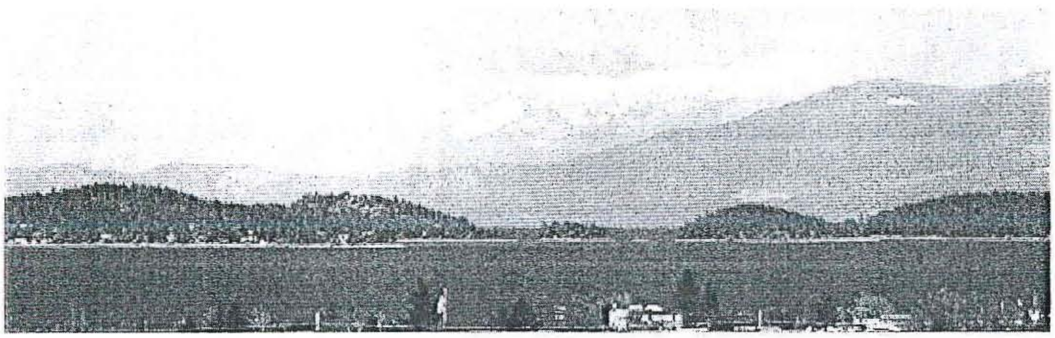

Development Impact Fees

City of Polson, Montana

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IMPACT FEE SUMMARY

Impact fees are one-time payments used to fund growth-related system improvements. As documented in this report, impact fees for Polson are proportionate and reasonably related to the capital facility service demands of new development. Specific costs have been identified using local data and current dollars. With input from City staff, TischlerBise determined demand indicators for each type of public facility and calculated proportionate share factors to allocate costs by type of development. The formulas used to calculate the impact fees are diagramed in a flow chart for each type of public facility. This report documents the specific factors used to derive the impact fees. Impact fee methodologies also identify the extent to which newly developed properties are entitled to various types of credits to avoid potential double payment of capital costs.

Highlights of the Montana Impact Fee Act

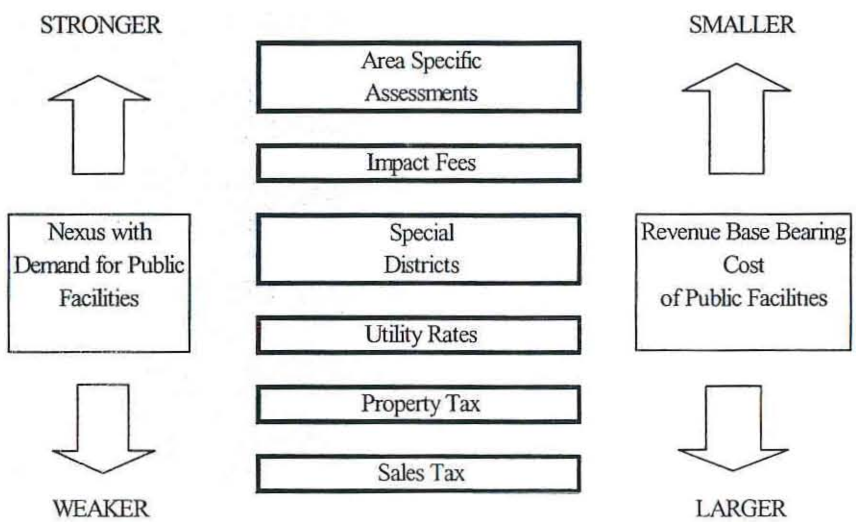
The Montana Impact Fee Act, passed in 2005, only requires simple majority approval by elected officials for water and sewer impact fees. The proposed park impact fee will require a two-thirds majority approval of the governing body. For the City of Polson to implement impact fees will also require a capital improvements plan (CIP) for growth-related projects. To be funded by impact fees, improvements must have a useful life of at least ten years. The CIP must be updated at least every two years. Therefore, impact fee calculations should be in current dollars (not inflated over time), with the costs updated as part of the regular budgetary process. In Montana, "new development may not be held to a higher level of service than existing users" although higher standards are acceptable if there is a funding plan to correct the deficiency.

The Montana Act also addresses adoption, collection and expenditure of the fees. The main procedural requirement is the involvement of an Impact Fee Advisory Committee that must include at least one representative of the development community and one certified public accountant. To help cover impact fee expenses, Montana allows an administrative surcharge, not to exceed five percent of the total impact fee.

Why Impact Fees?

Infrastructure funding alternatives force decision-makers to wrestle with a dynamic tension between two competing desires. As shown on the left side of Figure 1, various funding options have a strong-to-weak connection between the source of funds and the demand for public facilities. It is unfortunate that the funding options with the closest nexus to the demand for public facilities also have the smallest revenue base to bear the cost of the public facilities (see the right side of the diagram). For example, only new utility customers pay impact fees. In contrast, all existing customers, plus the new customers that are added each year, pay water and sewer user charges. Therefore, the base of utility user charges continues to increase over time, but the increase in new development is relatively constant from year to year.

Figure 1 – Infrastructure Funding Alternatives



Source: Paul Tischler, Dwayne Guthrie and Nadejda Mishkovsky. 1999. Introduction to Infrastructure Financing. IQ Service Report, Vol. 31, No. 3. Washington, DC: International City/City Management Association.

In the City of Polson, elected officials are considering a policy decision to increase impact fee funding of water and sewer infrastructure, plus add a new fee for park improvements and trails. If the City approves the proposed impact fees, it represents a policy decision to decrease infrastructure funding from broad-based revenues (i.e., property taxes and user charges) and increase revenues that have a stronger nexus between the fee payers and the demand for public facilities. As a dedicated revenue source, impact fees could provide significant funding for growth-related system improvements in Polson.

Basic Understanding of Impact Fees

In contrast to development exactions, which are typically referred to as project-level improvements, impact fees fund growth-related infrastructure that will benefit multiple development projects, or even the entire jurisdiction. The basic steps in a conceptual impact fee formula are illustrated below. The first step (see the left box) is to determine an appropriate demand indicator, or service unit, for the particular type of infrastructure. The demand/service indicator measures the number of demand or service units for each unit of development. For example, an appropriate indicator of the demand for parks is population growth and the increase in population can be estimated from the average number of persons per occupied housing unit (i.e., a household). The second step in the conceptual impact fee formula is shown in the middle box below. Infrastructure units per demand unit are typically called Level-Of-Service (LOS) standards. In keeping with the park example, a common LOS standard is park acreage per thousand people. The third step in the generic impact fee formula, as illustrated in the right box, is the cost of various infrastructure units. To complete the park example, this part of the formula would establish the cost per acre for park improvements.

Demand Units per Development Unit	X	Infrastructure Units per Demand Unit	X	Dollars per Infrastructure Unit

When applied to specific types of infrastructure, the conceptual impact-fee formula is customized using three common impact fee methods that focus on different timeframes. The first method is the cost recovery method. To the extent that new growth and development is served by the previously constructed improvements, the City of Polson may seek reimbursement for the previously incurred public facility costs. This method is used for facilities that have adequate capacity to accommodate new development, at least for the next five years. The rationale for the cost recovery approach is that new development is paying for its share of the useful life or remaining capacity of an existing facility. The second basic approach used to calculate impact fees is the incremental expansion cost method. This method documents the current LOS for each type of public facility in both quantitative and qualitative measures. The City of Polson will use impact fee revenue to incrementally expand or provide additional facilities as needed to accommodate new development. A third impact fee approach is the plan-based method. This method is best suited for public facilities that have commonly accepted engineering/planning standards or specific improvement plans. Figure 2 summarizes the method(s) used to derive the impact fee for each type of public facility.

Figure 2 – Fee Methods and Cost Components

Type of Fee	Cost Recovery (past)	Incremental Expansion (present)	Plan-Based (future)
Parks	Not applicable	Citywide Park Improvements	Trails
Potable Water	Not applicable	Not applicable	Wells, Tanks and Major Lines
Sanitary Sewer	Not applicable	Not applicable	Lift Stations, Major Lines and Treatment Plant
Fire-Rescue	Not applicable	Fire Stations and Apparatus	Not applicable

Current Fees for Water and Sewer Capacity

The City of Polson has existing fees for water and sewer facilities. The current fee schedule is shown in Figure 3. TischlerBise recommends switching to utility fees based on water meter size for nonresidential development. Utility fees based on meter size are commonly used by local governments, are easy to administer and make the fees more proportionate to the demand for service, which is a requirement of the Montana Impact Fee Act.

Figure 3 – Current Fee Schedule

			Parks	*Water*	*Sewer**	*5% Adm*	*TOTAL*
Residential			Per Housing Unit				
Detached Housing			$0	$1,000	$1,500	$0	$2,500
All Other Housing Types			$0	$1,000	$1,500	$0	$2,500
Nonresidential		*Capacity Ratio*	Per Meter Size				
Water and sewer fees for nonresidential development are based on water meter size.	0.75"	1.0		$1,000	$1,500	$0	$2,500
	1.00"	1.7		$1,000	$1,500	$0	$2,500
	1.50"	3.3		$1,000	$1,500	$0	$2,500
	2.00"	5.3		$1,000	$1,500	$0	$2,500
	3.00"	10.7		$1,000	$1,500	$0	$2,500
	4.00"	16.7		$1,000	$1,500	$0	$2,500

* A lift station fee is added in increments of $250, depending on the number of stations required to convey the wastewater flow to the treatment plant. The maximum sewer fee is $2,250.

Maximum Supportable Impact Fees

Figure 4 provides a schedule of the maximum supportable impact fees for the City of Polson. If elected officials adopt lower fees, it may be necessary to revise the corresponding capital improvement plans or provide additional non-impact fee funding. For residential development, impacted fees will be imposed per housing unit. Water and sewer impact fees for nonresidential development are based on water meter size. Also, the fire impact fee for nonresidential development is based on square feet of floor area in the building or a unique demand indicator, such as the number of rooms in a hotel/motel. The fee schedule provides a reasonable impact fee determination for common types of development. For unique development types, the City may allow or require an independent impact fee assessment.

The Montana Impact Fee Act allows local governments to collect an administrative surcharge, not to exceed five percent of the impact fees collected. If Polson imposes an administrative surcharge, the revenue may be used for consultant studies or staff time directly related to the impact fees.

Figure 4 – Maximum Supportable Citywide Impact Fees

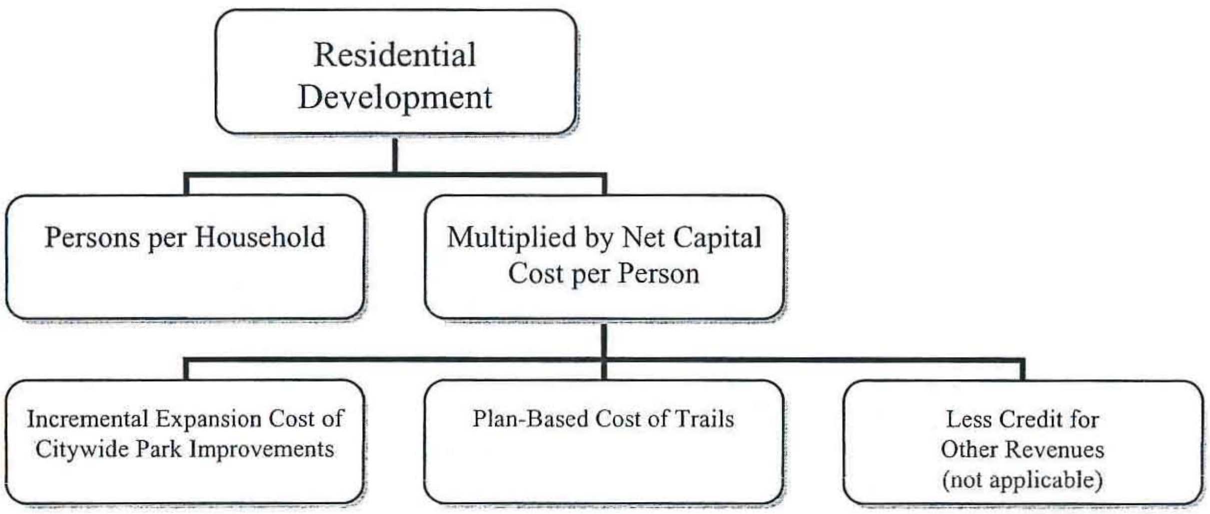
		Parks	Water	Sewer	Fire	5% Adm	TOTAL
Residential				**Per Housing Unit**			
Detached Housing		$1,020	$3,310	$1,531	$971	$341	$7,173
All Other Housing Types		$806	$2,617	$1,210	$768	$270	$5,671
Nonresidential				**Per Square Foot of Floor Area**			
820 Commercial / Shop Ctr 50,000 SF or less					$1.69	$0.08	$1.77
820 Commercial / Shop Ctr 50,001-100,000 SF					$1.41	$0.07	$1.48
820 Commercial / Shop Ctr 100,001-200,000 SF					$1.20	$0.06	$1.26
770 Business Park					$0.26	$0.01	$0.27
720 Medical-Dental Office					$1.13	$0.05	$1.18
710 General Office 25,000 SF or less					$0.57	$0.02	$0.59
710 General Office 25,001-50,000 SF					$0.49	$0.02	$0.51
710 General Office 50,001-200,000 SF					$0.35	$0.01	$0.36
610 Hospital					$0.55	$0.02	$0.57
151 Mini-Warehouse					$0.07	$0.00	$0.07
150 Warehousing					$0.15	$0.00	$0.15
140 Manufacturing					$0.12	$0.00	$0.12
110 Light Industrial					$0.21	$0.01	$0.22
520 Elementary School					$0.30	$0.01	$0.31
Other Nonresidential				**Per Unique Development Unit**			
620 Nursing Home (per bed)					$74	$3	$77
565 Day Care (per student)					$67	$3	$70
530 Secondary School (per student)					$38	$1	$39
520 Elementary School (per student)					$26	$1	$27
320 Lodging (per room)					$177	$8	$185
Nonresidential	*Capacity Ratio*			**Per Meter Size**			
0.75"	1.0		$3,313	$1,533		$242	$5,088
1.00"	1.7		$5,633	$2,607		$412	$8,652
1.50"	3.3		$10,935	$5,061		$799	$16,795
2.00"	5.3		$17,563	$8,129		$1,284	$26,976

Water and sewer fees for nonresidential development are based on water meter size. A building requiring a meter larger than two inches will pay impact fees based on average day gallons and the net capital cost per gallon of capacity.

PARK IMPROVEMENTS AND TRAILS

The park impact fee is derived using the incremental expansion cost method for citywide park improvements and a plan-based method for trails. The incremental expansion cost method documents current infrastructure standards in both quantitative and qualitative measures. As indicated in the park impact fee formula diagram (see Figure 5), cost components were allocated 100% to residential development. The diagram is intended to read like an outline, with lower levels providing a more detailed breakdown of the impact fee components. The park impact fee is derived from the product of persons per household multiplied by the net capital cost per person. The boxes in the next level down, with light-green shading, indicate cost components for two types of infrastructure.

Figure 5 – Park Impact Fee Formula



Citywide Park Standards

Infrastructure standards are based on an inventory of existing citywide parks and recent expenditures on park improvements. The City of Polson will use park impact fee revenue to make improvements to larger parks that have a citywide service area. Smaller, neighborhood scale parks and land for parks will continue to be provided under the State's mandatory dedication requirements for residential subdivisions.

As shown in Figure 6, the inventory of improvements represents an investment with a current value of almost $2.3 million. Park improvements cost an average of $82,000 per acre, or $404 per person. Infrastructure standards are derived using estimated peak (summer time) population in 2006. With 28 acres of land for citywide parks, the current standard is 5.0 acres per 1,000 residents. Unit prices and the inventory of various types of park improvements were provided by City staff.

Figure 6 - Incremental Expansion Cost of Citywide Parks

Park	Acreage	Softball/ Baseball	Soccer/ Football	Athletic Courts*	Picnic Shelters	Playground Equipment	Rest Rooms	Miscellaneous Improvements**	TOTAL
Sports Complex	20.0	2	3	2	1	1	1	$400,000	$1,090,000
Riverside	2.0			1	1	1	1	$40,000	$245,000
Boettcher	2.0			1	3	1	1	$40,000	$285,000
O'Malley	2.0	2		1		1	1	$40,000	$525,000
Sacajawea	2.0						1	$40,000	$140,000
TOTAL	28.0	4	3	5	5	4	5	Per Acre Cost	
Unit Price		$150,000	$50,000	$35,000	$20,000	$50,000	$100,000	$20,000	
Cost of Improvements		$600,000	$150,000	$175,000	$100,000	$200,000	$500,000	$560,000	$2,285,000

Existing Level of Service Standards

Total Improvements	$2,285,000
Peak Population 2006	5,647
Acres of Park Land per 1,000 Persons	**5.0**
Improvements Cost Per Acre	$82,000
Improvements Cost Per Person	**$404**

* Basketball, tennis and volleyball courts.

** These costs include items such as parking lots, security lighting, landscaping and irrigation.

Trails

Figure 7 provides a five-year capital improvements plan for trails to be constructed within the City of Polson. The estimated cost of eight feet wide trail is $28 per linear foot for asphalt and $11 per linear foot for crushed stone. The total cost for constructing 1.7 miles of trails is estimated to be approximately $215,000. Montana Impact Fee Act prohibits new development from being held to a higher standard than existing development unless there are other funding sources available to raise the level of service for the existing population. Therefore, new development over the next five years will only pay approximately 14% of the cost of trails plan and the City of Polson will have to fund approximately 86% of the cost from non-impact fee revenue (i.e., an existing deficiency of ~$185,000).

Figure 7 – Plan-Based Cost of Trails

Name	*Description*	*Linear Feet*	*$/LF*	*Cost*
Rail-To-Trail Conversion	Bayshore to 7th Ave.	2,640	$28	$73,900
7th Ave	Rail-To-Trail extension to 2nd St. E	1,584	$28	$44,400
Downtown Lakeshore	Around Sailors Point to Riverside Park	2,112	$11	$23,200
6th St W	Sports Complex to High School	2,640	$28	$73,900
TOTAL		8,976	$24	$215,400
		Peak Population in 2011		6,533
		Cost per Person		**$32**
		Linear Feet per Person		1.4

All trails are eight feet wide. Asphalt trails typically cost $28 per linear foot. Soft surface trails (crushed/fine gravel) cost approximately $11 per linear foot.

Credit Evaluation

Because new development will provide front-end funding of infrastructure, there is a potential for double payment of capital costs due to future principal payments on existing debt for public facilities. A credit is not necessary for interest payments if interest costs are not included in the impact fees. Because the City of Polson does not have any debt obligations for parks there is no applicable revenue credit.

Park Fee Calculations

Infrastructure standards used to calculate park impact fees are shown in the boxed area of Figure 8. The park impact fee is the product of persons per household multiplied by the net capital cost per person. For example, the fee for a detached housing unit is 2.34 x 436, or $1,020 per housing unit.

Figure 8 - Park Impact Fee Schedule

	Standards:
Persons Per Household	
Detached Housing	2.34
All Other Housing Types	1.85
Level Of Service	
Park Acreage per 1,000 People	5.0
Park Land Cost per Acre	$0
Land Cost per Person for Citywide Parks	$0
Improvements Cost per Person for Citywide Parks	$404
Trails Cost per Person	$32
Principal Payment Credit per Person	
Net Capital Cost Per Person	$436
Maximum Supportable Impact Fee per Housing Unit	
Detached Housing	$1,020
All Other Housing Types	$806

Cash Flow Analysis of Growth-Related Park Improvements

As shown in the upper portion of Figure 9, the City of Polson should receive approximately $376,000 in park impact fee revenue over the next five years, if the maximum supportable fee is imposed on new housing units within the city limits. A summary of capital costs for growth-related park improvements is shown in the lower portion of Figure 9. The need for citywide park improvements is derived from the impact fee infrastructure standards and the projected increase in population over the next five years. To accommodate new residential development in Polson over the next five years, the City will spend approximately $358,000 on citywide park improvements. The average annual deficit of approximately $39,000 represents existing development's share of the plan for additional trails.

To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs. See Appendix A for discussion of the development projections that drive the cash flow analysis.

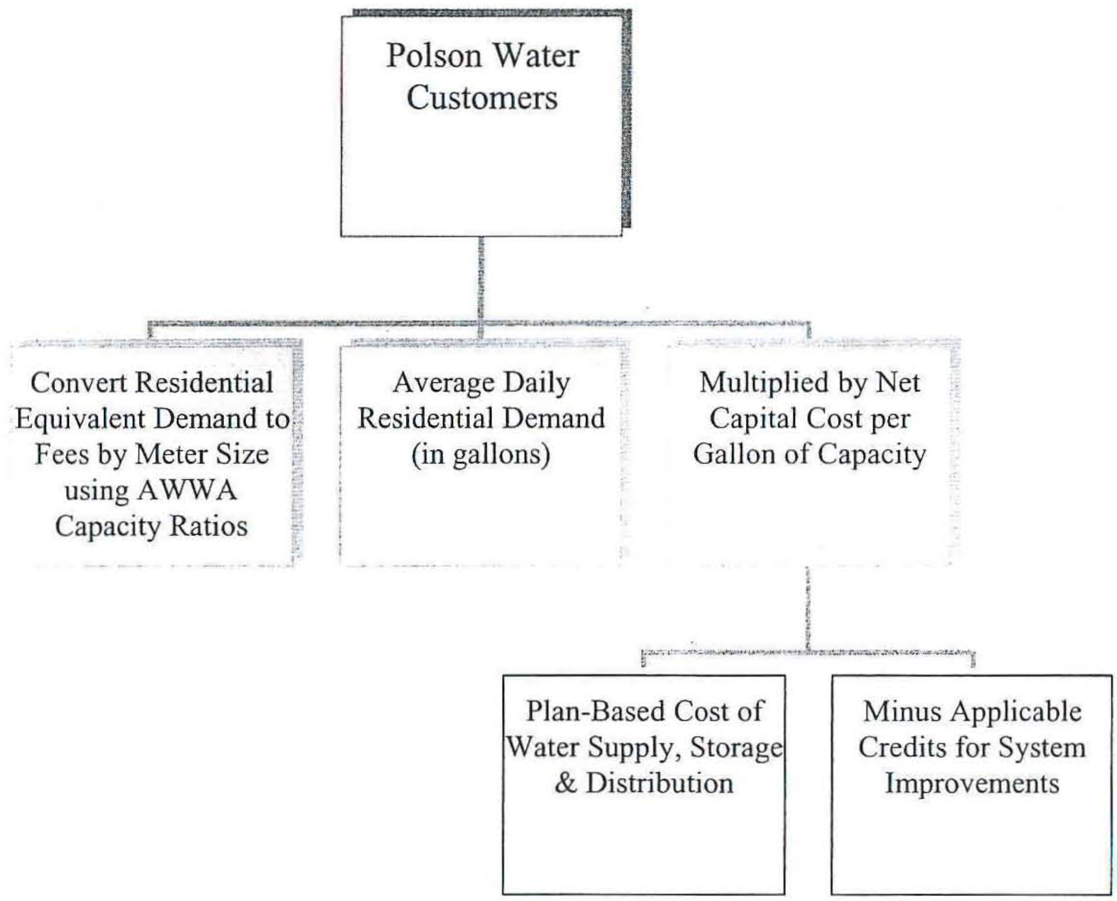
Figure 9 – Projected Cash Flow for Parks

Polson, Montana	1	2	3	4	5	Cumulative	Average
(Current $ in thousands)	2007	2008	2009	2010	2011	Total	Annual
REVENUES							
7 Park Fee - Detached HU	$55	$55	$55	$55	$55	$274	$55
8 Park Fee - Attached HU	$20	$20	$20	$20	$20	$102	$20
Park Fee Subtotal	$75	$75	$75	$75	$75	$376	$75
CAPITAL COSTS							
Citywide Park Improvements	$72	$72	$72	$72	$72	$358	$72
Trails	$0	$74	$44	$23	$74	$215	$43
Total Parks CIP	$72	$145	$116	$95	$145	$573	$115
NET CAPITAL FACILITIES CASH FLOW - Parks							
Annual Surplus (or Deficit)	$4	($70)	($41)	($20)	($70)	($197)	($39)
Cumulative Surplus (or Deficit)	$4	($67)	($108)	($127)	($197)		

WATER SYSTEM

Water impact fees are based on the net capital cost per gallon of system capacity, including water supply improvements, major water lines and water storage tanks. Impact fee cost components include growth-related capital improvements identified in a five-year Capital Improvements Plan (CIP). If Polson were to stop growing, these projects would not be constructed. As shown in Figure 10, the net capital cost per gallon of capacity was multiplied by the average daily demand for an equivalent residential connection to yield the impact fee for the smallest water meter. Nonresidential fees are derived from capacity ratios according to the size of the new connection's water meter. Capacity ratios were obtained from the American Water Works Association (AWWA).

Figure 10 – Water Impact Fee Formula



Water Demand Analysis

Water use for residential and nonresidential customers was determined using data from the City's billing records over the past three fiscal years. The number of water customers and average daily water use for residential and nonresidential development are shown in Figure 11. The Level-Of-Service (LOS) standard of 293 gallons per day for a residential connection was used to derive the water system impact fee for Polson.

Figure 11 - Water Demand Factors

	Avg Gallons Per Day (1)		Accounts (2)	Gallons Per Day Per Account	GPCD (3)
Annual Water Use FY03-04					
Residential	501,018	66%	1,736	289	123
Nonresidential	261,642	34%	350	748	
TOTAL	762,660		2,086		
Annual Water Use FY04-05					
Residential	518,020	65%	1,798	288	123
Nonresidential	273,160	35%	346	789	
TOTAL	791,180		2,144		
Annual Water Use FY05-06					
Residential	561,029	68%	1,864	301	129
Nonresidential	258,671	32%	344	752	
TOTAL	819,700		2,208		
Averages Over Three-Years					
Residential	526,689	67%	1,799	293	125
Nonresidential	264,491	33%	347	763	
TOTAL	791,180		2,146		

(1) Table 3 in Water Distribution System Modeling, TD&H, 4/05.
(2) Number of accounts in July, according to
City water billing records;
(3) Gallons per capita per day based on an average of 2.34 persons
per household in detached housing (SFD & MH).

Annual water demand data are shown in Figure 12. Projected water demand is a function of the development projections (discussed in Appendix A) and the water demand factors shown above. In July 2005, approximately 79% of the housing units in Polson were water customers. Based on the estimated number of jobs in Polson in 2005, each nonresidential water customer had an average of 8.9 employees.

Figure 12 - Annual Water System Demand

CY		FY	Million Gallons Per Avg Day	Acre-Feet Per Year	Utility Accounts	Annual Increase Accounts	Annual Increase MGD	Cumulative Increase Accounts	Cumulative Increase MGD
past 3	2003	03-04	0.76	850	2,086				
past 2	2004	04-05	0.79	890	2,144	58	0.03		
past 1	2005	05-06	0.82	920	2,208	64	0.03		
Base	2006	06-07	0.84	940	2,293	85	0.02		
future 1	2007	07-08	0.87	970	2,367	74	0.03	74	0.03
future 2	2008	08-09	0.89	1,000	2,441	74	0.02	148	0.05
future 3	2009	09-10	0.92	1,030	2,515	74	0.03	222	0.08
future 4	2010	10-11	0.95	1,060	2,589	74	0.03	296	0.11
future 5	2011	11-12	0.98	1,100	2,663	74	0.03	370	0.14
future 6	2012	12-13	1.00	1,120	2,736	73	0.02	443	0.16
future 7	2013	13-14	1.03	1,150	2,811	75	0.03	518	0.19
future 8	2014	14-15	1.05	1,180	2,884	73	0.02	591	0.21
future 9	2015	15-16	1.08	1,210	2,958	74	0.03	665	0.24
future 10	2016	16-17	1.11	1,240	3,032	74	0.03	739	0.27
future 11	2017	17-18	1.14	1,280	3,105	73	0.03	812	0.30
future 12	2018	18-19	1.17	1,310	3,180	75	0.03	887	0.33
future 13	2019	19-20	1.19	1,330	3,253	73	0.02	960	0.35
future 14	2020	20-21	1.21	1,360	3,328	75	0.02	1,035	0.37
future 15	2021	21-22	1.24	1,390	3,401	73	0.03	1,108	0.40
future 16	2022	22-23	1.27	1,420	3,475	74	0.03	1,182	0.43
future 17	2023	23-24	1.30	1,460	3,549	74	0.03	1,256	0.46
future 18	2024	24-25	1.33	1,490	3,622	73	0.03	1,329	0.49
future 19	2025	25-26	1.36	1,520	3,697	75	0.03	1,404	0.52

Water System Improvements

A summary of Polson's CIP for growth-related water system improvements is shown in Figure 13. These capacity projects have a projected total cost of approximately $7.69 million and will expand the water system average day capacity by 521,000 gallons per day over the next 19 years. Based on these factors, the LOS standard is $11.31 per gallon of system capacity.

Figure 13 - Water System Capital Improvements

		Year 1	Year 2	Year 3	Year 4	Years 5	
	Fiscal Year =>	2007-08	2008-09	2009-10	2010-11	to 19	TOTAL
	Marginal Cost Allocation of Improvements						
W1	Water Line Oversizing	$50,000	$50,000	$50,000		$650,000	$800,000
W2	Water Supply Wells				$1,300,000		$1,300,000
W3	Hillcrest Concrete Tank (1 MG)					$1,680,144	$1,680,144
W4	Skyline Tank (0.5 MG)					$1,003,000	$1,003,000
	Subtotal	$50,000	$50,000	$50,000	$1,300,000	$3,333,144	$4,783,144
			Water Demand Increase Over 19 Years (Gal/AvgDay)				521,000
			Capital Cost per Gallon Increase in System Demand				**$9.18**
	Average Cost Allocation of Improvements						
W5	Downtown Service Expansion					$1,196,215	$1,196,215
W6	Hydraulic Restrictions					$606,519	$606,519
W7	Looping Projects					$1,105,476	$1,105,476
	Subtotal	$0	$0	$0	$0	$2,908,210	$2,908,210
					Water Demand in 2025 (gal/day)		1,360,000
			Average Capital Cost per Gallon of System Demand				**$2.13**
	Growth-Related CIP	$50,000	$50,000	$50,000	$1,300,000	$6,241,354	$7,691,354
					Total Cost per Gallon of Capacity		**$11.31**

Source: Table I-1, Preliminary Engineering Report
Water Supply, Storage & Distribution, Anderson-Montgomery (4/05) with updates from City staff.

Credit Evaluation

The City of Polson has no outstanding debt related to the water system. With impact fees covering the cost of growth-related capital improvements, there is no potential double payment from other revenue sources.

Water Impact Fee Calculations

The LOS standards used to derive the water system impact fee are shown in the boxed area of Figure 14. Water impact fees for nonresidential customers are based on water meter sizes and their respective capacity. The capacity ratios by meter size are from the American Water Works Association. To derive the water impact fee, multiply the ERU demand factor by the net capital cost per gallon and the capacity ratio by meter size. For example, a restaurant requiring a 1.5 inch meter would pay a water impact fee of $10,935, which is derived from the formula 293 x $11.31 x 3.3.

Figure 14 – Water System Impact Fees

			Standards:
Demand Indicators			
Persons Per Household in Detached Housing			2.34
Persons Per Household in All Other Housing Types			1.85
Gallons Per Capita Per Average Day			125
ERU Gallons per Average Day			293
Cost Factors			
Water Distribution System Cost per Gallon of Capacity			$11.31
Revenue Credit per Gallon			$0.00
Net Capital Cost per Gallon of Capacity			$11.31
Maximum Supportable Impact Fee			
Residential			Per Dwelling Unit
Detached Housing			$3,310
All Other Housing Types			$2,617
Nonresidential			Per Meter
*Meter Size (inches)**		*Capacity Ratio*	
0.75	Displacement	1.0	$3,313
1.00	Displacement	1.7	$5,633
1.50	Displacement	3.3	$10,935
2.00	Compound	5.3	$17,563

* Fees for meters larger than two inches will be based on annualized average day demand and the net capital cost per gallon of capacity.

Cash Flow Analysis for Water System Improvements

Figure 15 summarizes projected impact fee revenue and expenditures for water system improvements through 2025. To enable the table to fit on a single page, years 2010-2025 are only shown in five-year increments (annual data are calculated but hidden from view). Water fees should yield average annual revenue of approximately $369,000, if implemented at the maximum supportable level. The projected annual capital cost of water system improvements averages $405,000 per year.

The cash flow summary provides an indication of the impact fee revenue and expenditures necessary to meet the projected demand for water system improvements. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs. See Appendix A for discussion of the development projections that drive the cash flow analysis.

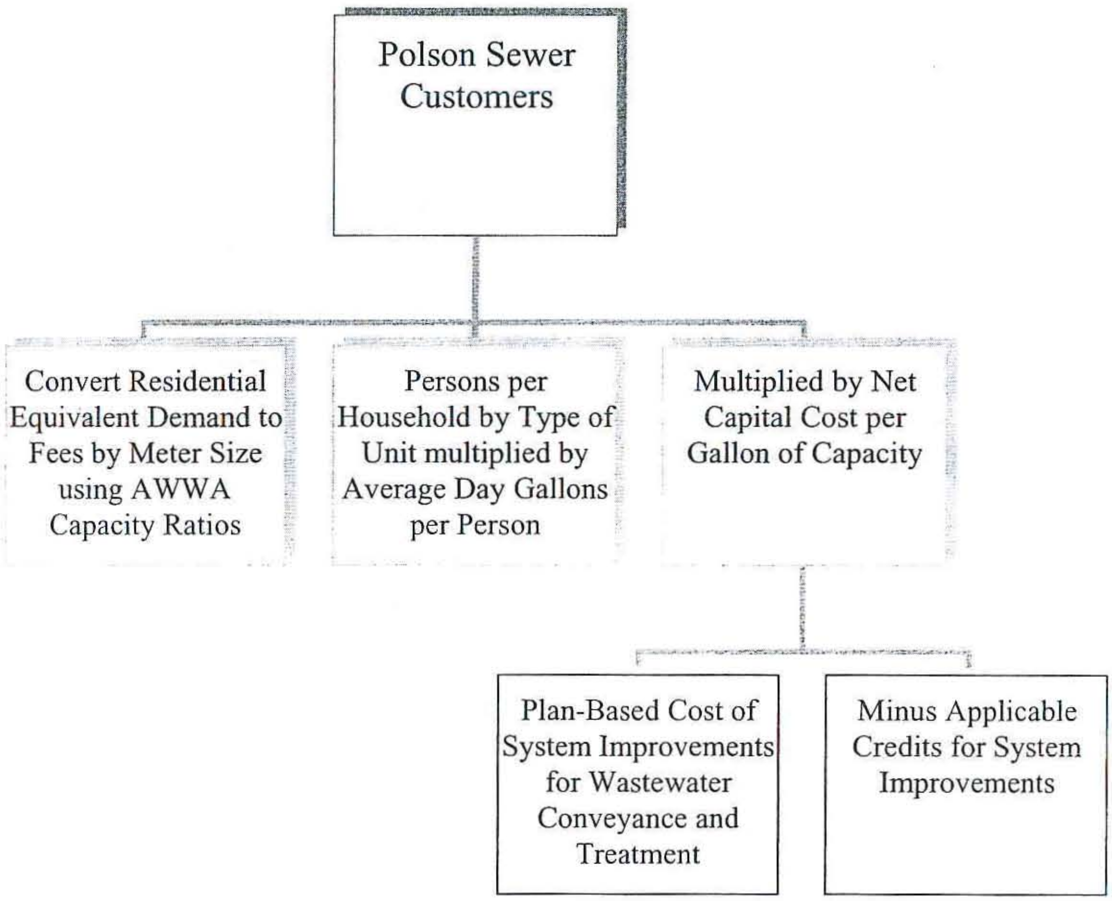
Figure 15 – Water System Cash Flow Summary

Polson, Montana	1	2	3	4	9	14	19	Cumulative	Average
(Current $ in thousands)	2007	2008	2009	2010	2015	2020	2025	Total	Annual
REVENUES									
1 Water Fee - Detached I	$178	$178	$178	$178	$178	$178	$178	$3,378	$178
2 Water Fee - Attached F	$66	$66	$66	$66	$66	$66	$66	$1,257	$66
3 Water Fee - Nonres (1.:	$127	$120	$131	$120	$120	$131	$131	$2,377	$125
Water Fee Subtotal	$371	$364	$375	$364	$364	$375	$375	$7,013	$369
CAPITAL COSTS									
Water System Growth-Related Cl	$50	$50	$50	$1,300	$416	$416	$416	$7,691	$405
NET CAPITAL FACILITIES CASH FLOW - Water									
Annual Surplus (or Deficit)	$321	$314	$325	($936)	($52)	($41)	($41)	($678)	($36)
Cumulative Surplus (or Deficit)	$321	$635	$960	$24	($214)	($441)	($678)		

SANITARY SEWER

Sewer system impact fees are based on the cost of planned system improvements for wastewater conveyance and treatment. Planned improvements anticipate the need to begin expansion of the wastewater treatment plant within the next five years. As shown in Figure 16, the capital cost per gallon of capacity was multiplied by a wastewater flow standard per capita to yield the proportionate impact fee by type of housing. Nonresidential fees are derived from capacity ratios according to the size of the water meter used to connect a new utility customer.

Figure 16 - Sewer System Impact Fee Formula



Sewer Demand Analysis

Wastewater generation for residential and nonresidential customers was determined using the City's billing data over the past three fiscal years. Figure 17 indicates the number of sewer connections and the average daily wastewater generation for residential and nonresidential development. The Level Of Service (LOS) standard of 67 gallons per capita per day has been used to derive the sewer system impact fee for new housing in Polson.

Figure 17 - Wastewater Average Daily Demand Factors

	Avg Gallons Per Day		Accounts	Gallons Per Day Per Account	GPCD*
Annual Sewr Flow During Winter Months FY03-04					
Residential	256,539	50%	1,461	176	75
Nonresidential	261,642	50%	350	748	
TOTAL	518,181		1,811		
Annual Sewr Flow During Winter Months FY04-05					
Residential	227,070	45%	1,525	149	64
Nonresidential	273,160	55%	346	789	
TOTAL	500,230		1,871		
Annual Sewer Flow During Winter Months FY05-06					
Residential	236,605	48%	1,591	149	64
Nonresidential	258,671	52%	344	752	
TOTAL	495,276		1,935		
Averages Over Three-Years					
Residential	240,071	48%	1,526	157	67
Nonresidential	264,491	52%	347	763	
TOTAL	504,562		1,872		

* *Gallons per capita per day based on an average of 2.34 persons per household in detached housing (SFD & MH).*
Source: City water billing records for October through May; number of accounts during July.

The residential and nonresidential wastewater generation rates discussed above were multiplied by projected development in Polson to yield the annual wastewater demand data shown in Figure 18. The projected number of nonresidential connections was determined by the 2005 ratio of jobs in Polson to nonresidential sewer connections. In 2005, approximately 67% of the housing units had a sewer service account with the City of Polson.

Figure 18 - Projected Annual Sewer System Demand

CY		FY	Sewer Customers	Million Gallons Per Avg Day	Annual Increase Customers	Annual Increase MGD	Cumulative Increase Customers	Cumulative Increase MGD
past 3	2003	03-04	1,811	0.52				
past 2	2004	04-05	1,871	0.50	60	-0.02		
past 1	2005	05-06	1,935	0.50	64	0.00		
Base	2006	06-07	1,999	0.53	64	0.03		
future 1	2007	07-08	2,063	0.55	64	0.02	64	0.02
future 2	2008	08-09	2,127	0.56	64	0.01	128	0.03
future 3	2009	09-10	2,192	0.58	65	0.02	193	0.05
future 4	2010	10-11	2,256	0.60	64	0.02	257	0.07
future 5	2011	11-12	2,321	0.62	65	0.02	322	0.09
future 6	2012	12-13	2,385	0.63	64	0.01	386	0.10
future 7	2013	13-14	2,450	0.65	65	0.02	451	0.12
future 8	2014	14-15	2,514	0.66	64	0.01	515	0.13
future 9	2015	15-16	2,578	0.68	64	0.02	579	0.15
future 10	2016	16-17	2,643	0.70	65	0.02	644	0.17
future 11	2017	17-18	2,707	0.72	64	0.02	708	0.19
future 12	2018	18-19	2,772	0.74	65	0.02	773	0.21
future 13	2019	19-20	2,836	0.75	64	0.01	837	0.22
future 14	2020	20-21	2,901	0.76	65	0.01	902	0.23
future 15	2021	21-22	2,964	0.78	63	0.02	965	0.25
future 16	2022	22-23	3,029	0.80	65	0.02	1,030	0.27
future 17	2023	23-24	3,093	0.82	64	0.02	1,094	0.29
future 18	2024	24-25	3,157	0.84	64	0.02	1,158	0.31
future 19	2025	25-26	3,222	0.86	65	0.02	1,223	0.33

Wastewater Treatment Plant

The Polson wastewater treatment plant has a capacity of approximately 650,000 gallons per average day. Based on the average daily flows shown above, Polson's treatment plant will be at capacity in the year 2013. Given the long lead time necessary to design/permit a new wastewater treatment plants, Polson will need to begin making expenditures on the plant expansion within the next five years. Based on the capital cost of recent plant expansions in Montana, the City anticipates a cost factor of at least $5 per gallon of plant capacity. The preliminary CIP shown in Figure 19 has a ball-park cost of $5 million for a new wastewater treatment plant that would accommodate projected development through 2025.

Planned Improvements to Sewer Conveyance System

The City of Polson is budgeting $50,000 per year to reimburse developers for over-sizing sewer lines that will benefit multiple developments. This is a common practice that pays the additional materials cost for installing larger pipe sizes to accommodate future upstream developments. At the bottom of Figure 19 are capital improvement projects that will benefit current and future customers. Because these projects are an enhancement to the sewer system, their estimated cost was allocated to projected sewer flow in 2025 from both current and new customers. This average cost allocation ensures that new development only pays its proportionate share of the capital cost. The total of sewer system improvements is $9.77 per gallon of capacity.

Figure 19 – Sewer CIP

		Year 1	*Year 2*	*Year 3*	*Year 4*	*Years 5*	
	Fiscal Year =>	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*to 19*	*TOTAL*
	Projects Solely Benefiting New Development						
S1	Sewer Line Oversizing		$50,000	$50,000	$50,000	$750,000	$900,000
	Subtotal	$0	$50,000	$50,000	$50,000	$750,000	$900,000
	Wastewater Flow Increase Over 19 Years (gal/avgday)						331,000
	Capital Cost per Gallon Increase in Average Daily Wastewater Flow						**$2.71**
	Projects Benefiting Current and Future Customers						
S2	DuCharme Lift Station	$1,079,000					$1,079,000
S3	New WWTP					$5,000,000	$5,000,000
	Subtotal	$1,079,000	$0	$0	$0	$5,000,000	$6,079,000
	Wastewater Flow in 2025 (gal/day)						860,000
	Average Capital Cost per Gallon of Wastewater Flow						**$7.06**
	Total Growth-Related CIP	$1,079,000	$50,000	$50,000	$50,000	$5,750,000	$6,979,000
	Total Cost per Gallon of Capacity						**$9.77**

Credit Evaluation

Before the sewer impact fee can be finalized, a funding plan needs to be worked out regarding potential phasing of the new wastewater treatment plant and the possibility of obtaining State grants and/or low interest loans. A revenue credit for future principal payments may be necessary, which will reduce the sewer impact fee.

Maximum Supportable Sewer Impact Fees

The standards used to derive the sewer system impact fee are shown in the boxed area of Figure 20. Nonresidential fees are based on water meter sizes and their capacity relative to a three-quarter-inch water meter. Capacity ratios convert the single-family impact fee into a proportionate fee for larger meter sizes. The capacity ratios by meter size are from the American Water Works Association.

For residential development the sewer impact fee is the product of persons per household, multiplied by gallons per capita, multiplied by the net capital cost per gallon. For a detached housing unit, the sewer impact fee is derived from the following formula: 2.34 x 67 x 9.77, or $1,531. For nonresidential development, the capacity ratio by meter size converts the ERU demand of 157 gallons per day to the respective impact fee for larger meters.

Figure 20 - Sewer System Impact Fee

		Standards:
Demand Factors		
Persons Per Household in Detached Housing		2.34
Persons Per Household in All Other Housing Types		1.85
Gallons Per Capita Per Average Day		67
ERU Gallons per Average Day		157
Cost Factors		
Sewer System CIP Cost per Gallon of Capacity		$9.77
Principal Payment Credit Per Gallon (not applicable)		$0.00
Net Capital Cost Per Gallon of Capacity		$9.77
Maximum Supportable Sewer Fee		
Residential		Per Dwelling Unit
Detached Housing		$1,531
All Other Housing Types		$1,210
Nonresidential		Per Meter
*Water Meter Size**	*Capacity Ratio*	
0.75"	1.0	$1,533
1.00"	1.7	$2,607
1.50"	3.3	$5,061
2.00"	5.3	$8,129

* Nonresidential sewer fees are based on water meter size. Fees for meters larger than two inches will be based on annualized average day demand and the net capital cost per gallon of capacity.

Projected Cash Flow for Sewer Capital Improvements

Figure 21 summarizes sewer impact fee revenue and capital costs through 2025. Impact fees should generate approximately $171,000 per year for sewer system improvements, if implemented at the maximum supportable level. The projected cumulative capital cost of approximately $6.98 million exceeds the projected revenue by more than $3.73 million. The average annual deficit of $197,000 represents the cost to existing customers for a new wastewater treatment plant, or approximately $100 per year per existing customer.

The cash flow summary provides an indication of the impact fee revenue and expenditures necessary to meet the projected demand for sewer system improvements. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs. See Appendix A for discussion of the development projections that drive the cash flow analysis.

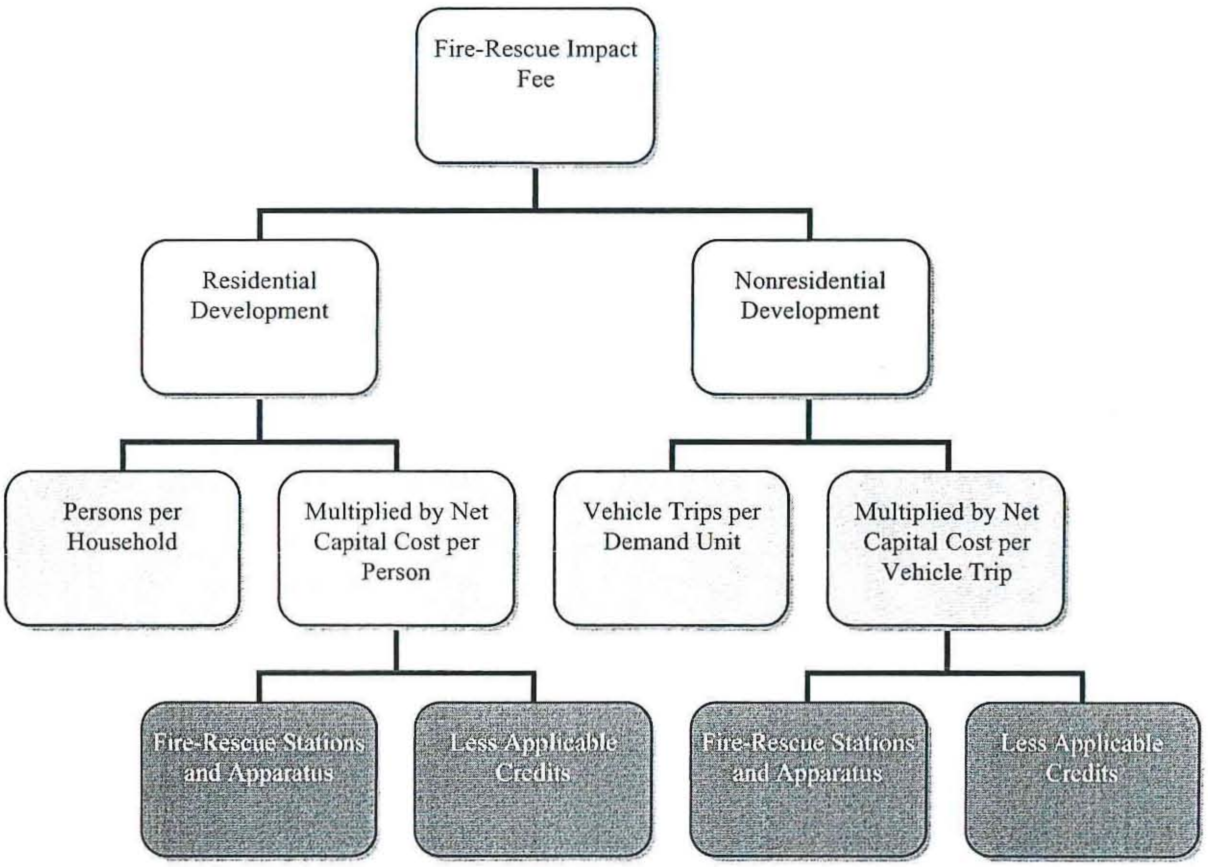
Figure 21 – Cash Flow Summary for Sanitary Sewer

Polson, Montana	1	2	3	4	9	14	19	Cumulative	Average
(Current $ in thousands)	2007	2008	2009	2010	2015	2020	2025	Total	Annual
REVENUES									
4 Sewer Fee - Detached HU	$82	$82	$82	$82	$82	$82	$82	$1,563	$82
5 Sewer Fee - Attached HU	$31	$31	$31	$31	$31	$31	$31	$581	$31
6 Sewer Fee - Nonres (1.5")	$59	$56	$61	$56	$56	$61	$61	$1,101	$58
Sewer Fee Subtotal	$172	$169	$174	$169	$169	$174	$174	$3,245	$171
CAPITAL COSTS									
Sewer System Growth-Related CIP	$1,079	$50	$50	$50	$383	$383	$383	$6,979	$367
NET CAPITAL FACILITIES CASH FLOW - Sewer									
Annual Surplus (or Deficit)	($907)	$119	$124	$119	($215)	($210)	($210)	($3,734)	($197)
Cumulative Surplus (or Deficit)	($907)	($789)	($665)	($547)	($1,611)	($2,670)	($3,734)		

FIRE-RESCUE

Since emergency medical calls are more frequent than fire calls, the number of people and jobs in Polson will be used in the proportionate share determination for the fire-rescue impact fee. As shown in Figure 22, residential impact fees are calculated on a per capita basis. Fees for nonresidential development are determined using capital cost factors per average weekday vehicle trip. The incremental expansion cost method for fire stations and apparatus will ensure new development maintains the current infrastructure standards, if the fees are imposed at their maximum supportable level.

Figure 22 – Fire-Rescue Impact Fee Methodology Chart



Cost Allocation for Fire-Rescue Infrastructure

An estimate of functional population was used to allocate capital costs to residential and nonresidential development (see Figure 23). For residential development, the proportionate share factor is based on estimated person hours of non-working residents, plus the non-working hours of resident workers. Based on census data, approximately 41% of Polson's population worked in 2000 and 59% did not work. For resident workers, two-thirds of a day (i.e., 16 hours) was allocated to residential demand. Time spent at work (i.e., 8 hours) was allocated to nonresidential development. In 2000, the U.S. Census Bureau estimated that 998 city residents also worked in Polson. Therefore, the 2,555 jobs located within Polson include 1,557 non-resident workers that commute into the city for work. Based on estimated person hours, the cost allocation for residential development is 80% while nonresidential development accounts for 20% of the demand for infrastructure.

Figure 23 – Proportionate Share Factors for Fire/EMS

	Demand Units in 2000			Demand Hours/Day	Person Hours
Residential					
Population	4,041				
Residents Not Working		2,374		24	56,976
Workers Living in City*		1,667			
Residents Working in City*			998	16	15,968
Residents Working Outside City*			669	16	10,704
				Residential Subtotal	83,648
					80%
Nonresidential					
Jobs Located in City**		2,555			
Residents Working in City*			998	8	7,984
Non-Resident Workers in 2000			1,557	8	12,456
				Nonresidential Subtotal	20,440
					20%
				TOTAL	104,088

* *Table P27 from SF3, Census 2000.*

** *2000 Census Transportation Planning Package, Part 2 (Place of Work), Table 10.*

Fire-Rescue Infrastructure Standards

The current infrastructure standard in the City of Polson for fire station building space was derived using the floor area of the existing fire downtown station. The cost factor for providing additional fire station space was derived from data published by Marshall Valuation Service, a company that maintains an extensive national database on actual construction costs for various types of buildings. To construction a fire station in Polson with load bearing walls and mid-range finish materials will cost at least $74 per square foot of floor area. Design fees, furniture and equipment will increase this cost by approximately 25%, yielding a cost factor of $92.50 per square foot, excluding the cost of land.

The bottom section of Figure 24 inventories the apparatus currently used to provide fire-rescue services within Polson. The City Fire Department provided the apparatus inventory and current unit costs for each type of equipment. These costs include all necessary add-ons to make the apparatus ready for service, such as lights and safety equipment. The fleet of fire apparatus in the City of Polson has a current cost of approximately $2.35 million.

Figure 24 – Infrastructure Standards for Fire-Rescue

Incremental Expansion Cost of Fire Station

Site	*Square Feet*
Downtown Fire Station	6,290

Cost per Sq Ft of New Building => $92.50

	Proportionate Share	2006 Demand Units		Cost per Demand Unit
Residential	80%	5,647	peak population	$82.42
Nonresidential	20%	9,300	nonres veh trips	$12.51

0.89 sq ft per person
0.14 sq ft per nonres veh trip

Incremental Expansion Cost of Fire Apparatus

Type	*Count*	*Unit Cost*	*Total Cost*
Fire Engines	2	$500,000	$1,000,000
Rescue Truck	1	$350,000	$350,000
Aerial Truck	1	$1,000,000	$1,000,000
			$0
TOTAL	4		$2,350,000

Weighted Average Cost => $588,000

	Proportionate Share	2006 Demand Units		Cost per Demand Unit
Residential	80%	5,647	peak population	$332.92
Nonresidential	20%	9,300	nonres veh trips	$50.53

0.57 equipment items per 1,000 persons
0.09 equipment items per 1,000 nonres veh trips

Credit Evaluation for Fire-Rescue Infrastructure

The City of Polson has no outstanding debt for fire stations or fire apparatus. However, to construct a future fire station of 8,000 square feet would cost approximately $740,000 and may require bond financing. If a future bond is retired using property tax revenue, the impact fee methodology should include a credit for future principal payments. A credit is not necessary for interest payments if interest costs are not added to the fire impact fee.

Fire-Rescue Impact Fee Calculations

Standards used to derive the fire-rescue impact fees are shown in Figure 25. Average weekday vehicle trips per nonresidential development unit are from the Institute of Transportation Engineers (see the Appendices for further documentation on trip generation rates and adjustment factors for pass-by trips).

The fire impact fee is the product of the demand units per development unit, multiplied by the net capital cost per demand unit. For example, the fee for a hotel/motel is obtained by multiplying 5.63 vehicle trip ends per room, times the trip adjustment factor of 0.50, times the net capital cost of $63.04 per vehicle trip, to yield an impact fee of $177 per lodging room, as shown below.

Figure 25 – Fire-Rescue Fee Input Variables

	Standards:		
Persons Per Household			
Detached Housing	2.34		
All Other Housing Types	1.85		
Weekday Vehicle Trip Ends and Adjustment Factors			
Nonresidential (per 1,000 Square Feet of Floor Area)			
820 Commercial / Shop Ctr 50,000 SF or less		86.56	31%
820 Commercial / Shop Ctr 50,001-100,000 SF		67.91	33%
820 Commercial / Shop Ctr 100,001-200,000 SF		53.28	36%
770 Business Park		12.76	33%
720 Medical-Dental Office		36.13	50%
710 General Office 25,000 SF or less		18.35	50%
710 General Office 25,001-50,000 SF		15.65	50%
710 General Office 50,001-200,000 SF		11.37	50%
610 Hospital		17.57	50%
151 Mini-Warehouse		2.50	50%
150 Warehousing		4.96	50%
140 Manufacturing		3.82	50%
110 Light Industrial		6.97	50%
520 Elementary School		14.49	33%
Other Nonresidential (per development unit)			
620 Nursing Home (per bed)		2.37	50%
565 Day Care (per student)		4.48	24%
530 Secondary School (per student)		1.71	36%
520 Elementary School (per student)		1.29	33%
320 Lodging (per room)		5.63	50%
Level of Service	Per Person	Per Trip	
Fire Station Cost	$82.42	$12.51	
Fire Apparatus Cost	$332.92	$50.53	
Principal Payment Credit	$0.00	$0.00	
Net Capital Cost	$415.34	$63.04	

Maximum Supportable Fire-Rescue Impact Fees

Figure 26 provides the schedule of maximum supportable impact fees for fire-rescue infrastructure (i.e. the results of the input variables and the impact fee formula for each type of development). For example, the fee for a detached housing unit is derived by multiplying the average number of persons per household by the net capital cost per person (i.e., 2.34 persons per household times the net capital cost of $415.34 per person) which equals $971 per housing unit.

Figure 26 – Fire-Rescue Impact Fees

City of Polson Fire Impact Fee		
Residential	Per Housing Unit	
Detached Housing	$971	
All Other Housing Types	$768	
Nonresidential		Per Sq Ft
820 Commercial / Shop Ctr 50,000 SF or less		$1.69
820 Commercial / Shop Ctr 50,001-100,000 SF		$1.41
820 Commercial / Shop Ctr 100,001-200,000 SF		$1.20
770 Business Park		$0.26
720 Medical-Dental Office		$1.13
710 General Office 25,000 SF or less		$0.57
710 General Office 25,001-50,000 SF		$0.49
710 General Office 50,001-200,000 SF		$0.35
610 Hospital		$0.55
151 Mini-Warehouse		$0.07
150 Warehousing		$0.15
140 Manufacturing		$0.12
110 Light Industrial		$0.21
520 Elementary School		$0.30
Other Nonresidential		Per Development Unit
620 Nursing Home (per bed)		$74
565 Day Care (per student)		$67
530 Secondary School (per student)		$38
520 Elementary School (per student)		$26
320 Lodging (per room)		$177

Fire-Rescue Cash Flow Analysis

At the maximum supportable level, the fire-rescue impact fees should yield approximately $464,000 over the next five years (see Figure 27). To accommodate new development, the Fire Department will need to expand the fire station by 1,020 square feet, at an estimated cost of approximately $94,000. The growth-related need for additional fire apparatus is approximately $381,000.

The cash flow summary provides an indication of the impact fee revenue and expenditures necessary to meet the demand for fire-rescue infrastructure. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs of fire stations and apparatus. See Appendix A for discussion of the development projections that drive the cash flow analysis.

Figure 27 – Cash Flow Summary for Fire-Rescue Infrastructure

Polson, Montana	1	2	3	4	5	Cumulative	Average
(Current $ in thousands)	2007	2008	2009	2010	2011	Total	Annual
REVENUES							
9 Fire Fee - Detached HU	$52	$52	$52	$52	$52	$261	$52
10 Fire Fee - Attached HU	$19	$19	$19	$19	$19	$97	$19
11 Fire Fee - Goods Pro	$2	$0	$2	$2	$2	$8	$2
12 Fire Fee - Retail	$14	$14	$0	$14	$14	$56	$11
13 Fire Fee - OtherComServ	$5	$3	$5	$5	$3	$21	$4
14 Fire Fee - Education	$3	$3	$3	$3	$3	$15	$3
15 Fire Fee - Government	$0	$6	$0	$0	$0	$6	$1
Fire Fee Subtotal	$96	$97	$82	$96	$93	$464	$93
CAPITAL COSTS							
Fire Station Expansion	$20	$20	$17	$20	$19	$94	$19
Fire Apparatus	$79	$79	$68	$79	$77	$381	$76
Growth-Related Fire Infrastructure	$98	$99	$84	$98	$96	$475	$95
NET CAPITAL FACILITIES CASH FLOW - Fire							
Annual Surplus (or Deficit)	($2)	($2)	($3)	($2)	($2)	($11)	($2)

IMPLEMENTATION AND ADMINISTRATION

Impact fees must be deposited in a separate interest bearing account. Fees should be spent within five years of when they are collected, with the expenditures limited to growth-related system improvements. An annual report of impact fee collections and expenditures should be prepared by the Finance Department for distribution to elected officials, city administrators and the general public (upon request).

Credits and Reimbursements

A general requirement that is common to impact fee methodologies is the evaluation of credits. A revenue credit may be necessary to avoid potential double payment situations arising from one-time impact fees plus on-going payment of other revenues that may also fund growth-related capital improvements. The determination of credits is dependent upon the impact fee methodology used in the cost analysis. There are three basic approaches used to calculate impact fees and each is linked to different credit methodology.

The first major type of impact fee method is a cost recovery approach. This method is used for facilities that have adequate capacity to accommodate new development for at least a five-year time frame. The rationale for the cost recovery is that new development is paying for its share of the useful life or remaining capacity of the existing facility. When using a cost recovery method, it is important to determine whether new development has already contributed toward the cost of existing public facilities (i.e., a past revenue credit). Outstanding principal and interest payments are typically subtracted from the value of the asset that was oversized for new development.

A second basic approach used to calculate impact fees is the incremental expansion cost method. This method documents current factors and it is best suited for public facilities that will be expanded incrementally in the future. Because new development will provide front-end funding of infrastructure, there is a potential for double payment of capital costs due to future principal payments on existing debt for public facilities. A credit is not necessary for interest payments if interest costs were not included in the impact fees.

A third basic approach used to calculate impact fees is the plan-based method. This method is based on future capital improvements needed to accommodate new development. The plan-based method may be used for public facilities that have commonly accepted service delivery factors to determine the need for future projects, or the jurisdiction plans to significantly increase the current factors and it has a financially feasible strategy to cover the cost of existing deficiencies. If a plan-based approach is used to derive impact fees, the credit evaluations should focus on future bonds and revenues that will fund planned capital improvements.

Specific policies and procedures related to site-specific credits should be addressed in the ordinance that establishes the impact fees. Project-level improvements, required as part of the development approval process, are not eligible for credits against impact fees. If a developer constructs a system improvement included in the fee calculations, it will be necessary to either reimburse the developer or provide a credit against the fees in the area that benefits from the system improvement. The latter option is more difficult to administer because it creates unique fees for specific geographic areas. Based on TischlerBise's experience, it is better for the City to establish a reimbursement agreement with the developer that constructs a system improvement. The reimbursement agreement should be limited to a payback period of no more than ten years and the City should not pay interest on the outstanding balance. The developer must provide sufficient documentation of the actual cost incurred for the system improvement. The City should only agree to pay the lesser of the actual construction cost or the estimated cost used in the impact fee analysis. If the City pays more than the cost used in the fee analysis, there will be insufficient fee revenue. Reimbursement agreements should only obligate the City to reimburse developers annually according to actual fee collections from the benefiting area.

The supporting documentation for each type of impact fee illustrates the types of infrastructure considered to be system improvements. For example, the park impact fee provides standards for larger citywide parks, but does not address the need for smaller neighborhood-scale park improvements. Therefore, neighborhood-scale park improvements are not eligible for credits against impact fees.

Site specific credits or developer reimbursements for one type of system improvement does not negate payment of impact fee for other system improvements. For example, the sewer impact fee includes cost components for wastewater treatment plant capacity and the conveyance system. A developer that installs a conveyance system improvement is eligible for a site-specific credit or reimburse for the sewer trunk line, but impact fee payments are still required for the wastewater treatment plant capacity.

Service Areas

To ensure a substantial benefit to new development paying impact fees, the City of Polson has evaluated collection and expenditure zones for public facilities that may have distinct benefit or service areas. In the City of Polson, impact fees for citywide parks, water and sewer infrastructure will benefit new development throughout the entire incorporated area. TischlerBise recommends citywide implementation of the development impact fees. Because existing water and sewer service areas extend beyond municipal boundaries, the service area for each utility is contiguous with the geographic extent of the parcels served by City utilities. To ensure collection of impact fees from new development benefiting from City infrastructure, TischlerBise recommends annexation of all properties that desire connection to City water and sewer utilities.

CAPITAL IMPROVEMENTS PLAN

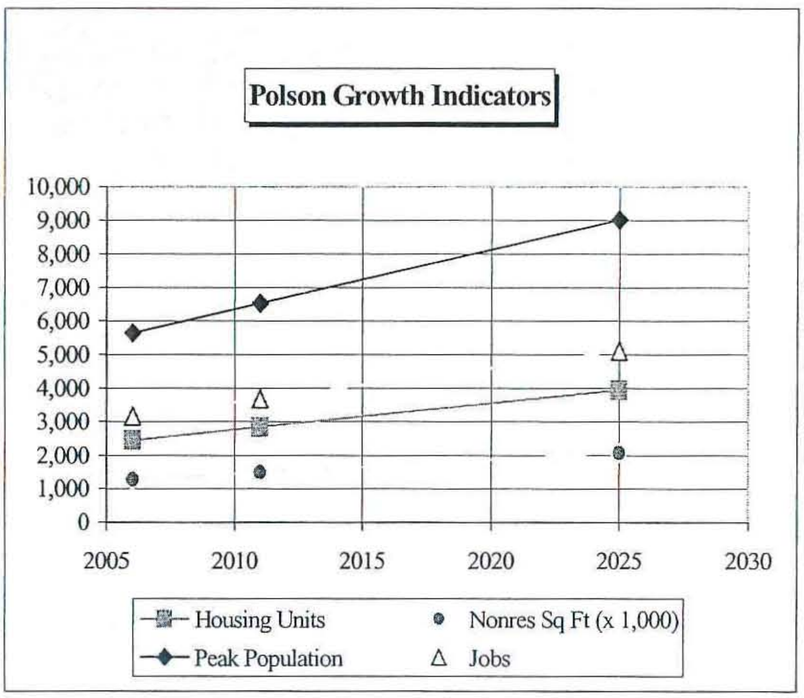
The State of Montana requires a capital improvements plan to show how a local government plans to spend impact fee revenue. This section of the impact fee study provides a planning-level summary of planned capital improvements needed to accommodate new development in the City of Polson.

Demand for Infrastructure

TischlerBise calculated the demand for facilities using infrastructure standards and the growth indicators summarized in Figure 28. For the impact fee study, Polson anticipates growth rates averaging approximately 3% per year. In contrast, the Polson Growth Policy projected a population growth rate of only 1.6% per year (see page 1-16).

Figure 28 – Summary of Projections

Polson, Montana				2006 to 2025 Average Annual	
	2006	2011	2025	Increase	Growth Rate
Peak Population	5,647	6,533	9,013	177	3.14%
Housing Units	2,453	2,848	3,954	79	3.22%
Jobs	3,170	3,681	5,110	102	3.22%
Nonres Sq Ft (x 1,000)	1,280	1,500	2,080	42	3.29%



For each type of public facility addressed in the impact fee study, TischlerBise identified an appropriate demand indicator or service unit. Expected service units over the next five years are listed in Figure 29. See Appendix A for supporting documentation on these projections.

Figure 29 – Projected Demand or Service Units

Polson, Montana		Year =>	1	2	3	4	5
		2006	2007	2008	2009	2010	2011
DEMAND PROJECTIONS (cumulative)							
P	PEAK POPULATION	5,647	5,824	6,001	6,179	6,356	6,533
H	HOUSEHOLDS	2,159	2,228	2,298	2,367	2,437	2,506
J	JOBS	3,170	3,272	3,374	3,476	3,579	3,681
PJ	POPULATION & JOBS	8,817	9,096	9,375	9,655	9,935	10,214
TVT	Total Avg Wkdy Veh Trips	19,582	20,304	21,041	21,539	22,261	22,941
RT	***Residential Units:***	2,453	2,532	2,611	2,690	2,769	2,848
R1	Detached (SFD & MH)	1,668	1,722	1,775	1,829	1,883	1,937
R2	All Other Hsg Types	785	810	836	861	886	911
RVT	Res Avg Wkdy Veh Trips	10,282	10,613	10,944	11,275	11,606	11,937
NRT	***NonRes Floor Area:***	1,280	1,330	1,370	1,410	1,460	1,500
NR1	Goods Producing	250	260	260	270	280	290
NR2	Retail	200	210	220	220	230	240
NR3	Other Services	500	520	530	550	570	580
NR4	Education	270	280	290	300	310	320
NR5	Government	60	60	70	70	70	70
NRVT	NR Avg Wkdy Veh Trips	9,300	9,691	10,097	10,264	10,655	11,004
Water and Sewer Data							
DB1	Res Water Customers	1,938	2,000	2,063	2,125	2,188	2,250
DB2	Nonres Water Customers	355	367	378	390	401	413
DB3	Total Water Customers	2,293	2,367	2,441	2,515	2,589	2,663
DB4	Res Wtr MGD	0.57	0.59	0.60	0.62	0.64	0.66
DB5	Nonres Wtr MGD	0.27	0.28	0.29	0.30	0.31	0.32
DB6	Total Wtr MGD	0.84	0.87	0.89	0.92	0.95	0.98
DB8	Res Swr MGD	0.26	0.27	0.27	0.28	0.29	0.30
DB9	Nonres Swr MGD	0.27	0.28	0.29	0.30	0.31	0.32
DB10	Total Swr MGD	0.53	0.55	0.56	0.58	0.60	0.62
DB11	Res Sewer Customers	1,644	1,696	1,749	1,802	1,855	1,908
DB12	Nonres Sewer Customers	355	367	378	390	401	413
DB13	Total Sewer Customers	1,999	2,063	2,127	2,192	2,256	2,321

Proposed Means to Meet the Demand for Public Facilities

The demand for public facilities is a function of the projected demand units shown above and the infrastructure standards summarized in Figure 30. For each type of public facility addressed in this report, a relationship is established between infrastructure units and demand units. For example, the City of Polson currently has five acres of citywide parks per 1,000 persons. In the case of utility systems, the need for infrastructure was determined by separate technical studies, such as the engineering master plans or needs assessments by City staff. Costs for various infrastructure items are summarized as cost factors per average day gallon of capacity. See the discussion of each type of infrastructure for further documentation on level of service standards and cost factors.

Figure 30 – Summary of Infrastructure Standards

Type of Infrastructure	*Amount*	*Infrastructure Units*	*Per Demand Unit*	*Cost Factor*	*Per Infra-structure Unit*
Parks	5.0	acres of citywide parks	1,000 persons	$82,000	acre (improvements)
Parks	1.4	linear feet of trails	person	$24	linear foot
Water	293	avg day gal of capacity	Equivalent Residential Unit	$11.31	gallon of avg day capacity
Sewer	157	avg day gal of capacity	Equivalent Residential Unit	$9.77	gallon of avg day capacity
Fire/EMS	0.57	fire apparatus	1,000 persons	$588,000	apparatus (fleet average)
Fire/EMS	0.09	fire apparatus	1,000 vehicle trips to nonres dev	$588,000	apparatus (fleet average)
Fire/EMS	0.89	sq ft of fire station	person	$92.50	square foot of building
Fire/EMS	0.14	sq ft of fire station	vehicle trip to nonres dev	$92.50	square foot of building

Figure 31 provides a schedule of growth-related capital improvements over the next five years. The capital improvements schedule only addresses projects needed to accommodate new development. Capital replacement expenditures are excluded from the following list of improvements. Because of the demand from both residential and nonresidential development, the projected need for fire stations and fire apparatus are shown on two separate lines.

Detailed information on specific capital improvements will be provided in the City of Polson's annual budget. Pay-as-you-go capital expenditures total approximately $4.53 million over the next five years.

Figure 31 – Capital Improvements Schedule

Polson, Montana		1	2	3	4	5	
		2007	2008	2009	2010	2011	
Projected Growth-Related Expenditures							*Cumulative*
	1000 's of current dollars						*Total*
C1	Water System CIP	$50	$50	$50	$1,300	$416	$1,866
C2	Sewer System CIP	$1,079	$50	$50	$50	$383	$1,612
C3	Citywide Parks	$72	$72	$72	$72	$72	$358
C4	Trails	$0	$74	$44	$23	$74	$215
C5	Fire Station - Res	$15	$15	$15	$15	$15	$73
C6	Fire Station - Nonres	$5	$5	$2	$5	$4	$21
C7	Fire Apparatus - Res	$59	$59	$59	$59	$59	$295
C8	Fire Apparatus - Nonre	$20	$21	$8	$20	$18	$86
TOTAL		$1,299	$344	$301	$1,543	$1,040	$4,527

Funding Sources for Capital Improvements

Polson has primarily funded parks and fire infrastructure from property taxes or other General Fund revenues. Because utilities function as an enterprise operation, user charges have provided most of the revenue for water and sewer infrastructure. In addition to historical sources for funding infrastructure, the City of Polson is pursuing alternative sources of funding. The alternative documented in this report is development impact fee revenue. Actual impact fee revenue may vary significantly from the projected amounts shown below due to annual fluctuations in the rate of development and the fee schedule approved by elected officials. In Figure 32, the percentage of growth-related capital costs paid by impact fees, which is 78% over the next five years, assumes adoption of the maximum supportable impact fees. The primary reason why impact fees do not cover 100% of the growth-related cost is due to water and sewer improvements that will also benefit existing customers.

Because each type of impact fee must be accounted for separately, TischlerBise provided cash flow summaries in the impact fee analysis for each type of public facility. Over the next five years, impact fees are expected to generate approximately $3.5 million for funding growth-related system improvements, if implemented at the maximum supportable level. Average annual impact fee revenue is projected to be approximately $709,000 per year.

The Montana Impact Fee Act allows local governments to collect an administrative surcharge, not to exceed five percent of the impact fees collected. If Polson imposed an administrative surcharge of 5%, the City should receive approximately $177,000 over the next five years. This revenue could be used for consultant studies or staff time necessary for the administration of impact fees.

Figure 32 – Projected Impact Fee Revenue

Polson, Montana		1	2	3	4	5	Cumulative	Average	
(Current $ in thousands)		2007	2008	2009	2010	2011	Total	Annual	
REVENUES									
Water Fee Subtotal		$371	$364	$375	$364	$375	$1,849	$370	
Sewer Fee Subtotal		$172	$169	$174	$169	$174	$856	$171	
Park Fee Subtotal		$75	$75	$75	$75	$75	$376	$75	
Fire Fee Subtotal		$96	$97	$82	$96	$93	$464	$93	
TOTAL IMPACT FEE REVENUE		$714	$705	$706	$704	$717	$3,545	$709	78%
5%	Adminstrative Surcharge	$36	$35	$35	$35	$36	$177	$35	

APPENDIX A – DEMOGRAPHIC DATA

MEMORANDUM

TO: City of Polson, Montana
FROM: TischlerBise
DATE: November 17, 2006
SUBJECT: **Demographic Data and Development Projections**

In this memo, TischlerBise documents the demographic data and development projections that will be used in the impact fee study for the City of Polson, Montana. Although long-range projections are necessary for planning capital improvements, a shorter time frame of five to six years is critical for the impact fees analysis. Infrastructure standards will be calibrated using fiscal year 2006-2007 data and the first projection year for the cash flow model will be fiscal year 2007-2008. The City of Polson fiscal year begins July 1st.

Persons per Household

As shown in Figure A1, the City of Polson had 1,977 housing units in 2000. The weighted average, household size in 2000 for all housing types was 2.25 persons per household. According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents.

Impact fees often use per capita standards and persons per housing unit or persons per household to derive proportionate-share fee amounts. When persons per housing unit are used in the fee calculations, infrastructure standards are derived using year-round population. When persons per household are used in the fee calculations, the impact fee methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. Given the seasonal peak demand during the summer months for water, sewer and park infrastructure, TischlerBise recommends persons per household multipliers for the City of Polson.

TischlerBise also recommends the use of two residential categories in the impact fee calculations. Differentiating impact fees by type of housing helps make the fees proportionate to the demand for public facilities. Detached housing units average 2.34 persons per household. Attached housing units (i.e., townhouses, duplexes and multifamily units) average 1.85 persons per household.

Figure A1 – Population and Housing Characteristics

Units in Structure	Renter & Owner Persons	Renter & Owner Hsehlds	Renter & Owner PPH	Housing Units	Persons Per Housing Unit	Vacancy Rate	Peak Population
1-Detached	2,526	1,074	2.35	1,194	2.12	10.1%	
Mobile Homes	256	114	2.25	121	2.12	5.8%	
1-Attached (Townhouse)	9	9	1.00	28	0.32	67.9%	
Two (Duplex)	156	86	1.81	114	1.37	24.6%	
3 or 4	417	157	2.66	177	2.36	11.3%	
5 to 9	192	117	1.64	131	1.47	10.7%	
10 to 19	82	40	2.05	40	2.05	0.0%	
20 to 49	80	71	1.13	81	0.99	12.3%	
50 or more	48	52	0.92	52	0.92	0.0%	
Other (Boat, RV, etc.)	0	0		0			
Total SF3 Sample Data	3,766	1,720	2.19	1,938		11.2%	
SF1 100-Percent Data	3,911	1,739	**2.25**	1,977	1.98	12.0%	4,446
House Type Demographics	Persons	Hsehlds	PPH	*Housing Units*	*Persons Per Housing Unit*	Hsg Mix	
Detached (SFD & MH)	2,782	1,188	**2.34**	1,315	2.12	68%	
All Other Housing Types	984	532	**1.85**	623	1.58	32%	
Group Quarters	130						130
Sample Difference	145	19		39			
TOTAL	4,041	1,739		1,977			4,576
							1.13
							Peak to Year-Round Multiplier

Source: U.S. Census Bureau, 2000 data.

Recent Residential Construction

Figure A2 indicates the US Census Bureau's 2005 population estimate of 4,828 year-round residents for the City of Polson and the corresponding increase in housing units to match the population increase. Assuming a constant group quarters population and average household size, the City of Polson has increased by an average of 79 housing units per year during calendar years 2000 through 2004. The actual housing unit increase over the past five years is more than double the projected rate of increase in Polson's Growth Policy (12/05, page 2-15). The City's growth policy projects an average increase of 30.7 households per year, or approximately 35 housing units per year.

The chart below indicates the estimated number of housing units added by decade in the City of Polson. If the recent rate of housing construction continues, the first decade of the 21st century will experience an increase of approximately 790 housing units, which is significantly greater than any previous decade.

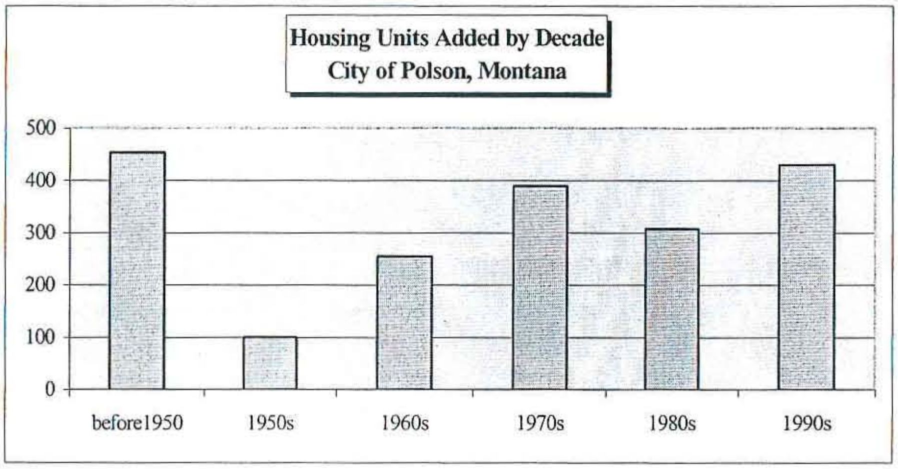
Figure A2 – Residential Building Permits

	City of Polson
Estimated Year-Round Population in 2005*	4,828
Total Housing Units in 2000	1,977
New Housing Units 2000-2004	397
Total Units in 2005*	2,374

During calendar years 2000 through 2004, the City of Polson added an average of 79 housing units per year.

* *US Census Bureau Population Estimate*

** *Population estimate (less 130 persons in GQ) divided by 2.25 person per household and multiplied by 1.137 to account for vacant units.*



Source: Table H34, SF3 Census 2000, U.S. Census Bureau.

Jobs and Nonresidential Development

In addition to data on residential development, the calculation of impact fees requires data on nonresidential development in the City of Polson. The impact fee study will convert projected jobs to nonresidential floor area using square feet per employee multipliers. TischlerBise uses the term "jobs" to refer to employment by place of work (i.e., located within Polson). In contrast, the City's growth policy document provides data on the number of employed persons living in the City of Polson.

The square feet per employee multipliers shown below were derived from national data published by the Institute of Transportation Engineers (ITE) and the Urban Land Institute (ULI). Impact fee methodologies may also use the number of employees per thousand square feet (KSF) to differentiate fees by type of nonresidential development. In Figure A3, gray shading indicates five nonresidential development prototypes that will be used by TischlerBise to calculate water/sewer demand and estimate potential impact fee revenue as part of the impact fee cash flow analysis. The prototype development for goods-producing jobs is Light Industrial. The prototype for retail jobs is a 100,000 square feet shopping center. The third prototype, for other commercial services, is a business park. The fourth prototype, for education, is an elementary school. The fifth prototype, for government jobs, is a 25,000 square feet office building.

Figure A3 – Employee and Building Area Ratios

ITE Code	*Land Use / Size*	*Demand Unit*	*Wkdy Trip Ends Per Dmd Unit**	*Wkdy Trip Ends Per Employee**	*Emp Per Dmd Unit***	*Sq Ft Per Emp*
Commercial / Shopping Center						
821	25K gross leasable area	1,000 Sq Ft	110.32	na	3.33	300
820	50K gross leasable area	1,000 Sq Ft	86.56	na	2.86	350
820	**100K gross leasable area**	**1,000 Sq Ft**	**67.91**	**na**	**2.50**	**400**
820	200K gross leasable area	1,000 Sq Ft	53.28	na	2.22	450
820	400K gross leasable area	1,000 Sq Ft	41.80	na	2.00	500
General Office						
710	10K gross floor area	1,000 Sq Ft	22.66	5.06	4.48	223
710	**25K gross floor area**	**1,000 Sq Ft**	**18.35**	**4.43**	**4.15**	**241**
710	50K gross floor area	1,000 Sq Ft	15.65	4.00	3.91	256
710	100K gross floor area	1,000 Sq Ft	13.34	3.61	3.69	271
710	200K gross floor area	1,000 Sq Ft	11.37	3.26	3.49	287
Industrial						
770	**Business Park*** **	**1,000 Sq Ft**	**12.76**	**4.04**	**3.16**	**317**
151	Mini-Warehouse	1,000 Sq Ft	2.50	56.28	0.04	22,512
150	Warehousing	1,000 Sq Ft	4.96	3.89	1.28	784
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
110	**Light Industrial**	**1,000 Sq Ft**	**6.97**	**3.02**	**2.31**	**433**
Other Nonresidential						
720	Medical-Dental Office	1,000 Sq Ft	36.13	8.91	4.05	247
620	Nursing Home	bed	2.37	6.55	0.36	na
610	Hospital	1,000 Sq Ft	17.57	5.20	3.38	296
565	Day Care	student	4.48	28.13	0.16	na
530	Secondary School	student	1.71	19.74	0.09	na
520	Elementary School	student	1.29	15.71	0.08	na
520	**Elementary School**	**1,000 Sq Ft**	**14.49**	**15.71**	**0.92**	**1,084**
320	Lodging	room	5.63	12.81	0.44	na

* Source: Trip Generation, Institute of Transportation Engineers (2003).

** Employees per demand unit calculated from trip rates, except for Shopping Center data, which are derived from Development Handbook and Dollars and Cents of Shopping Centers, published by the Urban Land Institute.

*** According to ITE, a Business Park is a group of flex-type buildings served by a common roadway system. The tenant space includes a variety of uses with an average mix of 20-30% office/commercial and 70-80% industrial/warehousing.

Jobs by Type of Nonresidential Development

Figure A4 indicates year 2000 estimates of jobs and nonresidential floor area located in the City of Polson. Converting jobs to floor area yields an estimate of approximately 1.04 million square feet of nonresidential development. The impact fee study assumes the job mix in 2000 remains constant through 2025.

Figure A4 – Jobs and Floor Area Estimates

City of Polson, Montana	Jobs in 2000*		Square Feet Per Employee	2000 Est Floor Area
Goods Producing				
Wholesale/Transp/Warehse	105			
Construction	170			
Manufacturing	150			
Ag/Forestry	25			
Subtotal	450	17.6%	433	195,000
Retail and Other Services				
Retail Trade	415	16.2%	400	166,000
Other Services	1,274	49.9%	317	404,000
Public Sector				
Education**	206	8.1%	1,084	223,000
Government	210	8.2%	241	51,000
GRAND TOTAL	2,555	100.0%	407	1,039,000

* *Place of work data from Census Transportation Planning Package (CTPP 2000)*

** *SY04-05 jobs at Polson public schools, estimated from NCES teacher data.*

Detailed Development Projections

The demographic data shown in Figure A5 will be used as key inputs to the impact fee study. Projected housing units were converted to households and year-round population using the residential vacancy rate and household size from the 2000 census. To derive peak population, TischlerBise assumed that vacant/seasonal units (i.e., the difference between housing units and households) have an average occupancy of 2.25 persons during the summer peak months.

According to the Census 2000 data on jobs and housing units, the City of Polson has a ratio of 1.29 jobs per housing unit. The impact fee study will assume this ratio holds constant over time. To keep pace with the projected increase in housing units, the City of Polson will add an average of 102 jobs per year, reaching 5,110 jobs by the year 2025.

As shown by the average annual increases (see the bottom section of Figure A5), Polson anticipates approximately 42,000 square feet of nonresidential development per year. However, the amount of nonresidential construction per year is typically more irregular than residential construction.

Figure A5 – Demographic Data for Impact Fee Study

		BaseYr	*1*	*2*	*3*	*4*	*9*	*14*	*19*
City of Polson, MT	*2000*	*2006*	*2007*	*2008*	*2009*	**2010**	**2015**	**2020**	**2025**
Cumulative		*FY06-07*	*FY07-08*	*FY08-09*	*FY09-10*	*FY10-11*	*FY15-16*	*FY20-21*	*FY25-26*
Pop in Hsehlds (rounded)	3,911	4,857	5,013	5,170	5,326	5,483	6,265	7,047	7,829
Pop in Group Quarters*	130	130	130	130	130	130	130	130	130
Year-Round Population	4,041	4,987	5,143	5,300	5,456	5,613	6,395	7,177	7,959
Peak Population	4,576	5,647	5,824	6,001	6,179	6,356	7,241	8,127	9,013
Jobs	2,555	3,170	3,272	3,374	3,476	3,579	4,089	4,600	5,110
Housing Units	1,977	2,453	2,532	2,611	2,690	2,769	3,164	3,559	3,954
Jobs to Housing Ratio	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29
Residential Vacancy Rate	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Households	1,739	2,159	2,228	2,298	2,367	2,437	2,784	3,132	3,480
Persons Per Household	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
Job Distribution									
Goods Producing	18%	18%	18%	18%	18%	18%	18%	18%	18%
Retail	16%	16%	16%	16%	16%	16%	16%	16%	16%
Other Services	50%	50%	50%	50%	50%	50%	50%	50%	50%
K-12 Education	8%	8%	8%	8%	8%	8%	8%	8%	8%
Government	8%	8%	8%	8%	8%	8%	8%	8%	8%
Nonres Sq Ft (x 1,000)									
Goods Producing	200	250	260	260	270	280	320	360	400
Retail	160	200	210	220	220	230	260	290	330
Other Services	400	500	520	530	550	570	650	730	810
K-12 Education	220	270	280	290	300	310	350	400	440
Government	50	60	60	70	70	70	80	90	100
Total	1,030	1,280	1,330	1,370	1,410	1,460	1,660	1,870	2,080
Avg Sq Ft Per Job		404	406	406	406	408	406	407	407

								2006 to 2025
Annual Increase	*06-07*	*07-08*	*08-09*	*09-10*	*10-11*	*15-16*	*20-21*	*City Increase*
Year-Round Population	156	156	156	156	156	156	156	2,972
Jobs	102	102	102	103	102	102	102	1,940
Housing Units	79	79	79	79	79	79	79	1,501
Goods Producing KSF**	10	0	10	10	10	10	10	150
Retail KSF**	10	10	0	10	10	10	10	130
Other Services KSF**	20	10	20	20	10	10	20	310
K-12 Education KSF**	10	10	10	10	10	10	10	170
Government KSF**	0	10	0	0	0	0	0	40
							Total KSF Increase =>	800
							Avg Anl KSF Incr =>	42

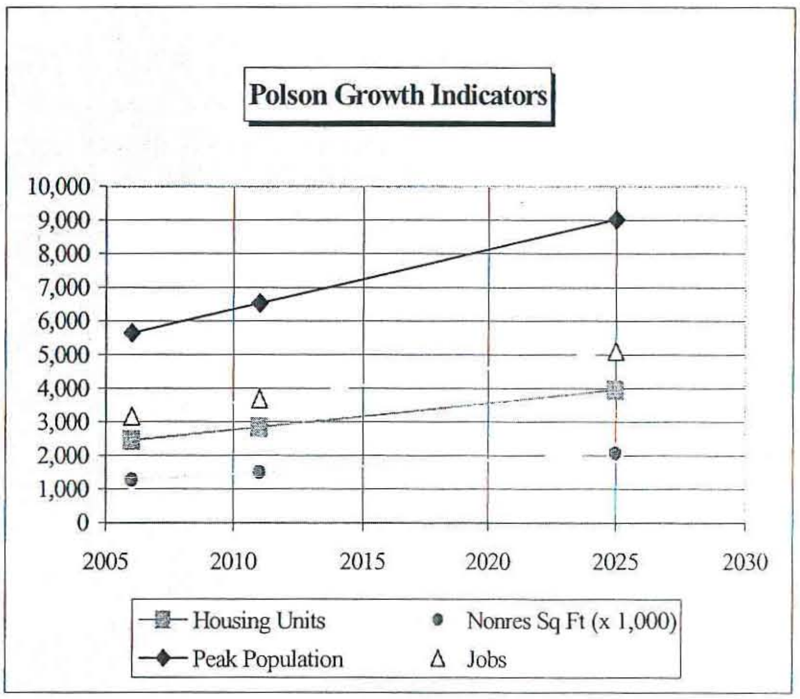
* *The 2000 GQ population is assumed to hold constant.*

** *KSF = square feet of floor area in thousands.*

Key growth indicators for the City of Polson are summarized in Figure A6 (population, housing units, jobs and nonresidential floor area). For the impact fee study, Polson anticipates growth rates averaging approximately 3.2% per year. In contrast, the Polson Growth Policy projected a population growth rate of only 1.6% per year (see page 1-16).

Figure A6 – Summary of Projections

Polson, Montana				2006 to 2025 Average Annual	
	2006	2011	2025	Increase	Growth Rate
Peak Population	5,647	6,533	9,013	177	3.14%
Housing Units	2,453	2,848	3,954	79	3.22%
Jobs	3,170	3,681	5,110	102	3.22%
Nonres Sq Ft (x 1,000)	1,280	1,500	2,080	42	3.29%



APPENDIX B – PASS-BY TRIP ADJUSTMENT FACTORS

Abstract

For commercial developments, trip generation rates are only one of the steps needed to determine traffic impacts. Because commercial developments attract vehicles passing by on adjacent streets, pass-by trip percentages reduce trip generation rates to more accurately assess travel demand. This Appendix documents a methodology for deriving pass-by trip percentages based on the floor area of a commercial development. A fitted curve equation is provided using data from traffic studies published in the second edition of Trip Generation Handbook (ITE, 2004). The recommended methodology is suitable for impact fees, which are derived using average characteristics of the transportation system.

Purpose

Transportation impact fees typically rely on trip generation rates published by the Institute of Transportation Engineers (ITE). For shopping centers, trip generation rates are derived from a formula using floor area as the independent variable. The fitted curve is a logarithmic equation that yields declining vehicle trip rates per thousand square feet as shopping center size increases. However, trip generation alone does not provide a complete evaluation of traffic impacts due to pass-by and diverted trips to commercial developments. Because diverted trips still increase vehicle miles of travel, transportation impact fees apply pass-by trip adjustments or derive the "percentage of new trips" associated with new development (Oliver, 1991; Tindale, 1991). This Appendix provides a methodology for deriving pass-by trip percentages from the floor area of commercial development. The analysis of pass-by trip percentages from traffic studies reported in Trip Generation Handbook (ITE, 2004) indicates a similar relationship to the trip generation formula for shopping centers. This Appendix also specifies the decline in pass-by trip percentages as commercial floor area increases.

Literature Review

The literature review in this section is discussed in chronological order beginning with the 1991 version of Trip Generation. In Table VII-1, pass-by trip percentages were reported for 67 shopping centers ranging in size from 44,000 to 1,200,000 square feet. These data indicate a decline in pass-by trip percentages as shopping center size increases. During 1991 and 1992, ITE also published four journal articles on the topic of pass-by trips and how these adjustments could be applied in the calculation of impact fees.

In March of 1991, Moussavi and Gorman examined how pass-by trip percentages were influenced by building size and the average daily traffic on adjacent streets. Their findings regarding the relationship between average daily trips on adjacent streets and pass-by percentages are not relevant to general impact fee formulas that estimate average travel characteristics for an entire service area. Although limited to an analysis of only 12 sites, their regression analysis did confirm that floor area is a strong predictor of pass-by trips for discount stores, but not grocery stores. Because traditional grocery stores and the more modern day version known as "discount supermarkets" tend to attract more primary trips than other comparably sized stores, this study excludes these development types.

In April of 1991, William Oliver discussed how to determine average trip length from survey data and then use the results in transportation impact fees. A key concept from this article is the idea that impact fees should only assess for the percentage of new trips attributable to new development, after accounting for internal trip capture, diverted and pass-by trips. The methodologies described by Oliver are useful for individual impact fee assessments of large-scale development, but they do not address more universal adjustments for pass-by trips, which is the focus of this research.

In May of 1991, Steven Tindale provided a detailed discussion of various technical issues related to transportation impact fees, including trip capture. The article is similar to Oliver's in advocating original data collection to establish trip rates, lengths and percentage of new trips. However, due to time and budget constraints, most jurisdictions derive impact fees using input variables readily available from regional, state or national sources such as Trip Generation.

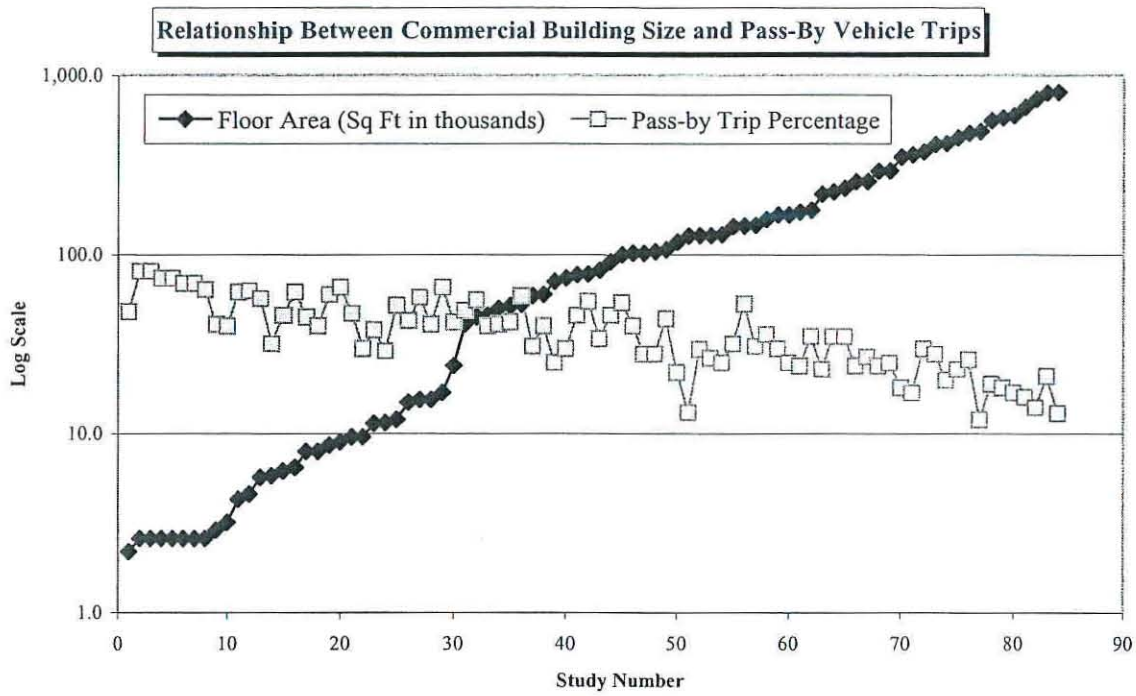
In May of 1992, Moussavi and Gorman provide a follow-up "refinement" to their 1991 article. One of the suggested refinements incorporated into the research presented below, was to use logarithmic, rather than linear regression.

The second edition of Trip Generation Handbook (ITE, 2004), provides a data plot of average pass-by trip percentage based on gross leasable floor area of a shopping center. The fitted curve equation shown in Figure 5.5 indicates a fitted logarithmic curve with an R-squared value of 0.37. The analysis presented below improves the "goodness" of fit, yielding a R-squared value of approximately 0.64.

Analysis

The general relationship between commercial building size and pass-by vehicle trips is illustrated in Figure B1. When commercial floor area, measured in thousands of square feet, is plotted on a log scale and rank-ordered, it is clear that increasing commercial building size decreases the pass-by trip percentage. In other words, small retail establishments, like a convenience store have higher pass-by trip percentages than large regional shopping malls.

FIGURE B1



To improve the correlation between commercial building size and pass-by trip percentage, this study used the following criteria. First, the number of interviews reported by a traffic study had to have at least 96 interviews, which ensures a maximum error of 10% in the mean at a 95% level of confidence (see Appendix B in Meyer and Miller, 2001). Second, the traffic study had to report a specific floor area of at least 1,000 square feet, rather than a floor area range. Third, traffic surveys included in the database are not older than 1989. The studies prior to 1989 include very large shopping centers of approximately one million square feet, which are rarely constructed in the current real estate market. Fourth, for consistency this analysis only includes PM-peak hour data.

Figure B2 provides a summary of the pass-by trip database, indicating types of development, the number of studies for each type, average floor area (in thousands of square feet) and average pass-by trip percentage. Shopping centers account for almost half of the studies and had the largest floor area, averaging 280,000 square feet. In total, the 84 studies analyzed had an average floor area of 159,000 square feet and an average of 39% pass-by trips.

FIGURE B2

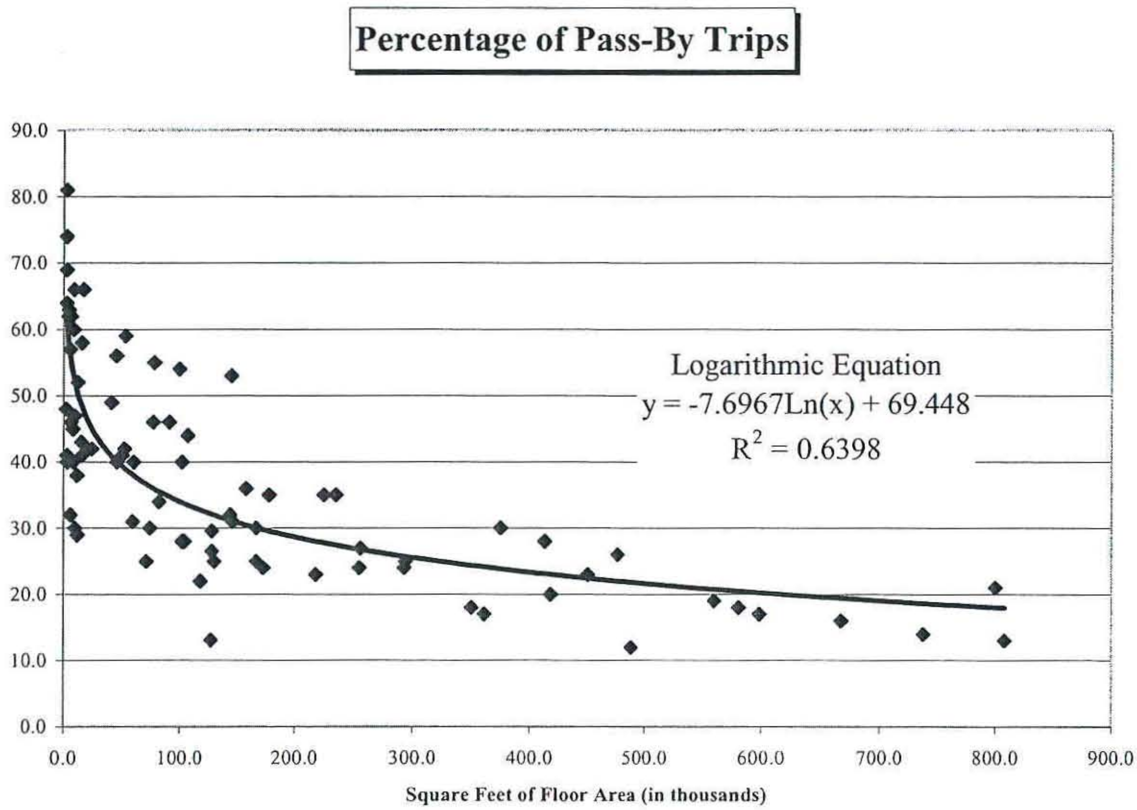
Summary of Pass-By Trips Database

ITE Code	*Description*	*# of Studies*	*AvgSqFt (thousands)*	*AvgPass-By Trip Pct*
813	Free-Standing Discount Superstore	8	151	28
815	Free-Standing Discount Store	3	128	23
820	Shopping Center	40	280	31
843	Automobile Parts Sales	1	15	43
851	Convenience Market	4	3	72
853	Convenience Market w Gas Pumps	4	3	68
862	Home Improvement Superstore	3	99	48
863	Electronics Superstore	1	46	40
880	Pharmacy/Drugstore w/o Window	3	10	47
881	Pharmacy/Drugstore w Drive-Through	3	14	49
890	Furniture Store	2	33	46
931	Quality Restaurant	2	7	54
932	High-Turnover Restaurant	7	8	44
934	Fast-Food with Drive-Through	3	3	48
	TOTAL	84	159	39

Studies in the database meet the following criteria: 1) PM-peak data;
2) Traffic survey in 1989 or afterwards; 3) Floor area at least 1,000 square feet;
4) Sample size of at least 96 interviews, which ensures a maximum error of 10% in the mean at a 95% level of confidence.

Figure B3 indicates a scatter plot of floor area versus percentage of pass-by trips. The best trend-line correlation between pass-by trips and floor area is a logarithmic curve with the equation ((-7.6967*LN(KSF)) + 69.448). The R-squared value for this curve is 0.6398, indicating the floor area accounts for approximately 64% of the variation in pass-by trip percentage.

FIGURE B3



The fitted curve equation allows a specific pass-by trip estimate for any size commercial building. To illustrate the change in trip generation rates and pass-by trips by size of commercial development, Figure B4 provides data for seven building-size thresholds ranging from 10,000 to 800,000 square feet of floor area.

FIGURE B4

Trip Rates and Adjustment Factors by Size Threshold

Floor Area in thousands (KSF)	*Shopping Centers* (ITE 820 Weekday*)		*Shopping Centers* (ITE 820 PM-Peak Hour*)		Commercial Pass-by Trips**	Commercial Trip Adj Factor***
	Trip Ends	Rate/KSF	Trip Ends	Rate/KSF		
10	1,520	152.03	137	13.70	52%	24%
25	2,758	110.32	251	10.03	45%	28%
50	4,328	86.56	396	7.92	39%	31%
100	6,791	67.91	626	6.26	34%	33%
200	10,656	53.28	989	4.95	29%	36%
400	16,722	41.80	1,563	3.91	23%	39%
800	26,239	32.80	2,470	3.09	18%	41%

* Trip Generation, ITE, 2003.

** Based on data published by ITE in Trip Generation Handbook (2004), the best trendline correlation between pass-by trips and floor area is a logarithmic curve with the equation ((-7.6967*LN(KSF)) + 69.448).

*** To convert trip ends to vehicle trips, the standard adjustment factor is 50%. Due to pass-by trips, commercial trip adjustment factors are lower, as derived from the following formula (0.50*(1-passby pct)).

To avoid double counting the same vehicle trip at both the origin and destination points, transportation impact fees typically convert trip ends to trips using a standard adjustment factor of 50%. For commercial development, trip adjustment factors are less than 50% because retail development and some services (like banks) attract vehicles as they pass by on arterial and collector roads. As shown above, for a small-size commercial development with 10,000 square feet of floor area, an average of 52% of the vehicles that enter are passing by on their way to some other primary destination. The remaining 48% of attraction trips have the commercial development as their primary destination. Because attraction trips are half of all trips, the commercial trip adjustment factor is 48% multiplied by 50%, or approximately 24% of the trip ends.

Conclusions

The methodology presented above significantly improves the "goodness" of fit between the independent variable of commercial floor area and the dependent variable of pass-by trip percentage. Commercial trip adjustment factors may be derived for any size commercial building using the recommended logarithmic regression, thus avoiding the use of a simple average pass-by trip percentage for an individual ITE land use code. The recommended methodology also avoids the small sample-size problem that currently exists for most of the ITE land use codes that only provide pass-by data for a limited number of traffic studies. The recommended use of pass-by trip adjustment factors by size of commercial development will improve transportation impact fees that are intended to proportionately allocate the cost of growth-related infrastructure to new development.

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