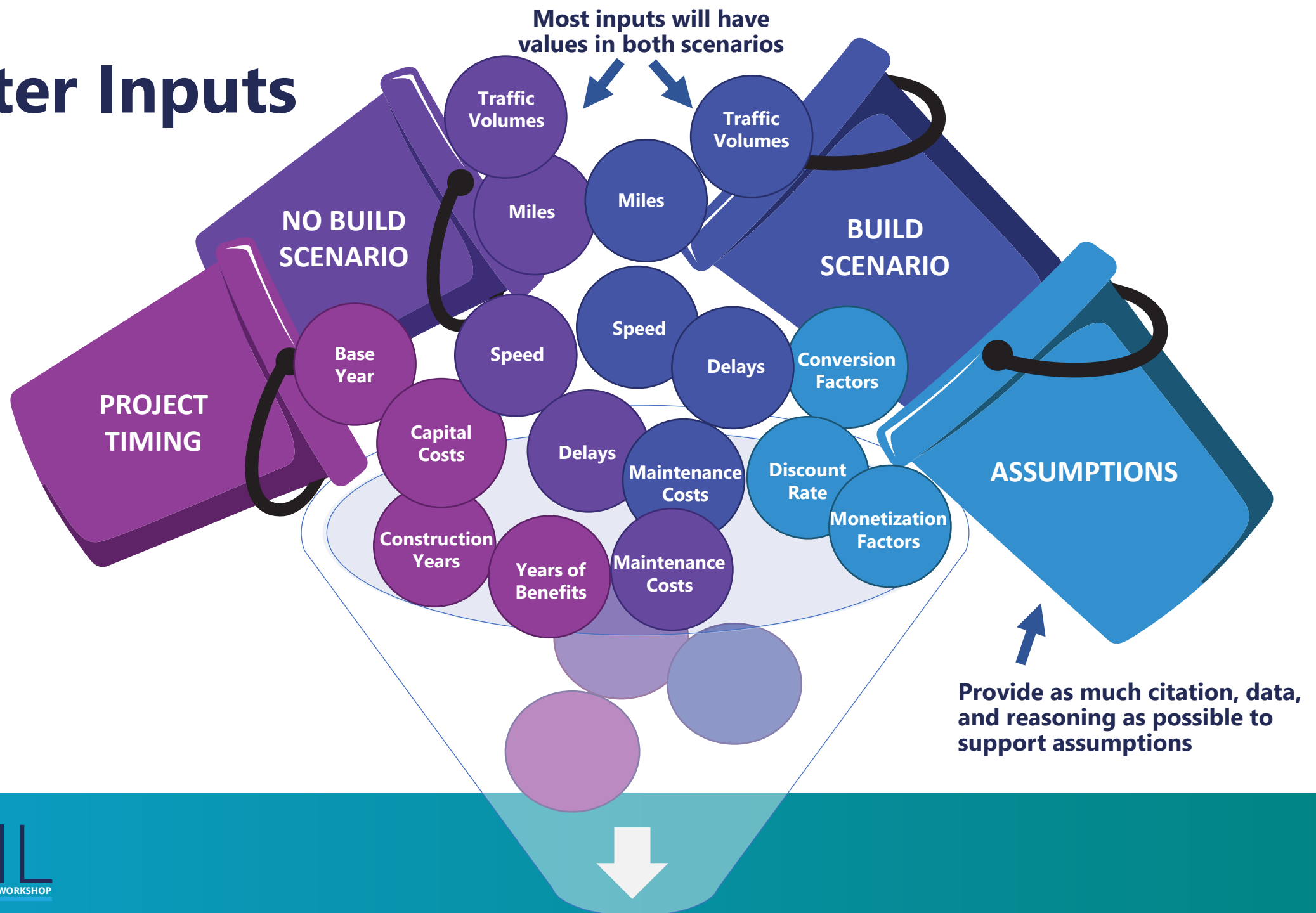
**2** Calculate Benefits



**3** Produce Results



# Enter Inputs



# Calculate Benefits Flowing from Shifted Traffic

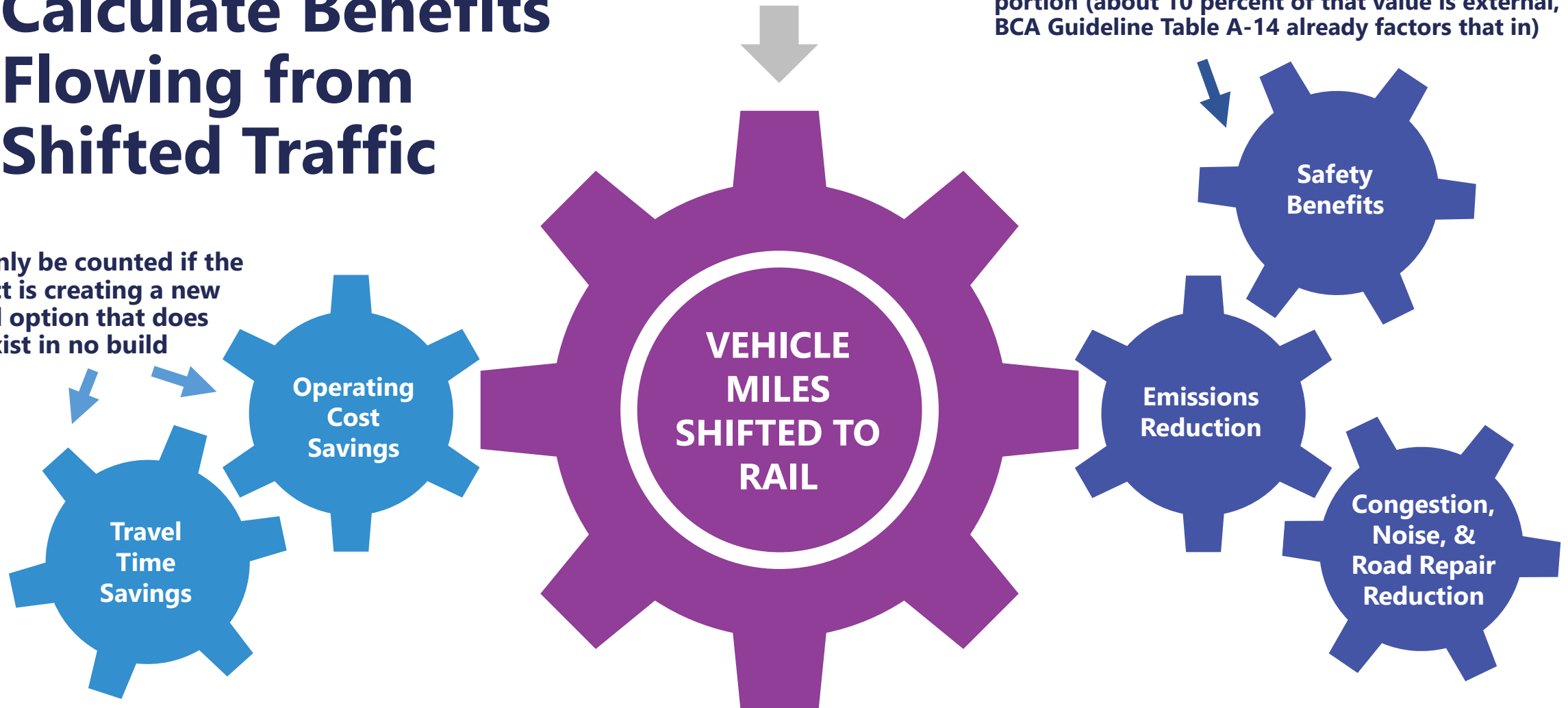
Usually 25-75 percent of  
Newly-Induced Rail Traffic



# Calculate Benefits Flowing from Shifted Traffic

Externalities can always be counted, but accident reductions on the roads need to only count the external portion (about 10 percent of that value is external, DOT BCA Guideline Table A-14 already factors that in)

Can only be counted if the project is creating a new modal option that does not exist in no build



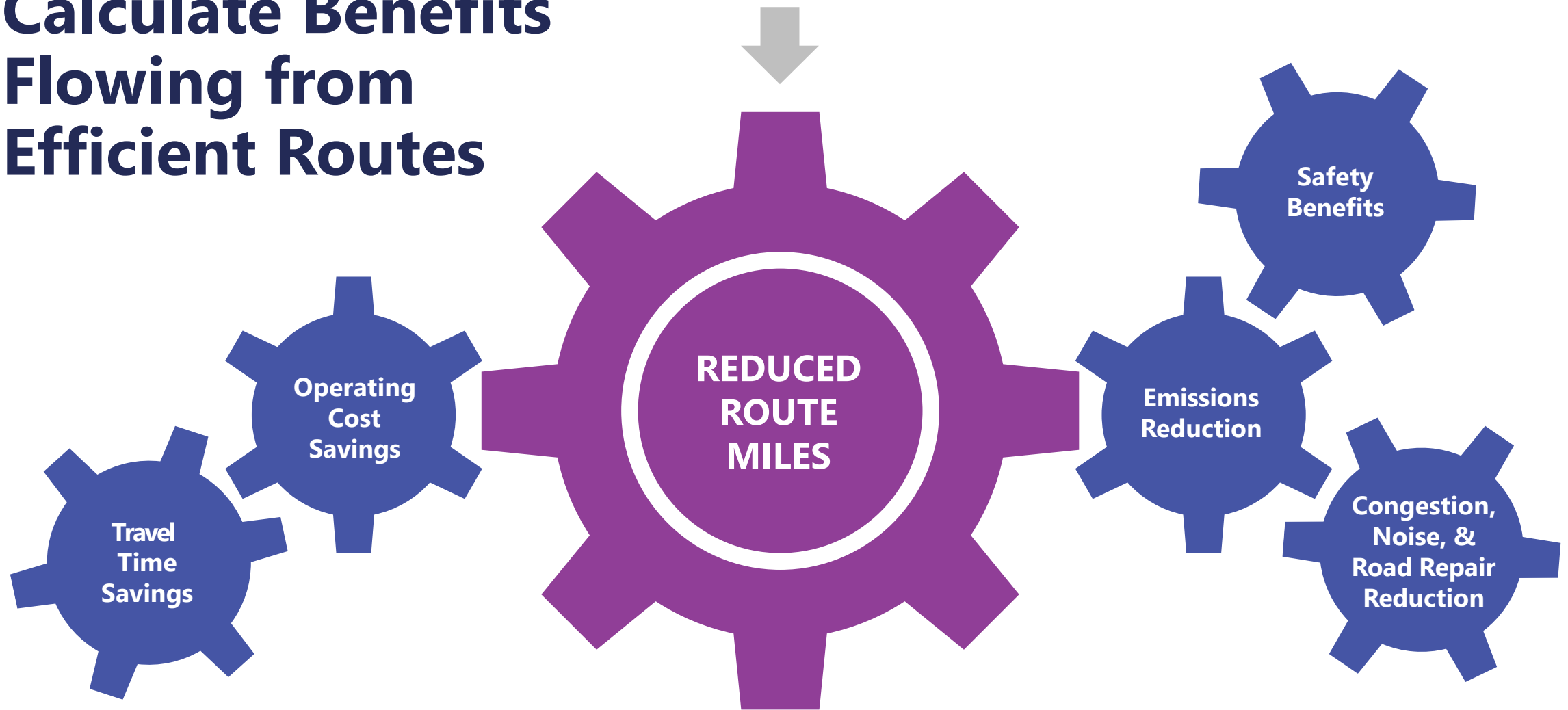
# Calculate Benefits Flowing from Efficient Routes

New Route May Be More  
Direct than Current Route



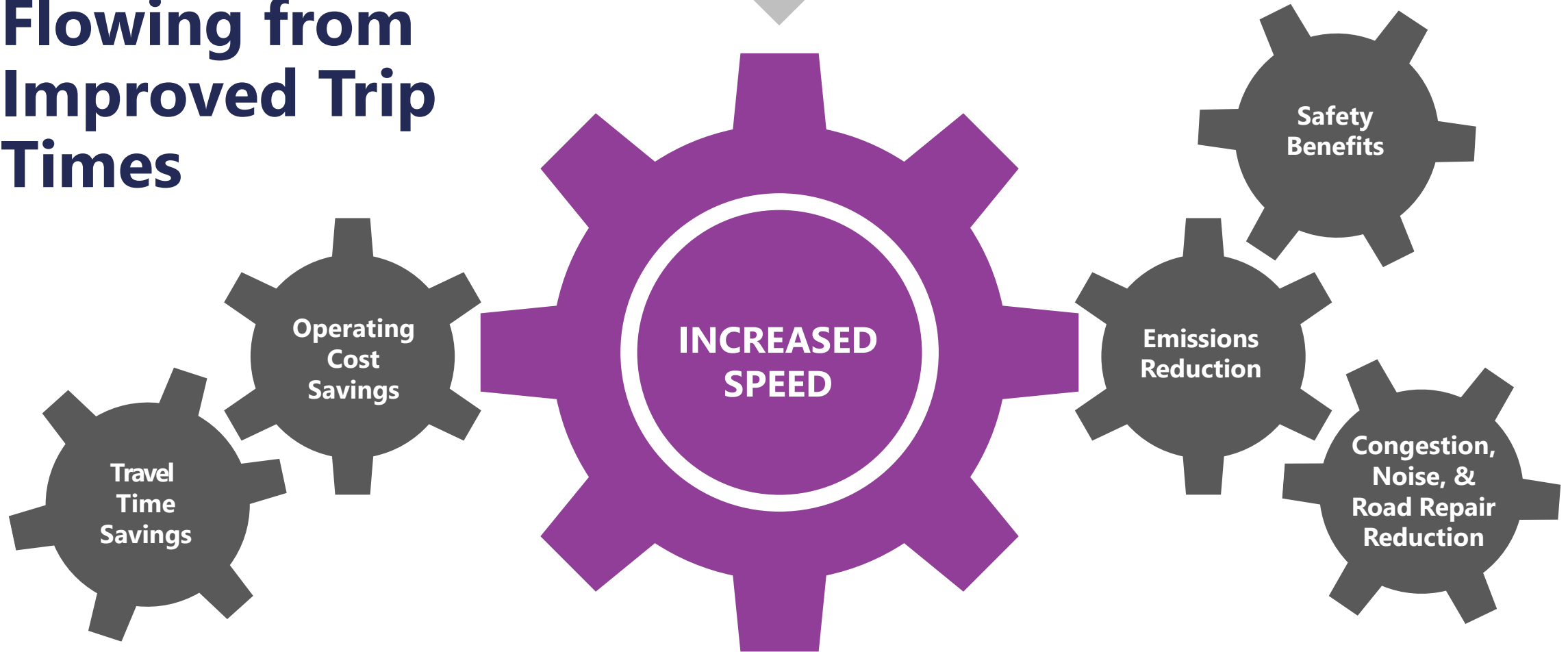


# Calculate Benefits Flowing from Efficient Routes

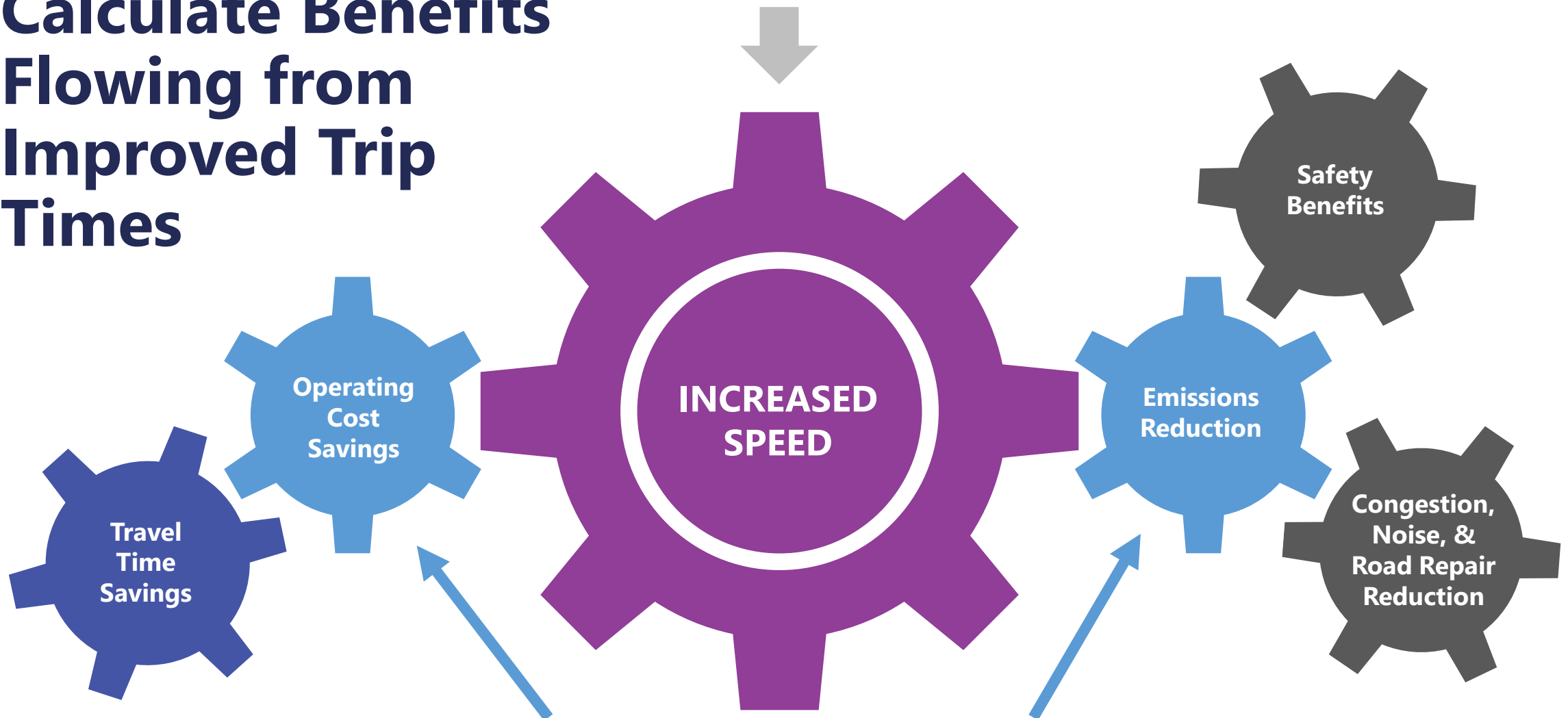


# Calculate Benefits Flowing from Improved Trip Times

Technology or Equipment  
May Enable Faster Speeds

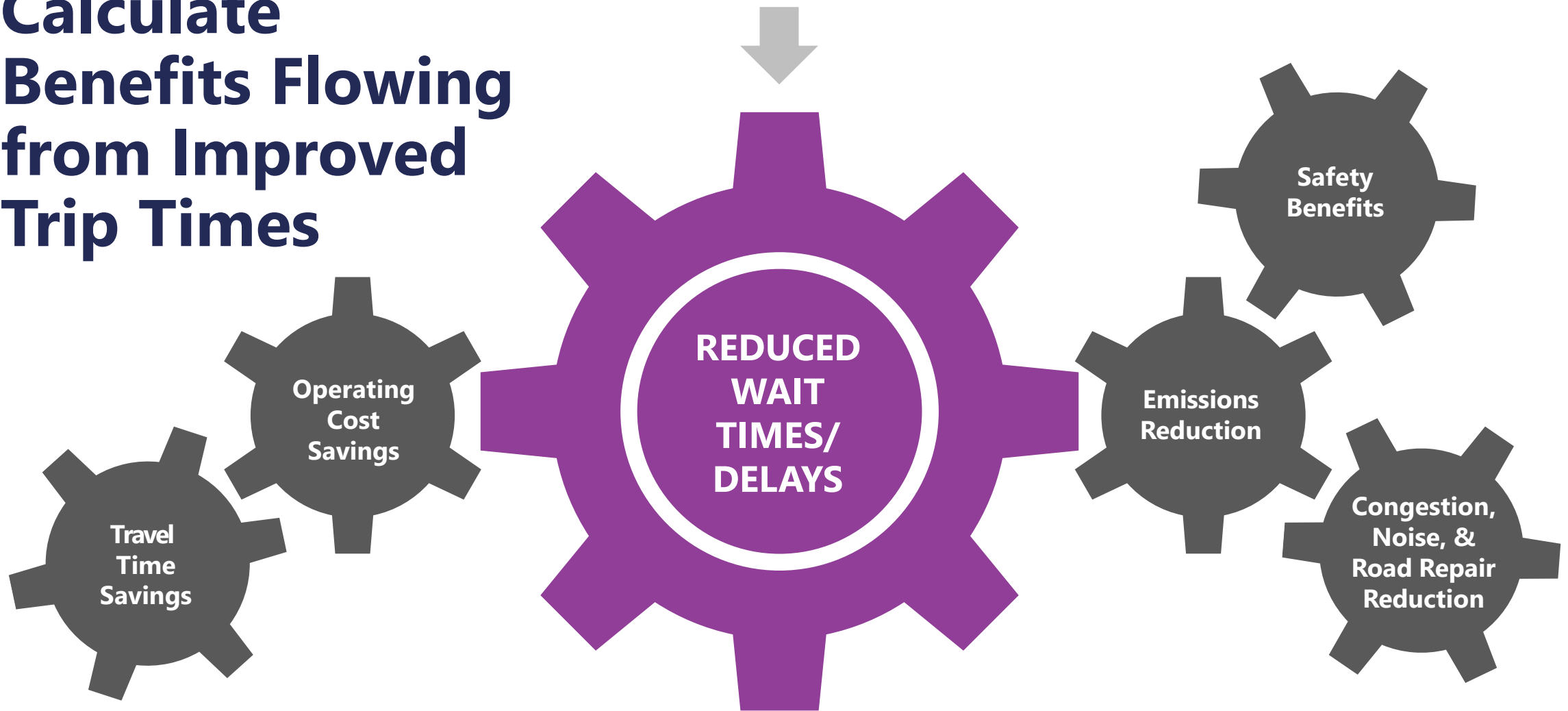


# Calculate Benefits Flowing from Improved Trip Times

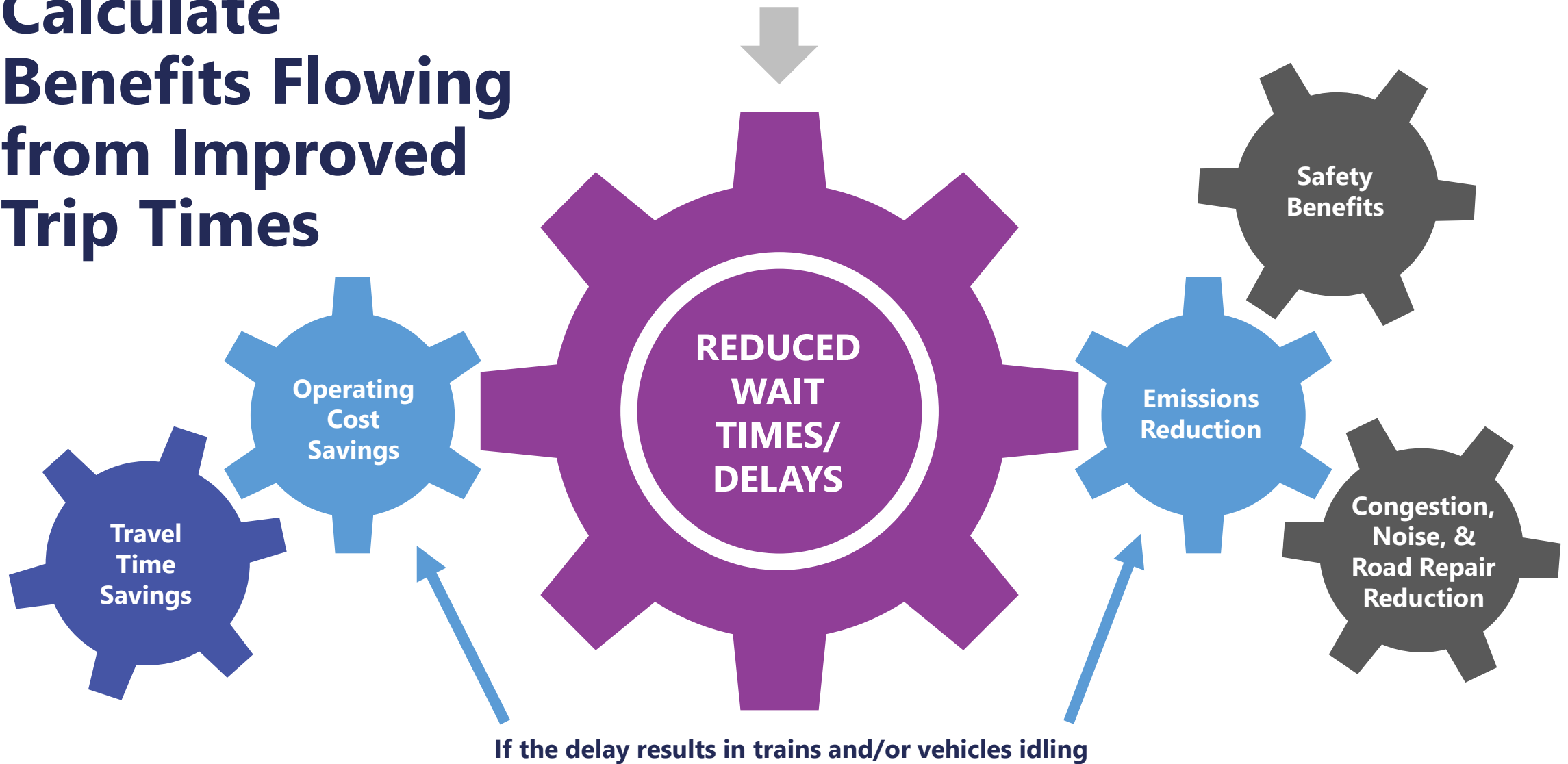


For Trains, These Depend on Hours in  
DOT BCA Guideline Table A-5

# Calculate Benefits Flowing from Improved Trip Times

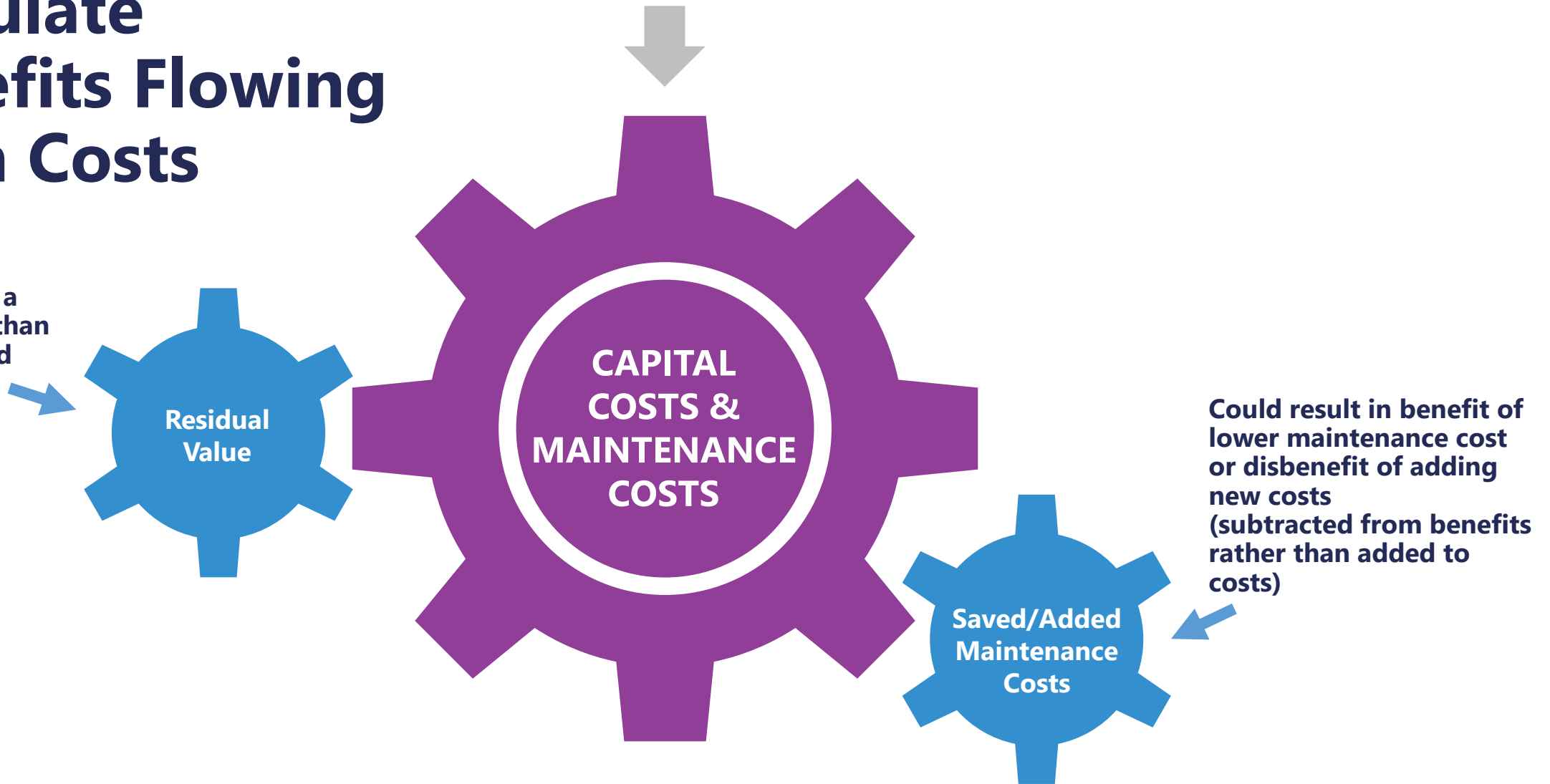


# Calculate Benefits Flowing from Improved Trip Times



# Calculate Benefits Flowing from Costs

Only if capital has a useful life longer than the benefits period



# Produce Results

2 percent discount rate for CO2, 3.1 percent for all others  
Discount back to base year (2022 in the current guidelines), not current year



1

$$\frac{1}{(1 + \text{Discount Rate})^{\text{Years Past Base Year}}}$$

Total cost of the project from all funding sources, not just construction costs or just federal funding

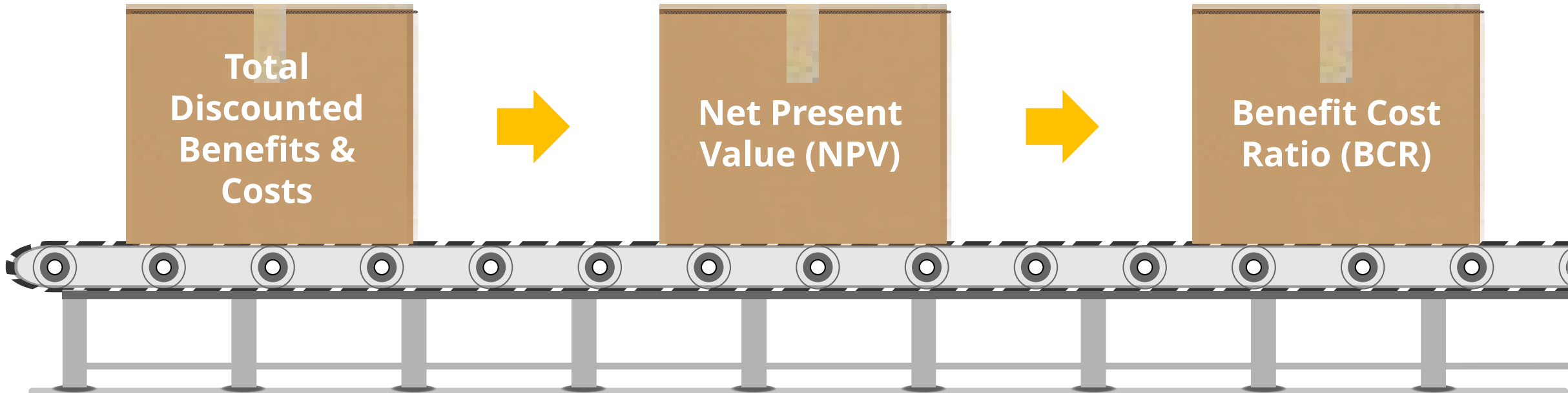


$$\text{Total Discounted Benefits} - \text{Total Discounted Costs}$$

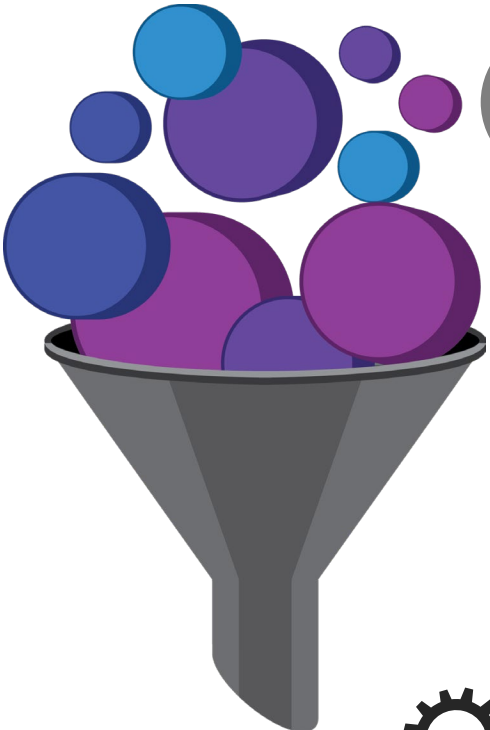
BCR over 1.0 is cost-effective, but grant funding decisions depend on more than this



$$\frac{\text{Total Discounted Benefits}}{\text{Total Discounted Costs}}$$



# The BCA Process



## 1 Enter Inputs

- ✓ Always support your inputs
- ✓ Always support your inputs
- ✓ Provide values for no-build and build scenarios

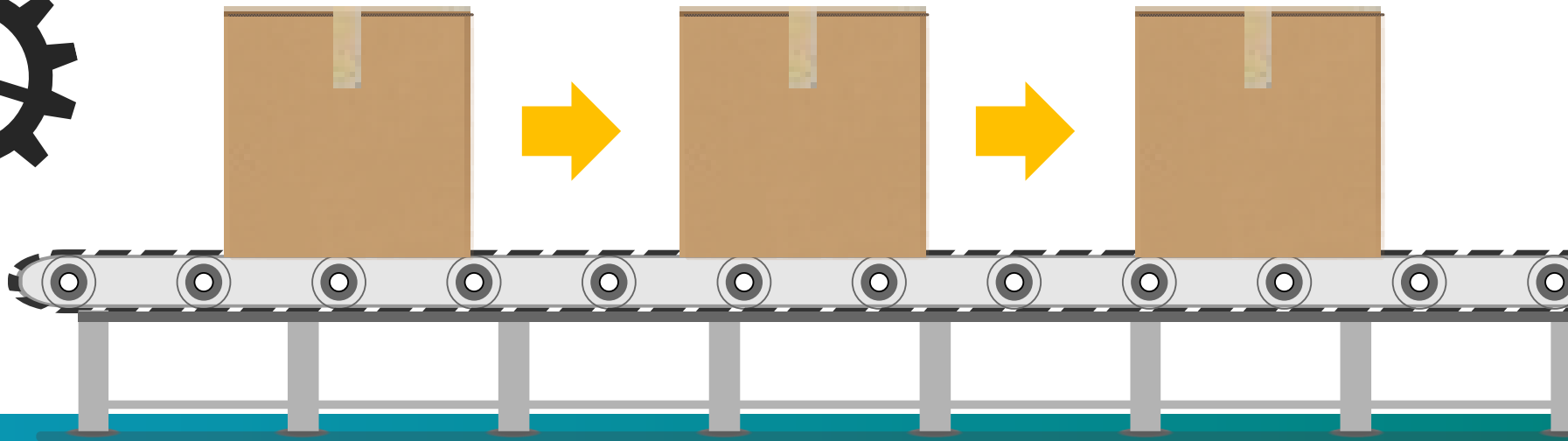
## 2 Calculate Benefits

- ✓ Only use applicable benefits



## 3 Produce Results

- ✓ Use the correct base year and discount rates





# Available Tools & Resources

- **DOT BCA Guideline**

- [transportation.gov/mission/office-secretary/office-policy/transportation-policy/benefit-cost-analysis-guidance](https://www.transportation.gov/mission/office-secretary/office-policy/transportation-policy/benefit-cost-analysis-guidance)

- **OST BCA Template**

- [transportation.gov/mission/office-secretary/office-policy/transportation-policy/benefit-cost-analysis-spreadsheet-template](https://www.transportation.gov/mission/office-secretary/office-policy/transportation-policy/benefit-cost-analysis-spreadsheet-template)

- **FMCSA Large Truck and Bus Injury Crash Facts 2021**

- [fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2021](https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2021)



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# Contact Us:

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