

# An Economic Impact Assessment of a Whitewater Recreational Park in Cascade, ID

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# Cascade White Water Analysis Report

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## *Summary*

The city of Cascade in Valley County, ID is adapting a brownfield, located in the center of town along the Payette River, for use as a Whitewater Park. Available data from fourteen whitewater parks and river areas in the United States were used in a regression analysis to predict the expected incremental economic impact to Valley County as a result of this Whitewater Park.

Once Cascade's Whitewater Park reaches its full potential for the region, this analysis suggests that Valley County can expect around 40,000 incremental visitors per year, but, depending on several factors<sup>1</sup> (like relative road access, successful events and promotion of the park) this number can be considerably lower or higher. The expected direct economic impact of the Whitewater Park for Valley County, given the full potential of the park, is estimated at \$7.7 million, with a conservative estimate of \$1.3 million.

Using a regional economic impact model to estimate the indirect economic activity generated by \$7.7 million in visitor expenditures, the total economic output impact on the region is estimated at \$8.2 million, with an employment impact of 103 jobs and tax impact of \$1.3 million evenly divided in local/state taxes and federal taxes.

## *Introduction*

When the Boise Cascade timber mill in the City of Cascade closed in 2001, it left an extensive brownfield (that is, a contaminated and abandoned industrial site) in the middle of town on prime riverfront property. The site will be expensive to develop, with the river shore in need of considerable ecological restoration – a project far beyond the current financial means of the city. The alternative, an empty brownfield dominating the city center, would be detrimental for the city's development as well. Inspired through the Idaho Horizons program<sup>2</sup> a group of citizens, white water enthusiasts among them, recognized that a liability can be turned into an asset with imagination, hard work, and investment. A feasibility study proved that the river segment along the site had enough drop and flow to make the brownfield site into a Whitewater City Park while simultaneously restoring the river shore. This analysis provides an estimate of the economic impact of such a whitewater park for Valley County, *without* accounting for synergistic effects on already existing tourist activities, or the needed investments in adaptive reuse of the brownfield if the park would not be established.

The planned Whitewater Park is an amenity that will not generate any direct income for the City of Cascade; there are no entrance or user fees, unless combined with a festival or other activity. The economic activity and impact that justify the creation and maintenance of a park like this are usually found in the increased revenues generated by the hospitality industry (hotel and restaurant), in turn generating tax revenues for the local and state government. Rather than doing a localized analysis with

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<sup>1</sup> In the regression analysis it is assumed that Cascade's Whitewater Park will be equally developed and promoted as the average park in the analysis.

<sup>2</sup> Idaho Horizons is a community leadership program aimed at reducing poverty in small, rural towns in Idaho. The program is funded by the Northwest Area Foundation in partnership with University of Idaho Extension.

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rough estimates on visitor potential, an approach often limited in value, we looked at the available visitor data for existing whitewater parks in the United States, and estimated a visitor potential and related spending for Cascade through regression analysis. The resulting incremental impact on the region was then further analyzed using IMPLAN.

### ***Model Data***

Visitation data for 20 whitewater parks or active river locations around the country (attachment 1) was collected using different reports and studies. The following predictors were included or estimated:

- Non-local visitors per season: the number of incremental visitors that are uniquely attributable to the white water park or river location in that region;
- Visitation and spending data (average days and spending per day) per park or river location; the spending data ranged in time of collection from 1986 through 2007, with most data from the mid 1990s - the data was *not* corrected for inflation;
- Natural amenity index<sup>3</sup>: the USDA natural index of the county where the park or river location is located;
- GIS calculated population estimates for areas within a 50 mile, 100 mile and 200 mile radius around the park or river location; most studies indicated that, other than for out-of-state vacationing tourists, the parks drew from up-to 200 miles.
- A qualitative indicator: whether or not another whitewater park was located within 200 miles of the park;
- Data on rapids, flow, dependence on dam-releases to establish a qualitative park-quality index; this proved very difficult within the time allotted, and of limited value to this study;

The available dataset has 10 observations with complete visitation data and demographics, and 14 datasets with demographics only.

### ***Methods***

Unique visitors: The sub-set of 10 observations with complete data was used to run a model selection using the Akaike Information Criterion (AIC) in SAS 9.2 software to find the best predictors or interaction between predictors. The same was done for the set of 14 observations with only demographic data. The best predictive model between runs was then used for the ultimate prediction of unique visitors through regression analysis, again using SAS 9.2 software.

Direct Regional Economic Impact: The economic activity and impact that justify the creation and maintenance of a park like this are usually found in the increased revenues generated by the hospitality industry, in turn generating tax revenues for the local and state government.

For this model we assumed that the direct economic impact was generated by the spending of unique visitors to the Whitewater Park (i.e. visitors that would not have come to the county if not for the park). For spending per visitor we choose to use a simple average and range for both the stay (days/visitor) and the visitor's spending (spending per day) as reported in the ten observations with complete data.

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<sup>3</sup> Natural amenities county-level data, <http://www.ers.usda.gov/Publications/AER781/>, accessed March 2009

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Indirect Impact: When a business expands or contracts, there is a ripple effect through the economy. More visitors in the area means more business for the hotels and restaurants who will buy more food and supplies and hire more workers. This new economic activity generates even more activity in related businesses who sell to or contract with the hotels and restaurants, and who, in turn, buy more inputs and hire more labor. The change in one industry, therefore, is multiplied throughout the economy following its linkages to other businesses and payments to workers. To capture these effects, it is necessary to use an economic impact model that contains these linkages, like IMPLAN.

The categorization of economic activity by IMPLAN can be summarized in these three areas:

- Direct effects refer to the production changes associated with a variation in final demand for the good itself. It is the initial activity supposed to occur in the economy, which is exogenous to the model.
- Indirect effects refer to secondary activity caused by changing input needs of directly affected industries (e.g., additional input purchases to produce additional output).
- Induced effects are caused by changes in household spending due to additional employment generated by direct and indirect effects.

It is immediately evident that this structure describes “backward” linkages, as some exogenous economic event affects an industry under investigation, which then creates economic activity in input supply industries and from labor income. Any economic additions found downstream in supply channels are not captured, nor are the enabled industries examined endogenously. In the case of the Whitewater Park, the ultimate goal is to model a ‘whitewater outing’ and what it takes to produce this experience and also include those forward linkages.

For purposes of this analysis we generated a simple sector model with linkages to the hospitality industry and other recreational services (hotels, campings and restaurants, recreational retail and grocery stores) and used IMPLAN 2007 data to generate the indirect economic impact and related tax income for local and state governments.

### ***Results***

The results below assume the Whitewater Park at its full potential for the region; if or when this will happen is a matter of successful promotion, event-planning and further development.

#### **Visitor prediction model analysis:**

Even though park-quality and adjacency of competitive parks provided very high correlations in modeling (over 90%), it also introduced collinearity that falsely skewed the predictions and created overly influential observations which forced us to drop these predictors. We therefore ran a second AIC analysis using only demographic data, from which we choose our final model (attachment 2, page A2-2).

Influence analysis (page A2-3) indicated high influence of the Upper Delaware river park (DFFITS of 2.7); we included it in the model, however, since nothing indicated that the data point was an outlier (RSTUDENT 0.78).

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Two other data points were suspected outliers (New River and Nanthala River (RSTUDENT of 2 and 3.6 respectively), but since neither was particularly influential, we also kept these two data points.

### Visitor regression analysis

The best predictive model obtained with regression analysis was (model 3, Attachment2-4):

$$\text{Visitors} = 41,002 + 2.66655\text{E-}17 \times [(\text{pop}50) \times (\text{pop}100) \times (\text{pop}200)]$$

The model has significant predictive value ( $p=0.06$ ; good considering the data), but a very high noise level ( $r^2 = 26\%$ ), meaning that the calculated visitor value will have a high spread associated with the estimation. In Cascade's case, the calculated visitor total from the model would be 41,012 with a 95% confidence interval of (low=-770, high=82,800). Translated into practical terms, this means that:

Cascade can reasonably expect around 40,000 visitors per year, but, depending on several factors (like valley accessibility, park quality, events, etc) this number can become considerably lower, or as high as 80,000 visitors.

### Direct Economic Impact

The average spending per visitor in the data was as low as \$33 per visit and as high as \$319 per visit (attachment 1). Visitors were on average 1.6 days per year in the region and spending an average \$121 per day or a total average of \$194 per season.

Using the *average* as the expected spending for Cascade, and the *low end of the range* as a worst-case spending, than:

Cascade can expect  $40,000 \times \$194 = \$7.7$  million in direct economic activity, with a conservative estimate of  $40,000 \times \$33 = \$1.32$  million

NOTE: we purposely did not use optimistic scenarios (using either the \$319 spending per visitor, or the high of 80,000 visitors); the high noise in the predictive model and the limited data points in the analysis warrant a cautious approach in this case.

### Indirect economic impact

Using a regional economic impact model to estimate the indirect economic activity generated by \$7.7 Million in visitor expenditures, the *total economic output impact* on the region is estimated at \$8.2 Million, suggesting a (low) multiplier effect of 1.06. The total direct *Value-Added* impact is \$3.6 Million, with an additional \$1.1 Million in indirect and induced impact.

The annual tax impact is summarized in attachment 3-1, and shows a fairly even contribution in Federal revenues and State/local taxes of around \$600K each.

The calculated employment impact for the region is 83 direct, the majority of which in the hospitality sector, and 20 indirect or induced.

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## *Discussion*

### Predictive value

The predicted visitors for Cascade's whitewater park, and the related economic impact, are *rough indications* for what Cascade can realistically expect once the park reaches its full amenity potential for the region. They are *by no means exact data due to the limited number of data points leading to the conclusions, as well as the high noise level in the model* (influenced by all highly competitive factors like access to the region, successful events and promotion of the park).

This impact does not take into account cost avoidance (either the negative impact on the city's economy of an empty brownfield dominating the city center, or the cost of alternative development) or synergistic effects on the existing tourist sector. This, in and of themselves, could be reasonable justifications for the undertaking of the park.

For this analysis we expected to have a high predictive value from factors like the amenity index and park-quality index. The reality is that most, if not all, current white water parks are, by necessity, located in areas with a high natural amenity index (white water and mountains are highly rated in the index). This implicit collinearity (that is: indices being surrogates for each other) distorts the model and without doing further research to adjust these indices, we needed to omit them from the model. The park-quality index that we intended to develop had a similar problem: whitewater areas, without parks, still attract large numbers of visitors, but usually more self-sufficient visitors or guided groups. This was not differentiated within our model. Our omitting of these indices from the model is therefore not an indication for its usefulness, or lack thereof; further research may very well prove their usefulness in future models.

### Alternative methods

The traditional alternative method - building a visitor model from the ground up extrapolating from local data - is not only time consuming but an educated guess at best, and usually gains confidence only by directly or indirectly referring to data from other regions or parks to bring proportionality into the estimations.

Regression analysis to predict economic impact in a new area, extrapolated from experience in other areas, can therefore be very powerful and omits the necessity for local estimations altogether, other than to determine the relative data for the model.

### Economic Impact

The multiplier effect is low and indicative of the low density of the local economy. Most of the county's resources are used to purchase food and supplies externally as opposed to generating it locally; any import substitution with locally provided food or supplies will greatly increase the multiplier effect and thus the indirect economic impact.

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# Cascade White Water Analysis Report

## Attachment 1

### Data Points

Abbreviated Name	Park	County
	Cascade	Valley County, ID
Jamaica	Jamaica	Windham County, VT
Stoneycreek	Tire Hill (Stoneycreek)	Somerset County, PA
Golden	Golden	Jefferson County, CO
Reno	Reno	Washoe County, NV
Muscogee County	Columbus & Phenix City	Muscogee County, GA
Sacandaga River	Sacandaga River, Hadley + Lake Luzerne, NY	Warren County, NY
Cheoah River	Cheoah River Recreation Study	Graham County, NC
Upper Delaware	Upper Delaware Scenic and Recreational River	Pike County, PA
Gauley River	Gauley River	Fayette County, WV
New River	New River	Summers County, WV
MiddleFork	Middle Fork of the Salmon	Idaho County, ID
Kennebec River	Kennebec River	Kennebec County, ME
Nanthala River	Nantahala River	Swain County, NC
Upper Klamath	Upper Klamath	Klamath County, OR



## Cascade White Water Analysis Report

### Data Gathered

Site	Non-Local Visitors per Season	State	Year Data Was Collected	Park Quality (0-5)	Natural Amenity Index (1-7)	Competitive Parks Within 200 Miles	Population Within 50 Miles	Population Within 100 Miles	Population Within 200 Miles
Valley County	*	ID	2009	3	5	1	296674	671921	1850175
Jamaica	2,193	VT	2003	3	3	1	2161782	9961817	34172007
Stoneycreek	3,135	PA	1999	4	3	1	1945558	5631761	24394710
Golden	13,635	CO	2000	3	6	1	2408321	3723288	4365213
Reno	7,050	NV	1997	5	6	0	784659	1832011	11633663
Muscogee County	27,000	GA	2005	4	4	0	757607	5153025	13080844
Sacandaga River	21,553	NY	2007	3	3	1	1203015	3238205	33547043
Cheoah River	12,800	NC		1	5	1	1176765	6009483	17329806
Upper Delaware	193,058	PA	1986	1	4	1	4667123	26960505	43625326
Gauley River	65,438	WV	1995	3	3	1	786901	2663887	17338755
New River	160,142	WV	1995	1	4	1	734951	2630687	15205780
Middle Fork	4,500	ID	1993	1	4		242244	691901	2384003
Kennebec River	36,000	ME	1993	1	3		730851	1390233	9160807
Nanthala River	213,000	NC	1993	1	5		1606002	5869671	18409025
Upper Klamath	4,000	OR	1988	1	6		532335	1421093	5255896

## Cascade White Water Analysis Report

Park	Average Spending Per Person Per Day	Average Days Spent at Park	Generated Revenue (D x E x F)	Economic Multiplier	Dam Release Based?	Park (y/n)	Output (G x H x I)	
Average	\$121	1.6						
Jamaica	\$87	1	\$86.86	\$190,484	1.53	1	y	\$291,440
Stoneycreek	\$50	1.85	\$92.50	\$289,988	1.60	1	y	\$463,980
Golden	\$33	1	\$33.00	\$913,545	2.00	0	y	\$1,827,090
Reno	\$104	2.6	\$270.40	\$1,907,392		0	y	
Muscogee County	\$110	1.42	\$156.20	\$4,202,584	1.70	0	y	\$7,144,393
Sacandaga River	\$51	2	\$102.00	\$2,198,406	1.54	1	y	\$3,385,545
Cheoah River	\$250	1	\$250.00	\$3,200,000	1.00	0	n	\$3,200,000
Upper Delaware	\$19	3.56	\$69.16	\$13,351,228	2.03	0	n	\$27,102,992
Gauley River	\$319	1	\$319.10	\$20,881,266	1.47	1	n	\$30,695,461
New River	\$188	1	187.7	\$30,058,653	1.48	0	n	\$44,486,807
MiddleFork				\$9,700,000		0	n	
Kennebec River				\$10,650,000		1	n	
Nanthala River				\$14,370,000		1	n	
Upper Klamtath		?		\$653,900			n	

# Cascade White Water Analysis Report

## Attachment 2

```

/*used data set */
data wwdata;
  input
  park $ park_quality index parks_200mi
  pop50 pop100 pop200 visitors
  avgspend avgdays avgrev multiplier release_based $;
  output=avgrev*multiplier;
  mix0=pop50*pop100*pop200;
  mix1=pop50*pop100;
  mix2=pop100*pop200;
  mix3=pop50*pop100*pop200;
  mixindex=parks_200mi*index;

```

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Obs	park	park_ quality	index	parks_ 200mi	pop50	pop100	pop200
1	Jamaica	3	3	1	2161782	9961817	34172007
2	Stoneycr	4	3	1	1945558	5631761	24394710
3	Golden	3	6	1	2408321	3723288	4365213
4	Reno	5	6	0	784659	1832011	11633663
5	Muscogee	4	4	0	757607	5153025	13080844
6	Sacandag	3	3	1	1203015	3238205	33547043
7	CheoahRi	1	5	1	1176765	6009483	17329806
8	UpperDel	1	4	1	4667123	26960505	43625326
9	GauleyRi	3	3	1	786901	2663887	17338755
10	NewRiver	1	4	1	734951	2630687	15205780

Obs	visitors	avgspend	avgdays	avgrev	multiplier	release_ based	output
1	2193	87	1	190484	2	1	380968
2	3135	50	2	289988	2	1	579976
3	13635	33	1	913545	2	0	1827090
4	7050	104	3	1907392	2	0	3814784
5	27000	110	1	4202584	2	0	8405168
6	21553	51	2	2198406	2	1	4396812
7	12800	250	1	3200000	1	0	3200000
8	193058	19	4	13351228	2	0	26702456
9	65438	319	1	20881266	1	1	20881266
10	160142	188	1	30058653	1	0	30058653

Obs	mix0	mix1	mix2	mix3	mixindex
1	7.359E20	2.1535E13	3.4042E14	7.359E20	3
2	2.6729E20	1.0957E13	1.3739E14	2.6729E20	3
3	3.9142E19	8.9669E12	1.6253E13	3.9142E19	6
4	1.6723E19	1.4375E12	2.1313E13	1.6723E19	0
5	5.1067E19	3.904E12	6.7406E13	5.1067E19	0
6	1.3069E20	3.8956E12	1.0863E14	1.3069E20	3
7	1.2255E20	7.0717E12	1.0414E14	1.2255E20	5
8	5.4893E21	1.2583E14	1.1762E15	5.4893E21	4
9	3.6346E19	2.0962E12	4.6188E13	3.6346E19	3
10	2.9399E19	1.9334E12	4.0002E13	2.9399E19	4

# Cascade White Water Analysis Report

```
/*model selection using the Akaike Information Criterion */  
proc rsquare; model visitors=pop50 pop100 pop200 mix1 mix2 mix3 /aic;
```

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The RSQUARE Procedure  
Model: MODEL1  
Dependent Variable: visitors

R-Square Selection Method

Number of Observations Read 14  
Number of Observations Used 14

\*\*\*\*\*Final run model\*\*\*\*\*

Number in Model	R-Square	AIC	Variables in Model
1	0.2638	313.1232	mix1
1	0.2619	313.1597	mix3 chosen model
2	0.2752	314.9042	mix1 mix2
3	0.3075	316.2678	pop100 mix2 mix3
6	0.5290	316.8699	pop50 pop100 pop200 mix1 mix2 mix3

\*\*\*\*\*First run Models with unacceptable collinearity\*\*\*\*\*

Number in Model	R-Square	AIC	Variables in Model
4	0.8158	214.9488	park_quality pop50 pop100 mix1
5	0.8405	215.5091	park_quality index pop100 pop200 mix2
6	0.9829	-26.5656	park_quality index parks_200mi pop50 pop100 mix1

# Cascade White Water Analysis Report

```

/*influence testing:
- upperdalaware: influential (DFFITS=2.7) but not an outlier (Rstudent: 0.78)
- NewRiver and Nanthala River seem like outliers (RSTUDENT 2 and 3.6
  respectively) but not influential
*/
proc reg; model visitors= mix2/influence;

```

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The REG Procedure  
 Dependent Variable: visitors

## Output Statistics

Obs	Residual	RStudent	Hat Diag H	Cov Ratio	DFFITS
1	-74646	-1.1690	0.0992	1.0453	-0.3880
2	-49113	-0.7318	0.0717	1.1658	-0.2034
3	-23942	-0.3533	0.0875	1.2751	-0.1094
4	-31140	-0.4611	0.0864	1.2536	-0.1418
5	-16773	-0.2455	0.0779	1.2766	-0.0714
6	-27213	-0.3991	0.0733	1.2478	-0.1122
7	-35422	-0.5223	0.0737	1.2233	-0.1473
8	14994	0.7845	0.9242	14.0805	2.7393
9	24235	0.3565	0.0814	1.2661	0.1061
10	119689	2.0628	0.0825	0.6744	0.6186
11	-31308	-0.4648	0.0910	1.2593	-0.1471
12	-1151	-0.0169	0.0883	1.3053	-0.0053
13	164304	3.4551	0.0733	0.2953	0.9720
14	-32513	-0.4827	0.0896	1.2535	-0.1514

## Output Statistics

Obs	-----DFBETAS-----	
	Intercept	mix2
1	-0.1948	-0.2054
2	-0.1855	0.0130
3	-0.1093	0.0469
4	-0.1415	0.0589
5	-0.0700	0.0206
6	-0.1063	0.0179
7	-0.1402	0.0256
8	-0.5582	2.6313
9	0.1052	-0.0371
10	0.6148	-0.2267
11	-0.1471	0.0683
12	-0.0053	0.0023
13	0.9211	-0.1567
14	-0.1514	0.0682

Sum of Residuals 0  
 Sum of Squared Residuals 55975664269  
 Predicted Residual SS (PRESS) 1.04913E11

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```

/*final regression analysis and 95% confidence limits */
model visitors= mix3/clb;
  output out=new predicted=yhat residual=res;
  proc rank normal=blom ;/*calculate residuals to check normality */
    var res;
    ranks nscore;
  proc plot; /* plot the data */
    plot res*yhat;
    plot res*nscore;
    plot visitors*pop50;
    plot visitors*pop100;
    plot visitors*pop200;
    plot res*nscore;
    plot visitors*pop50;
    plot visitors*pop100;
    plot visitors*pop200;

```

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 The REG Procedure  
 Model: MODEL3  
 Dependent Variable: visitors  
 Number of Observations Read 14  
 Number of Observations Used 14

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	19346053955	19346053955	4.26	0.0614
Error	12	54523350281	4543612523		
Corrected Total	13	73869404236			

Root MSE 67406 R-Square 0.2619  
 Dependent Mean 54536 Adj R-Sq 0.2004  
 Coeff Var 123.59968

Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	1	41002	19172	2.14	0.0537
mix3	1	2.66655E-17	1.29227E-17	2.06	0.0614

Parameter Estimates			
Variable	DF	95% Confidence Limits	
Intercept	1	-769.92890	82774
mix3	1	-1.4907E-18	5.48217E-17



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# TAX IMPACT

IMPACT NAME: Whitewater4 MULTIPLIER: Type SAM  
2007 Valley County.iap

May 14, 2009

Enterprises (Corporations)	Transfers	Employee Compensation	Proprietary Income	Household Expenditures	Enterprises (Corporations)	Indirect Business Taxes	Total
	Total	-2,156	0	0	0	0	-2,156
Federal Government NonDefense	Corporate Profits Tax	-2,156			87,432		-2,156
	Indirect Bus Tax: Custom Duty					16,076	87,432
	Indirect Bus Tax: Excise Taxes					38,461	16,076
	Indirect Bus Tax: Fed NonTaxes					19,258	38,461
	Personal Tax: Estate and Gift Tax					0	19,258
	Personal Tax: Income Tax			185,694			0
	Personal Tax: NonTaxes (Fines- Fees)						185,694
	Social Ins Tax- Employee Contribution	152,598	8,306				0
	Social Ins Tax- Employer Contribution	160,247					160,903
	Total	312,845	8,306	185,694	87,432	73,796	160,247
State/Local Govt NonEducation	Corporate Profits Tax				15,430		668,073
	Dividends				24,862		15,430
	Indirect Bus Tax: Motor Vehicle Lic					7,256	24,862
	Indirect Bus Tax: Other Taxes					29,575	7,256
	Indirect Bus Tax: Property Tax					194,403	29,575
	Indirect Bus Tax: S/L NonTaxes					25,955	194,403
	Indirect Bus Tax: Sales Tax					244,798	25,955
	Indirect Bus Tax: Severance Tax					474	244,798
	Personal Tax: Estate and Gift Tax					0	474
	Personal Tax: Income Tax			63,192			0
	Personal Tax: Motor Vehicle License			4,088			63,192
	Personal Tax: NonTaxes (Fines- Fees)			7,067			4,089
	Personal Tax: Other Tax (Fish/Hunt)			6,096			7,067
	Personal Tax: Property Taxes			1,179			6,096
	Social Ins Tax- Employee Contribution	2,246					1,179
	Social Ins Tax- Employer Contribution	9,662					2,246
	Total	11,908	0	81,617	40,292	502,461	9,662
	Total	322,597	8,306	267,311	127,724	576,256	636,278
	Total						1,302,194

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