



West Virginia Multi-modal Statewide Transportation Plan

**Presented to:
WVDOT/MPO/FHWA Planning Conference**

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Today's Discussion

AGENDA

- Project Prioritization
- B/C Calculator

Project ID	Project Name	Project Description	Section ID	Capital Cost of Improved Section (\$)	Earmarked Funding (\$,000)	Section Capacity (vehicles/hour)		Annual Traffic (Growth Rate %)				Per Person Truck Coasting rate per 100 million VMT		Permanent Jobs Created	Other Benefits (\$,000)
						Existing	Improve	Existing	Improve	Existing	Improve	Existing	Improve		
10	I-78US 50 INTERCHANGE	Construct split diamond interchange Per draft Harrison County 2025 Transportation Plan report. Construct 11.6 miles of additional lane in both directions		39,000	18,620			21.0%	21.0%	78.0	64.0				
12	I-81 Widening-VA Line to S. Martinsburg	Construct 4.26 miles of additional lane in both directions		48,900				21.0%	21.0%	78.0	64.0				
13	WV 14 (City Limits of Parkersburg to Pettsville)	Reconstruct and widen WV 14 to four lanes from the Parkersburg city boundary at the Pantol Center (V-M) south to the newly relocated WV 14 four-lane highway		9,500						384.0	384.0				
14	I-64 Widening-Hume Lane to Barboursville	Construct 8 miles of additional lane in both directions		163,000						84.0	71.0				
15	US 30 - Barkin Bridge to CR 42	Construct 11 miles of four lane road		103,000						71.0	71.0				
16	I-81 Widening-S. Martinsburg I/C to Falling Waters	Construct 16.12 miles of additional lane in both directions		83,720				21.0%	21.0%	78.0	64.0				
17	Corridor H	Karena to Parsons (APD FUNDING) Construct 6.47 miles four lane road	2	357,350									14,382		
18	I-64 Widening-Barboursville to WYKY State Line	Construct 18 miles of additional lane in both directions		168,000						116.0	64.0				
19	Corridor H	Martinsville to Virginia Line (APD FUNDING) Construct 6.53 miles four lane road	2	85,221											
20	East Beckley Bypass	Construct new 5-bn bypass-Shanaford to Flagland	3	28,400				2%							
21	Corridor H	Birmark to Foreman Construct 10.78 miles four lane road	2	184,000											
22	WV 9	lanes from existing 4 lanes to CRT (Duke Rd). Construct four-lane WV 9 on new alignment between Beckley and Birmark Construct 16.11 miles four lane road	4	61,000											
23	Corridor H	Davis to Birmark Construct 16.11 miles four lane road	2	241,850											
24	Corridor H	Parsons to Davis (APD FUNDING) Construct 10.1 miles four lane road	2	177,600											
25	I-79 Widening-Armora to US 250 South Fairmont	Construct 15 miles of additional lane in both directions		104,720											
26	JEFFERSON ROAD (WV 60) UPGRADE	Widen to two lanes and provide grade separation with Kanawha Turnpike and rail line. ADHS Corridor G (US 10) Davis Creek interchange to MacCorkle Avenue (US 60) - 18 miles		56,000											

West Virginia
Multi-Modal Statewide Transportation Plan

STATE OF WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION

WILBURSMITH ASSOCIATES
June 2010 Final Report

Project Name	Description	Capital Cost (\$)	Annual Traffic (Growth Rate %)	Per Person Truck Coasting rate per 100 million VMT	Permanent Jobs Created	Other Benefits (\$,000)
WV 25 SPUR, WV 25 IN NITRO-8TH AVE. IN ST. ALBANS (BRIDGE)	Replace Richard Henderson Bridge (3 lanes)	\$40,500	15.76			
WELLSBURG BRIDGE (OHIO RIVER CROSSING)	Construct new Ohio River bridge in Brooke County south of Wellsburg to Ohio Route 7 in the vicinity of Brilliant	\$75,000	10.73			
US 340	VA line Taylorsville to Horse Pen Connector 4-Lane upgrade	\$34,439	6.33			
BEECHURST AVE, WALNUT STREET-EIGHTH STREET (MONONGALIA CO)	Upgrade Beechurst Avenue (US 19, WV 7) in Morgantown to four and five lanes between Walnut Street and 8th Street CP: WVDOH August 2003 report	\$40,000	3.62			
I-81 Widening-S. Martinsburg I/C to Falling Waters	Construct 10.12 miles of additional lane in both directions	\$83,720	2.13			
US 19 - SUMMERSVILLE (WIDENING)	Widen US 19 to six lanes at Summersville from Nicholas County 1981 to WV 41; approximately 1 mile	\$15,000	2.10			
I-64 WHITE SULPHUR SPRINGS INTERCHANGE	Add a westbound on-ramp and an eastbound off-ramp at the White Sulphur Springs Interchange in Greenbrier County	\$10,000	1.86			
WEST RUN EXPRESSWAY	Construct new four-lane highway north of Morgantown area to connect I-68 and I-79 Per Morgantown/Monongalia County 2020 Plan	\$175,000	1.81			
US 11, TABLER STATION TO WV 45WV9	Widen US 11 to three, four, and five lanes in Berkeley County between Tabler Station and WV45WV 9, Per HEP MPO 2030 plan report	\$24,590	1.76			

Press to calculate B/C and sort projects

Elements of Prioritization

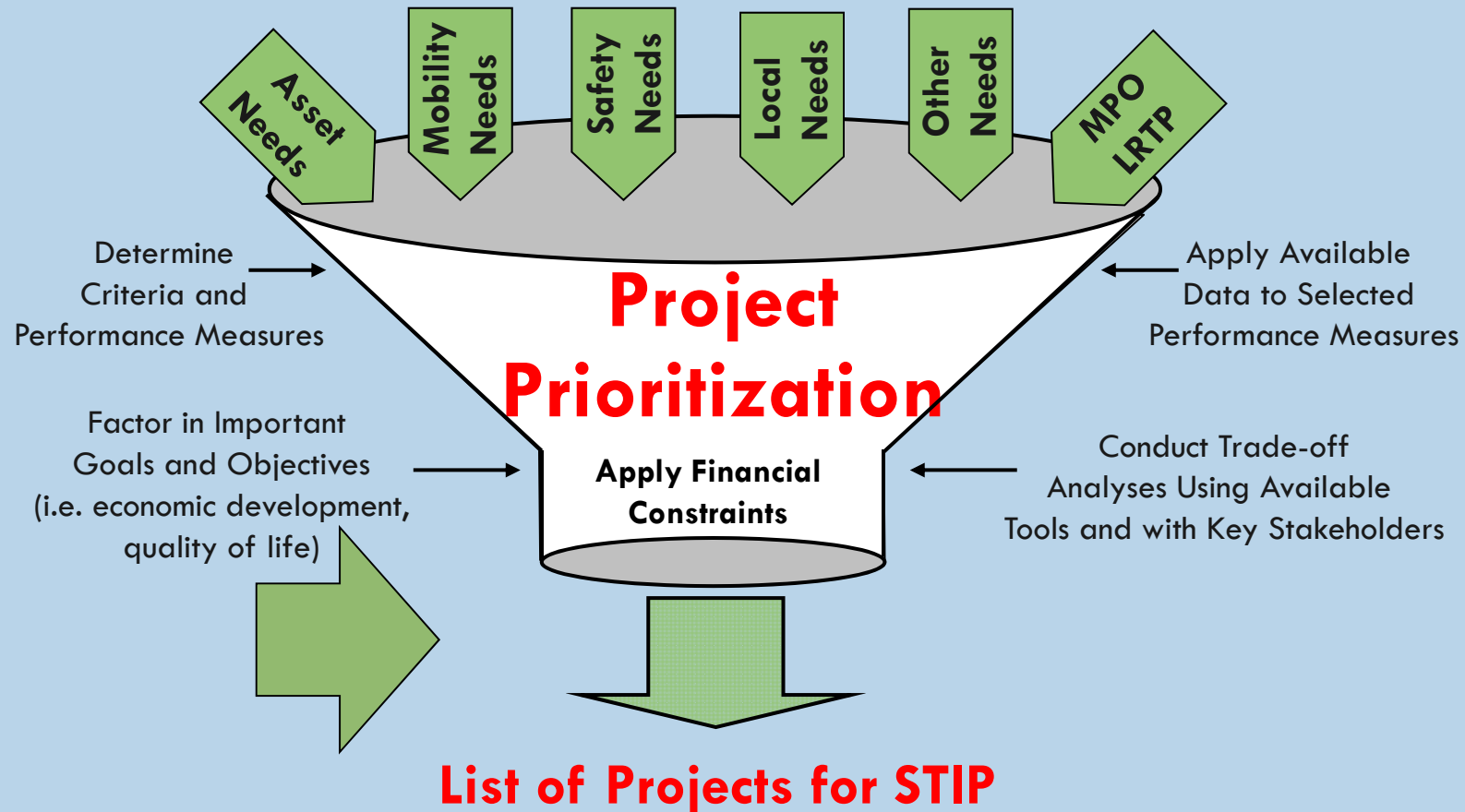


- B/C Ratio
- Funding Constraints
- Social, Environmental & Economic Development Considerations
- System Linkage
- Stage of Project Development
- Federal Financial Plan Requirements
- Geographic Distribution of Projects

WV STIP Process

WV Statewide Transportation Plan

Determines Needs



Why B/C Methodology?



- Deals with actual impact measures (time savings, crash reductions, vehicle operating cost savings)
- Focuses on who benefits (how much and how many) and therefore less likely to double-count or miss benefits
- Extensive past research supporting benefit-cost analysis provides guidance on making the hard trade-offs (e.g., travel time savings vs. reductions in fatalities)
- Support for benefit-cost analysis by AASHTO (recently produced User Benefit Analysis for Highways) and FHWA (maintains Highway Economic Requirements System (HERS) and recently produced Economic Analysis Primer)
- Maximizes benefits from a fixed budget

Analysis Process



INITIAL PROJECT SCREENING:

The approach used to select and prioritize projects must incorporate a transparent decision making process and an easy to understand methodology that is consistent with identified general goals.

- Screen Projects for Eligibility
 - ✓ Screen for Purpose and Need
 - ✓ Screen for Independence
 - ✓ Screen for Duplication
 - ✓ Screen for Project Sponsor
- Group Sets of Projects and Corridor Projects
- Sort Projects into Modal and Funding Groupings

Analysis Process



QUANTITATIVE ANALYSIS:

- Develop estimates of state revenues and federal funds available for funding selected improvements over the course of the planning period.
- Consider relationships among projects to identify instances where the implementation of one project might make another project more or less desirable.
 - ✓ Where appropriate, combine projects
 - ✓ Identify projects that should be seen as mutually exclusive
- Compile inputs for each project.
 - ✓ Initially make assumptions that are favorable to the implementation of the project. (makes sure that a good alternative is not wrongly rejected)
 - ✓ If a project scores poorly, it's useful to be able to show that even with favorable assumptions results unfavorable

Analysis Process



- Apply workbook to produce a rank-ordering of projects by benefit-cost ratio.
- For the highest ranked projects, develop more accurate cost estimates, traffic forecasts, and assessment of economic development potential. Apply the workbook to recalculate benefit-cost ratios.
- If it continues to be the highest ranked project, assume it will be highly considered during the long-range planning period. If not, repeat the above step with the new highest ranked project.
- Continue this process until the projects identified as priority during the long-range planning period equal funds available for this period (identified in the first step).

Analysis Process

Inputs:

- Setting (Urban or rural)
- Length
- Number of lanes
- Freeway or non-freeway
- Free flow speed (or speed limit)
- Annual average daily traffic
- Cost of improvement (engineering, right-of-way, and construction)
- Special funding sources for the project (federal or state earmarks; contributions by local agencies or private groups)

Project No.	Project Name	Project Description	Section ID	Capital Cost of Improved Section (\$ 000)	Estimated Funding (\$ 000)	JEFFERSON HIGHWAY (US 29) IMPROVEMENTS									
						Section Capacity (vehicles/hour)	Annual Traffic Growth Rate (%)	Percent Trucks	Crash Rate per 100 million VMT	Private or Jobs Created	Other Benefits (\$ 000)				
1															
2															
3															
4															
5															
6															
7															
8															
9															
10	770US 50 INTERCHANGE	Construct split diamond interchange for all Harrison County 2005 Transportation Plan report		20,000											
11	181 Videning-VA Line to St. Martinsburg	Construct 10 miles of additional lane in both directions		11,670					21.0%	21.0%	78.0	64.0			
12	181 Videning-Falling Waters to MD Line	Construct 1.5 miles of additional lane in both directions		48,900					21.0%	21.0%	78.0	64.0			
13	VV 11 (City Limits of Parkersburg to Pattysville)	Reconstruct and widen VV 11 to four lanes from the Parkersburg city boundary at the Parlor Center (V at Mari) south to the newly redefined VV 11 four lane highway		8,500							284.0	284.0			
14	184 Videning-Marietta to Barboursville	Construct 7 miles of additional lane in both directions		149,000							94.0				
15	US 50 - Durbin Bridge to DEKZ	Construct 8 miles of four lane road		19,000							71.0	71.0			
16	181 Videning-St. Martinsburg to Falling Waters	Construct 1.5 miles of additional lane in both directions		63,720					21.0%	21.0%	78.0	64.0			
17	Corridor H	Widen to Four Lane (2005 FUTURE) Construct 16.47 miles four lane road	2	267,260											184,262
18	184 Videning-Barboursville to WV KY State Line	Construct 10 miles of additional lane in both directions		188,000							18.0	64.0			
19	Corridor H	Wardensville to Virginia Line (APC) - HUNTERSVILLE Construct 4.51 miles four lane road	2	55,224											17,671
20	East Beckley Bypass	Construct new 5.61 mile alignment to Flagland	3	28,430					2%	4.0%	4.0%	695.0			9,088
21	Corridor H	Widening to Four Lane (2005 FUTURE) Construct 13.78 miles four lane road	2	194,000											63,080
22	VV 9	Widen from existing 4 lanes to CRU (State Rd) Construct four lane VV 9 on new alignment between Beckley and Marietta Construct 18.31 miles four lane road	4	61,000							264.0	264.0			19,520
23	Corridor H	Widening to Four Lane (2005 FUTURE) Construct 10.0 miles four lane road	2	241,000							107.0				77,228
24	Corridor H	Construct 10.0 miles four lane road	2	177,600							109.0				56,632
25	173 Videning-Armora to US 290 South Fairmont	Construct 15 miles of additional lane in both directions		184,720							68.0				
26	JEFFERSON ROAD (VV 60) UPGRADE	Widen to five lanes and provide grade separation with Statewide Turnpike and fall line. AD-60 Corridor G (US 19) Davis Creek interchange to MacCorkle Avenue (US 60) - 1.8 miles		66,000							637.0				

Analysis Process



Optional Workbook Inputs for Project

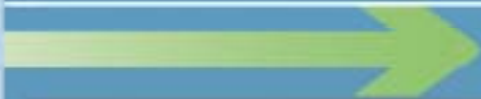
(Default values will be provided by facility type)

- Percent trucks
- Annual traffic growth rate
- Capacity per lane
- Economic development mark-up factor for benefits
- Crash rates

Parameters for Economic Analyses

	Model Parameters	Parameters for Sensitivity Analysis	Parameter Used in Project Analysis:
Discount Rate	7.0%		7.0%
Base Year for Analysis	2009		2009
Default Annual Traffic Growth Rate	1.0%		1.0%
Default Percent Trucks			
Rural Freeway	19.5%		19.5%
Rural Other Multilane	7.3%		7.3%
Rural Two-Lane	7.3%		7.3%
Urban Freeway	16.7%		16.7%
Urban Other	4.3%		4.3%
Value of Travel Time (\$/vehicle hour)			0
Autos	24.64		24.64
Trucks	38.81		38.81
Value of Delay Due to Incidents (\$/vehicle hour)			
Autos	41.42		41.42
Trucks	77.62		77.62
Average Fuel Consumption (gallons/mile)			
Autos	0.0505		0.0505
Trucks	0.1516		0.1516
Added Gallons Per Hour of Congestion Delay			
Autos	0.4203		0.4203
Trucks	1.8711		1.8711
Fuel Price exc. Taxes (\$ / gallon) (Aug 2009)			
Autos	2.23		2.23
Trucks	2.07		2.07
Non-Fuel Vehicle Op. Cost (\$ / mile)			
Autos	0.2373		0.2373
Trucks	0.5172		0.5172

Outputs



Project Name	Project Description	Project Capital Cost Less Earmarked Funds (\$ 000)	Project B/C Ratio						
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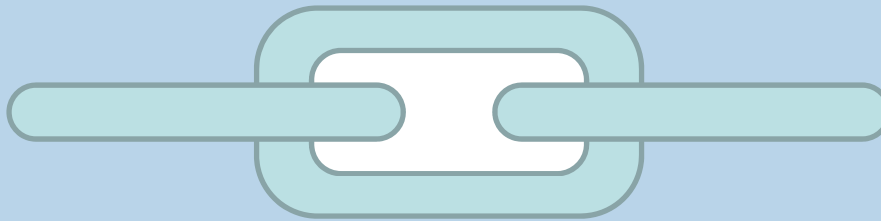
Performance Measures



- Revenue Expenditure Estimates
- Programmatic Categories
 - Bridge
 - Rehabilitation
 - Raising
 - Replacement
 - Preservation
 - Modernization
 - Expansion (Capacity Improvements)

SW LRTP and STIP Linkage

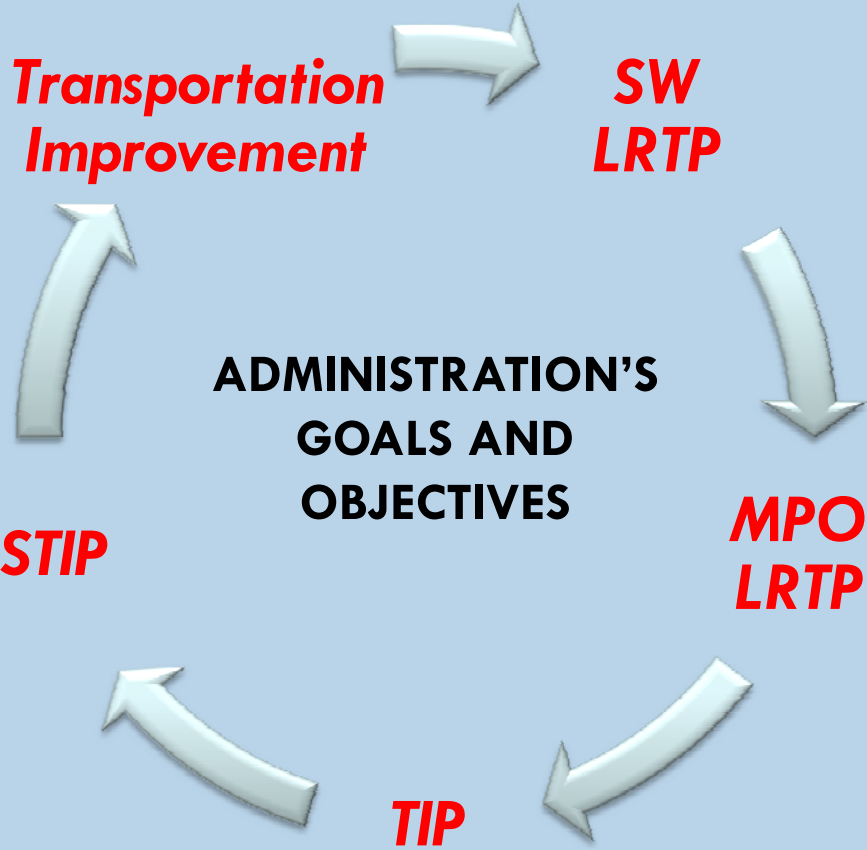
**SW
LRTP**



STIP

- Categorical Spending Based on Needs
- Forecasted vs. Actual Revenues
- Forecasted vs. Actual Expenditures
- Planning vs. Politics

Prioritization Implementation



Questions

