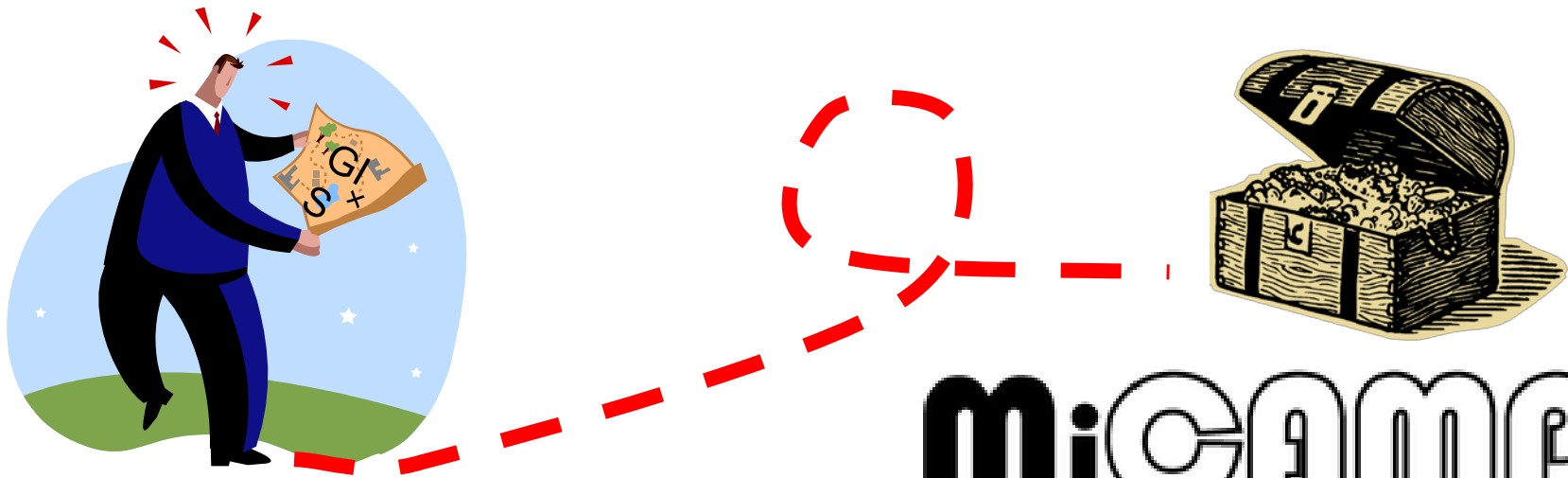


ROI's for GIS – Proving Up Your Department's Worth

*18th Annual
Communities GIS Conference*



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What is an ROI?

- **Return on Investment:** “A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments.” (<http://www.investopedia.com/terms/r/returnoninvestment.asp>)
- ROI = gain from investment / cost of investment

GIS ROI Examples

- King County, Washington
 - 1992 – 2010 derived return estimate of approximately \$775 million
- State of Indiana
 - 200% return on IndianaMap
 - 34:1 three year return on statewide orthoimagery project

GIS ROI Examples

- Top 10 Responding Sectors in Indiana
 - Transportation
 - Utilities
 - Natural Resources
 - Economic Development
 - Engineering/Surveying
 - Planning/Land Use
 - Infrastructure
 - Environmental
 - Wastewater/Storm water
 - Public Safety

Basic Methodology

- Formula

ROI = gain from investment / cost of investment

- Costs – staff, software, facilities, hardware, etc

- Fee Study

- Gains – sale of products/services, economic development, greater productivity

- Internal and External

- Results – prepare for metrics and measurements

- Comprehensive analysis – direct impacts and future expansions

- Problems

- Very complex and hard to read

Fee Study Example

- Some portions of the fee study can be hard to understand

MaxCars - Cost Allocation Module

10/29/2008 06:22:44 AM

ST. JOSEPH COUNTY, MICHIGAN
 LAND RESOURCE CENTRE COST ALLOCATION PLAN
 Schedule .2 - Costs To Be Allocated
 For Department GIS OPERATIONS

LAND RESOURCE
 2008

	1st Allocation	2nd Allocation	Sub-Total	Total
Expenditures Per Financial Statement:	112,894			112,894
Capital Outlay- Equipment	(1,063)			
Total Deductions:	(1,063)			(1,063)
COUNTYWIDE SERVICES	16,095		16,095	
AMORTIZED COSTS	2,167		2,167	
INFO TECH	6,902		6,902	
Total Allocated Additions:	25,164		25,164	25,164
Total To Be Allocated:	136,995	0		136,995

Fee Study Example... confused yet?

MaxCars - Cost Allocation Module
10/29/2008 08:22:44 AM

ST. JOSEPH COUNTY, MICHIGAN
LAND RESOURCE CENTRE COST ALLOCATION PLAN
Schedule .3 - Costs Allocated By Activity
For Department GIS OPERATIONS

LAND RESOURCE CENTRE
2008 Version 1.0002-1

	Total	General & Admin	GIS SYSTEM MAINT	PDF TAX MAPS	PUBLIC INFORMATION
Wages & Benefits					
Salaries & Wages	106,626	22,202	47,997	7,583	14,784
Other Expense & Cost					
Supplies	1,800	0	0	0	0
Operating Expenses	3,005	3,005	0	0	0
*Capital Outlay- Equipment	1,063	1,063	0	0	0
Software	400	400	0	0	0
Departmental Totals					
Total Expenditures	112,894	26,670	47,997	7,583	14,784
Deductions					
Total Deductions	(1,063)	(1,063)	0	0	0
Functional Cost	111,831	25,607	47,997	7,583	14,784
Allocation Step 1					
Inbound- All Others	25,164	25,164	0	0	0
Reallocate Admin Costs		(50,771)	28,262	4,465	8,705
1st Allocation	136,995	0	76,259	12,048	23,489
Allocation Step 2					
2nd Allocation	0	0	0	0	0
Total For 0500 GIS					
Total Allocated	136,995	0	76,259	12,048	23,489

Fee Study Example...some usable results!

Printer and Printer Paper Costs

Printer	Cost	Useful Life	Annual Depreciation	Black & White Print Cartridges (1.5 @ \$130)	Color Print Cartridges (1.5 @ \$88)	Total Annual Printer Cost	Estimated Annual Copies	Cost per Copy
Plotter	\$ 7,000	7	\$ 1,000	\$ 195	\$ 132	\$ 1,327	600	\$ 2.21
Laser Jet	\$ 2,000	5	\$ 400	n/a	\$ 150	\$ 550	2,000	\$ 0.28

Paper	Width / Feet	Length / Feet	Cost per Roll	Per Square Foot
Plotter Paper	3	150	\$ 30	\$ 0.07
Plotter Paper	2	150	\$ 20	\$ 0.07

Note: GIS currently has an old Inkjet Printer. For the purpose of this study we have factored in a Laser Jet replacement.

Fee Study Example – Layer Cost Breakdown

GIS System Costs	\$	97,759
Aerial Photography	\$	15,000
Costs Less Aerials	\$	82,759
Number of Parcels		29,286

<u>Layer</u>	<u>Percent</u>	<u>Cost</u>	<u>Full Cost Per Parcel</u>	<u>Land Resource</u>	<u>Users of Data Layer 911</u>	<u>Local Units</u>	<u>Per Parcel Cost Per User</u>
Parcels	42.0%	\$ 34,759	\$ 1.187	x	x	x	\$ 0.396
Roads	23.5%	\$ 19,448	\$ 0.664	x	x		\$ 0.332
Address Points	22.7%	\$ 18,786	\$ 0.641	x	x		\$ 0.321
Aerial		\$ 15,000	\$ 0.512	x	x		\$ 0.256
Water	4.4%	\$ 3,641	\$ 0.124	x	x		\$ 0.062
<u>Other Miscellaneous</u>	<u>7.4%</u>	<u>\$ 6,124</u>	<u>\$ 0.209</u>	<u>x</u>	<u>x</u>		<u>\$ 0.105</u>
		\$ 97,759	\$ 3.338				

Summary of Cost Allocated by GIS User

<u>Layer</u>	<u>Land Resource</u>	<u>911</u>	<u>Local Units</u>	<u>Total Cost By Layer</u>
Parcels	\$ 11,586	\$ 11,586	\$ 11,586	\$ 34,759
Roads	\$ 9,724	\$ 9,724	\$ -	\$ 19,448
Address Points	\$ 9,393	\$ 9,393	\$ -	\$ 18,786
Aerial	\$ 7,500	\$ 7,500	\$ -	\$ 15,000
Water	\$ 1,821	\$ 1,821	\$ -	\$ 3,641
<u>Other Miscellaneous</u>	<u>\$ 3,062</u>	<u>\$ 3,062</u>	<u>\$ -</u>	<u>\$ 6,124</u>
Total Cost by GIS System User	\$ 43,086	\$ 43,086	\$ 11,586	\$ 97,759
Per Parcel Cost by GIS System User	\$ 1.471	\$ 1.471	\$ 0.396	\$ 3.338

Percent of cost by layer based upon staff effort analysis to maintain the individual layers of the system.



Fee Study Example – Print Costs

GIS Map Cost Summary

Cost Variables:

Printer Costs		(per sq ft)		Customer Svc		(per linear inch)		Printer Costs		Printing Costs		Printing Costs			
Plotter		Paper Costs		Costs		24 Inch Plotter		Laser Jet		Laser Jet		PDF			
\$	2.21	\$	0.07	\$	13.91	\$	0.14	\$	0.23	\$	0.28	\$	1.11	\$	0.70

<u>Paper Width</u>	<u>Length</u>	<u>Printer Costs</u>	<u>Paper Costs</u>	<u>Customer Service</u>	<u>Printing Costs</u>	<u>1st Copy Total Cost</u>	<u>Additional Copies</u>
24	12	\$ 2.21	\$ 0.14	\$ 13.91	\$ 1.68	\$ 17.94	\$ 4.03
24	18	\$ 2.21	\$ 0.21	\$ 13.91	\$ 2.52	\$ 18.85	\$ 4.94
24	24	\$ 2.21	\$ 0.28	\$ 13.91	\$ 3.36	\$ 19.76	\$ 5.85
24	30	\$ 2.21	\$ 0.35	\$ 13.91	\$ 4.20	\$ 20.67	\$ 6.76
24	36	\$ 2.21	\$ 0.42	\$ 13.91	\$ 5.04	\$ 21.58	\$ 7.67
24	42	\$ 2.21	\$ 0.49	\$ 13.91	\$ 5.88	\$ 22.49	\$ 8.58
24	48	\$ 2.21	\$ 0.56	\$ 13.91	\$ 6.72	\$ 23.40	\$ 9.49
24	54	\$ 2.21	\$ 0.63	\$ 13.91	\$ 7.56	\$ 24.31	\$ 10.40
24	60	\$ 2.21	\$ 0.70	\$ 13.91	\$ 8.40	\$ 25.22	\$ 11.31
36	12	\$ 2.21	\$ 0.21	\$ 13.91	\$ 2.76	\$ 19.09	\$ 5.18
36	18	\$ 2.21	\$ 0.32	\$ 13.91	\$ 4.14	\$ 20.58	\$ 6.67
36	24	\$ 2.21	\$ 0.42	\$ 13.91	\$ 5.52	\$ 22.06	\$ 8.15
36	30	\$ 2.21	\$ 0.53	\$ 13.91	\$ 6.90	\$ 23.55	\$ 9.64
36	36	\$ 2.21	\$ 0.63	\$ 13.91	\$ 8.28	\$ 25.03	\$ 11.12
36	42	\$ 2.21	\$ 0.74	\$ 13.91	\$ 9.66	\$ 26.52	\$ 12.61
36	48	\$ 2.21	\$ 0.84	\$ 13.91	\$ 11.04	\$ 28.00	\$ 14.09
36	54	\$ 2.21	\$ 0.95	\$ 13.91	\$ 12.42	\$ 29.49	\$ 15.58
36	60	\$ 2.21	\$ 1.05	\$ 13.91	\$ 13.80	\$ 30.97	\$ 17.06
Laser Jet Maps		\$ 0.28	n/a	\$ 13.91	\$ 1.11	\$ 15.30	\$ 1.39
PDF Maps		n/a	n/a	\$ 13.91	\$ 0.70	\$ 14.61	n/a

Additional copies do not include customer service time



Keep It Simple!

- Standardized surveys – internal and external
- Pre-set metrics and measurements based on questions
- Calculate and disseminate **provable benefits**



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Internal and External Users

- Appraiser
- Central Dispatch/911
- Clerk/Register
- Courts
- Drain Commissions
- Economic Development
- Health
- Law Enforcement
- Prosecutor
- Public Works
- Road Dept / Commissions
- Treasurer
- Zoning/Planning

Municipal GIS Websites

- External efficiencies
 - 24/7 access
- Internal Efficiencies
 - Saved time throughout departments
 - Less time spent responding to inquiries within department
 - Organization wide efficiencies
- Use website analytics for tracking and generating statistics

Berrien County Website Example

beaconTM Berrien County, MI
Welcome Iwinans

Config | General | Resources | Visitors | Activity | Trends | Technical

Stats (Admin)

Yearly

Year	Requests	%	Visits	%
2013	209,424	100.00%	22,968	100.00%

Monthly


Month	Requests	%	Visits	%
2013 January	17,538	8.37%	2,160	9.40%
2013 February	17,608	8.41%	1,989	8.66%
2013 March				11.59%
2013 April				11.49%
2013 May				11.70%
2013 June				12.66%
2013 July				13.90%
2013 August				14.44%
2013 September				6.15%

Summary





Application Name	BerrienCountyMI
Date	Monday, September 16, 2013 4:10:05 PM
Date Range	1/1/2013 12:00:00 AM - 9/15/2013 11:59:59 PM
Total Requests	209,424
Avg Requests / Day	814.88
Total Visits	22,968
Avg Visits / Day	89.37
Avg Requests / Visitor	9.12




Berrien County Website Example

 **Berrien County, MI**
Welcome **hwinans**

[Config](#)
[General](#)
[Resources](#)
[Visitors](#)
[Activity](#)
[Trends](#)
[Technical](#)




Stats (Admin) 

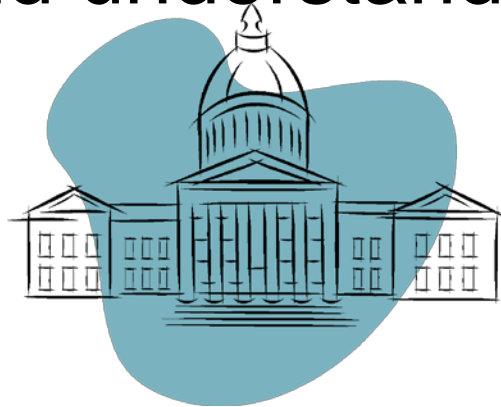
Layers 

Name	Requests	%	Visits	%
Parcels	192,777	92.05%	20,128	68.96%
Survey Townships	14,268	6.81%	8,590	29.43%
Users	888	0.42%	87	0.30%
Tax Sale Properties	569	0.27%	97	0.33%
Roles	129	0.06%	25	0.09%
Site Options	92	0.04%	10	0.03%
Drains	77	0.04%	28	0.10%
Stats	61	0.03%	11	0.04%
Soils	45	0.02%	7	0.02%
Railroads	36	0.02%	5	0.02%
Sections	35	0.02%	14	0.05%
Subdivisions & Condos	33	0.02%	12	0.04%
Municipalities	33	0.02%	18	0.06%
Roads	31	0.01%	13	0.04%
Contours	28	0.01%	3	0.01%
Local Municipal Buildings	27	0.01%	11	0.04%
Image Tiles	27	0.01%	12	0.04%
2011 Aerial Photography	26	0.01%	5	0.02%
Tax Sale Locations	25	0.01%	20	0.07%
Schools	24	0.01%	7	0.02%
Zip Codes	23	0.01%	2	0.01%
Permissions	20	0.01%	10	0.03%
City and Villages	18	0.01%	14	0.05%
Flood Zones	16	0.01%	5	0.02%
Wetlands	16	0.01%	8	0.03%
Cemeteries	15	0.01%	4	0.01%
Commissioner Districts	13	0.01%	6	0.02%
Voter Precincts 2012	12	0.01%	2	0.01%
Water Lines	11	0.01%	4	0.01%
Critical Dunes	8	0.00%	3	0.01%
School Districts	8	0.00%	6	0.02%
Rivers	8	0.00%	5	0.02%
Lakes	7	0.00%	5	0.02%
Lake Michigan	4	0.00%	2	0.01%
Ren Zone	4	0.00%	2	0.01%
2005 Aerial Photography	3	0.00%	2	0.01%
	2	0.00%	2	0.01%
Remonumentation Corners	2	0.00%	2	0.01%
Sewer Lines	1	0.00%	1	0.00%
Sirens	1	0.00%	1	0.00%
2010 Census Blocks	1	0.00%	1	0.00%



Transparency and Communications

- Partnerships and collaborations
- Power from openness
- Provide raw results and methodologies
- Good governance through information and understanding



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Results and Potentials

- Share results and promote GIS awareness to your end-users
 - Municipalities
 - Private Industries
 - Legislature
 - State Departments
- Funding and Support for Services!



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