

ROADWAYS IMPACT FEE ANALYSIS

The following assumptions are made in the Roads Impact Fee Analysis:

- Road expansion as a result of new development includes the following:¹

LOCATION	COST
Canyon Road from 400 S to Grand View	\$83,635
400 E from Canyon Road to City Boundary	\$55,757
1000 S from 400 E to Church Road	\$163,124
Total Cost:	\$302,516

- Average miles per gallon is 17.3²
- State Gas Tax Rate is \$0.195 per gallon³
- Federal Gas Tax Rate is \$0.183 per gallon⁴
- State Highway User Fees, including Special Fuel Taxes and Permits Paid by City Residents are \$0.116 per gallon⁵

As outlined in the Impact Fees Act, the following steps are taken to calculate the roads impact fee:

- Step 1** Identify the impact on system improvements required by the development activity
- Step 2** Demonstrate how those impacts on system improvements are reasonably related to the new development activity
- Step 3** Estimate the proportionate share of the costs of impacts on system improvements that are reasonably related to the new development activity by:
 - A. Calculating the cost of existing public facilities
 - B. Determining the manner of financing existing public facilities
 - C. Assessing the relative extent to which the newly developed

¹Joseph Campbell; Knighton & Crow Engineering

²Utah Department of Transportation

³Utah Department of Transportation

⁴Utah Department of Transportation

⁵Utah Department of Transportation, Annual Statistical Summary and Statistics

properties and the other properties in Providence have already contributed to the cost of existing public facilities

- D. Determining the relative extent to which the newly developed properties and the other properties in the municipality will contribute to the cost of existing public facilities in the future
- E. Calculating the extent to which the newly developed properties are entitled to a credit
- F. Assessing the extraordinary costs in servicing the newly developed properties
- G. Calculating the time-price differential inherent in fair comparisons of amounts paid at different times

Step 4 Based on the above steps and the requirements of Utah Code, Title 11, Chapter 36, identify how the impact fee is calculated

Step 1: Impact on System Improvements by Development Activity

New development in Providence City generates demand for improved and new roadways as the existing roadway system becomes congested or inadequate. Providence City officials determined the future impact on the existing system by new development and outlined the necessary road expansions to accommodate future growth. **Table 12** details the road improvements necessitated by new development, including the cost of the roads impact fee analysis.

Step 2: Relation Between System Improvements and New Development

According to the Impact Fees Act, system improvements included in the roadways analysis must reasonably relate to new development. This section of the law ensures new development pays only for the system improvements for which the development is a primary generator of demand. A careful analysis of the roadways system will examine two aspects of the relationship between system improvements and new development. One aspect is a relationship of causation. The system improvements described in **Table 11** are a result of new development activity. Without the new development, these road constructions are unnecessary, therefore, the outlined system improvements reasonably relate to new development.

The second aspect of the relation between system improvements and new development is the service area of roads. This aspect is more precise than the first. New development should only pay for those roads by which the development is serviced.

One way to measure service area is in trip lengths. A trip length is the distance covered by a one-way automobile trip. If the average trip length of all development types in Providence City is greater than the size of Providence, then all new development may be serviced by new roadways. If the average trip length is less, then only certain areas in Providence will be serviced by particular new roadways. Modeling by the Wasatch Front Regional Council concludes that the average trip length for various land use types along the Wasatch Front exceeds eight miles. Although Providence City is not within the area studied by the Wasatch Front Regional Council, it may be assumed the average trip length in Providence is similar. Providence City does not exceed eight miles either north to south or east to west. Therefore, it may be assumed that all system improvements service all new development, and all system improvements relate to all new development.

TABLE 11: ROAD EXPANSIONS AS A RESULT OF NEW DEVELOPMENT			
LOCATION	COST	LENGTH (ft)	COST PER LINEAL FOOT
Canyon Road from 400 S to Grand View	\$83,635	6,336	\$13.20
400 E from Canyon Road to City Boundary	\$55,757	4,224	\$13.20
1000 S from 400 E to Church Road	\$163,124	1,216	\$134.15
Total Cost: \$302,516		Average Cost per Lineal Foot: \$53.52	

Step 3: Proportionate Share Analysis

A. Calculation of the Cost of Existing Public Facilities

The cost of existing public facilities is applicable in two cases. One case is when an outstanding debt obligation exists and the retirement of the debt will include future monthly payments by new development. There is an outstanding debt obligation for roadways in Providence. The second case is in the assessment of a benefit/cost ratio experienced by current residents. A fairly assessed impact fee allocates the same benefit/cost ratio to new development as experienced by current residents. The relationship between existing facilities and the benefit/cost ratio is discussed in the following section.

B. Manner of Financing Existing Public Facilities

Existing facilities, including the outstanding bond, have been financed through Class "C" road funds. The current residents of Providence City have contributed to Class "C" road funds through state gasoline tax and state highway user fees. Future residents of Providence will make similar contributions. Because general fund, state funds and federal funds have not been used to construct roads in Providence, contributions to these sources through municipal taxes is not relevant to this analysis. A Gas Tax Credit to account for the future contributions of newly developed properties to the cost of public facilities through the payment of gas taxes and state highway user fees is included in this analysis. This credit ensures future residents of Providence will face the same benefit/cost ratio as current residents.

Gas Tax Credit

A percentage of the gas taxes paid by Providence City residents returns to the city through Class "C" road funds. These funds are used for the improvement of road systems. The Gas Tax Credit reimburses new development for the amount of future gas taxes that may be spent on new capacity roadways based on historical expenditures of Class "C" road funds. **Table 13** outlines the calculation of the credit, which includes the following components:

- Trips Per Year is the number of trips generated, per year, by a particular land use. The trips per year is calculated as follows:

(Daily Trip Rate * Average Trip Length * Percent New Trips * Travel Days per Year)

Daily Trip Rate is the average number of daily trips generated by a particular land use. A trip is one-way. If a car leaves a residence, travels to the supermarket and then back home, that constitutes two trips: one from the home to the supermarket, and one from the supermarket back to the home. The most appropriate rate from the 4th edition of the technical manual, *Trip Generation*, produced by the Institute of Transportation Engineers (ITE) is used. The ITE rate is halved to avoid double counting, which occurs when a trip is counted twice, once by the starting point and once by the destination. For example, when a resident leaves home, travels to the office and returns back home, four trips are counted: one leaving home, one returning home, one arriving at the office, one leaving the office. To avoid this problem, each trip rate is halved.

Average Trip Length is the average number of miles for a trip generated by a particular land use. The trip lengths were obtained from the Wasatch Front Regional Council.

% New Trips represents the percent of trips for which the particular land use is the destination. For example, the percent new trips for a residence is 100%, meaning that on average a residence is the primary destination every time a trip ends at that residence. The Wasatch Front Regional Council provided the percent new trips.

Travel Days per Year is the number of days during the year upon which trips occur. This is assumed to be 365.

- Gallons Per Year is the number of gallons of gasoline consumed each year by a particular land use. The gallons per year is calculated as follows:

(Trips Per Year / Miles Per Gallon)

Miles Per Gallon is the average number of miles per gallon obtained by drivers in Utah. The Utah Department of Transportation calculated the average miles per gallon to be 17.3.

- New Capacity Gas Tax represents the amount of gas tax paid by Providence City residents that returns to the city and is used for new capacity improvements on roads. The tax is calculated as follows:

[Gallons Per Year * ((State Gas Tax Rate + State Hwy User Fees per Gallon) * % of State Funds Spent on New Capacity Roads Improvements in Providence)]

State Gas Tax Rate is the tax rate imposed by the State of Utah on gasoline. Currently, the state tax rate is \$0.195.⁶

State Highway User Fees Per Gallon include all State Highway user receipts except motor fuel tax, which is the state gas tax rate. The State Highway User Fees Per Gallon is \$0.116, calculated from the *Annual Statistical Summary* of the Utah Department of Transportation.

Percent of State Funds Spent on New Capacity Roads Improvements in Providence is the percent of State funds historically spent on new capacity improvements in Providence City. This number is calculated in **Table 14**.

⁶Utah Department of Transportation

- Gas Tax Credit is the final Gas Tax Credit, which is subtracted from the assessed impact fee. The credit is calculated as follows:

$$(\text{New Capacity Gas Tax} * \text{Present Value Factor})$$

Present Value Factor accounts for the present value of future payments. Assuming the average life of major transportation improvements is 25 years, the present value of payments made for 25 years with a discount rate of 6% is 12.78.

The Gas Tax Credit for possible land use types is found in column 7 of **Table 12**.

TABLE 12: TOTAL TAX CREDITS

LAND USE TYPE	1	2	3	4	5	6	7	8
	trip rate	ave. trip length	% new trips	trips per year	gallons per year	new capacity gas tax per year	gas tax credit	TOTAL TAX CREDIT
Residential Per Dwelling Unit								
Single Family Detached	3.72	10	100%	13578.00	784.86	17.56	\$224.43	\$224.43
Multi Family (Apartment)	3.14	10	100%	11461.00	662.49	14.82	\$189.44	\$189.44
Multi Family (Condominiums)	2.72	10	100%	9928.00	573.87	12.84	\$164.10	\$164.10
Commercial/Retail Per 1000 Sq. Ft.								
Convenience Store	333.70	2	21%	51156.21	2957.01	66.16	\$845.56	\$845.56
Service Stations	53.75	4	21%	16479.75	952.59	21.31	\$272.39	\$272.39
Fast Food	316.06	4	39%	179964.56	10402.58	232.76	\$2,974.63	\$2,974.63
Sit Down Restaurant	102.68	4	50%	74956.40	4332.74	96.94	\$1,238.95	\$1,238.95
Super Market	88.80	4	20%	25928.14	1498.74	33.53	\$428.57	\$428.57
Day Care	39.63	3	21%	9112.92	526.76	11.79	\$150.63	\$150.63
Surgical Center	11.90	5	100%	21708.38	1254.82	28.08	\$358.82	\$358.82
Office Per 1000 Sq. Ft.								
Stand Alone Office	9.86	5	100%	17994.50	1040.14	23.27	\$297.43	\$297.43
Office Park	5.71	5	100%	10420.75	602.36	13.48	\$172.24	\$172.24
Business Park	7.19	5	100%	13112.63	757.96	16.96	\$216.74	\$216.74
Research Center	3.85	5	100%	7026.25	406.14	9.09	\$116.14	\$116.14
Medical	17.09	5	100%	31180.13	1802.32	40.33	\$515.38	\$515.38
Industrial Per 1000 Sq. Ft.								
Light Industrial	3.49	8	100%	10176.20	588.22	13.16	\$168.20	\$168.20
Heavy Industrial	0.75	8	100%	2190.00	126.59	2.83	\$36.20	\$36.20
Other								
Elementary/Jr. High	5.36	4	100%	7825.60	452.35	10.12	\$129.35	\$129.35
High School	5.45	4	100%	7957.00	459.94	10.29	\$131.52	\$131.52
Church	4.66	4	100%	6803.60	393.27	8.80	\$112.46	\$112.46

TABLE 13: DERIVATION OF GAS TAX CREDITS IN TABLE 12

THE FORMULA FOR THE DERIVATION OF GAS TAX CREDITS

GAS TAX CREDIT Column 7 of Table 12	=	Present Value Factor 12.78	*	New Capacity Gas Tax Column 6 of Table 12	
New Capacity Gas Tax Column 6 of Table 12	=	Gallons Per Year Column 5 of Table 12	*	(State Gas Tax Rate \$0.195 + State Hwy User Fees) \$0.12	* State % of New Capacity 7.19%
Gallons Per Year Column 5 of Table 12	=	Trips Per Year Column 4 of Table 12	\	Miles Per Gallon 17.3	
Trips Per Year Column 4 of Table 12	=	Daily Trip Rate Column 1 of Table 12	*	Average Trip Length * Column 2 of Table 12	% New Trips * Column 3 of Table 12 Travel Days per Year 365

TABLE 14: PERCENT OF STATE TRANSPORTATION TAXES PAID BY CITY RESIDENTS SPENT ON NEW CAPACITY IN CITY FISCAL YEARS 1988-1996											
	STATE GAS TAX RATE										
	1988	1989	1990	1991	1992	1993	1994	1995	1996		
	\$0.190	\$0.190	\$0.190	\$0.195	\$0.195	\$0.195	\$0.195	\$0.195	\$0.195		
	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	9 Year Average	
Total Utah Gasoline Purchases	680,800,000	691,100,000	697,200,000	689,800,000	719,600,000	743,800,000	795,600,000	818,900,000	839,500,000	741,811,111	
Gallons Purchased By Providence City Residents	1,087,238	1,103,687	1,113,428	1,101,611	1,149,201	1,187,849	1,270,573	1,307,783	1,340,682	1,184,672	
State Gas Taxes Paid By Providence City Residents	\$206,575	\$209,700	\$211,551	\$214,814	\$224,094	\$231,630	\$247,762	\$255,018	\$261,433	\$229,175	
State Highway User Fees Paid by Providence City Residents	\$126,120	\$128,028	\$129,158	\$127,787	\$133,307	\$137,790	\$147,386	\$151,703	\$155,519	\$137,422	
Total State Transportation Taxes Paid by Providence Residents	\$332,695	\$337,728	\$340,709	\$342,601	\$357,402	\$369,421	\$395,148	\$406,721	\$416,952	\$366,597	
B&C Road Fund Expenditures in Providence City	\$44,715	\$47,806	\$52,616	\$57,006	\$58,889	\$62,154	\$66,045	\$68,521	\$68,001	\$58,417	
B&C Road Fund Expenditures for New Capacity in Providence City	\$6,018	\$36,225	\$20,998	\$25,073	\$23,940	\$22,793	\$21,630	\$20,453	\$64,060	\$26,799	
Percent of State Transportation Taxes Paid by Providence City Residents Spent on New Capacity in Providence City	1.81%	10.73%	6.16%	7.32%	6.70%	6.17%	5.47%	5.03%	15.36%	7.19%	

C. Relative Extent of Past Contributions by Undeveloped Properties to Cost of Existing Facilities

The Impact Fees Act requires each political subdivision to identify the extent to which newly developed properties have already contributed to the cost of existing public facilities. Providence City has used general fund revenues in the past to fund general road improvements. Therefore, an undeveloped property tax credit is applied to the roads impact fee to offset the partial funding of road capital improvements in the past through the general fund. This credit reimburses the owners of undeveloped property who have already contributed to existing facilities through the payment of property taxes for the amount of their contribution. This calculation is found in the **Appendix**.

D. Relative Extent of Future Contributions to Cost of Existing Facilities

If there exists an outstanding debt obligation that will be retired through future payments from residents, there is a possibility of double charging new development for the cost of existing facilities. The continuing tax debt obligation in Providence City, however, is funded through Class "C" road funds, therefore there are no credits for payments through the general fund. The payments through Class "C" road funds have been taken into account in the Gas Tax Credit.

E. Calculation of Credit Entitlements

New development may be entitled to a credit when the development provides common facilities inside or outside the proposed development when similar facilities have been funded through general taxation or other means in other parts of the municipality. For example, if a developer is required to construct a road similar to other roads funded by Providence in other parts of the city, the developer may be entitled to a credit for the amount of the road. Credits must be determined by the city on a per development basis.

F. Extraordinary Costs

Extraordinary costs must be evaluated by the city on a per development basis. This procedure also needs to be addressed in the impact fee ordinance. An extraordinary cost is one which cannot be anticipated in this analysis. The impact fee ordinance must allow for these credits.

G. Time-Price Differential Inherent in Fair Comparisons

To deal with the time-price differential inherent in fair comparisons of dollars paid in different years, two mechanisms are employed in this analysis. First, in the calculation

of the Gas Tax Credit, the historical percentage of state expenditures on new capacity system improvements through Class "C" road funds, instead of the actual values, is employed to determine the projected spending by the state on new capacity. Even if the state does not spend on new capacity system improvements in Providence in the future, the past expenditures must be accounted for to ensure new development experiences the same benefit/cost ratio. Using the percentage ensures a dollar paid by a new resident compared to the benefit experienced by a new resident is equivalent to the dollar spent and benefit received by a current resident. Second, a present value factor has been included to ensure payments made in different years are valued correctly.

Step 4: Calculation of Impact Fee, Recommended Schedule

There are three components in the calculation of the Roads Impact Fee:

- Trip Miles is the average peak-hour trip miles generated by a particular land use. The trip mile is calculated as follows:

(Average Peak Hour Trip Rate * Average Trip Length * % New Trips)

Average Peak Hour Trip Rate is the average number of trips generated by a particular land use during peak traffic hours. Peak hour trip rates are generally 10% of the average daily trip rate⁷. The trip rates used in the calculation of the gas and municipal tax credits were liberal to ensure the highest tax credit possible. The trip rates used in the Average Peak Hour Trip Rate are conservative, to ensure new development is not overcharged. Using liberal and conservative trip rates diminishes the possibility of overcharging. The Wasatch Front Regional Council provided the Average Peak Hour Trip Rates.

Average Trip Length is the average number of miles of a trip generated by a particular land use. The trip lengths were obtained from the Wasatch Front Regional Council.

% New Trips represents the percent of trips for which the particular land use is the destination. For example, the percent new trips for a residence is 100%, meaning that on average a residence is the primary destination every time a trip ends at that residence.

- Impact Fee is the impact fee for a particular land use before the subtraction of tax credits. The Impact Fee is calculated as follows:

⁷ITE, *Trip Generation*, 4th edition

(Trip Miles * Trip-Mile Cost)

Trip-Mile Cost is the average cost for a one mile cross section of new roadway, divided by average daily trips.

The level of service for roadways is measured in vehicular capacity per lane of travel. The average capacity for new roads in Providence City is 400 vehicles per day in each direction, as shown in **Table 15**.⁸ The average capacity multiplied by the average cost per lineal foot (see **Table 11**) yields the average cost of one additional mile of roadway in Providence City. The trip-mile cost is generated by dividing the average cost of one additional mile by the average capacity of new roadways.

⁸ *A Policy On Geometric Design of Highways and Streets*, 1994, American Association of State Highway and Transportation Officials; and *Traffic and Highway Engineering*, Nicholas J. Garber and Lester A. Hoel.

TABLE 15: AVERAGE CAPACITY AND TRIP MILE COST		
LOCATION	LENGTH (ft)	CAPACITY
		(vehicles per day in each direction)
Canyon Road from 400 S to Grand View	6,336	400
400 E from Canyon Road to City Boundary	4,224	400
1000 S from 400 E to Church Road	1,216	400
Average Capacity:		400
Average Cost Per Lineal Foot:		\$53.52
Average Cost of One Additional Mile of Roadway:		\$282,565
Trip Mile Cost (average cost per trip mile):		\$706

- Recommended Impact Fee is the roadways impact fee for possible land use types in Providence City. The fee is calculated in **Table 16**.

The Recommended Impact Fee is calculated as follows:

$$(\text{Unit Fee} - (\text{Unit Fee} \times \text{Adjustment Factor}) - \text{Gas Tax Credit})$$

The recommended impact fee schedule is shown in **Table 16**. The impact fee for land uses not shown may be obtained by using the appropriate trip rates from the ITE manual, *Trip Generation*.

TABLE 16: RECOMMENDED FEE SCHEDULE

LAND USE TYPE	AVEPHT TRIP RATE	AVE TRIP LENGTH	% NEW TRIPS	TRIP MILES	TRIP-MILE COST	UNIT COST	TAX CREDIT FOR UNDEVELOPED PROPERTY	TAX CREDIT	RECOMMENDED IMPACT FEE
RESIDENTIAL, PER DWELLING UNIT:									
Single Family Detached	0.506	10.00	100%	5.06	\$706.41	\$3,574.45	0.38%	\$224.43	\$3,336.43
Condo/Townhome	0.272	10.00	100%	2.72	\$706.41	\$1,921.44	0.38%	\$164.10	\$1,750.04
Low Rise Apt. (3- Floors)	0.341	10.00	100%	3.41	\$706.41	\$2,408.87	0.38%	\$189.44	\$2,210.27
COMMERCIAL/RETAIL PER 1000 SQ. FT.									
Convenience Store	35.563	2.00	21%	14.94	\$706.41	\$10,551.30	0.38%	\$845.56	\$9,665.64
Service Station/ Pump	3.630	4.00	21%	3.05	\$706.41	\$2,153.99	0.38%	\$272.39	\$1,873.41
Fast Food	16.629	4.00	39%	25.94	\$706.41	\$18,325.21	0.38%	\$2,974.63	\$15,280.94
Sit Down Restaurant	3.625	4.00	50%	7.25	\$706.41	\$5,121.49	0.38%	\$1,238.95	\$3,863.07
Super Market	4.411	4.00	20%	3.53	\$706.41	\$2,492.79	0.38%	\$428.57	\$2,054.75
Day Care Center	12.286	3.00	21%	7.74	\$706.41	\$5,467.76	0.38%	\$150.63	\$5,296.35
Clinic	2.484	5.00	100%	12.42	\$706.41	\$8,773.64	0.38%	\$358.82	\$8,381.48
OFFICE PER 1000 SQ. FT.									
Office Building (<50,000 Sq. Ft.)	1.105	5.00	100%	5.53	\$706.41	\$3,902.93	0.38%	\$297.43	\$3,590.66
Office Park	1.530	5.00	100%	7.65	\$706.41	\$5,404.05	0.38%	\$172.24	\$5,211.27
Research & Development Center	1.502	5.00	100%	7.51	\$706.41	\$5,305.15	0.38%	\$116.14	\$5,168.86
Medical Office	3.415	5.00	100%	17.08	\$706.41	\$12,061.99	0.38%	\$515.38	\$11,500.78
INDUSTRIAL PER 1000 SQ. FT.									
Light Industry	1.127	8.00	100%	9.02	\$706.41	\$6,369.01	0.38%	\$168.20	\$6,176.61
Heavy Industry	0.683	8.00	100%	5.46	\$706.41	\$3,859.84	0.38%	\$36.20	\$3,808.97
OTHER									
Elementary/Jr. High	0.536	4.00	100%	2.14	\$706.41	\$1,514.55	0.38%	\$129.35	\$1,385.20
High School	0.545	4.00	100%	2.18	\$706.41	\$1,539.98	0.38%	\$131.52	\$1,408.46
Church	0.466	4.00	100%	1.86	\$706.41	\$1,316.75	0.38%	\$112.46	\$1,204.30