

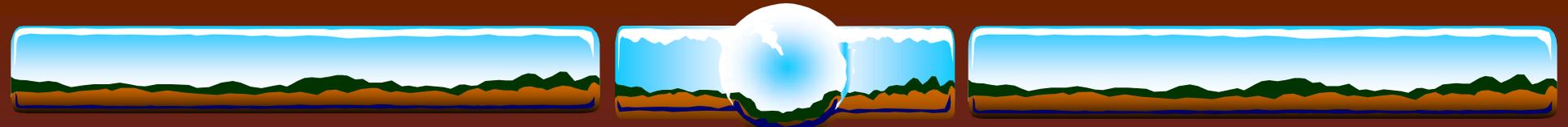
The Economic Impacts & Benefits From Three Trails in Virginia

J.M. Bowker
USDA Forest Service

John C. Bergstrom
University of Georgia

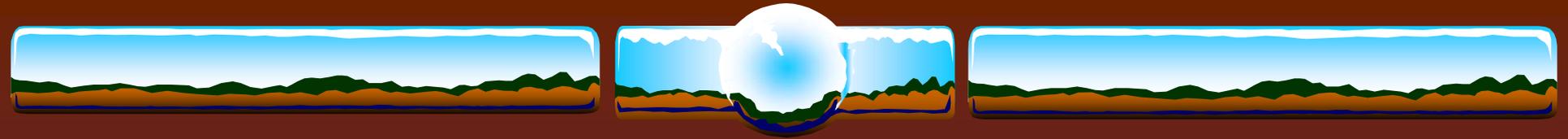
Joshua Gill
US Peace Corps

Presentation to the Virginia Parks and Trails Association
Alexandria, Virginia
September 28, 2004



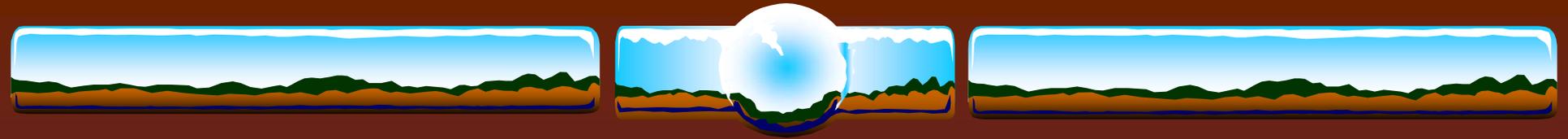
Partners

- ❖ **Virginia Creeper Club**
- ❖ **Creeper Cabins**
- ❖ **Virginia Trails**
- ❖ **Virginia Dept Conservation & Recreation**
- ❖ **Virginia Dept Forestry**
- ❖ **National Park Service, Rivers & Trails**
- ❖ **University of Georgia, Dept Ag & Applied Econ**
- ❖ **USDA Forest Service, Region 8 & SRS**
- ❖ **Numerous Volunteers**



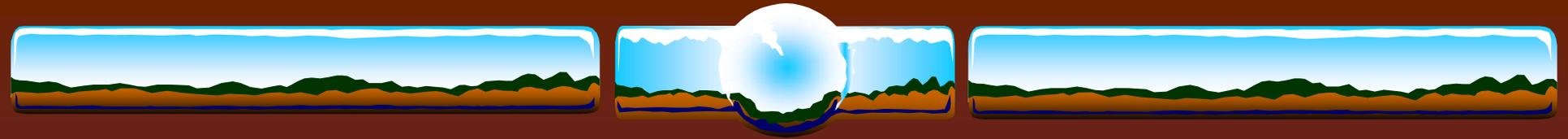
Major Objectives

- ❖ **Estimate Local Economic Impacts**
- ❖ **Estimate User Economic Net Benefits**
- ❖ **Describe Trail Users**
- ❖ **Examine User Attitudes / Preferences**



Today's Objectives

- ❖ **Trail Descriptions**
- ❖ **Economic Impacts vs. Net Benefits**
- ❖ **Estimating Economic Impacts**
- ❖ **Estimating Economic Benefits**
- ❖ **Trail Case Studies**
- ❖ **Some Conclusions**



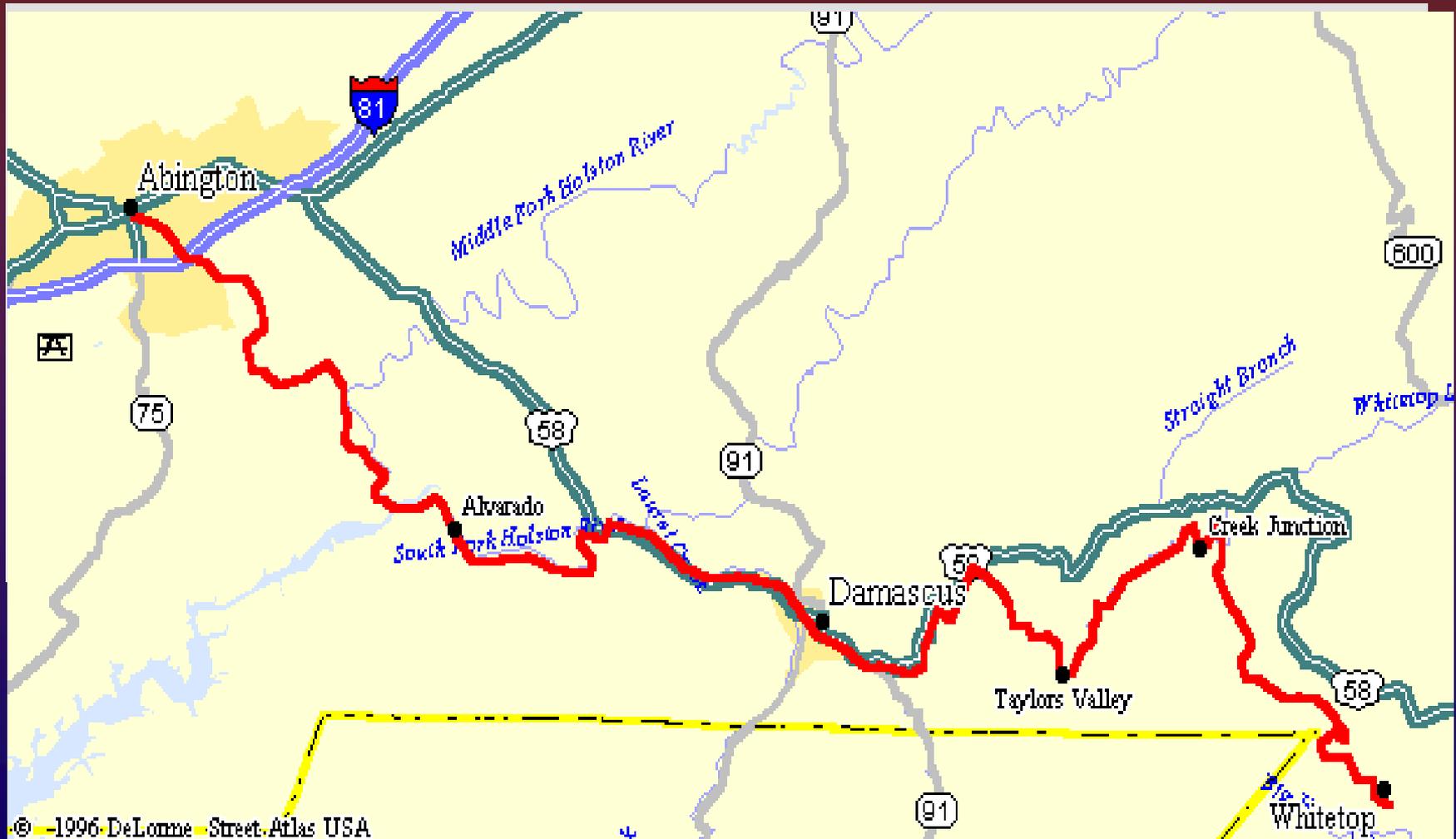
Trails

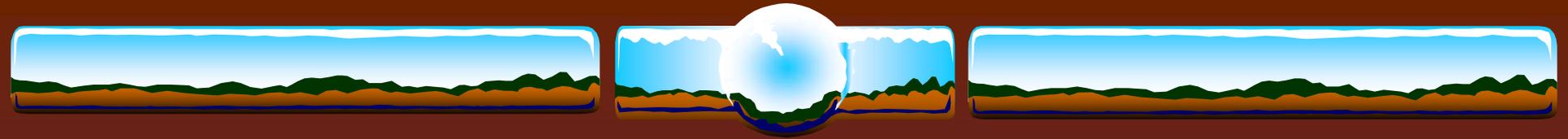
Virginia Creeper

Washington & Old Dominion

New River State Park— water trail

Virginia Creeper Trail



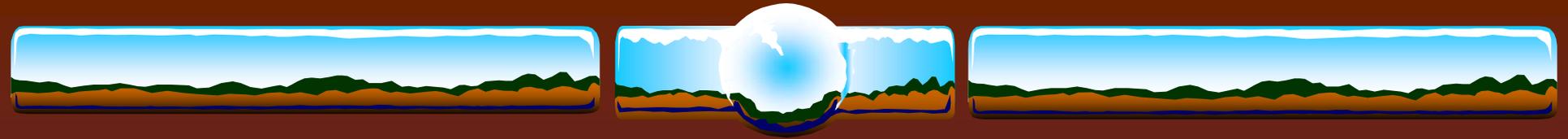


Virginia Creeper Trail

- ❖ Rural rail trail - Southwestern VA
- ❖ 35 miles long - multiple ownerships/mgmt
- ❖ Cinder & limestone surface
- ❖ Destination trail with heavy local use (48%)
- ❖ Primarily day use - biking & walking
- ❖ 130,000+ visits annually
- ❖ Strong local support

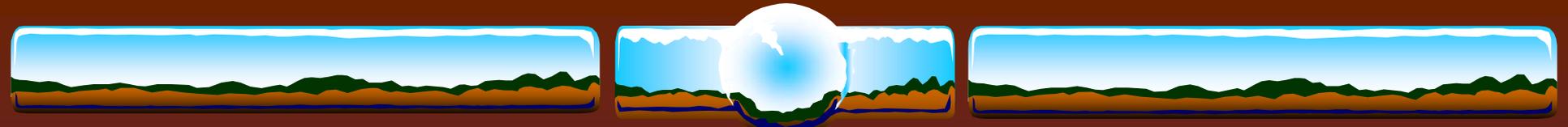
Virginia Creeper Trail





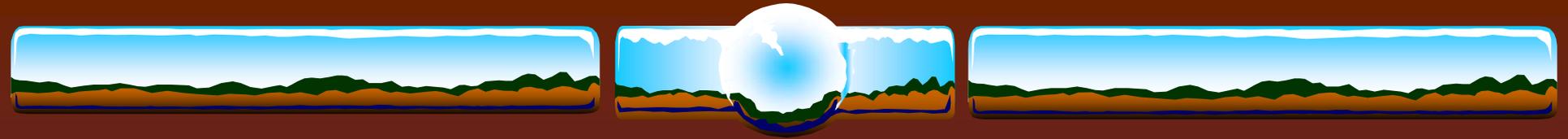
Washington & Old Dominion

- ❖ **Linear urban corridor - Northern VA**
- ❖ **45 miles - Northern VA Reg Park Authority**
- ❖ **Parallel asphalt & gravel (32) surface**
- ❖ **Primarily local use (95%) - rec & commuting**
- ❖ **Biking, blading, jogging, walking**
- ❖ **1.7+ million visitors annually**
- ❖ **Strong local group support**



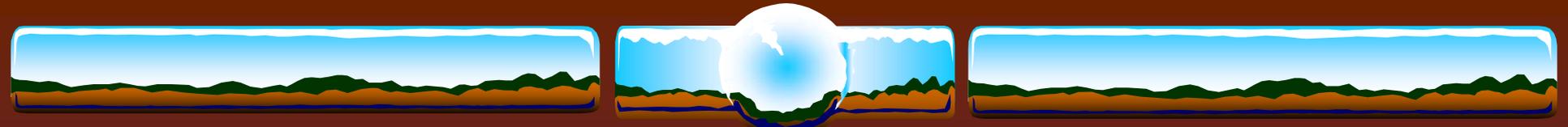
Washington & Old Dominion





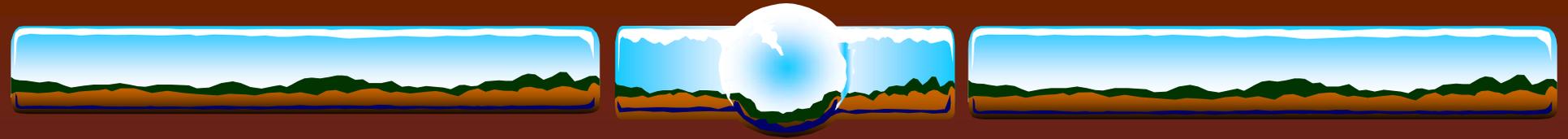
New River State Park





New River State Park – water trail

- ❖ **Multi-venue setting – South central VA**
- ❖ **39 mile water trail – 57 mile gravel trail**
- ❖ **Destination trail with strong local use (57%)**
- ❖ **Fishing, floating, other (gravel trail)**
- ❖ **1 million visits annually to NRSP**
- ❖ **155,000 water trail visits annually**
- ❖ **State owned and operated**



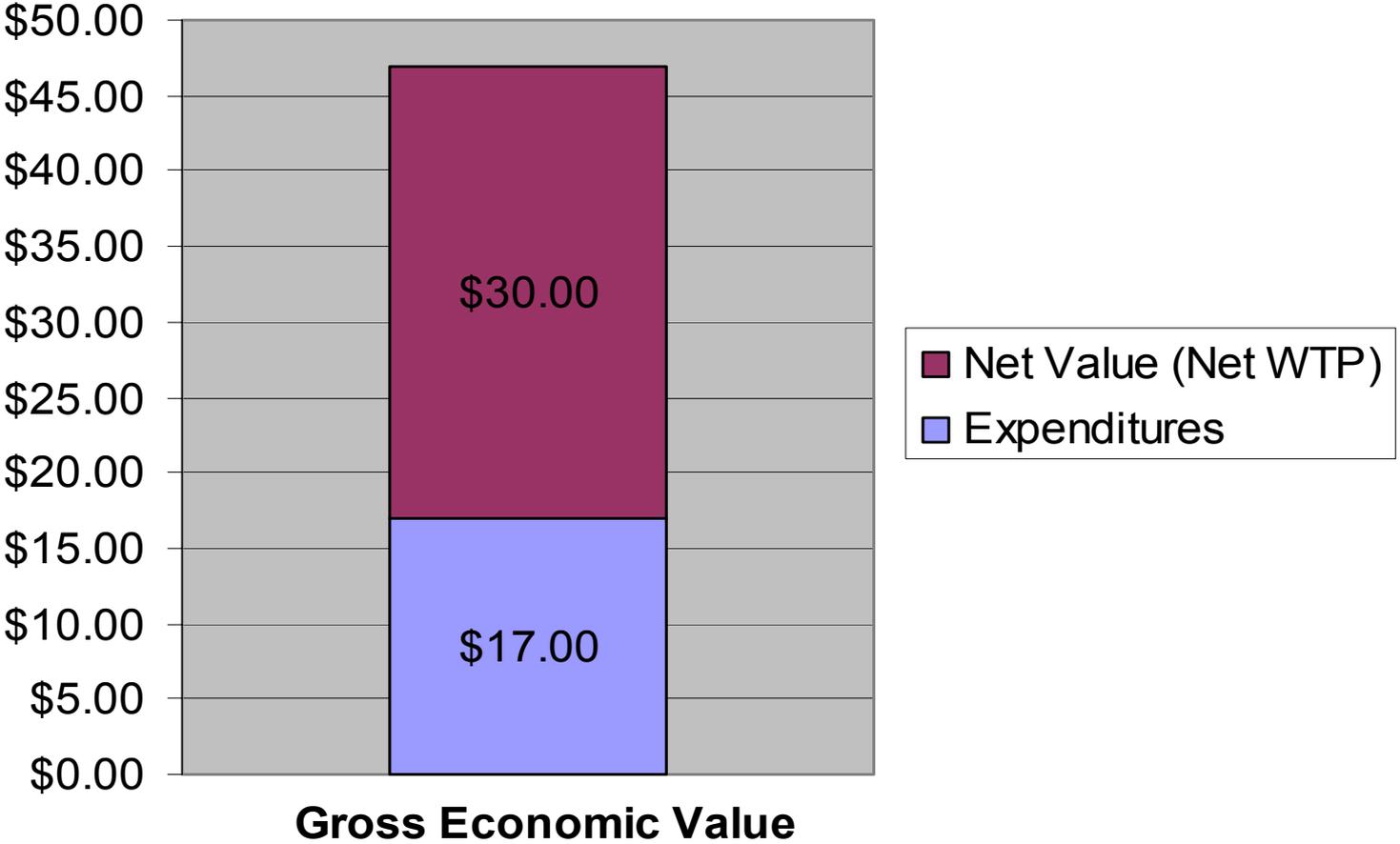
Benefits

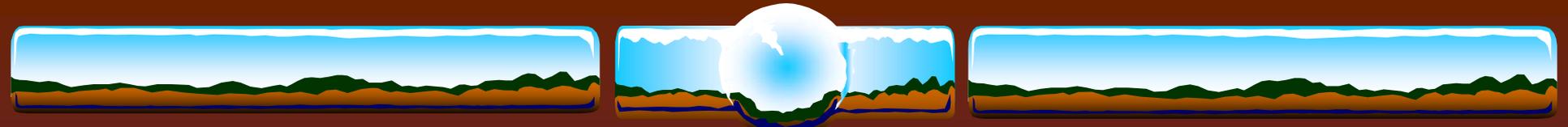
- ❖ Economic efficiency
- ❖ Utility maximization
- ❖ Demand curve
- ❖ Consumer surplus
- ❖ Willingness to pay
- ❖ Measures value

Impacts

- ❖ Economic distribution
- ❖ Export base theory
- ❖ Input-output model
- ❖ Linkages in economy
- ❖ Traces effects of spending
- ❖ Measures output & jobs

Gross Economic Value and Expenditures





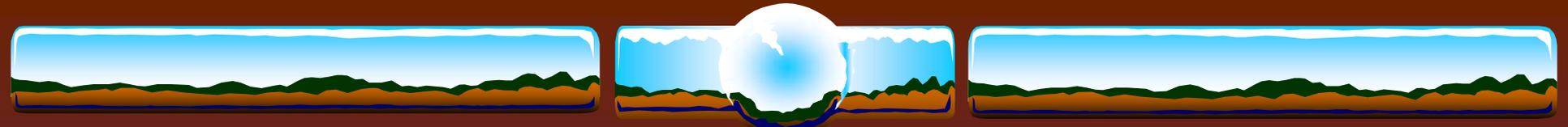
Expenditures by Locals and Nonlocals

Impact Region Counties

Local Resident Expenditures Per Person
Per Day Trip (example: \$10 average)

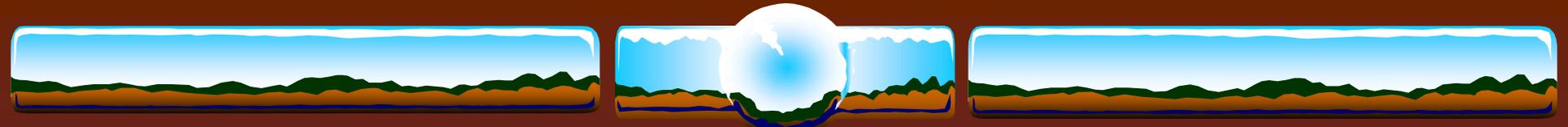


Nonlocal Resident Expenditures Per Person
Per Day Trip (example: \$17 average)



Regional Economic Impact Analysis

- ❖ **Estimate Use**
- ❖ **Define Local Impact Region**
- ❖ **Survey Nonlocals** – category, expenditures, group
- ❖ **Estimate recreation expenditures** per person per trip by **nonlocals** for major expenditure categories
- ❖ **Allocate Local Impact Region expenditures to economic sectors** in the Local Impact Region
- ❖ Use **IMPLAN** model or **MGM2** to estimate output, jobs and income in the Local Impact Region supported by nonlocal resident expenditures



Nonlocal Spending & Impacts

- ❖ **Detailed Survey NLB**

- ❖ Group expenditures **whole trip**

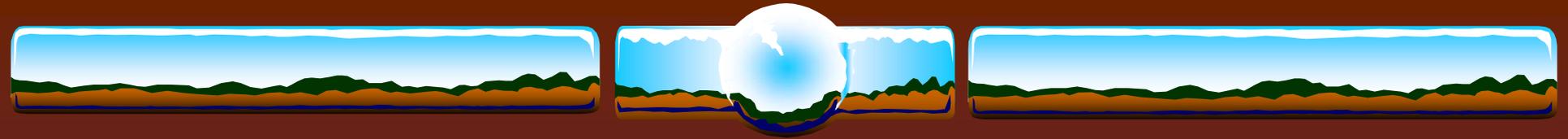
- ❖ Group expenditures **impact region**

- ❖ Spending party size

- ❖ Per-person or group trip expenditures

- ❖ **IMPLAN Model or MGM2**

- ❖ Economic Impacts per 1,000 person-trips or per 1,000 group-trips



Use Estimation & Sampling

❖ VCT

- ❖ Stratified random – season, use density, weekday
- ❖ 130,000+ annually

❖ W&OD

- ❖ Quota sample – 8 trail segments
- ❖ Summer density counts – seasonally adjusted
- ❖ 1.7 million+ annually

❖ NRSP water trail

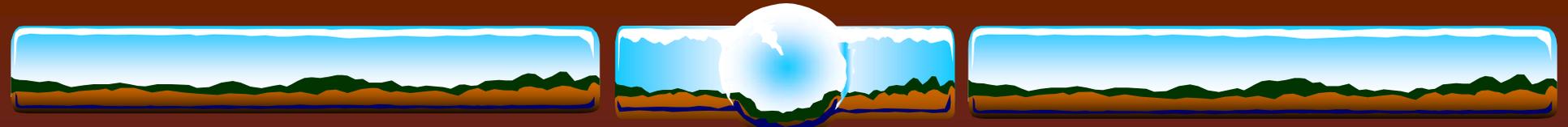
- ❖ Convenience sample – 155,000 annually



Overview of IMPLAN

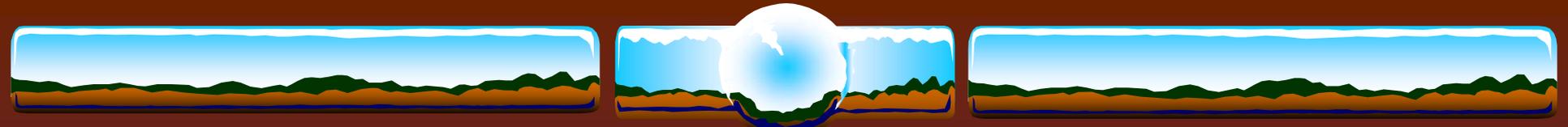
Impact Modeling for PLANning

- ❖ Computer-based, input-output economic model
- ❖ Designed for regional economic impact analysis
- ❖ Developed by the Forest Service, now MIG
- ❖ Provides comprehensive, science-based system for estimating economic impacts of natural resource related projects
- ❖ Since 1979, it has been used in a multitude of private and public sector applications to estimate the economic impacts of natural resource related and non-natural resource related projects on regional economies



Overview of IMPLAN

- ❖ **IMPLAN has two major components:**
- ❖ **Nationwide database describing county-level economic activity and a computer model for constructing regional input-output models and estimating economic impacts from changes in economic activity.**
- ❖ **The model is based on input-output accounting and analysis procedures used by the U.S. Bureau of Economic Analysis and recommended by the United Nations**



Detailed Survey Content

- ❖ Trip characteristics
- ❖ Spending characteristics
- ❖ Travel time and distance to site
- ❖ Trail issues and benefits
- ❖ Area features
- ❖ Household demographics
- ❖ Annual usage
- ❖ Primary purpose



Primary Purpose Day User Exp Profile

Ave Spending Party Size = 3.34

	Whole trip	25 miles VCT	VCT person/trp
Priv. Lodg	14.69	0.00	0.00
Pub. Lodg	0.09	0.00	0.00
Food In	38.13	21.29	6.37
Food Out	6.49	2.65	0.79
Prim. Trans.	18.68	11.42	3.39
Other Tran.	0.06	0.06	0.02
Bike Rent	12.98	11.68	3.50
Shuttle	10.51	9.17	2.75
Use Fees	0.14	0.14	0.42
Other	1.42	0.89	0.27
Total	103.19	57.30	17.16



Primary Purpose Overnight Exp Profile

Ave Spending Party Size = 4.5

	Whole trip	25 miles VCT	VCT person/trp
Priv. Lodg	211.86	126.95	28.21
Pub. Lodg	29.30	22.29	4.95
Food In	137.02	99.71	22.16
Food Out	40.02	28.23	6.27
Prim. Trans.	61.50	36.32	8.07
Other Tran.	1.90	1.85	0.41
Bike Rent	18.44	17.28	3.84
Shuttle	20.96	19.26	4.28
Use Fees	0.00	0.00	0.00
Other	18.32	17.57	4.39
Total	539.32	369.46	82.10



Non-primary Purpose Day Use Exp Profile

Ave Spending Party Size = 4.3 Time Share = .193

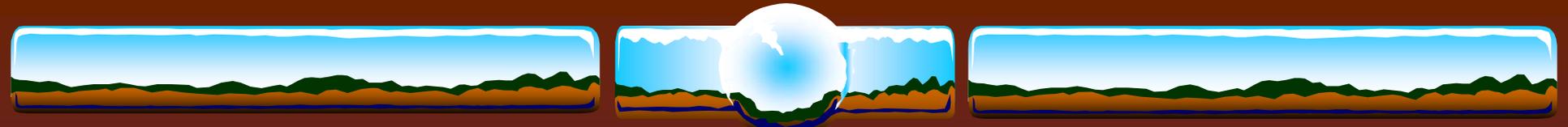
	Whole trip	25 miles VCT	VCT person/trp
Priv. Lodg	165.13	0.00	0.00
Pub. Lodg	31.18	0.00	0.00
Food In	154.18	51.00	3.51
Food Out	23.63	5.90	0.10
Prim. Trans.	82.18	59.00	3.98
Other Tran.	72.72	0.00	0.00
Bike Rent	47.13	47.13	2.66
Shuttle	3.09	3.09	0.14
Use Fees	0.18	0.00	0.00
Other	100.95	54.81	0.70
Total	680.37	161.93	11.11



Non-primary Purpose Overnight Exp Profile

Ave Spending Party Size = 3.40 Time Share = .04

	Whole trip	25 miles VCT	VCT person/trp
Priv. Lodg	175.53	125.17	1.74
Pub. Lodg	47.89	46.19	0.20
Food In	120.51	97.32	1.31
Food Out	28.19	17.23	0.13
Prim. Trans.	100.51	44.73	0.56
Other Tran.	29.19	6.80	0.01
Bike Rent	17.59	17.25	0.35
Shuttle	9.03	8.50	0.15
Use	1.06	0.00	0.00
Other	3.93	3.40	0.10
Total	533.43	366.59	4.55



Nonlocal Expenditures per Person-trip by User Type for Creeper

- ❖ **PPDU**- \$ 31 total → \$ 17 in local area
- ❖ **PPON**- \$ 120 total → \$ 82 in local area
- ❖ **NPDU**- \$ VCT share → \$ 11 in local area
- ❖ **NPON**- \$ VCT share → \$ 4 in local area

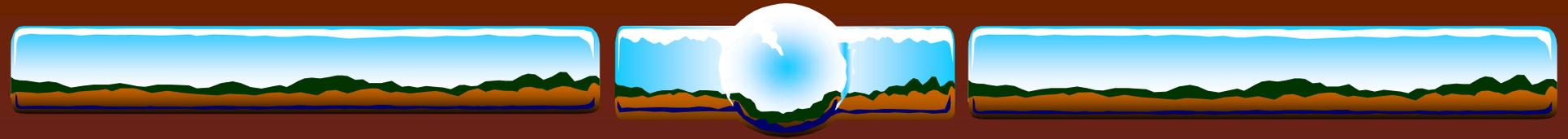
*These numbers have been trimmed for outliers



Creeper Impacts

Economic Impacts Per 1,000 Person Trips of VCT Use in Grayson & Washington Counties, VA, 2003 dollars

Economic Impact Indicators	Economic Impacts Per 1,000 Person Trips			
	Primary Day Use	Primary Overnight	Non Prim Day Use	Non Prim Overnight
Output	\$23,606	\$114,398	\$14,968	\$6,411
Employment	0.4	2.1	0.2	0.1
Total Income	\$10,270	\$45,944	\$6,014	\$3,200

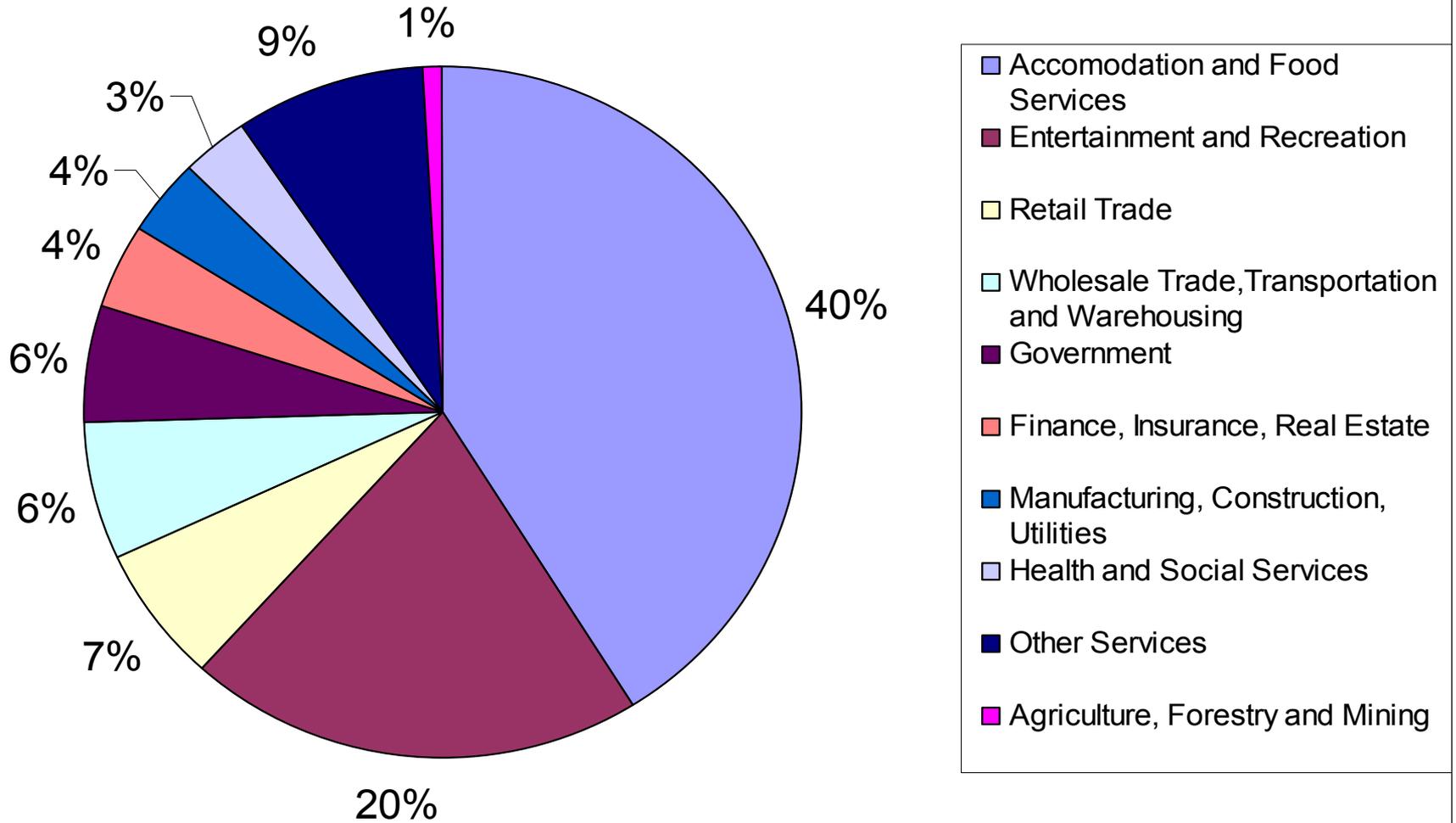


Nonlocal Economic Impacts

Combined Local Economic Impacts of Nonlocal VCT Use
Grayson & Washington Counties, VA, 2003 dollars

Economic Impact Indicators	Total Economic Impact
Output	\$1,587,000
Employment	27.4
Total Income	\$670,000

Distribution of Creeper Output Impacts

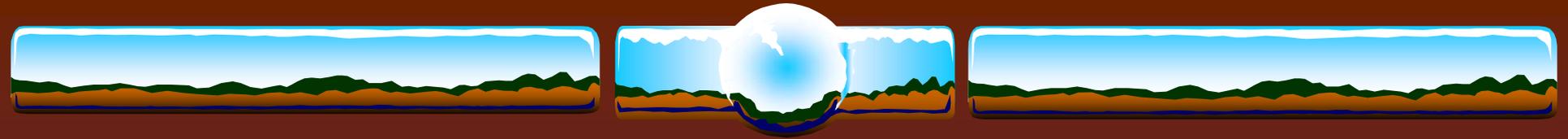




Economic Impact of VCT

❖ Nonlocal spending supports

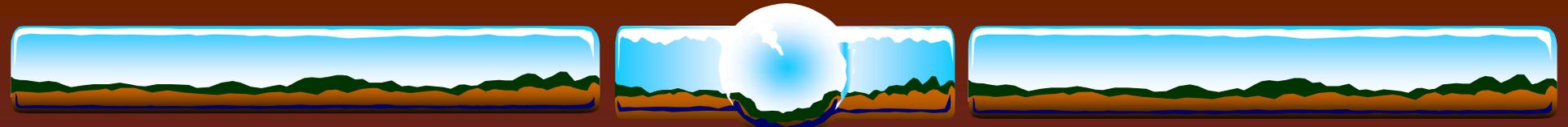
- ❖ \$1.6 million local economic output
- ❖ 30 local jobs
- ❖ \$670 thousand local income
- ❖ 40% to accommodation & food service sector
- ❖ 20% to recreation & entertainment sector



Economic Impact W&OD

- ❖ **\$1.4 mil spending by nonlocals (5%) supports:**
- ❖ **\$1.8 million local economic output**
- ❖ **34 local jobs**
- ❖ **\$643 thousand in local income**

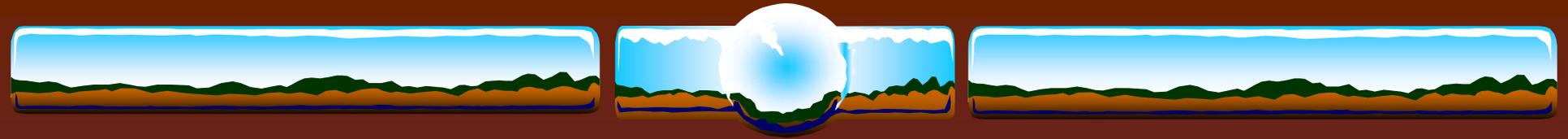
- ❖ **\$ 5.3 million local spending**
- ❖ **\$ 6.6 million nonlocal spending total**



Economic Impact NRSP – water trail

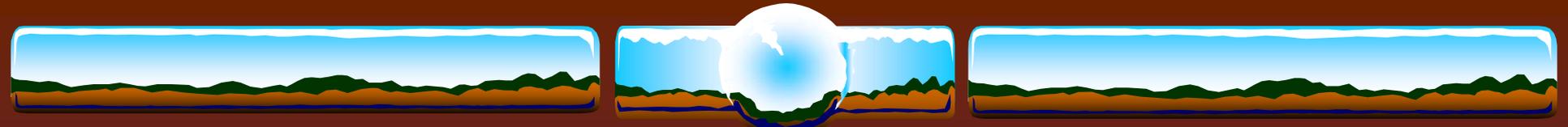
- ❖ **\$2 mil spending by nonlocals (43%) supports**
- ❖ **\$2.3 million local economic output**
- ❖ **50 local jobs**
- ❖ **\$752 thousand in local income**

- ❖ **\$465 thousand local spending**
- ❖ **\$5 million nonlocal spending total**



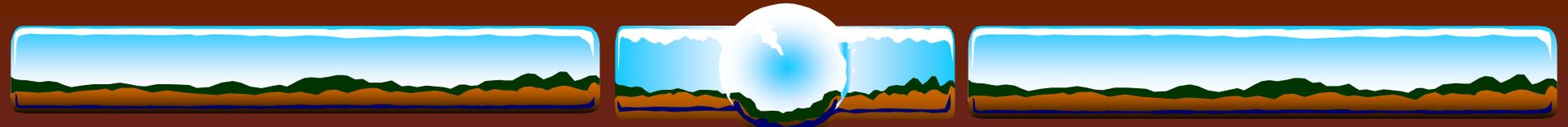
Impacts Conclusions

- ❖ **Three trails have similar impacts in absolute \$\$ at \$1.4 to \$2.0 million/yr & 30-50 jobs but ...**
 - ❖ **Creeper and New River larger relative effects**
- ❖ **To increase economic impacts**
 - ❖ **Increase share of primary purpose overnights**
 - ❖ **Induce visitors to stay another night**



Net Economic Benefit Analysis

- ❖ Estimate **Use** – Primary purpose
- ❖ Implement **Survey**
 - ❖ Trips per time period
 - ❖ Factors – distance, time, activity, demographics, etc
- ❖ Estimate Statistical **TC Demand Relationship**
 - ❖ Trips = f (price, subst, income, activity, etc)
 - ❖ Derive **Consumer Surplus** per person/trip
- ❖ Scale Use and CS for **Aggregate Estimate**



VCT Net Economic Benefit

- ❖ Trips = tnb (TC, Sub, Num, High, Bike, Sex, Age) N=800
- ❖ TC1= \$0.131 mile TC2= TC1 + $\frac{1}{4}$ Wage
- ❖ CS1= \$22.78 ppt CS2= \$38.90 ppt
- ❖ 130,000 visits \rightarrow 108,870 prim purp trips
- ❖ Aggregate NEB1= \$ 2.3 million
- ❖ Aggregate NEB2= \$ 3.9 million



W&OD Net Economic Benefit

❖ Trips = tnb (TC, Sub, Num, Time, Income)

N=997

❖ TC1= \$0.131 mile TC2= TC1 w/ tsp

❖ CS1= \$ 9.08 ppt CS2= \$13.63 ppt

❖ Trips = 1.7 mil * 93% prim purp.

❖ Aggregate NEB1= \$ 14.4 million

❖ Aggregate NEB2= \$ 21.6 million



NRSP-WT Net Economic Benefit

❖ Trips = tnb (TC, Sub, Num, Income, Fish)

N=157

❖ TC1= \$0.131 mile

TC2= TC1 + $\frac{1}{4}$ Wage

❖ CS1= \$11.73 ppt

CS2= \$25.24 ppt

❖ Trips = 155,331 * 87% prim purp

❖ Aggregate NEB1= \$1.6 million

❖ Aggregate NEB2= \$3.4 million



Net Economic Benefits Conclusions

❖ VCT	\$31 person/trip	\$3.1 million/yr
❖ NRSP	\$18 person/trip	\$2.5 million/yr
❖ W&OD	\$11 person/trip	\$18 million/yr