

Snow & Ice Control

Snow & Ice Control

- Review some facts
- Review some possibilities
- Review policy & snow routes

O'Fallon Snow & Ice Facts

In 2003, City had 136 miles of roadways, in 2011 - 180 miles.

- No snow plow equipment or personnel added since 2003
- 2011 – 46 miles of Snow Routes
- 40 miles of dead-end or cul-de-sac ending roads
- 454 dead-end or cul-de-sac ends

In 2003 the Corporate Area was 11.5 square miles, in 2011 - 14 square miles

Cost of Snow Event Responses:

Avg. Cost per Man-hour Expended in 2011 - \$180/Man-hour
(includes equipment, salt and personnel)

Avg. Cost per Hour of Operation in 2011 - \$1,200/Hour
(includes equipment, salt and personnel)

Avg. Cost per Event (Snow Routes only) - \$30,000

Avg. Cost per Event (Removal from All Streets) - \$100,000

Snow Event History

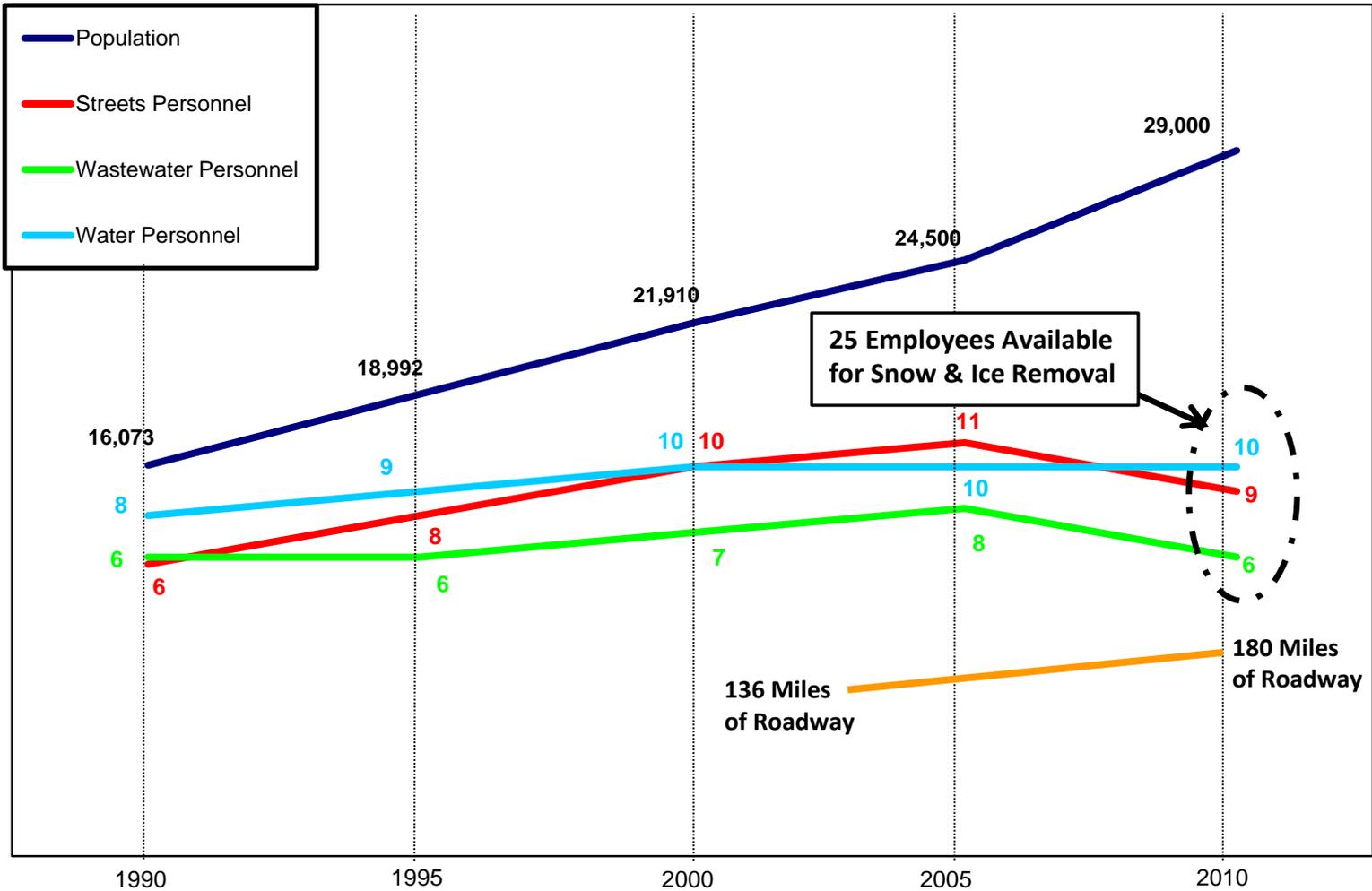
		2010/2011 Summary		2009/2010 Summary		2008/09 Summary		2007/08 Summary		2006/07 Summary	
		Total	Average per Event	Total	Average per Event	Total	Average per Event	Total	Average per Event	Total	Average per Event
1	Regular Hours	824	103	324	36	490	49	542	60.2	173	34.6
2	Overtime Hours	1484	185.5	685	76.1	1321.5	132.2	1922.5	213.6	395	131.7
3	Total Hours	2308	288.5	1010	112.2	1811.5	181.2	2465	273.9	431	143.7
4	Tons of Salt Used	3484	435.5	1370	152.2	1108.5	110.9	3912	434.7	1117	223.4
5	10' Plow Blades Used	44	5.5	27	3	26	2.6	54	6	22	4.4
6	8' Plow Blades Used	0	0	0	0	2	0.2	2	0.2	0	0
7	Est. Ice/Snowfall (in.)	27	3.4	13	1.6	9.8	1.0	25.9	2.9	10.5	2.1
8	Duration of Event (Hrs)	296.5	37.1	130.75	16.3	126	12.6	216.4167	24.0	40.25	13.4
9	Duration of Snow/Ice Fall	122.0	15.3	48.75	5.4	66.9	6.7	125.4167	13.9	18.25	6.1
10	# of mailboxes damaged	3	0.38	3	0.33	6	0.6	12	1.3	2	1
11	# of yards damaged	2	0.25	0	0	2	0.2	6	0.7	3	0.6
		8	Events	9	Events	10	Events	9	Events	5	Events
		2005/06 Summary		2004/05 Summary		2003/04 Summary		2002/03 Summary		Overall Average	
		Total	Average per Event	Total	Average per Event	Total	Average per Event	Total	Average per Event	Average Total	Average per Event
1	Regular Hours	111	55.5	112	28	284	40.6	514.5	51.5	374.9	50.9
2	Overtime Hours	220.5	110.3	268.5	67.1	761.5	108.8	1283	128.3	926.8	128.2
3	Total Hours	331.5	165.8	380.5	54.4	1045.5	149.4	1797.5	179.8	1286.7	172.1
4	Tons of Salt Used	147	73.5	204	51	1260	180	1580	158	1575.8	202.1
5	10' Plow Blades Used	5	2.5	13	3.25	not tracked		not tracked		27.3	3.9
6	8' Plow Blades Used	0	0	0	0	not tracked		not tracked		0.6	0.1
7	Est. Ice/Snowfall (in.)	4.5	2.3	7.5	1.9	9.2	1.3	28	2.8	15.0	2.1
8	Duration of Event (Hrs)	28.25	14.1	34	4.9	108.5	15.5	247	24.7	136.4	18.1
9	Duration of Snow/Ice Fall	6.833333	3.4	16.5	2.4	59	8.4	107	11.9	63.4	8.2
10	# of mailboxes damaged	0	0	1	0.25	2	0.3	10	1	4.3	0.6
11	# of yards damaged	0	0	0	0	1	0.1	15	1.5	3.2	0.4
		2	Events	4	Events	7	Events	10	Events	7	Events

2010-2011 Snow & Ice Event Estimated Costs

	12/12/2010- 12/13/10	12/15/2010- 12/16/10	12/24/10- 12/26/10	1/10/11- 1/12/11	1/19/11- 1/21/11	1/23/11- 1/24/2011**	1/31/11- 2/3/11	2/5/2011
Regular Hours	-	80	-	40	440	0	264	-
Overtime Hours	218	76	153	103	352	45	354	168
labor cost/hr	\$ 24.38	\$ 24.38	\$ 24.38	\$ 24.38	\$ 24.38	\$ 24.38	\$ 24.38	\$ 24.38
Cost of Regular Hours	\$ -	\$ 1,950	\$ -	\$ 975	\$ 10,727	\$ -	\$ 6,436	\$ -
Cost of Overtime Hours	\$ 7,972	\$ 2,779	\$ 5,595	\$ 3,767	\$ 12,873	\$ 1,646	\$ 12,946	\$ 6,144
Personnel Costs	\$ 7,972	\$ 4,730	\$ 5,595	\$ 4,742	\$ 23,600	\$ 1,646	\$ 19,382	\$ 6,144
salt/ton	\$ 55.91	\$ 55.91	\$ 55.91	\$ 55.91	\$ 55.91	\$ 55.91	\$ 55.91	\$ 55.91
Salt Costs	\$ 16,773	\$ 25,160	\$ 11,182	\$ 22,364	\$ 27,955	\$ 4,473	\$ 82,188	\$ 4,696
1 truck hour/every mnhr	\$ 55.13	\$ 55.13	\$ 55.13	\$ 55.13	\$ 55.13	\$ 55.13	\$ 55.13	\$ 55.13
Equipment Costs	\$ 12,018	\$ 8,600	\$ 8,435	\$ 7,884	\$ 43,663	\$ 3,308	\$ 34,070	\$ 9,262
Total Cost for Event	\$ 36,764	\$ 38,490	\$ 25,212	\$ 34,990	\$ 95,218	\$ 9,426	\$ 135,640	\$ 20,102
Avg Cost (Snow Routes Only)	\$ 27,497			Total Cost for 2010-2011 to date				\$ 395,841
Avg Cost (All Streets)	\$ 115,429							

**Note - Does not include Parks and Police hourly costs or overhead,
nor Public Works overhead, admin hours or facility costs.**

O'Fallon Public Works Employees vs Population Change

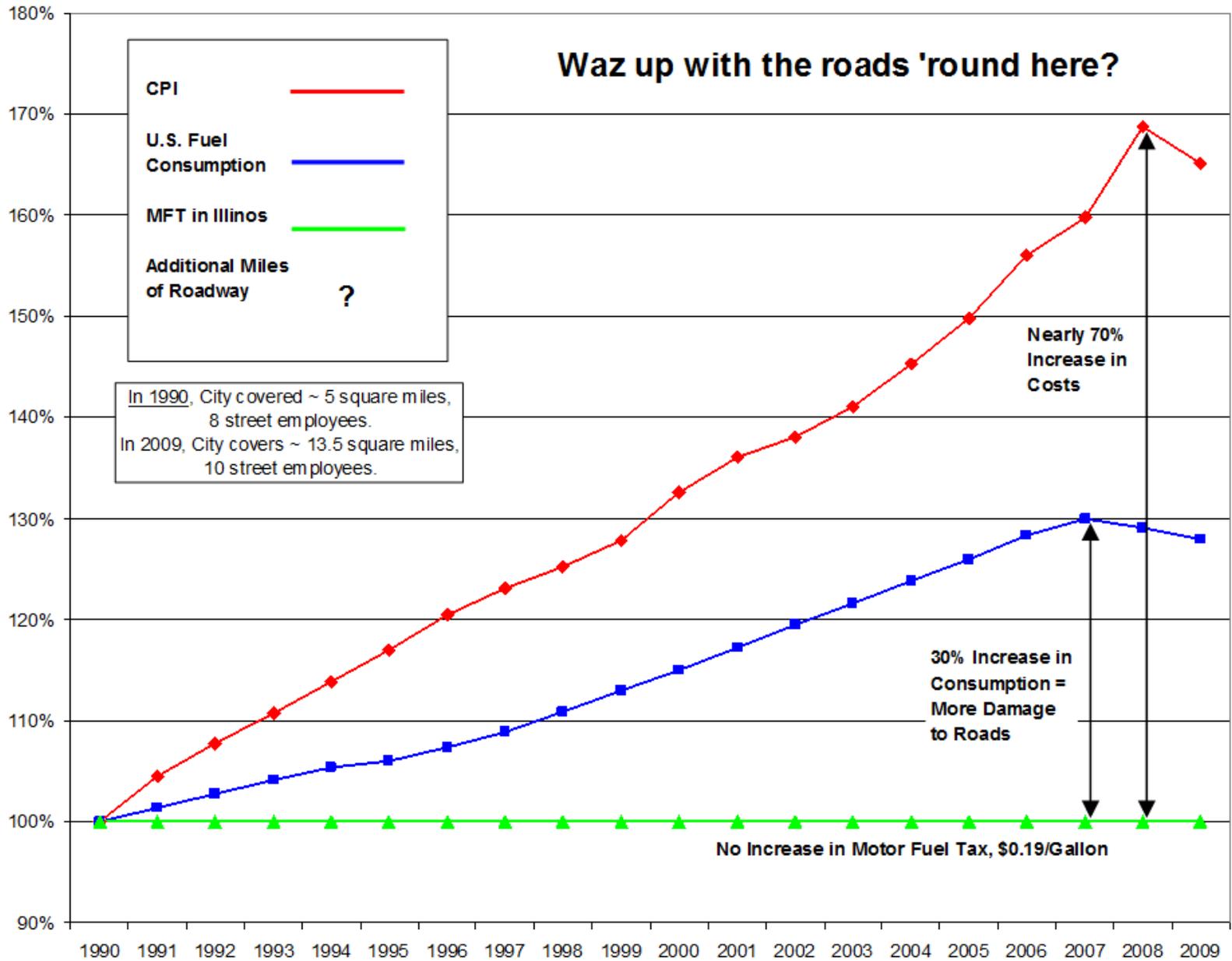


With 25 employees in a Snow & Ice Event –

Notional Distribution of Personnel During Snow & Ice Events		
Shift	# of Employees	Duties
#1	10	8 on Plows, 1 on Salt Loader/Mechanic, 1 Supervisor/Expediter
#2	10	8 on Plows, 1 on Salt Loader/Mechanic, 1 Supervisor
Supplemental	3	Operate Backhoes & 1-ton Dumps to clear Fire Station, PSB, City Hall, Library & downtown parking lots.
	2	WWTP & Water Operations
Total	25	

Item	UNIT NO.	YEAR	VEHICLE / EQUIPMENT	NOTES	COMMENT
1	4	2003	Ford F350 Dumpbed Truck	w/snow plow blade	Minimally used for street snow & ice removal due to manpower shortage.
2	12	2011	Ford F350 Utility Pickup	w/snow plow blade	Minimally used for street snow & ice removal due to manpower shortage.
3	13	2001	International 4900 Dumpbed Trk.	Spreader/Snow Plow	Primary snow & ice control vehicle
4	18	2008	Ford F450 Dumpbed Truck	w/snow plow blade	Minimally used for street snow & ice removal due to manpower shortage.
5	19	2007	Intern'l 7400 Dumpbed Truck	Spreader/Snow Plow	Primary snow & ice control vehicle
6	23	1998	Intern'l 4900 Series Dumpbed Trk.	Spreader/Snow Plow	Primary snow & ice control vehicle
7	24	1999	Intern'l 4900 Series Dumpbed Trk.	Spreader/Snow Plow	Primary snow & ice control vehicle
8	26	1999	Intern'l 4900 Series Dumpbed Trk.	Spreader/Snow Plow	Primary snow & ice control vehicle
9	27	2001	Intern'l 4900 Series Dumpbed Trk.	Spreader/Snow Plow	Primary snow & ice control vehicle
10	40	2005	Intern'l 7400 Dumpbed Truck	Spreader/Snow Plow	Primary snow & ice control vehicle
11	41	2005	Intern'l 7400 Dumpbed Truck	Spreader/Snow Plow	Primary snow & ice control vehicle
12	5	2010	John Deere JD410 SJ Backhoe	w/loader attachment	Minimally used for street snow & ice removal due to manpower shortage.
13	14	2007	John Deere JD310 SG Backhoe	w/loader attachment	Minimally used for street snow & ice removal due to manpower shortage.
14	20	2001	Dodge Ram 2500 Pickup	w/snow plow blade	Used at WWTP.
15	22	2005	John Deere JD310 SG 4 WD backh	w/loader attachment	Used at WWTP.
16	JD 240	2002	JD Skid Steer loader w/attachments		Seldom used for snow & ice removal due to manpower shortage.
17	MG	1994	Motor Grader		Useful for removing hard packed snow; but should be replaced due to age.
18	TC	2007	John Deere Tool Carrier w/Fr. Ldr.		Used to load salt at Public Works Compound.

Waz up with the roads 'round here?



Tax Year 2009 Property Taxes

Market Value	\$ 250,000	Equalized Assessed Value (EAV)*	\$ 77,325
Taxing Authority	Rate (per \$100)	Home in O'Fallon Township	Home in Caseyville Township
St. Clair County	0.9168	\$ 708.92	\$ 708.92
O'Fallon Township	0.0608	\$ 47.01	
O'Fallon Township Road District	0.2677	\$ 207.00	
Caseyville Township	0.1065		\$ 82.35
Caseyville Township Road District	0.1017		\$ 78.64
City of O'Fallon **	0.7580	\$ 586.12	\$ 586.12
O'Fallon District #90	3.0518	\$ 2,359.80	\$ 2,359.80
O'Fallon HS District #203	1.9187	\$ 1,483.63	\$ 1,483.63
Central District #104 **	3.1600		\$ 2,443.47
SWIC District #522	0.3608	\$ 278.99	\$ 278.99
O'Fallon Library	0.1500	\$ 115.99	\$ 115.99
	Total Property Tax Bill	\$ 5,787.47	\$ 5,694.44

* EAV shown is with Owner Occupied Exemption of \$6,000 subtracted from actual Equalized Assessed Value.

** City of O'Fallon Rate is comprised of the Corporate Rate of 0.0365; Illinois Municipal Retirement Fund Rate of 0.0542; Fire Protection Rate of 0.1561; Police Pension Rate of 0.1369; Parks Rate of 0.0900; Social Security Rate of 0.0840; and Emergency Medical Service Rate of 0.2003.

*** Not included in Total Property Tax Bill, for information only.

Distribution of Property Taxes Collected to Streets Budget

Property Tax Distribution to the City's General Fund due to the Corporate Rate (0.0365) which is included in the overall City of O'Fallon Property Tax Rate above is	4.82%	
City of O'Fallon Property Tax Amount from above is	\$	586.12
Amount of O'Fallon Property Tax generated by Corporate Rate that goes into City's General Fund is	\$	28.25
Distribution of General Fund to Streets Budget in 2009 was 19.90%	\$	5.62
O'Fallon Township Road District's Rate in the table above is comprised of a Road & Bridge Tax Rate of 0.0963 of which approximately 44% is distributed to the City of O'Fallon	\$	32.76
Caseyville Township Road District's Rate in the table above is comprised of a Road & Bridge Tax Rate of 0.0103 of which approximately 12% is distributed to the City of O'Fallon	\$	0.96
Home in O'Fallon Township Contribution	\$	38.39
Home in Caseyville Township Contribution	\$	6.58

State of Illinois Income Tax		
Household Income*		\$ 125,000
Adjusted Gross Income (AGI) **	\$ 93,750	Income Tax
State Income Tax Rate **	2.6%	\$ 2,438
Actual Distribution of State Income Tax to City of O'Fallon Per Capita		\$ 91.08
Distribution to General Fund Based persons/domicile ***	3	\$ 273.24
Distribution of General Fund to Streets Budget = 19.9%	19.9%	\$ 54.37
* Assumed to be 50% of home's Market Value.		
** Assumed to be 75% of Household Income		
*** Note - Traditionally persons/domicile in the City of O'Fallon is less than 3.		
State of Illinois Use Tax		
Distribution of State Use Tax to City of O'Fallon Per Capita *		\$ 13.64
Distribution to General Fund Based persons/domicile **	3	\$ 40.92
Distribution of General Fund to Streets Budget = 19.9%	19.9%	\$ 8.14
* Source: State of Illinois Department of Revenue		
** Note - Traditionally persons/domicile in the City of O'Fallon is less than 3.		

City of O'Fallon Cable Television Tax

Cost of Cable Service per Year		\$ 1,000.00
Tax Rate	5%	\$ 50.00
Distribution of Cable TV Tax to General Fund = 100%	100%	\$ 50.00
Distribution of General Fund to Streets Budget = 19.9%	19.9%	\$ 9.95

City of O'Fallon 1/2% Sales Tax (Prop S)

Household Income *		\$ 125,000.00
Household Income Spent on General Merchandise in the City of O'Fallon **	8%	\$ 10,000.00
Tax Rate only on General Merchandise	0.5%	\$ 50.00
Distribution to Streets Budget = 100%	100%	\$ 50.00

* Assumed to be 45% of home's Market Value.

** Assumption based on Family Budget shown below.

City of O'Fallon General Sales Tax

Household Income *		\$ 125,000.00
Household Income Spent on General Merchandise in the City of O'Fallon **	8%	\$ 10,000.00
Tax to O'Fallon, only on General Merchandise ***	1.00%	\$ 100.00
Distribution to Streets Budget = 19.9%	19.9%	\$ 19.90

* Assumed to be 45% of home's Market Value.

** Based on a Family Budget that expends 12% of income on Miscellaneous General Merchandise (clothing, toiletries, recreation, gifts, allowances, etc.) annually, and spends two-thirds (8%) of that amount in O'Fallon.

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Illinois Motor Fuel Tax		
Motor Fuel Tax Rate *		\$0.19 per Gallon
Assume Household Mileage	20,000	miles per year
Vehicle Mileage	22	mpg
Fuel Usage	909.1	gallons
Total Motor Fuel Tax Paid		\$ 172.73
Distribution of Motor Fuel Tax to City of O'Fallon is Per Capita *		\$ 26.33
Distribution to General Fund based on household size **	3	\$ 78.99
Distribution of Funds to Streets Budget = 100%	100%	\$ 78.99
* Source: State of Illinois Department of Revenue. Rate established 1990.		
** Note - Traditionally persons/domicile in the City of O'Fallon is less than 3.		

Homeowners' Contribution to Public Works' Street Division

For Home valued at \$150K, HI of \$75K/Year, 3 occupants

Total Tax Contribution to Streets Budget	
Home in O'Fallon Township Contribution per Year	\$ 215.24
Home in Caseyville Township Contribution per Year	\$ 197.14

For Home valued at \$250K, HI of \$125K/Year, 3 occupants

Total Tax Contribution to Streets Budget	
Home in O'Fallon Township Contribution per Year	\$ 259.74
Home in Caseyville Township Contribution per Year	\$ 227.94

For Home valued at \$400K, HI of \$200K/Year, 3 occupants

Total Tax Contribution to Streets Budget	
Home in O'Fallon Township Contribution per Year	\$ 326.50
Home in Caseyville Township Contribution per Year	\$ 274.13

Snow Operations Comparison

City	Miles of Roadway	Single Axle Plows	Tandem Axle Plows	Other	Miles of Roadway per Plow	Brine System (1)	Grit Use	Comments
Alton	120	12	0	na	10.0	No	No	
Belleville	300	5	4	na	33.3	Yes	No	
Collinsville	160	6	2	na	20.0	Yes	Yes	
Columbia	70	5	1	3	11.7	Yes	No	Other is 2 backhoes, 1 front-end loader for cul-de-sacs
Edwardsville	120	7	1	na	15.0	Yes	No	One truck to apply brine on bridge and hilly roadways; One tandem plow and one budgeted for coming snow season
Fairview Heights	91	4	3	na	13.0	No	No	
Highland	62	7	0	1	8.9	No	Yes	Other is a 4-wheel drive utility tractor w/plow for use in cul-de-sacs
O'Fallon	180	8	0	1	22.5	No	No	Other is a road grader; 46 miles of snow routes
Note: (1) For pretreatment of problem areas								

Possibilities

Dump Truck Comparison



Single Axle (3-ton) Dump Truck
10' Wide Snow Plow Blade



Tandem Axle (10-ton) Dump Truck
11' Wide Snow Plow Blade

Spreader Capacity

Dimensional Chart

	Length	Width	Height	Overall Length	Capacity	Approx. Weight
Single Axle Spreader	8'	84"	51"	118"	5.1 Cu. Yd.	1850
	9'	84"	51"	130"	5.8 Cu. Yd.	1925
Tandem Axle Spreader	10'	84"	51"	142"	6.4 Cu. Yd.	2000
	11'	84"	51"	154"	7.0 Cu. Yd.	2100
	12'	84"	51"	166"	7.7 Cu. Yd.	2190
	13'	84"	51"	178"	8.3 Cu. Yd.	2280
	14'	84"	51"	190"	8.9 Cu. Yd.	2330

With tandem axle dump truck, the spreader capacity increases 60%.

Brine Production System/Application



Hopper/Mixer



Storage



Transfer Pump



Truck Bed Tank



Application

Sand/Calcium Chloride/ Equipment Storage



Deicer Comparison					
Common chemicals for de-icing	Lowest effective temperature	Damage to plants	Soil damage	Water pollutant	Damage to concrete/ metals
Common salt	+15°F	High	High	Yes	Yes
Calcium chloride	-20°F	Medium	Medium	Yes	Yes
Calcium magnesium acetate	+15°F	Low	Low	No	No
Urea	+15°F	Medium	Low	Yes	Yes

- Storage of Snow & Ice Removal equipment needs to be improved.
- Existing spreader rack is subject to elements and as a result corrosion of salt spreaders is excessive.

Calcium Chloride Application

Calcium Chloride Tank

Calcium Chloride—A “Multi-Use” Material

Calcium Chloride may be used in several applications. For the road industry, it offers 3 basic benefits: as a de-icing agent in winter; for dust control/stabilization on rock roads; and as an add mixture (additive) to accelerate the set of ready mix concrete.

Snow Removal

Calcium Chloride is stored in a 30% to 32% solution. It is applied to rock salt (sodium chloride) by either an overhead method (applying the calcium chloride to the top of

the loaded truck) or by an onboard method (applying the calcium chloride through a tank/application system). The onboard application method is more efficient because the material can be metered and applied in proportion to the rock salt application. Calcium Chloride application rates vary between 15 to 30 gallons per ton of rock salt applied to the pavement. Rock salt starts to lose its effectiveness below 20° F. Calcium



Plastic tanks mounted to the side of the hopper store liquid calcium chloride which is sprayed onto the salt as it falls from the conveyor.

Chloride releases heat as it melts allowing effective melting of snow and ice to -15° F. Calcium Chloride may be applied in liquid form as a pre-treatment agent but if it is sprayed too heavily, an oily residue may appear on the pavement.

(cont. on page 4)

Potential Snow Operation Enhancements

	Item	Cost
1	International 7400, 6x4 (Tandem Axle) Dump Truck w/11' Reversible Snowplow, Belly Blade & Pre-Wet System	\$ 135,000
2	International 7400, 6x4 (Tandem Axle) Dump Truck w/11' Reversible Snowplow, Belly Blade & Pre-Wet System	\$ 135,000
3	International 7400, 6x4 (Tandem Axle) Dump Truck w/11' Reversible Snowplow, Belly Blade & Pre-Wet System	\$ 135,000
4	4-wheel Drive Tractor with Snowplow Blade	\$ 70,000
5	Salt Truck Wash Water Reuse System w/Heated Building for Equipment Housing	\$ 100,000
6	Salt Hopper & Mixing System	\$ 30,000
7	10,000 Gallon Storage Tank w/Agitation System	\$ 20,000
8	Sand-Calcium Chloride Storage Tent w/Concrete Floor (40'x50')	\$ 100,000
9	Calcium Chloride Use	3 x Salt Cost?
10	GPS Tracking for 10 Vehicles	\$ 15,000

Policy & Snow Routes



The policy of the City of O'Fallon is to provide snow and ice control on roadway pavements in a safe, timely and cost-efficient manner for its citizens. The following priorities for pavement treatment are set according to public safety needs:

Priority-

1. Emergency vehicle access to designated "Snow Routes."
2. "Snow Routes" as recommended by the Department of Public Works in consultation with the Department of Public Safety and the Fire Department and adopted by City Council.
3. Roadway surfaces serving City, Township, County, State and Federal Facilities.
4. Roadway surfaces serving Schools.
5. Major intersections.
6. Secondary arterial connectors as recommended by Public Works in consultation with Public Safety and Fire and adopted by City Council.
7. Subdivision through streets.

During ice or snow conditions, Public Works will apply de-icers and plow snow based on the following criteria:

1. After-hour callouts for snow and ice control operations will only be made after a Public Safety Supervisor consults with a member of the Public Works Operations Management Team, which includes the Public Works Supervisor, Public Works Operations Manager and Public Works Utilities Supervisor, in that order of call preference. If these individuals are unavailable for consultation, the chain of command then proceeds to the Public Works Director and Public Works Engineering Manager.
2. When snow or ice conditions exist and a Public Safety Supervisor requests Public Works to respond, de-icer will be applied to the pavements as described above in priority order, and will limit that treatment to only the areas requested by Public Safety, unless a Public Works Supervisor authorizes additional treatment.
3. Depending on the pavement conditions and forecast, snow plowing will commence when 2 inches of snow accumulates.
4. When Priority 1 and 2 pavements have been addressed, plowing and de-icing may be terminated by direction of a Public Works Supervisor based on pavement conditions and weather forecast.
5. If pavement beyond Priority 1 and 2 pavements need to be addressed due to conditions and forecast, the Department will address Priority 3 through 6 pavements, plowing and de-icing may be terminated by direction of a Public Works Supervisor based on pavement conditions and weather forecast.
6. Subdivision through streets will only be addressed if snowfall accumulation exceeds depths of 4 inches or more.

In creation of this policy, it must be noted that the motoring public's responsibility by law is to heed the weather and roadway conditions at all times and make appropriate accommodations for them. No governmental unit has the resources to go beyond a reasonable effort to keep its pavements clear due to seasonal and weather-induced conditions.

Exception: The Mayor or City Administrator may direct Department personnel to treat ice and remove snow at other locations dependent upon unique conditions that affect citizens' safety.

Heart of the Snow & Ice Control Policy

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7. Subdivision through streets.

— RSnowRoute_2008

Snow Routes Coverage areas

Truck Numbers

- 13
- 19
- 23
- 24
- 26
- 27
- 40
- 41

