

BENEFIT COST ANALYSIS (BCA)

FOR FEDERAL GRANT PROJECTS



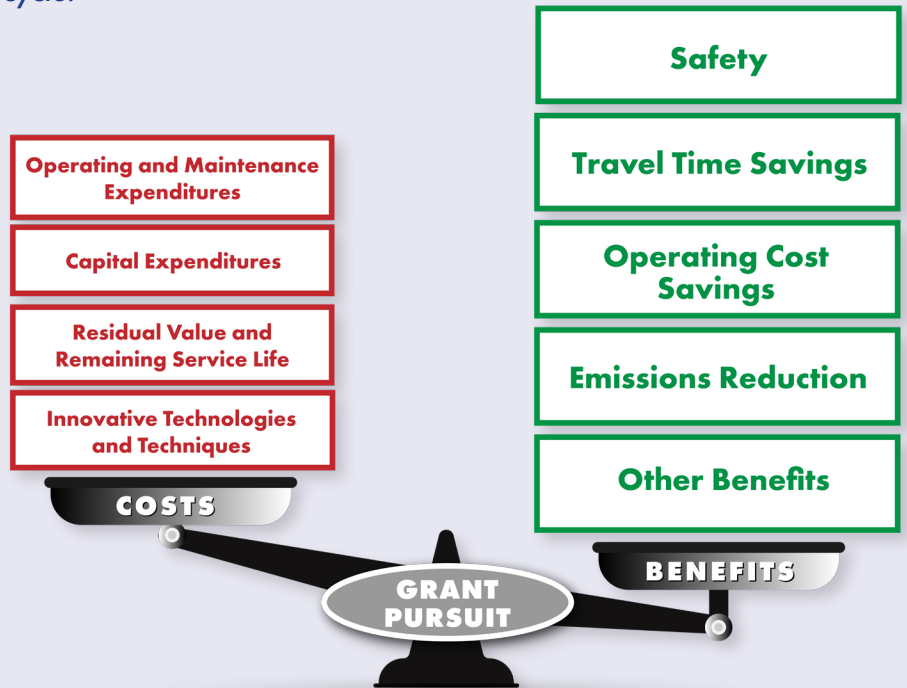
FLORIDA DEPARTMENT OF
TRANSPORTATION

What is a Benefit Cost Analysis?

A BCA is a systematic process for quantifying, monetizing, and comparing the expected benefits and costs of a potential infrastructure project. This process allows the benefits of diverse transportation projects to be compared while providing a critical lens on a project's benefits. Typical benefits associated with infrastructure projects include improvements in safety, travel time, and economic outcomes. Typical costs include up-front capital expenditures and operating costs incurred over the project's lifecycle.

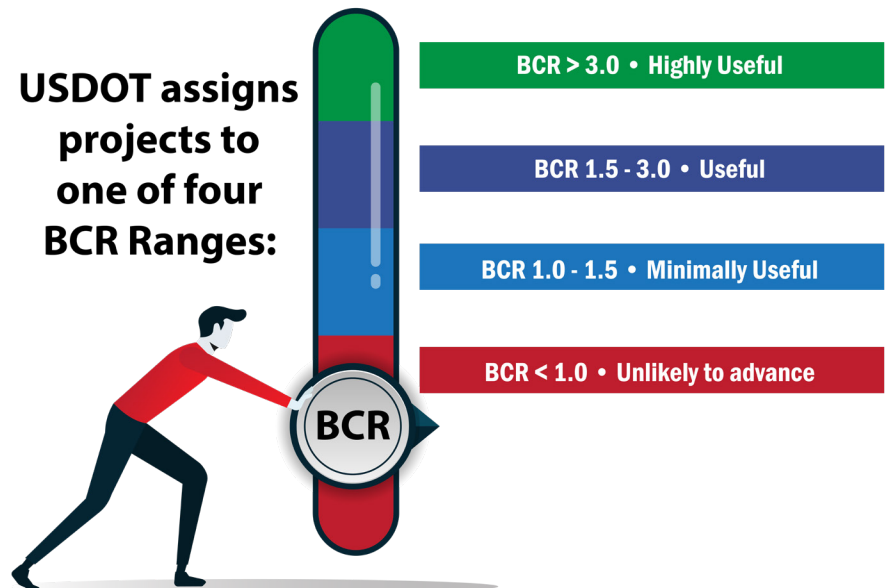
This document is intended to support the development of BCAs in pursuit of federal discretionary grant programs. United States Department of Transportation (USDOT) has stated that data-driven projects will be the most competitive during project selection and prioritization. Therefore, data from the BCA and other project or statewide sources can be incorporated throughout the entire grant application to tell the story and demonstrate the local, regional, and statewide need.

USDOT has developed a framework that outlines BCA methodologies and sources referenced throughout this document, [USDOT BCA Guidance for Discretionary Grant Programs, 2023](#).



BCA GOAL IS TO ACHIEVE A
BENEFIT COST RATIO
OF **1.5**
OR GREATER

USDOT assigns projects to one of four BCR Ranges:



Note: BCR Ranges are not consistent across all grants

Source: USDOT Benefit Cost Analysis Guidance for Discretionary Grant Programs, 2023

All costs should be shown per year in constant dollars for the entire useful life of the project.

SAFETY

Many transportation projects aim to reduce the likelihood and severity of fatalities, injuries, and property damage from crashes. Applicants should address how an identified safety issue will be effectively mitigated through the project.

Recommended sources include:

- ▶ Crash data history - [Signal 4 Analytics](#)
- ▶ Crash Modification Factors (CMF) - [CMF Clearinghouse](#) or [FHWA Proven Safety Countermeasures](#).

Other important resources include:

- ▶ Valuing Injuries and Fatalities - USDOT BCA Guidance, Table A-1, page 37
- ▶ Vehicle Miles Traveled, see Travel Time Savings sources

TRAVEL TIME SAVINGS

Many transportation projects aim to reduce travel times for users of the transportation system. This may be accomplished through new connections, improving traffic flow, or increasing transit vehicle operating speeds. This metric is communicated as a function of hours saved through the analysis period along with the associated monetization factor. To estimate travel time savings often traffic forecasts, modeling, or other engineering analysis is required.

- District Developed Travel Demand Models - [Regional Planning Models](#)
- Daily Vehicle Miles Traveled - [Reports of Highway Mileage and Travel](#) (Use Annual Report)
- Physical Description of Facilities - [Roadway Characteristics Inventory](#)
- Historic Counts & Classifications - [Traffic Counts Online](#)

Other important resources include:

- ▶ Vehicle Occupancy - Local occupancy factors can be derived from either Regional Planning Models; or USDOT BCA Guidance Table A-4, page 39
- ▶ Reliability - State Source: [FDOT Sourcebook](#)
- ▶ Reliability - Federal Source: [Regional Integrated Transportation Information System \(RITIS\)](#)
- ▶ Valuing Time - USDOT BCA Guidance, Table A-3, page 38

OPERATING COSTS SAVINGS

Commonly, transportation projects will have associated operating cost savings through reduced fuel consumption or new efficiencies. Applicants are encouraged to use local facility-specific data for the development of costs. An agency's Operations/Maintenance Division is likely to be the source of this data. If local data is not available

generalized operating costs can be sourced from a number of sources as outlined below:

- ▶ Roadway Operations Cost - USDOT BCA Guidance, Table A-5, page 39
- ▶ Vehicle Operating Costs - [AAA Cost of Driving](#)
- ▶ Truck Operations Cost - [American Transportation Research Institute Operational Cost of Trucking](#)
- ▶ Transit Operations Cost - [National Transit Database; Transit Information Data Exchange](#)
- ▶ Maintenance Cost - [FDOT Maintenance Cost Handbook](#)

EMISSIONS REDUCTION

Transportation projects may also reduce impacts on the environment by lowering emissions of air pollutants and particulate matter. This will generally be achieved through the reduction in vehicle miles traveled, operational improvements, or mode shifts. The reduction in miles and time traveled is then monetized for the most common air pollutants. Note: CO² Emission reduction should be discounted at a three percent rate.

USDOT recommends using the monetization values found in USDOT BCA Guidance Table A-6, page 40.

Additionally, the Environmental Protection Agency has developed:

- ▶ [The Motor Vehicle Emission Simulator \(MOVES\)](#)
- ▶ [Average Annual Emissions and Fuel Consumption for Gasoline - Fueled Passenger Cars and Light Trucks](#)

OTHER BENEFITS

Other potential benefits can be incorporated into a BCA as appropriate. Some common additional benefits include:

Facility and Vehicle Amenities

USDOT BCA Guidance Tables A-8 — A-12, page 42-46

Health

[Health Economic Assessment Tool \(HEAT\) for Walking and For Cycling \(2017\)](#); [National Household Travel Survey \(2017\)](#); USDOT BCA Guidance, Table A-13, page 47

Resiliency

[FEMA BCA Toolkit, V6.0](#)

Wildlife Safety

[Signal 4 Analytics](#)

Bridge Condition

[FDOT Bridge Condition Reports](#); [National Bridge Inventory](#)

Property Value and Land Use

[Florida Real Estate/Property Appraiser Data](#); [Florida Geographic Data Library](#)