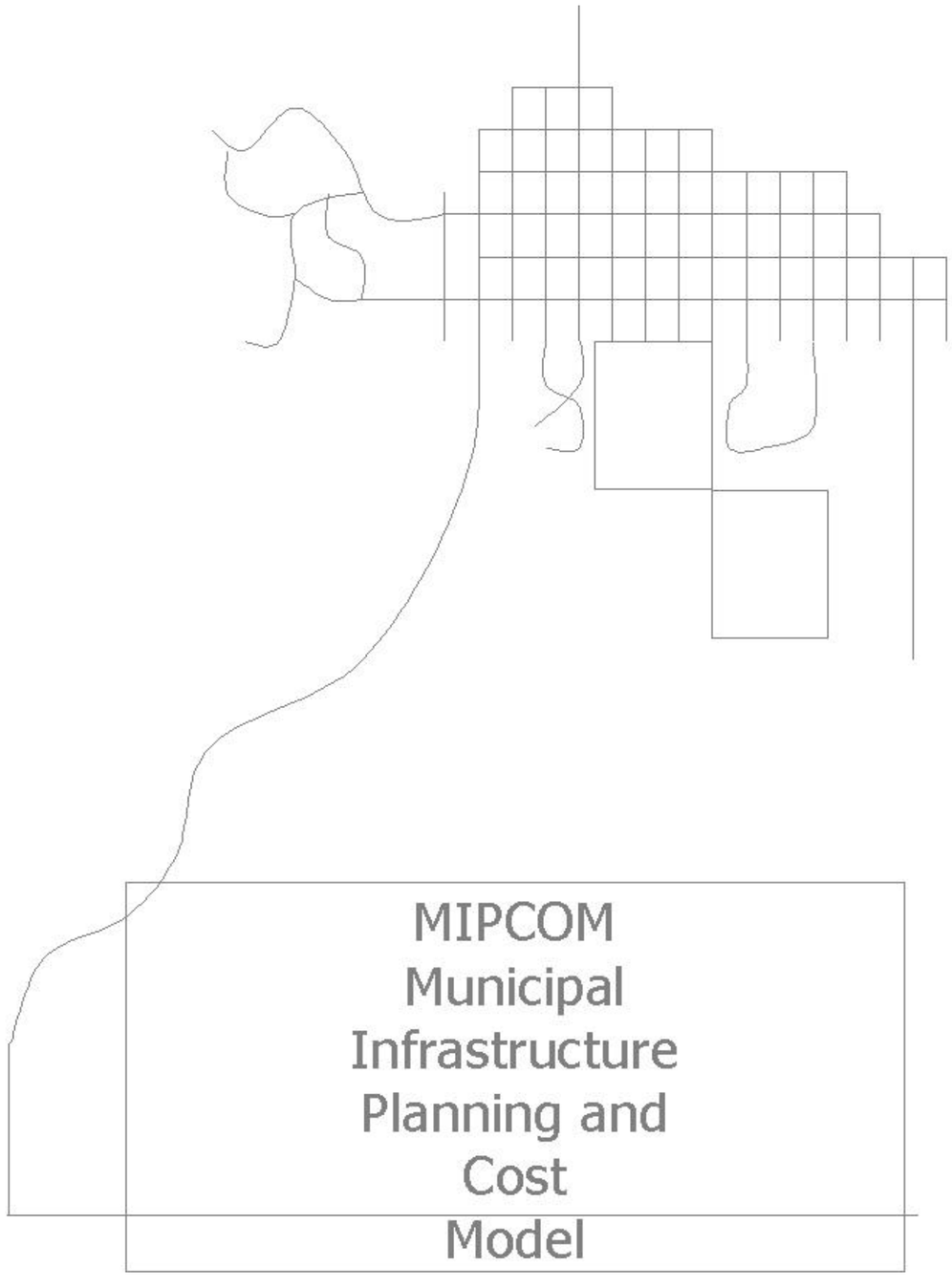


MIPCOM Reference Manual
Version 3
May 2002

MIPCOM, as the name suggests, is an infrastructure planning model to help communities estimate the costs associated with the installation, maintenance, and replacement of roads and utilities in new development. Multiple evaluations using MIPCOM can show how different development methods will impact a community's infrastructure budget.

MIPCOM is not a fiscal analysis program. It cannot provide revenue-based projections for development. It can, however, help planners and community officials understand the costs involved and can show what investments will be necessary to enjoy the benefits of growth.

Obtaining Data to enter into MIPCOM requires effort and coordination between city departments. Please don't delay use of the model due to missing data elements. MIPCOM will operate with rough data estimates until more refined figures are produced. Entering refined data makes MIPCOM results more accurate and more meaningful to a community. However, the model still produces insightful cost estimates when entering quick data estimations.

MIPCOM is structured to receive input for two community scenarios. The first data input represents a community's present day structure, and the second input series represents projections for a future growth scenario. The future growth scenario may be for any future year, and may represent a projection of current zoning and growth trends, or alternative zoning and growth trends.

Accompanying MIPCOM is an Estimators spreadsheet file, which can be used to produce and refine data requirements to be entered into MIPCOM. The Estimators file includes worksheets that address the following data categories: Average block size, street right-of-way average, pavement width average, percentage of streets with curb - gutter and sidewalk, average lot sizes, irrigation area, total development units, and a projection utility. MIPCOM inputs that correspond to the Estimator spreadsheets are indicated by an asterisk (*) symbol.

MIPCOM and its accompanying reference manual are works in progress. Please direct your comments to GOPB - edits and improvements will follow.

Thank you,

Brian Carver
Governor's Office of Planning and Budget
801.538.1153

bcarver@utah.gov

CONTENTS:

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 1 Updated 8/7/2002

Analysis by	Eckhoff & Watkins (DWE Update)		Date	7-Aug-02	
Municipality Name	WOODS CROSS				
Base Year	2002		Planning Horizon (Year)	2010	
Objective	No Annexations				

		2002		2010	
DEMOGRAPHIC DATA					
Population*		7,155		8,717	
No. of Households*		2,142		2,610	
Avg No. of Persons/Household		3.34		3.34	
Employment*		3,532		4,303	
GEOMETRIC DATA					
~~Community Core Parameters~~					
Core Rectangle	Long Side (ft)	10,000		10,700	
	Short Side (ft)	6,712		7,000	
	Core Acres, % of Annexed Area	1,541	64%	1,719	71%
	Effective Percentage		64%		71%
Gross Block Size*	Length (ft)	650		650	
	Width (ft)	250		250	
Or:	Acres				
	Calculated Acres	3.73		3.73	
Estimated Average Street Width (ft)*		55		60	
Lot Coverage Ratio		71.4%		69.0%	
~~Municipal Area & Boundary~~					
Area within City Limits (Acres)		2,405		2,405	
Municipal Boundary Rectangle					
	Long Side (ft)	13,000		13,000	
	Short Side (ft)	8,100		8,100	
	Rectangle Area	2,417		2,417	
Area Not Served by Munic Infra (Acres)		-		-	
(Restricted from developent, etc)					
Effective Area w/in City Limits (Acres)		2,405	#DIV/0!	2,405	#DIV/0!
Adjusted Rectangle		-	#DIV/0!	-	#DIV/0!
~~Peripheral Zone Parameters~~					
Estimated Avg Road Interval (Miles)		0.25		0.25	
Percent Arterial Grade		25%		75%	
Upgrade Cost per Lineal Foot*		$ 40.00		$ 40.00	

MIPCOM Copyright Restrictions

1. MIPCOM is free to the public in the state of Utah. The software is intended for use by government organizations, private non-profit organizations, and special service districts.

2. MIPCOM is not to be transferred from one organization to another. MIPCOM may be obtained by request from the Utah Governor's Office of Planning and Budget (GOPB) at http://www.governor.utah.gov/Planning/Mipcom.html, or by calling GOPB at 801.538.1153, or 1-801.538.1027.

3. MIPCOM may be used by private planning consultants, engineering consultants, developers, and other private interests under the following conditions:

   - MIPCOM may not be sold to any group or entity within Utah or outside of the state.
   - Consultants may not charge a fee for use of the MIPCOM model.
   - Time may be billed for helping a community or an organization collect data and run growth scenarios using MIPCOM.
   - Consultants and developers may use MIPCOM to measure the costs of development concepts or proposals.
   - If requested, consultants or developers using MIPCOM to project development costs of a new subdivision or community must provide MIPCOM files to the local jurisdiction (free of charge) in which the studied development is proposed to occur. The local government may then use MIPCOM to compare and verify data and figures contained in these files.
   - If requested, consultants or developers using MIPCOM to project development costs of a new subdivision or community must provide MIPCOM files (free of charge) to the organizations that will provide services to the new development, be it infrastructure, emergency, or sanitary. These entities may then use MIPCOM to compare and verify data and figures contained in these files.
   - MIPCOM may not be reproduced, manipulated, or repackaged by any organization.

Suggestions or requests for improvements may be directed to GOPB.

INTRODUCTION

SYSTEM REQUIREMENTS

MIPCOM requires the commonly available Microsoft Excel or Corel Quattro Pro 9 computer software to perform its calculations. It also requires some simple geometric data that can be obtained with a scaled map of your community and a ruler. These materials are used to create a conceptual rectangle of your community's approximate area.

WHAT TO EXPECT FROM MIPCOM

Blue cells
Are where you enter the information specific to your community.

Red cells
Display calculated results for observation and verification.

Yellow cells
Contain default data that can be customized to fit your community's actual costs.

Fields with an asterisk (*) have corresponding Estimator Tools to help you calculate the figures MIPCOM requires for that particular input.

PASSWORD PROTECTION

The MIPCOM workbook is password protected to prevent the included formulae and operations from becoming corrupted. Please remember to use the 'Save As…' command to create a new copy of the file after you have made any desired changes to the worksheets. Any cells that do not require input from the user are also locked to prevent disruption.

HIDDEN CELLS AND SHEETS

In the Microsoft Excel version of MIPCOM, some columns within the input modules as well as two separate worksheets are hidden from view. These hidden members perform the analysis and calculations MIPCOM uses to project costs based on the data scenarios provided. The calculations are locked out of view only to maintain the visual simplicity of the MICPOM input modules. Hidden sheet features are already viewable in Corel Quattro Pro 9, though some columns may still remain hidden. If you wish to examine the calculations behind the output, copies of the hidden material are available by request.

EXAMPLE

The MIPCOM file you are viewing as well as the examples provided in this manual display a scenario evaluated for Woods Cross City, Utah. All the information in blue fields must be replaced with data relevant to your specific community in order to provide accurate results.

Check http://www.governor.utah.gov/Planning/Mipcom.html for updates.

Input Module 1
(Population & Community Development Parameters)

DEMOGRAPHIC DATA

Population:

Enter the current community population, and a future population projection.

Population & Population Projections for Utah's Cities - Year 2000 to 2030:

Year 2000 Census data with population projections by community is available from GOPB, DEA (Demographic and Economic Analysis):
http://governor.state.ut.us/dea/demographics/2000FinalPublish.pdf

You may also use the Projection utility in the Estimators file to project a future population. See Page 24 in this manual for more information on Projections.

No. of Households by City:

Year 2000 Social and Economic Characteristics Census data contains these figures for both city and county.
http://www.governor.state.ut.us/dea/Demographics/2000_Census_Data/2000_census_data.html

Select: **Demographic Profiles for Utah's Counties and Cities**
This census data indicates households by single family or multiple groupings. To project a future year household figure, divide the projected population by the current household average size (available from DEA's projections on the web at: (*http://governor.state.ut.us/dea/demographics/2000FinalPublish.pdf*). You may also use the Projection utility in the Estimators file to calculate the future number of households.

Employment:

Enter non-farm employment within the community. You may wish to conduct your own community analysis of businesses to determine city non-farm employment. The Department of Workforce Services Data offers a statewide report of estimated employment by Utah Department of Transportation (UDOT) Traffic Zones. A community may wish to compare traffic zones to current city boundaries, and add or subtract employees based on commercial units that may or may not be contained within the city boundary. This may require a windshield survey of the community boundary. This report is available at:
http://jobs.utah.gov/wi/pubs/EM/AnnualReport/00annual/table1800.pdf

Or

http://censtats.census.gov/cbpnaic/cbpnaic.shtml by zip code.

Another source option is to contact a data collection company such as InfoUSA at 1-888-260-8244. InfoUSA provides number of employees and businesses by zip code throughout the United States and internationally. Info USA's data collection techniques differ from the Utah Department of Workforce Services. The charge varies according to volume of data purchase and regular subscription to the company. Records may cost 20 cents each (per business or agency).

Communities in Cache County may obtain employment by community from Cache County Planning and Development Office, Socio-Economic Characteristics Report.

Communities in Weber, Davis, and Salt Lake Counties may refer to Wasatch Front Regional Council, Socio-Economic Characteristics Reports to obtain employment data at: http://www.wfrc.org/resources/resources.htm

Employment Projection
The Estimators Projections utility estimates employment from year 2000 to current year or a future year projection, by dividing the current population by current employment to derive "employees per capita." It then multiplies 'employees per capita' by the projected population.

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL
Input Module 1 Updated 8/7/2002

Analysis by	Eckhoff & Watkins (DWE Update)	Date	7-Aug-02	
Municipality Name	WOODS CROSS			
Base Year	2002	Planning Horizon (Year)	2010	
Objective	No Annexations			

		2002		2010	
DEMOGRAPHIC DATA					
Population*		7,155		8,717	
No. of Households*		2,142		2,610	
Avg No. of Persons/Household		3.34		3.34	
Employment*		3,532		4,303	
GEOMETRIC DATA					
Community Core Parameters					
Core Rectangle	Long Side (ft)	10,000		10,700	
	Short Side (ft)	6,712		7,000	
	Core Acres, % of Annexed Area	1,541	64%	1,719	71%
	Effective Percentage		64%		71%
Gross Block Size*	Length (ft)	650		650	
	Width (ft)	250		250	
	Or: Acres				
	Calculated Acres	3.73		3.73	
Estimated Average Street Width (ft)*		55		60	
Lot Coverage Ratio		71.4%		69.0%	
Municipal Area & Boundary					
Area within City Limits (Acres)		2,405		2,405	
Municipal Boundary Rectangle					
	Long Side (ft)	13,000		13,000	
	Short Side (ft)	8,100		8,100	
	Rectangle Area	2,417		2,417	
Area Not Served by Munic Infra (Acres)		-		-	
(Restricted from developent, etc)					
Effective Area w/in City Limits (Acres)		2,405	#DIV/0!	2,405	#DIV/0!
Adjusted Rectangle		-	#DIV/0!	-	#DIV/0!
Peripheral Zone Parameters					
Estimated Avg Road Interval (Miles)		0.25		0.25	
Percent Arterial Grade		25%		75%	
Upgrade Cost per Lineal Foot*		$ 40.00		$ 40.00	

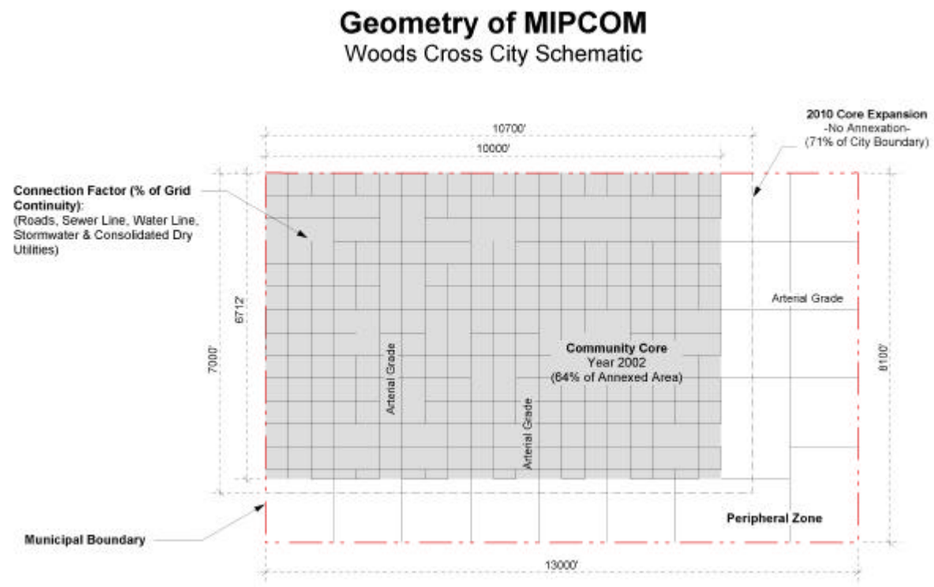
GEOMETRIC DATA

Community Core Parameters

Community Core:

The community core area refers to a community's central developed land area. The core is comprised of building units that share streets, water lines, or sewer lines in an adjacent or relatively adjacent configuration. Core development is a continuum of uses such as residential, commercial, industrial, and institutional building units, parks & cemeteries, golf courses, and utilities including power plant and storage facilities. Agricultural and vacant lands are not counted as part of a community core unless they are virtually surrounded or severely interrupted by developed land uses.

Using an engineering scale and a scaled map of your community, draw a rectangle that averages the developed land area within community boundaries, similar to the image below. If development is serviced outside of the community boundary, include these areas as part of the total core rectangle. As a refined technique, multiple rectangles or triangles may be drawn to represent the total core development area. This process requires more time to calculate the area of each shape, but offers more precision in a total area estimate. Ultimately, MIPCOM will abstract your community's geometry into a rectangle with a long and short side, consisting of a smaller 'Community Core' rectangle surrounded by the community's "Peripheral Zone." This rectangle is used to compute road and pipe lengths as well as developable community area.



Do not include isolated building units beyond the urban fringe, or streets with water and sewer lines with sparse development that are separated from the core developed area (piped streets without development are calculated in Input Module 4). For communities that run their mapping on a GIS or CADD system, a polygon(s) may be traced over the community core as a vector shape in the mapping software program. In any of the described methods of area calculation, it is helpful to refer to recent aerial photographs to determine developed land areas within a community.

If multiple shapes are used, add each of the shape's area to create the total area of the community core. Some communities may have several community cores due to a clustered, polycentric development pattern. In this case, each community core area should be added together to create one total area. MIPCOM requires a simplified rectangle to represent the total area, defined by a short side and a long side of a rectangle. Do not enter the square

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 1 Updated 8/7/2002

Analysis by	Eckhoff & Watkins (DWE Update)	Date	7-Aug-02	
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		2002		2010	
DEMOGRAPHIC DATA					
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~~Community Core Parameters~~					
Core Rectangle	Long Side (ft)	10,000		10,700	
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	Core Acres, % of Annexed Area	1,541	64%	1,719	71%
	Effective Percentage		64%		71%
Gross Block Size*	Length (ft)	650		650	
	Width (ft)	250		250	
	Or: Acres				
	Calculated Acres	3.73		3.73	
Estimated Average Street Width (ft)*		55		60	
Lot Coverage Ratio		71.4%		69.0%	
~~Municipal Area & Boundary~~					
Area within City Limits (Acres)		2,405		2,405	
Municipal Boundary Rectangle					
	Long Side (ft)	13,000		13,000	
	Short Side (ft)	8,100		8,100	
	Rectangle Area	2,417		2,417	
Area Not Served by Munic Infra (Acres)		-		-	
(Restricted from developent, etc)					
Effective Area w/in City Limits (Acres)		2,405	#DIV/0!	2,405	#DIV/0!
Adjusted Rectangle		-	#DIV/0!	-	#DIV/0!
~~Peripheral Zone Parameters~~					
Estimated Avg Road Interval (Miles)		0.25		0.25	
Percent Arterial Grade		25%		75%	
Upgrade Cost per Lineal Foot*		$ 40.00		$ 40.00	

root of the total area as a short side and long side measurement unless the shape of the community resembles a perfect square in reality. Rather, divide the total square feet by an estimated long side to derive a short side. These lengths should proportionately represent the community and its core, or in the case of multiple cores, the rectangular proportions should reflect the average shape of each community core. Enter these amounts into the Long Side (ft), and Short Side (ft) cells. MIPCOM will automatically generate acres based on the length of two sides.

Area Calculations:

- Area (square feet) of a Rectangle = Length ft. x Width ft.
- Area (square feet) of a Triangle = Area of a Rectangle ÷ 2 (Double the size of the triangle to create a rectangle, measure size of rectangle, then divide by 2)
- Acres = Total area (square feet) ÷ 43,560 square feet

Gross Block Size:

This figure represents the average distance between street intersections. This entry allows the MIPCOM to establish street coverage in the urban core. Determining an average gross block size can be somewhat challenging due to evolving zoning standards from a community's original settlement pattern. For example, most Utah communities have a traditional block system in the older community center (roughly 660' x 660'), and newer development patterns surrounding the historic core with smaller block size averages. Commercial and industrial developments might occur on larger block areas, creating a larger distance span between intersections.

To account for this variability in average block size, a weighted block size average can be calculated using the Gross Block Size Estimator (included as Estimator #1 on the accompanying Excel File "Estimators"). This tool requires the following entries: Total area of each development district, and the average span between street intersections for each development district or block type. The estimator calculates a weighted average figure that may then be entered into the MIPCOM model. You may initially enter a rough estimate that represents your community type and refine the average block size later. A community with a pioneer grid in the center of town might enter 500 ft. by 500 ft. as a generalized length and width distance. Suburban communities such as the city of Woods Cross that do not have an older town grid at the core might enter the gross block size at 650 ft. by 250 ft.

Refining the average block size will increase MIPCOM's accuracy in estimating the community's existing infrastructure value. See the section in this manual on Gross Block Size for more assistance in calculating this figure.

Estimated Average Street Width:

This figure represents a community's average road right–of–way R-O-W width. This width may vary by neighborhood district just as gross block sizes vary by age of a district (see Gross Block Size). The road right-of-way estimator - Estimator #2 on the 'Street R-O-W, Pavement' Estimator worksheet - aids in determining a weighted R-O-W average in a community that may be entered into MIPCOM. Refer to the Average Street Width – R-O-W section of this manual for additional help in determining this value for your community.

If you are in a hurry and would like to refine your community's R-O-W width later, you might enter the average estimate of Cache County municipalities at 72.5 feet (Based on a 1997 windshield survey of the Logan/Cache County urbanized corridor). This figure combines wider historic street widths with modern suburbs. For communities that do not have an early settlement pattern and are mainly comprised of suburban type subdivisions, 56 to 60 feet is a good average estimate.

Municipal Area & Boundary

Area Within City Limits:

Create a rectangle that averages the area contained within incorporated city limits (or add the area of a series of rectangles and triangles). Your community engineer might have this information, and it may also be available from Utah's AGRC (Automated Geographic Referencing Center), which has a GIS shape file of all municipal boundaries and county boundaries in the state. Divide the square feet of the city into an average long side and an average short side length that proportionally represents the average city limits in a rectangular shape.

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 1 Updated 8/7/2002

Analysis by	Eckhoff & Watkins (DWE Update)	Date	7-Aug-02	
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Base Year	2002	Planning Horizon (Year)	2010	
Objective	No Annexations			

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DEMOGRAPHIC DATA					
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Employment*		3,532		4,303	
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~~Community Core Parameters~~					
Core Rectangle	Long Side (ft)	10,000		10,700	
	Short Side (ft)	6,712		7,000	
	Core Acres, % of Annexed Area	1,541	64%	1,719	71%
	Effective Percentage		64%		71%
Gross Block Size*	Length (ft)	650		650	
	Width (ft)	250		250	
Or:	Acres				
	Calculated Acres	3.73		3.73	
Estimated Average Street Width (ft)*		55		60	
Lot Coverage Ratio		71.4%		69.0%	
~~Municipal Area & Boundary~~					
Area within City Limits (Acres)		2,405		2,405	
Municipal Boundary Rectangle					
	Long Side (ft)	13,000		13,000	
	Short Side (ft)	8,100		8,100	
	Rectangle Area	2,417		2,417	
Area Not Served by Munic Infra (Acres)		-		-	
(Restricted from developent, etc)					
Effective Area w/in City Limits (Acres)		2,405	#DIV/0!	2,405	#DIV/0!
Adjusted Rectangle		-	#DIV/0!	-	#DIV/0!
~~Peripheral Zone Parameters~~					
Estimated Avg Road Interval (Miles)		0.25		0.25	
Percent Arterial Grade		25%		75%	
Upgrade Cost per Lineal Foot*		$ 40.00		$ 40.00	

Peripheral Zone Parameters

Estimated Avg Road Interval, Miles:

This entry requirement could be restated as "the average gross block size in the peripheral zone." The peripheral zone is the area outside of the urban core, and within city boundaries. Looking at your community map, measure the distance between street intersections (do not count dirt roads) and enter the average distance in miles (Miles = 5280 feet). Most peripheral roads are equal divisions of a square mile grid system, such as every ⅛ mile or ¼ mile.

Percent Arterial Grade:

This percentage expresses the amount of peripheral roads that have been upgraded to at least three lanes width to accommodate heavier traffic flow. Enter an estimated percentage figure, or measure the total length of arterial grade roads in the peripheral zone, and divide that figure by the total length of improved roads in the peripheral zone.

Upgrade Cost per Lineal Foot:

This cell contains a default cost figure required to upgrade a road to arterial status – from two lanes to three or more lanes. You may enter another estimated cost per lineal foot to upgrade from a standard two-lane road to arterial grade road. Some community's might upgrade from two lanes to a greater average than three lanes. Slopes and wetlands may increase the average road upgrade cost. Consult with your engineer to determine average costs.

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL

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Estimated Average Street Width (ft)*		55		60	
Lot Coverage Ratio		71.4%		69.0%	
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	Rectangle Area	2,417		2,417	
Area Not Served by Munic Infra (Acres)		-		-	
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Effective Area w/in City Limits (Acres)		2,405	#DIV/0!	2,405	#DIV/0!
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Estimated Avg Road Interval (Miles)		0.25		0.25	
Percent Arterial Grade		25%		75%	
Upgrade Cost per Lineal Foot*		$ 40.00		$ 40.00	

Input Module 2

(Community Land Use Parameters & Street Data)

This module may require windshield survey of your community to account for all land uses. A useful approach is to enter a best estimate to begin with, and then refine the data over time. MIPCOM shows a sum total of residential and non-residential land use acreage in the community core for a reference. This number should be 25% to 35% less than the community core area estimate shown in Input module 1. This difference is due to a deduction of the street right-of-way area from the community core, based on the data entered into Input Model 1.

To project future land use development units, use the Estimator Projection utility. The Projection utility calculates the ratio of non-residential land uses relative to current and future population estimates. These numbers may be used to project current standards into future scenarios. If different ratios or standards are desired in the future, further study and assumptions may be applied. See page 24 describing the Projection utility for more details.

All data input into this module is for the community core area only!

LAND USE DATA

Residential

The Census Bureau recently released housing units by single-family units or multi-family units in June of 2002. This data is found in the Census Bureau's year 2000 Profile of General Demographic Characteristics at: http://censtats.census.gov/pub/Profiles.shtml Look on Table DP-4 under "Total Housing Units," and "Units by Structure."

To aid in determining the average lot size of each of the following land use categories, use the Average Lot Size Estimator (#5) from "Estimators" Excel file. This exercise requires total acres of a land use, as well as the total number of units within the land use(s). Vacant area and total number of vacant lots is also required input to produce an accurate reading of the community core. See the Average Lot Size section on page 21 for more details.

Single Family Data:

Enter the total number of single-family residential units in the community, followed by the average lot size of these units.

Multi Family Data:

Enter the total number of multi-family residential units in the community, followed by the average lot size of each unit. A four-plex unit on a ½ acre lot would be .125 acres per unit. The Average Lot Size Estimator requires total buildings as an input as well as the average number of units.

Vacant Parcels Data:

This may require a drive through the community with property plats to note which lots are vacant. An easy method of estimating vacant parcels is look at a recent aerial photograph of the community, calculate the acres, and divide the acres by an estimated average vacant lot size. If you have parcel data available, identify vacant lots, calculate the area, and divide the total vacant acreage area by total number of vacant lots seen on the parcel maps. The Average Lot Size Estimator aids in making these calculations.

Inst and Open Space (Acres):

Enter the total acreage devoted to institutional and open space such as school sites, parks, cemeteries, city and county buildings, public works buildings, etc.

Non-Residential

Retail Commercial:

Enter the total number of retail commercial units and the total land area of retail commercial usage. The Average Lot Size Estimator produces an average lot size for total retail commercial buildings and retail commercial units and accounts for shopping complexes with multiple stores or tenants – (each tenant or business entity will count as one unit). The average lot size per units figure may then be entered into MIPCOM.

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 2

Municipality Name	**WOODS CROSS**		**Date**	**7-Aug-02**		
	2002		**2010**			
COMMUNITY CORE LAND USE DATA*					**TOTALS**	
~~**Residential***~~	**Units**	Acres	**Units**	Acres	**Units**	Acres
No. of Residentail Units						
Single Familly	1,666	573	1,981	614	314	41
Est Avg Lot Size (Ac/D	0.34		0.31			
Multifamily	400	50	573	72	173	22
Est Avg Lot Size (Ac/D	0.13		0.13			
Est No. of Vacant Parcels	85	29	68	23	(17)	(6)
Est Avg Lot Size (Ac/P	0.34		0.34			
Est Inst and Open Space (Acres)	100	100	123	123	23	23
Total Residential Zone Acreage	752		832			80
~~**Non-Residential***~~						
No. of Com & Ind Units						
Retail Commercial	96	77	126	101	30	24
Est Avg Lot Size (Ac/U	0.80		0.80			
Office Commercial	52	42	73	58	21	17
Est Avg Lot Size (Ac/U	0.80		0.80			
Other: Transpo Corridors, etc.	2	75	3	120	1	45
Est Avg Lot Size (Ac/P	37.50		40.00			
Industrial	24	61	28	71	4	10
Est Avg Lot Size (Ac/U	2.55		2.55			
Est No. of Vacant Parcels	10	100	6	60	(4)	(40)
Est Avg Lot Size (Ac/P	10.00		10.00			
Total Acreage	355		411	411		56
~~**Total Acreage Above**~~	1,107	72%	1,242	72%		136
Difference from Net in Core Rectangle	(3)		(3)			
Manual Adjustment (Acres)	3		3			
STREET SYSTEM DATA						
~~**Streets**~~ **Conn Factor =**	80.0%		80.0%	smoothed		
Installed Cost per Lineal Foot =	$ 40.00		$ 40.00			
~~**Curbs, Gutters & Sidewalks**~~						
Percent of Streets w/C, G & S* =	90%		90%			
Installed Cost per Lineal Foot =	$ 14.00		$ 14.00			

Office Commercial:
Follow the same procedure as outlined for Retail Commercial.

Other Land Uses:
This category includes the total acreage of other land uses not included in typical land use categories, including railroad rights of way, airports, freeway rights of way, etc.

Industrial:
Follow the same procedure as outlined for Retail and Office Commercial.

Total Acreage Above
MIPCOM allows you to compare the difference of total residential and non-residential acreage to the estimated core developed area. This number should be 25% to 35% less than the community core area estimate shown in Input module 1. This difference is due to a deduction of the street right-of-way and any other undevelopable land area from the community core, based on the data entered into Input Model 1. If the figures vary significantly, you may wish to double check the land use area data, or check the urban core area measurement. Refine the acreage inputs into the Urban Core Land Use Data until the acreage appropriately matches the community core. The closer the match, the more accurate MIPCOM's results will be.

The total can be manually adjusted but is only acceptably accurate when the Difference from Net in Core Rectangle is less than eight [8]. To manually adjust, enter the positive or negative opposite of the number displayed as the Difference from Net in Core Rectangle. For example, if a three [3] is displayed, enter a minus three [-3] in the Manual Adjustment cell and vice versa for a negative number displayed. Please note that MIPCOM will display a negative value as a number in parentheses, i.e., in our Woods Cross example the Difference from Net figure is minus three [-3] and appears on the spreadsheet as (3).

STREET SYSTEM DATA
Data entered into this section allows MIPCOM to generate the replacement value of existing infrastructure. You may leave the yellow cell default values, or adjust the values after consulting with your community engineer or public works departments.

Streets
Conn Factor:
The connection factor refers to a community's percent of street connectivity, or the percent of streets that join to another street at an intersection. Streets that do not join into another street include those that terminate due to topography or water barriers, dead ends, cul-de-sacs, etc. 80% represents an average community's street connection factor, meaning that 80% of the streets connect to other streets in the street network. You may wish to analyze a community street map to determine a connection factor for your community.

Installed Cost per Lineal Foot:
This figure represents the average cost per linear foot of road based on a single paved lane, twelve feet in width. You may enter a different estimated cost of road per lineal foot depending on your individual community costs.

Curbs, Gutters & Sidewalks
Percent of Streets w/C, G & S:
Enter the percentage of streets that have curb gutter and sidewalk. This figure should not be left at the default percentage due to great variability in community street improvements. You may wish to drive around the community with a road map and indicate with colored markers streets that contain curb, gutter, or sidewalk improvements. Each color should represent a different level of improvement to a street. After taking this inventory, total the distances of streets by similar improvement categories, such as total streets with curb, gutter & sidewalk, total streets without curb, gutter & sidewalk, or streets that may only have a sidewalk on one side, or streets with curb and gutter on one side of the street only. Enter these totals into Estimator #4 - Percent of Streets w/Curb, Gutter & Sidewalk. See the Curb, Gutter & Sidewalk section of this manual for more help.

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 2

Municipality Name WOODS CROSS **Date** 7-Aug-02

COMMUNITY CORE LAND USE DATA*

	2002 Units	2002 Acres	2010 Units	2010 Acres	TOTALS Units	TOTALS Acres
~~Residential*~~						
No. of Residentail Units						
Single Familly	1,666	573	1,981	614	314	41
Est Avg Lot Size (Ac/D	0.34		0.31			
Multifamily	400	50	573	72	173	22
Est Avg Lot Size (Ac/D	0.13		0.13			
Est No. of Vacant Parcels	85	29	68	23	(17)	(6)
Est Avg Lot Size (Ac/P	0.34		0.34			
Est Inst and Open Space (Acres)	100	100	123	123	23	23
Total Residential Zone Acreage	752		832			80
~~Non-Residential*~~						
No. of Com & Ind Units						
Retail Commercial	96	77	126	101	30	24
Est Avg Lot Size (Ac/L	0.80		0.80			
Office Commercial	52	42	73	58	21	17
Est Avg Lot Size (Ac/L	0.80		0.80			
Other: Transpo Corridors, etc.	2	75	3	120	1	45
Est Avg Lot Size (Ac/P	37.50		40.00			
Industrial	24	61	28	71	4	10
Est Avg Lot Size (Ac/L	2.55		2.55			
Est No. of Vacant Parcels	10	100	6	60	(4)	(40)
Est Avg Lot Size (Ac/P	10.00		10.00			
Total Acreage	355		411	411		56
~~Total Acreage Above~~	1,107	72%	1,242	72%		136
Difference from Net in Core Rectangle	(3)		(3)			
Manual Adjustment (Acres)	3		3			

STREET SYSTEM DATA

~~Streets~~ Conn Factor =	80.0%	80.0%	smoothed
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
~~Curbs, Gutters & Sidewalks~~			
Percent of Streets w/C, G & S* =	90%	90%	
Installed Cost per Lineal Foot =	$ 14.00	$ 14.00	

The "Ratio to full input" represents the percentage of cost of a curb, gutter & sidewalk configuration compared to a street with curb and gutter on both sides of the pavement. For example, if sidewalk, and curb & gutter on both sides of the street represents full cost, or $14 per linear foot, then a sidewalk on one side of the street would represent 25% of the full cost, and a curb & gutter on one side of the street would also represent 25% of the full cost (2 sidewalks and 2 curb & gutter represent 100% of the full cost). An example of a curb and gutter configuration might be 2000 feet of street with a sidewalk and a curb & gutter on only one side of the road. This configuration represents 50% of the full curb, gutter, and sidewalk cost. The estimator factors in the total feet of roads and all cost ratios (ratio to full input) to create a weighted percentage of streets with a full configuration of curb, gutter and sidewalk.

To reference the accuracy of your street length inputs, the "Total Miles of Roads" line converts total road feet to miles. This figure may then be compared to UDOT's Class A and B road mileage figures for your community. This data is provided in the accompanying Udot.xls spreadsheet.

Installed Cost per Lineal Foot:
You may adjust the average lineal foot cost of curb, gutter, and sidewalk based on input from public works or your city engineer.

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 2

Municipality Name	**WOODS CROSS**		**Date**	**7-Aug-02**			
			2002		**2010**		
COMMUNITY CORE LAND USE DATA*						**TOTALS**	
~~Residential*~~			**Units**	Acres	**Units**	Acres	**Units**	Acres
No. of Residentail Units								
Single Familly			**1,666**	573	**1,981**	614	314	41
Est Avg Lot Size (Ac/D			**0.34**		**0.31**			
Multifamily			**400**	50	**573**	72	173	22
Est Avg Lot Size (Ac/D			**0.13**		**0.13**			
Est No. of Vacant Parcels			**85**	29	**68**	23	(17)	(6)
Est Avg Lot Size (Ac/P			**0.34**		**0.34**			
Est Inst and Open Space (Acres)			**100**	100	**123**	123	23	23
Total Residential Zone Acreage			**752**		**832**			**80**
~~Non-Residential*~~								
No. of Com & Ind Units								
Retail Commercial			**96**	77	**126**	101	30	24
Est Avg Lot Size (Ac/U			**0.80**		**0.80**			
Office Commercial			**52**	42	**73**	58	21	17
Est Avg Lot Size (Ac/U			**0.80**		**0.80**			
Other: Transpo Corridors, etc.			**2**	75	**3**	120	1	45
Est Avg Lot Size (Ac/P			**37.50**		**40.00**			
Industrial			**24**	61	**28**	71	4	10
Est Avg Lot Size (Ac/U			**2.55**		**2.55**			
Est No. of Vacant Parcels			**10**	100	**6**	60	(4)	(40)
Est Avg Lot Size (Ac/P			**10.00**		**10.00**			
Total Acreage			**355**		**411**	411		**56**
~~Total Acreage Above~~			**1,107**	72%	**1,242**	72%		**136**
Difference from Net in Core Rectangle			**(3)**		**(3)**			
Manual Adjustment (Acres)			**3**		**3**			
STREET SYSTEM DATA								
~~Streets~~	**Conn Factor =**		**80.0%**		**80.0%**	smoothed		
	Installed Cost per Lineal Foot =		**$ 40.00**		**$ 40.00**			
~~Curbs, Gutters & Sidewalks~~								
	Percent of Streets w/C, G & S* =		**90%**		**90%**			
	Installed Cost per Lineal Foot =		**$ 14.00**		**$ 14.00**			

Input Module 3

(Water Use and Infrastructure)

WATER SYSTEM DATA

Most of the information in this module should be available from your city engineer, contracted engineering consultant, or public works department. Additional information is available from your local water provider or the State divisions detailed below.

Is There a Secondary Water System?

Secondary water is not treated for culinary use, and is used exclusively for irrigation or animal watering. MIPCOM's definition of secondary water systems does not include open or piped canals. Answer yes only if irrigation systems are underground and pressurized. Register a "no" answer if your community does not have any secondary system(s), and a "yes" answer if your community has at least one secondary irrigation system. This information is used to calculate the additional costs of installing and maintaining a closed secondary irrigation system.

No. Residential Connections:

This figure is available from the State Division of Water Rights website. The Division of Water Rights tracks data of public water systems throughout the state. Residential connections are the total number of residential units attached to the community's culinary water system. The figure includes single family and multiple family unit connections, e.g., one four-plex = four units, or four residential connections. The information on this website is reliable to the degree that a community or its water provider are diligent in reporting annual information to the State. To indicate how reliable the data may or may not be, the State provides a data rating for each water system in the web report: http://waterrights.utah.gov/cgi-bin/wuseview.exe?Startup If the data rating is low, the water provider may need to be contacted.

No. Comm + Inst Connections:

This figure is also found in the public water system data on the State Division of Water Rights website listed above. It represents the total number of commercial and institutional units attached to the community's culinary water system.

Irrigation Area per Unit:

This area calculation represents the average area on developed lots that requires irrigation. The figure should represent the average irrigation area per development unit rather than area per lot. For example, a four-plex on a .5-acre lot would be considered as four units on .125 acres (.5 Acre ÷ 4). Irrigated areas, otherwise known as softscape areas include plant beds, lawns or native vegetation areas. A softscape area can be calculated by subtracting solid surfaces from a lot's total area. Solid surfaces include the home area footprint, driveways, walkways, patios, and auxiliary sheds and structures.

The Irrigation Area per Lot Estimator helps to determine the weighted average area of softscape on residential and nonresidential lots in a community. The estimator averages in multifamily units that generally have a smaller land area per unit for irrigation than a single family home. It also factors in hard surface parking requirements for commercial, industrial, and institutional units. This is done by calculating in an average landscape factor, which is the percentage of landscaping relative to a land use type. For more information on this item, see the Irrigation Area section.

Average M&I Water Usage:

Municipal and Industrial water is treated for culinary use. MIPCOM allows you to choose a water measurement unit (Acre-Feet per Year or Millions of Gallons per day). Enter water usage based on community records, or based on reported amounts from the Division of Water Rights Public Water System Data site: http://waterrights.utah.gov/cgi-bin/wuseview.exe?Startup The information on this website is reliable to the degree that a community is diligent in reporting annual information to the State. Notice in the Woods Cross MIPCOM file that parks and open space has been entered as "0". This is because parks and open space are irrigated by the secondary water system, and not with M&I water.

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 3

Municipality Name	**WOODS CROSS**		**Date**	**7-Aug-02**
WATER SYSTEM DATA	**2002**		**2010**	
Is there a Secondary Water System?				
What percentage of Community is Served?	95%		95%	
~~Connections/User Data~~	**Totals**		**Totals**	Increments
No. Resid Connect =	2,066		2,464	398
No. Com+Inst Conn (all other) =	188		218	30
Irrig Area per Unit (Acres)* =	0.21		0.21	
Conservation Reduction % =			10%	
~~Average M&I Water Usage~~		MGD		MGD
Use 1	**Res-Inside**	562	562.00	616	0.55
	Commerci	181	181.00	198	0.18
	Institution	14	14.00	15	0.01
	Industrial	273	273.00	299	0.27
Est @ 3AF/Ac	**Parks* =**	0	-	0	-
Est @ 3AF/Ac	**Res-Outside =**	65	65.08	0	0.06
	Sum =	1,095	0.98	1,201	1.07
Avg ACRE-FEET PER YEAR	**Per Capita**	0.15		0.14	
Gallons per Day	**Per Capita**		137		123
~~Transmission Facilities~~	**Peaking Factor =**	2.0		2.0	
	Vmax (fps) =	7.5		7.5	
	Fire Flow (gpm) =	3,500		3,500	
	Duration (hrs) =	3		3	
	No. of Major Sources =	1		1	
	Avg Source Dist from Core Rectangle (ft) =	1,000		1,500	
	Installed Cost per InFt =	$ 4.00		$ 4.00	
~~Storage Facilities~~					
	Reqmt: Indoor Only (GPD/ERU) =	400		400	
	Commercial Multiplier =	10		10	
	Installed Cost per Gallon =	$ 0.50		$ 0.50	
~~Water Mains~~	**Installed Cost per InFt =**	$ 5.00		$ 5.00	

Transmission Facilities:

Consult with your city engineer or public works officials to obtain Peaking Factor, Vmax (fps), Fire Flow (gpm), and Duration (hrs). MIPCOM's default inputs show minimum levels required by the state Division of Water Resources.

Average Source Dist from Core Rectangle:

This figure represents the average distance of the community's water source(s) to the community's water storage or distribution point(s). The water source is defined as the diversion point from a spring or well – not the actual treated water storage tank. Using a scaled map of your community, measure the distance(s) of your water source(s) from the water source to the storage reservoir. To derive the average source distance from multiple sources, divide the total length of each source to the storage facility by the number of sources.

If a water district services your community, and the water source(s) are shared by multiple communities take the following steps to derive an equivalent or weighted average distance to source.

1. Contact your water district to conclude the total distance of water "transmission line" from your community core edge or point of delivery / storage to the water source of the water district. This will likely be a reservoir stored in the mountains.
2. Obtain the total water usage of your community in acre-feet.
3. Obtain the total water usage of all users from the same source in acre-feet.
4. Divide your community's water use by the total water use to derive a community use ratio (percentage).
5. Multiply the total distance of water transmission line between your community and the water source by the water use ratio.

Storage Facilities and Water Mains:

The remaining information such as Installed Cost per Linear Foot and all data relating to Storage Facilities and Water Mains should be available from public works or your engineers.

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 3

Municipality Name	WOODS CROSS		Date	7-Aug-02	
WATER SYSTEM DATA		2002		2010	
Is there a Secondary Water System?					
What percentage of Community is Served?		95%		95%	
~~Connections/User Data~~		Totals		Totals	Increments
No. Resid Connect =		2,066		2,464	398
No. Com+Inst Conn (all other) =		188		218	30
Irrig Area per Unit (Acres)* =		0.21		0.21	
Conservation Reduction % =				10%	
~~Average M&I Water Usage~~			MGD		MGD
Use 1	Res-Inside	562	562.00	616	0.55
	Commerci	181	181.00	198	0.18
	Institution	14	14.00	15	0.01
	Industrial	273	273.00	299	0.27
Est @ 3AF/Ac	Parks* =	0	-	0	-
Est @ 3AF/Ac	Res-Outside =	65	65.08	0	0.06
	Sum =	1,095	0.98	1,201	1.07
Avg ACRE-FEET PER YEAR	Per Capita	0.15		0.14	
Gallons per Day	Per Capita		137		123
~~Transmission Facilities~~	Peaking Factor =	2.0		2.0	
	Vmax (fps) =	7.5		7.5	
	Fire Flow (gpm) =	3,500		3,500	
	Duration (hrs) =	3		3	
	No. of Major Sources =	1		1	
	Avg Source Dist from Core Rectangle (ft) =	1,000		1,500	
	Installed Cost per InFt =	$ 4.00		$ 4.00	
~~Storage Facilities~~					
	Reqmt: Indoor Only (GPD/ERU) =	400		400	
	Commercial Multiplier =	10		10	
	Installed Cost per Gallon =	$ 0.50		$ 0.50	
~~Water Mains~~	Installed Cost per InFt =	$ 5.00		$ 5.00	

Input Module 4

(Water, Sewer, Drainage & Dry Utilities)

As with the previous module, this information should all be available through your public works department or city engineer.

WATER SYSTEM DATA (Continued)

Conn Factor:

As with streets, the Conn Factor refers to a community's percent of water main connectivity. Water lines that do not join into another pipe include those that terminate due to topography or water barriers, dead ends, cul-de-sacs, etc. 85% represents an average community's water line connection factor. You may wish to analyze a community utility map to determine a connection factor for your community.

Fire Flow (gpm):

As a standard, fire flow for a community should be no less than 1,000 gallons per minute for 4 hours. To determine the exact fire flow available in your community, contact your consulting engineer or engineering staff.

Peaking Factor, Vmax, Installed Cost per Linear Foot:

All of this variable data should be available through your public works department or city engineer.

Percent of Peripheral Roads with Water Lines:

This figure represents the percentage of roads lying outside of the core-developed area – but within the service area of community that contain water piping in the easement. This area is called the peripheral service zone. Using a scaled community infrastructure map, measure the length of roads (in feet) contained within the peripheral service zone that have a water line within the road right-of-way). Also include water lines within non-road easements that lie outside of the core development area. To calculate the percent of peripheral roads with water lines, measure the total length of roads lying outside of the core-developed area (but inside of the municipal service area), and divide the total length of water lined-roads (and other easements) by the total length of roads within the core-developed area.

Example:

- Total feet of water lines outside of core-developed area, and within the community service area: 18,640 ft.
- Total length of roads outside the core-developed area, and within the community service area (including streets with and without water lines): 79,215 ft.
- 18,640 ft. ÷ 79,215 ft. = .235
- .235 x 100 = 23.5%

Installed Cost per Linear Foot:

Check with your public works officials or city engineers for the installed cost per linear foot of sewer line.

SANITARY SEWER SYSTEM DATA

Peaking Factor, Manning's n-value:

Both of these variable data should be available through your public works department or city engineer.

Sewer Slope s =:

This percentage represents the change in grade of the community sewer system from the lower edge of the community core-developed area to treatment facility. Using a scaled topographic map of your community, determine the vertical change in elevation (in feet) from the highest point of sewer line on the upper side of the core developed area, to the lowest point of sewer line at the sewage treatment facility. Divide this figure by the horizontal distance between these two points to calculate the average sewer slope.

Sewer Slope Example:

- Vertical Change (elevation difference) from high sewer point to low sewer point: 80 ft.
- Horizontal distance between sewer high point and sewer low point: 5280 ft.
- 80 ft. ÷ 5280 ft. = .015
- .015 x 100 = 1.5%

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 4

Municipality Name: WOODS CROSS Date: 7-Aug-02

	2002	2010	
WATER SYSTEM DATA (cont'd)			
~~Core Water Lines~~			
Conn Factor =	85.0%	85.0%	smoothed
Fire Flow (gpm) =	3,500	3,500	
Peaking Factor =	4.0	4.0	
Vmax (fps) =	10.0	10.0	
Installed Cost per InFt =	$ 5.00	$ 5.00	
~~Peripheral Water Lines (Roads)~~			Increments
Percent of Periph Roads with Water Lines =	25%	22%	-3%
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
SANITARY SEWER SYSTEM DATA			
~~Sewer Outfall~~			
Peaking Factor =	2.5	2.5	
Manning's n-value =	0.012	0.012	
Sewer Slope, s =	1.0%	1.0%	
Length of Outfall from Core Rect (ft) =	8,000	7,000	
~~Sewer Outfall & Mains~~			
Installed Cost per InFt =	$ 5.00	$ 5.00	
~~Sewer Collectors~~			
Conn Factor =	70.0%	70.0%	
Peaking Factor =	4.0	4.0	
Installed Cost per InFt =	$ 5.00	$ 5.00	
Effective Ground Slope=	1.3%	1.3%	
~~Peripheral Sewer Lines (Roads)~~			
Percent of Periph Roads with Sewer Lines =	75%	75%	0%
STORMWATER FACILITIES			
Conn Factor =	75.0%	75.0%	
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
CONSOLIDATED DRY UTILITIES (TRENCHED)			
Conn Factor =	90.0%	90.0%	
Installed Cost per Lineal Foot =	$ 64.50	$ 64.50	

Length of Outfall from Core Rectangle (ft):

This number represents the distance of the main sewer line from the edge of the core-developed area (edge closest to the sewer treatment facility) to the sewer treatment facility outside of the core-developed area. Refer to a scaled sewer infrastructure map available from your community's sewer district.

Determining outfall distance can be challenging when more than one community shares an outfall line. When multiple communities share an outfall line, the cost is distributed between these communities. To reflect shared costs, the total number of outfall feet for one community should be adjusted to its share of effluent into a shared outfall line. A population ratio (expressed as percent) can be developed by dividing a community's population by the total population of communities sharing an outfall line.

For example, the city of Woods Cross uses one outfall line exclusively, and shares two other lines with communities in the South Davis Sewer District. The outfall lines transport sewage waste to two treatment facilities at the north tank, and the south tank. The table below shows a population ratio applied to the sewer outfall lines. For communities that have multiple core development areas that are separated by peripheral roads with sewer line, count the sewer line(s) connecting development cores as part of the total sewer outfall.

Example of outfall distance for one community in a shared sewer outfall line:

	Feet from Lower Urban Core to Sewer Plant	Population of City 1	Total Population of City 1 and Other Contributing Communities	City 1: % of Total Population (Population Ratio)	City 1 Ratio of Sewer Outfall Line(s)
Line One	4000	6950	6950	1	4000
Line Two	5000	6950	25000	0.28	1400
Line Three	5000	6950	36000	0.19	950
Total Feet					**6350**

Effective Ground Slope:

This percentage represents the change in grade of the community sewer system from upper edge of the core-developed area, to the lower edge of the core-developed area. Using a scaled topographic map of your community, determine the vertical change in elevation (in feet) from the highest point of sewer line on the upper side of the core developed area, to the lowest point of sewer line at the lower side of the core developed area. Divide this figure by the horizontal distance between these two points to calculate the average sewer slope.

Effective Ground Slope Example:

- Vertical Change (elevation difference) from high sewer point to low sewer point: 60 ft.
- Horizontal distance between sewer high point and sewer low point: 1640 ft.
- 60 ft. ÷ 1640 ft. = .0365
- .0365 x 100 = 3.65%

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 4

Municipality Name: WOODS CROSS Date: 7-Aug-02

	2002	2010	
WATER SYSTEM DATA (cont'd)			
~~Core Water Lines~~ Conn Factor =	85.0%	85.0%	smoothed
Fire Flow (gpm) =	3,500	3,500	
Peaking Factor =	4.0	4.0	
Vmax (fps) =	10.0	10.0	
Installed Cost per InFt =	$ 5.00	$ 5.00	
~~Peripheral Water Lines (Roads)~~			Increments
Percent of Periph Roads with Water Lines =	25%	22%	-3%
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
SANITARY SEWER SYSTEM DATA			
~~Sewer Outfall~~ Peaking Factor =	2.5	2.5	
Manning's n-value =	0.012	0.012	
Sewer Slope, s =	1.0%	1.0%	
Length of Outfall from Core Rect (ft) =	8,000	7,000	
~~Sewer Outfall & Mains~~ Installed Cost per InFt =	$ 5.00	$ 5.00	
~~Sewer Collectors~~ Conn Factor =	70.0%	70.0%	
Peaking Factor =	4.0	4.0	
Installed Cost per InFt =	$ 5.00	$ 5.00	
Effective Ground Slope=	1.3%	1.3%	
~~Peripheral Sewer Lines (Roads)~~ Percent of Periph Roads with Sewer Lines =	75%	75%	0%
STORMWATER FACILITIES			
Conn Factor =	75.0%	75.0%	
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
CONSOLIDATED DRY UTILITIES (TRENCHED)			
Conn Factor =	90.0%	90.0%	
Installed Cost per Lineal Foot =	$ 64.50	$ 64.50	

Percent of Peripheral Roads with Sewer Lines:

Using an engineering scale and a scaled community infrastructure map, estimate the length of roads (in feet) outside of your estimated developed core area (but inside of the municipal service area) that have a sewer line within the road right-of-way. Also include sewer lines within non-road easements that lie outside of the core development area. To calculate the percent of peripheral roads with sewer lines, divide this total length by the total length of roads lying outside of the core-developed area, but inside of the municipal boundary.

Example:

- Total feet of sewer lines outside of core-developed area, and within the community service area: 11,755 ft.
- Total length of roads outside the core-developed area, and within the community boundary (including streets with and without sewer lines): 79,215 ft.
- 11,755 ft. ÷ 79,215 ft. = .148
- .148 x 100 = 14.8%

STORMWATER FACILITIES

Conn Factor, Installed Cost per Linear Foot:

Your city engineer or public works director can assist in determining Connection Factor and Installed Cost per Foot of these facilities.

CONSOLIDATED DRY UTILITIES (Trenched)

Conn Factor, Installed Cost per Linear Foot:

Your utilities provider should be able to supply Connection Factor and Installed Cost per Linear Foot for trenched utilities. If power or communication lines are operated and maintained by the municipality, costs may be higher than the included default estimate.

MUNICIPAL INFRASTRUCTURE PLANNING AND COST MODEL

Input Module 4

Municipality Name: WOODS CROSS Date: 7-Aug-02

	2002	2010	
WATER SYSTEM DATA (cont'd)			
~~Core Water Lines~~ Conn Factor =	85.0%	85.0%	smoothed
Fire Flow (gpm) =	3,500	3,500	
Peaking Factor =	4.0	4.0	
Vmax (fps) =	10.0	10.0	
Installed Cost per InFt =	$ 5.00	$ 5.00	
~~Peripheral Water Lines (Roads)~~			Increments
Percent of Periph Roads with Water Lines =	25%	22%	-3%
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
SANITARY SEWER SYSTEM DATA			
~~Sewer Outfall~~ Peaking Factor =	2.5	2.5	
Manning's n-value =	0.012	0.012	
Sewer Slope, s =	1.0%	1.0%	
Length of Outfall from Core Rect (ft) =	8,000	7,000	
~~Sewer Outfall & Mains~~ Installed Cost per InFt =	$ 5.00	$ 5.00	
~~Sewer Collectors~~ Conn Factor =	70.0%	70.0%	
Peaking Factor =	4.0	4.0	
Installed Cost per InFt =	$ 5.00	$ 5.00	
Effective Ground Slope=	1.3%	1.3%	
~~Peripheral Sewer Lines (Roads)~~ Percent of Periph Roads with Sewer Lines =	75%	75%	0%
STORMWATER FACILITIES			
Conn Factor =	75.0%	75.0%	
Installed Cost per Lineal Foot =	$ 40.00	$ 40.00	
CONSOLIDATED DRY UTILITIES (TRENCHED)			
Conn Factor =	90.0%	90.0%	
Installed Cost per Lineal Foot =	$ 64.50	$ 64.50	

Output

(Infrastructure Summary)

MIPCOM's output is displayed as a table of results from the two development scenarios entered into the Input sheets, each with a list of components with their relative connection factors, lengths, and replacement values. It is important to note that MIPCOM does not estimate or display any costs associated with operating or maintaining water and sewer treatment facilities – only the infrastructure necessary to convey the resources involved.

Connection Factors:

The Connection Factors are copied from the Input sheet entries simply for reference. They help illustrate how any changes in connectivity influence costs when different scenarios are compared.

Lengths:

Length for each component is determined by using the community size, average block size, and connectivity factor to calculate a figure representative of the community's actual infrastructure length. Street length also includes average street width in the calculation. Be sure to compare this figure (converted to miles, i.e., divided by 5,280) with your public works records or the Udot.xls. A large variance would indicate that your estimated community core size or block size is inaccurate and needs to be adjusted.

Replacement Value:

Replacement Value is a representation of the costs, according to the infrastructure costs entered in the previous Input tables, of replacing ALL existing infrastructure. The second scenario's replacement values are a representation of current infrastructure values PLUS any additional infrastructure that is anticipated to be built by the planning horizon. It should be noted that future replacement figures do not account for inflation or other market-related cost fluctuations.

Length and Replacement Value show both a Total and a Per DU, or Dwelling Unit. Per DU represents the total length and cost of each component in proportion to the total number of developed units within your community. It does not represent the current fiscal responsibility of an individual development unit's infrastructure, but instead represents a theoretical value for each unit if the community's entire infrastructure were to be replaced simultaneously. At first glance, this cost may seem high for a single residence, but it should be understood that the per DU cost is offset somewhat by multiple commercial and industrial tenants that share individual developed buildings. These additional units were not initially accounted for in this version of MIPCOM, but can be adjusted for using the Total Units Estimator Tool. For a more accurate figure, divide the Replacement Value figure by the Total Units figure from the Total Units Estimator Tool worksheet. This will represent the total value of infrastructure for all developed units – residential and commercial – in your community.

Increments:

The Increments box displays the increase in feet and cost for each component with a final total that shows how much the community can plan on paying to install the new infrastructure predicted in the second planning scenario. And while the developers usually cover the installation costs, it is important to note that impact fees and installation costs are usually passed on to the homebuyers in the form of increased housing costs. Reduced impact fees can therefore contribute to more affordable housing and encourage home building and related growth. The incremental value of each individual component can also be of use to determine the effectiveness of a community's impact fees. Is the new development truly sustainable or will the community end up paying more in the future for operating and maintenance costs? If so, where will those additional funds come from? While MIPCOM cannot answer these questions, it was specifically created to encourage communities to consider them while exploring development scenarios.

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL

8/7/02

CITY: WOODS CROSS **Objective: No Annexations**

Component	Scenario: Year 2002 Base				
	Connection Factors	Lengths (Ft) Total	Lengths (Ft) Per DU	Replacement Values Total	Replacement Values Per DU
Streets & Roads	80%	330,916	154.5	$ 13,793,625	$ 6,440
Arterial Roads	25% Imp	13,924			
Water System*	85%	269,084	125.6	12,238,805	5,714
		73%			
Sewer System*	70%	243,849	113.8	10,018,540	4,677
		81%			
Seconday Water	95%			5,813,433	2,714
Cost Factor	50%				
		Subtotals		**$ 41,864,403**	**$ 19,545**
C, G & SW	90%	495,395	231.3	6,935,526	3,238
Storm Sewer	75%	182,887	85.4	7,315,466	3,415
Dry Utilities	90%	247,697	115.6	15,976,479	7,459
* Do not include Treatment Facilites.		**Totals**		**$ 72,091,873**	**$ 33,656**

Component	Scenario: Year 2010 Base					Increments	
	Connection Factors	Lengths (Ft) Total	Lengths (Ft) Per DU	Replacement Values Total	Replacement Values Per DU	Ft	Cost
Streets & Roads	80%	357,260	136.9	$ 15,674,302	$ 6,005	26,343	$ 1,880,677
Arterial Roads	75% Imp	34,598				20,674	
Water System*	85%	298,149	114.2	13,589,183	5,207	29,065	1,350,377
Sewer System*	70%	260,853	99.9	10,908,784	4,180	17,004	890,244
Seconday Water	95%			6,454,862	2,473		641,429
Cost Factor	50%						
		Subtotals		**$ 46,627,130**	**$ 17,865**		**$ 4,762,727**
C, G & SW	90%	560,033	214.6	7,840,461	3,004	64,638	904,936
Storm Sewer	75%	195,640	75.0	7,852,585	2,998	12,753	510,119
Dry Utilities	90%	280,016	107.3	18,061,063	6,920	32,319	2,084,584
* Do not include Treatment Facilites.		**Totals**		**$ 80,354,239**	**$ 30,787**		**$ 8,262,336**

What the Results Mean:

The true cost of a new development is displayed in the Totals line at the bottom of the Increments table. This figure - in the case of our example Woods Cross City, $8,262,336 – represents the total cost necessary to install all new infrastructure for the Year 2010 Base Scenario. Again, developers will cover much of the initial infrastructure installation cost, but the new construction will then become the municipality's responsibility to maintain and replace in the future.

The greatest benefit of MIPCOM is realized when multiple scenarios using different development styles or patterns are compared. One Year 2010 Base, for example could perpetuate current design standards while a second Year 2010 Base could emphasize smaller lot sizes and narrower street widths. Savings or cost increases affected by one development style over another can be determined by comparing the replacement values per DU in the Totals row of the two Future scenarios. This information can be used to show citizens and community leaders the true costs of different growth patterns.

MUNCIPAL INFRASTRUCTURE PLANNING AND COST MODEL

8/7/02

CITY: WOODS CROSS **Objective: No Annexations**

Component	Scenario: Year 2002 Base				
	Connection Factors	Lengths (Ft) Total	Lengths (Ft) Per DU	Replacement Values Total	Replacement Values Per DU
Streets & Roads	80%	330,916	154.5	$ 13,793,625	$ 6,440
Arterial Roads	25% Imp	13,924			
Water System*	85%	269,084	125.6	12,238,805	5,714
		73%			
Sewer System*	70%	243,849	113.8	10,018,540	4,677
		81%			
Seconday Water	95%			5,813,433	2,714
Cost Factor	50%				
		Subtotals		**$ 41,864,403**	**$ 19,545**
C, G & SW	90%	495,395	231.3	6,935,526	3,238
Storm Sewer	75%	182,887	85.4	7,315,466	3,415
Dry Utilities	90%	247,697	115.6	15,976,479	7,459
* Do not include Treatment Facilites.		**Totals**		**$ 72,091,873**	**$ 33,656**

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	Connection Factors	Lengths (Ft) Total	Lengths (Ft) Per DU	Replacement Values Total	Replacement Values Per DU		Ft	Cost
Streets & Roads	80%	357,260	136.9	$ 15,674,302	$ 6,005		26,343	$ 1,880,677
Arterial Roads	75% Imp	34,598					20,674	
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Seconday Water	95%			6,454,862	2,473			641,429
Cost Factor	50%							
		Subtotals		**$ 46,627,130**	**$ 17,865**			**$ 4,762,727**
C, G & SW	90%	560,033	214.6	7,840,461	3,004		64,638	904,936
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Dry Utilities	90%	280,016	107.3	18,061,063	6,920		32,319	2,084,584
* Do not include Treatment Facilites.		**Totals**		**$ 80,354,239**	**$ 30,787**			**$ 8,262,336**

ESTIMATOR TOOLKIT

Gross Block Size

Gross Block Size is used to determine the average distance between street intersections. By subtracting the average street right of way from the total municipal area, it calculates the amount of developable acres within your community.

Area, Length, & Width:

Most Utah communities have a historic center laid out in the traditional "Mormon Grid." These blocks are typically 660 feet by 660 feet for 10 acres per block. Newer developments may use smaller block sizes or have curvilinear shapes that make estimating more complicated. Some subdivision plats may provide average block acreage. Otherwise, use a best guess. Acreage can be determined by multiplying the number of blocks of a certain size by the average area of the block type.

Once all block sizes have been calculated and added up, the total should be equal to the total Community Core Area from Module 1. The closer this total is to the figure in Module 1, the more accurate the average block size will be.

MIPCOM Data Estimators (Preparation Tool)

Data Entry
Data Variable
Result
Final Result

1. Gross Block Size Estimator	Area (Acres)	% of Total	Block Length	Block Width
Traditional Block Size	110 Ac.	7%	660 l.f.	660 l.f.
New Development 1	400 Ac.	26%	600 l.f.	200 l.f.
New Development 2	321 Ac.	21%	590 l.f.	200 l.f.
New Development 3	300 Ac.	19%	400 l.f.	200 l.f.
Other	Ac.	0%	l.f.	l.f.
Commercial	210 Ac.	14%	550 l.f.	200 l.f.
Industrial Development	200 Ac.	13%	1320 l.f.	330 l.f.
Total (Should Match Community Core Area)	1541 Ac.			
Weighted Average			**650 l.f.**	**250 l.f.**

Street Right-of-Way

The Average Street Right-of-Way Estimator produces a figure that represents a community's average road right-of-way (R-O-W) width. This R-O-W is not considered developable and is subtracted from the total developable area of the community. The R-O-W width may vary by neighborhood district just as gross block sizes vary by age of a district. The types of different R-O-Ws should be available from your community zoning ordinances and the total amount of roadway for each R-O-W type should be available from public works or may require a windshield survey.

Total Roads (ft):

The total length of roads in feet for each different R-O-W width should be measured. This may be done using existing records such as zoning ordinances or subdivision plats, through public works, or with a windshield survey of the community. The survey may be taken by highlighting a street map with a color that represents an average pavement width (i.e., Red = 18' to 22', Blue = 22' to 26', Yellow = 26' to 30', etc. The estimator totals street lengths and converts the length from feet to miles. The Total Miles of Roads should be equal or comparable to the total mileage of roads within your community. For comparison, this figure may be obtained from the UDOT Class A, and Class B road miles listed by community in the Udot.xls spreadsheet.

Pavement Width:

This tool also determines a weighted average of pavement widths throughout the community. Pavement widths may also be included in zoning ordinances, found through public works, or obtained by windshield surveys. These measurements do not include curb, gutter, and sidewalk. These figures are used to determine the replacement values of the community road system.

MIPCOM Data Estimators (Preparation Tool)

Data Entry
Data Variable
Result
Final Result

2. Average Street R-O-W Estimator

	Total Roads (ft)	% of Total	R-O-W Width
Traditional	3,000	2%	90 l.f.
New Development 1	12,000	8%	50 l.f.
New Development 2	98,000	64%	50 l.f.
New Development 3	4,000	3%	50 l.f.
State Highway	4,500	3%	100 l.f.
Other (Free Way)	4,500	3%	250 l.f.
Other	-	0%	l.f.
Gravel	5,600	4%	40 l.f.
Dirt	4,500	3%	40 l.f.
Commercial / Industrial Development Area	17,000	11%	85 l.f.
Total Feet of Roads	153,100		
Total Miles of Roads (Compare to UDOT Data)	29.00		
Weighted R-O-W Average			**61 l.f.**

3. Street Coverage Ratio (Requires Total Roads (ft) Entered Above)

(Use to determine Cost Value of Road Pavement Area)

	Roads (from above)	Pavement Width*	
Traditional	3,000.00	25 l.f.	
New Development 1	12,000.00	35 l.f.	
New Development 2	98,000.00	40 l.f.	
New Development 3	4,000.00	30 l.f.	
State Highway	4,500.00	44 l.f.	
Other (Free Way)	4,500.00	130 l.f.	
Other	-	l.f.	
Gravel	5,600.00	11 l.f.	**(22 feet ÷ 2)
Dirt	4,500.00	4 l.f.	***(20 feet ÷ 5)
Commercial / Industrial Development Area	17,000.00	51 l.f.	
Weighted Average Pavement Width		**41 l.f.**	
Pavement Coverage Ratio		**66.7%**	

* Does not include Curb, Gutter, and Sidewalk.

**Gravel Roads are 2 times less the cost of pavement. Divide maintained gravel surface width by 2.

***Dirt Roads are 5 times less the cost of pavement. Divide maintained dirt surface width by 5.

Curb, Gutter, & Sidewalk

The Curb, Gutter, and Sidewalk Estimator Tool takes the total length of road with any combination of the three pavement types and compares their ratio of coverage to that of a street with curb, gutter, and sidewalk on both sides to give a weighted average.

Total Roads (ft):

To obtain this detailed information, you may wish to drive around the community with a road map and indicate with colored markers streets that contain curb, gutter, or sidewalk improvements. Each color should represent a different level of improvement to a street. After taking this inventory, total the distances of streets by similar improvement categories, such as total streets with curb, gutter & sidewalk, total streets without curb, gutter & sidewalk, or streets that may only have a sidewalk on one side, or streets with curb and gutter on one side of the street only.

The total length of road must be measured for each level of improvement. The Total Miles of Roads should be equal or comparable to the total mileage of roads within your community. See the Udot.xls spreadsheet or a more recent community record to compare your results.

MIPCOM Data Estimators (Preparation Tool)

Data Entry
Data Variable
Result
Final Result

4. Percent of Streets with Curb, Gutter & Sidewalk Estimator

	Total Roads (ft)	% of Total	Ratio to Full
Streets with no Curb, Gutter and Sidewalk	4,500	3%	-
Streets with Sidewalk only on one side	1,500	1%	25%
Streets with Sidewalk only on two sides	2,300	2%	50%
Streets with Curb & Gutter only on one side	1,800	1%	25%
Streets with Curb & Gutter only on two sides	-	0%	50%
Streets with Curb & Gutter and one Sidewalk	1,600	1%	50%
Streets with two sidewalks, one side curb & G.	26,000	17%	75%
Streets with Curb, Gutter & Sidewalk	115,000	75%	100%
Other	-	0%	0%
Total Feet of Roads	152,700		
Total Miles of Roads (Compare to UDOT Data)	28.92		
Weighted Average			**90%**

Average Lot Size

IMPORTANT: Data from this Estimator Tool is automatically entered into several following Tools, so please be sure to fill this sheet out as completely and accurately as possible to ensure accurate results in other Tools.

Average Lot Size is estimated by dividing total acreage of a land use type by the total number of units and factoring in the average street right-of-way. Multi-Family residential and all commercial and industrial lots require the average number of units in each building by development district.

Avg Units / Building:
Determine the average number of units per building for each land use type. Single Family – one per building, duplexes – two units per building, multifamily – eight units per building, etc.

Land Use Type:
This is the zone or development district as outlined in your community ordinances. You may list them by descriptive name such as 'Single Family, Duplex, Multifamily, Retail Commercial,' etc., or you may change them to fit codes or names specific to your community.

Area:
Enter the total acreage for each land use type within your community. The number of acres per land use type can be acquired with a scale photo or map of your community, or through zoning records or other data sources.

Less ROW Area:
The Right-of-Way Area is displayed as a percentage determined by subtracting the Lot Coverage Ratio calculated in Input Module 1 from 100%. This represents the total amount of each lot that is undevelopable due to existing Rights-of-Way for utilities and roads.

The ROW Area for Parks & Open Space and Vacant Lots will be less as they tend to have less property fronting roads or are located within existing development blocks and have no frontage.

Number of Bldgs:
The number of buildings can be obtained from census data or zoning records. Multi-family buildings are usually listed with the number of dwelling units.

Parks & Open Space:
Parks and open space is entered as a total acreage.

Vacant Lots:
The number and acreage of vacant lots in both residential and non-residential zones must be accounted for. These lots may or may not be considered developable due to existing uses such as agriculture, but they must be accounted as undeveloped to provide accurate measurements of existing infrastructure.

The total acreage of other Land uses such as ROWs for railroads, interstate freeways, utility easements, etc., must be measured as well. This information is usually available from public works, the local department of transportation, and utility providers.

Total:
The total acreage tallied at the bottom of the Acres column should match the area of your Community Core.

Average Lot Size:
The red boxes will display the data necessary for MIPCOM Input Module 2. Average Lot Size will be determined for Single Family lots, Multi-Family lost, as well as Commercial, Industrial, Open Space, and Vacant lots.

MIPCOM Data Estimators (Preparation Tool)

Data Entry
Data Variable
Result
Final Result

5. Average Lot Size Estimator				Less R-O-W Area	Average	Number	Average	*Weighted Ave.*		
Ave. Units / Building	Land Use Type	Area (Acres)	% of Total	28.0%	Lot Size / Bldg	of Bldgs	Lot Size / Unit	Lot Size / Unit		No. Units
1	Single Family	787.00 Ac.	53%	566.64 Ac.	.34 Ac.	1666	**.34 Ac.**			1666
2	Duplex	25.00 Ac.	2%	18.00 Ac.	.51 Ac.	35	.26 Ac.			70
3	Three Plex	22.00 Ac.	1%	15.84 Ac.	.53 Ac.	30	.18 Ac.			90
4	FourPlex	22.00 Ac.	1%	15.84 Ac.	.57 Ac.	28	.14 Ac.			112
5	Other Multi-Family	9.00 Ac.	1%	6.48 Ac.	.59 Ac.	11	.12 Ac.			55
6	Other Multi-Family	4.25 Ac.	0%	3.06 Ac.	.61 Ac.	5	.10 Ac.	Multi Family	Total Units	30
7	Other Multi-Family	5.00 Ac.	0%	3.60 Ac.	.59 Ac.	6.1	.08 Ac.	**.13 Ac.**	**400**	42.7
2	Retail Commercial 1	50.00 Ac.	3%	36.00 Ac.	1.71 Ac.	21	.86 Ac.	Retail Comm.		42
4	Retail Commercial 2	50.00 Ac.	3%	36.00 Ac.	3.00 Ac.	12	.75 Ac.	**.79 Ac.**	**90**	48
6	Office Commercial 1	40.00 Ac.	3%	28.80 Ac.	9.00 Ac.	3.2	1.50 Ac.	Office Comm.		19.2
4	Office Commercial 2	30.00 Ac.	2%	21.60 Ac.	3.93 Ac.	5.5	.98 Ac.	**1.29 Ac.**	**41**	22
6	Light Industrial	53.00 Ac.	4%	38.16 Ac.	9.54 Ac.	4	1.59 Ac.	Industrial		24
1	Heavy Industrial	32.00 Ac.	2%	23.04 Ac.	23.04 Ac.	1	23.04 Ac.	**4.65 Ac.**	**25**	1
1	Institutional	80.00 Ac.	5%	57.60 Ac.	8.23 Ac.	7	8.23 Ac.		**7**	7
										2228.9

			Less R-O-W Area	
			8.0%	Total Inst.& Open Space
	Parks & Open Space	47.00 Ac.	3%	43.24 Ac.	**100.84 Ac.**

Vacant Land Data				Less R-O-W Area			*Average*	*Weighted Ave.*
Number of Lots				16.3%			*Lot Size*	*(Vac. Lot Size)*
60	Residential Vacant Area 1	11.00 Ac.	1%	9.21 Ac.			.15 Ac.	Resid.
25	Residential Vacant Area 2	21.00 Ac.	1%	17.59 Ac.			.70 Ac.	**.32 Ac.**
4	Non-Residential Vacant Area 1	51.20 Ac.	3%	42.88 Ac.			10.72 Ac.	Non-Resid.
5	Non Residentail Vacant Area 2	58.00 Ac.	4%	48.58 Ac.			9.72 Ac.	**10.16 Ac.**
				(No R-O-W Reduction)				
2	Other Land (Rail, Fr-wy, Utility)	75.00 Ac.	5%	75.00 Ac.			**37.50 Ac.**	
Total (Should Match Core -Development Area)		1472.45 Ac.	100%	1107.16 Ac.				

Irrigation Area per Lot

The Irrigation Area tool estimates how much irrigated space is present on each lot based on averages taken from several development projects with residential figures based on analysis of the Jordan Landing Subdivision in West Jordan City, Utah. These scenarios subtract an estimated average building footprint and pavement area from the total lot size to achieve the weighted average of irrigated area per unit.

Landscape Factor:

Landscape factor for retail, commercial, and industrial lots can be adjusted to fit your community's averages.

Lot size data is entered from the Average Lot Size Estimator so please be sure to complete that form before continuing to this one. No additional data is required for this sheet.

MIPCOM Data Estimators (Preparation Tool)

Data Entry
Data Variable
Result
Final Result

6. Irrigation Area per Lot Estimator (Requires Average Lot Size Estimator Data)

	Average Lot Size	Landscape Factor*	Avg Units per Bldg	Irrigated (Area) Acreage / Unit***	Total Irrig Acres	Ann Irrig Appl - in	Ann Irrig Use - AcFt
Single Family	.34 Ac.		1	0.22	369.29	30	923
Duplex	.51 Ac.		2	0.18	12.62	30	32
Three Plex	.53 Ac.		3	0.12	11.16	30	28
FourPlex	.57 Ac.		4	0.10	11.30	30	28
Other Multi-Family	.59 Ac.		5	0.08	4.65	30	12
Other Multi-Family	.61 Ac.		6	0.07	2.21	30	6
Other Multi-Family	.59 Ac.		7	0.06	2.59	30	6
Retail Commercial 1	1.71 Ac.	5%	2	0.04	1.80	24	4
Retail Commercial 2	3.00 Ac.	5%	4	0.04	1.80	24	4
Office Commercial 1	9.00 Ac.	10%	6	0.15	2.88	24	6
Office Commercial 2	3.93 Ac.	10%	4	0.10	2.16	24	4
Light Industrial	9.54 Ac.	2.0%	6	0.03	0.76	24	2
Heavy Industrial	23.04 Ac.	0.1%	1	0.02	0.02	24	0
Institutional	8.23 Ac.	67%	1	5.51	38.59	24	77
	Ave. Lot Size	Landscape Factor**					
Residential Vacant Area 1	0.15	11%		0.02	1.01	30	3
Non-Residential Vacant Area 1	10.72	15%		1.61	2.64	24	5
Non Residentail Vacant Area 2	9.72	9%		0.87	3.86	24	8
Irrigation Area per Lot				0.21 ****	469.34		**1,146.1**

* % of Lot Irrigated
** % of Vacant lots Irrigated
*** Residential Area is based on analysis of the Jordan Landing Subdivision

(Not required in MIPCOM if Parks and Rec are irrigated by secondary system)

6a.

Irrigation of Parks and Rec.	
Parks & Open Space	43.2 Ac.
% Irrigated	15%
Ac. Ft / Ac. / Yr.	3
Total Annual Ac. Ft.	19.46

Total Units

This Estimator calculates the total number of development units based on square footage of commercial, office, and industrial lots. The results are then useful to compare with the MIPCOM Output to derive cost in dollars per developed unit instead of Dwelling Unit (DU) so as to account for all development within the community.

IMPORTANT: The top half of the sheet (Single Family through Other Multi-Family) requires input automatically extracted from the 'Average Lot Size' worksheet. Be sure that sheet is filled out accurately before proceeding.

S. F. (square feet):
Enter the average building square footage of each commercial, industrial, and institutional zone within your community. This information should be available from subdivision plats or other zoning records.

'Non-Residential Units' on this worksheet differ by definition from Units on the 'Average Lot Size' worksheet. For this worksheet, each 1000 square feet of a developed commercial or industrial unit is equal to 1 DU.

Total Community Development Units

Compare with MIPCOM Output Costs to derive $ per Development Unit
Note: Non-Residential Units differ by definition from Units on Average Lot Size Worksheet

(Requires data input into Average Lot Size Estimator)

Single Family		1666	Residential
Duplex		70	
Three Plex		90	
FourPlex		112	
Other Multi-Family		55	
Other Multi-Family		30	
Other Multi-Family		42.7	
	*S.F.**		
Retail Commercial 1	3600	76	Non-Residential**
Retail Commercial 2	4500	54	
Office Commercial 1	6000	19.2	
Office Commercial 2	5000	27.5	
Light Industrial	4000	16	
Heavy Industrial	5000	5	
Institutional	4000	28	

2291 Total Units

Assumptions / Definitions

*Enter average square footage of building type

Residential Units: Single-family homes count as one unit, Multi-family buildings count as multiple units (I.e. one 4-plex equals 4 units).

****Nonresidentail Units:** 1000 square feet of building area equals one unit (I.e. one 8,000 square foot building equals 8 units).

Projections

The Population Growth and Employment Projections tool provides estimates useful in completing the Demographic Information on Input Module 1. It can project all fields through a range of up to 50 years while providing opportunities to adjust the future growth rate estimate every 10 years. This helps accommodate a wide range of future horizons.

IMPORTANT: Certain fields in this worksheet require input automatically extracted from the 'Average Lot Size' worksheet. Be sure that sheet is filled out accurately before proceeding.

Growth R., Year, Pop, H.H.'s:

Enter the Growth Rate, Year 2000, current Population, and number of Households for your community. These figures are available from the 2000 census. The Growth Rate may be adjusted every 10 years to reflect any anticipated changes.

It should be noted that in this release of the Estimators Toolkit, the green fields below Year, Pop, and H.H's are programmed to reflect 2002 results based on 2000 Census data. Changing the year in cell C7 to something other than '2002' will result in errors later in the sheet. Some minor adjustments to the blue entry fields may be necessary to generate accurate results if you are using data more recent data such as for 2003.

Per Capita Estimations:

Green fields under this heading require data that is automatically taken from the 'Average Lot Size' worksheet. Be sure that sheet is filled out accurately before proceeding with the Projections tool.

This feature also projects the following demographic and development numbers based on the community's population growth rate: Parks & Rec. Acreage, Single Family Units, Multi-family Units, Retail Commercial Units, Office Commercial Units, Industrial Units, Institutional Units, and Total Units. Please note that this projection does not reflect any change in development styles but merely increases the number of each type of unit according to the included growth rate. Total Units requires manual input from the Total Units Estimator.

Employment:

Enter the non-agricultural employment figures for the community. This figure is also available from the 2000 Census. The Projection utility estimates employment from year 2000 to current year or a future year projection by dividing the current population by current employment to derive 'employees per capita.' It then multiplies 'employees per capita' by the projected population.

Community: Woods Cross — *Requires Data Entry into the Average Lot Size Estimator*

Base Data Source: US 2000 Census

	Growth R.	Year	Pop	H.H's.	Per Capita Estimations (From 2000 Census and 2002 Baseline) Parks & Rec. Ac.	S.F. Units	M.F. Units	R. Com. Units	O. Com. Units	Indust. Units	Instit. Units	Total Units	Employ.
				3.34	0.0066	0.2329	0.0559	0.0126	0.0058	0.0035	0.0010		0.4937
Base	2.50%	2000	6,810	2,039	45 Ac.	1,586	380	86	39	24	7	2,229	3,362
		2001	6,980	2,090	46 Ac.	1,625	390	88	40	24	7	2,175	3,446
		2002	7,155	2,142	47 Ac.	1,666	400	90	41	25	7	2,229	3,532
		2003	7,334	2,196	48 Ac.	1,708	410	92	42	26	7	2,285	3,621
		2004	7,517	2,251	49 Ac.	1,750	420	95	43	26	7	2,342	3,711
		2005	7,705	2,307	51 Ac.	1,794	430	97	44	27	8	2,400	3,804
		2006	7,898	2,365	52 Ac.	1,839	441	99	45	28	8	2,460	3,899
		2007	8,095	2,424	53 Ac.	1,885	452	102	47	28	8	2,522	3,996
		2008	8,297	2,484	55 Ac.	1,932	464	104	48	29	8	2,585	4,096
		2009	8,505	2,546	56 Ac.	1,980	475	107	49	30	8	2,649	4,199
		2010	8,717	2,610	57 Ac.	2,030	487	110	50	30	9	2,716	4,304
Future Rat	2.55%	2011	8,940	2,677	59 Ac.	2,082	499	112	51	31	9	2,785	4,413
Estimate		2012	9,168	2,745	60 Ac.	2,135	512	115	53	32	9	2,856	4,526
		2013	9,401	2,815	62 Ac.	2,189	525	118	54	33	9	2,929	4,641
		2014	9,641	2,887	63 Ac.	2,245	539	121	56	34	9	3,003	4,760
		2015	9,887	2,960	65 Ac.	2,302	552	124	57	35	10	3,080	4,881
		2016	10,139	3,036	67 Ac.	2,361	566	128	58	35	10	3,159	5,006
		2017	10,398	3,113	68 Ac.	2,421	581	131	60	36	10	3,239	5,133
		2018	10,663	3,192	70 Ac.	2,483	596	134	61	37	10	3,322	5,264
		2019	10,935	3,274	72 Ac.	2,546	611	138	63	38	11	3,406	5,398
		2020	11,214	3,357	74 Ac.	2,611	626	141	65	39	11	3,493	5,536
Future Rat	2.53%	2021	11,497	3,442	76 Ac.	2,677	642	145	66	40	11	3,582	5,676
Estimate		2022	11,787	3,529	77 Ac.	2,745	658	148	68	41	12	3,672	5,819
		2023	12,085	3,618	79 Ac.	2,814	675	152	70	42	12	3,765	5,966
		2024	12,390	3,709	81 Ac.	2,885	692	156	71	43	12	3,860	6,117
		2025	12,703	3,803	83 Ac.	2,958	710	160	73	44	12	3,957	6,271
		2026	13,023	3,899	86 Ac.	3,033	728	164	75	46	13	4,057	6,429
		2027	13,352	3,998	88 Ac.	3,109	746	168	77	47	13	4,160	6,592
		2028	13,689	4,099	90 Ac.	3,188	765	172	79	48	13	4,265	6,758
		2029	14,035	4,202	92 Ac.	3,268	784	177	81	49	14	4,372	6,929
		2030	14,389	4,308	95 Ac.	3,351	804	181	83	50	14	4,483	7,104
Future Rat	2.50%	2031	14,749	4,416	97 Ac.	3,434	824	186	85	52	14	4,595	7,281
Estimate	30 Years	2032	15,118	4,526	99 Ac.	3,520	845	190	87	53	15	4,710	7,463
		2033	15,496	4,639	102 Ac.	3,608	866	195	89	54	15	4,827	7,650
		2034	15,883	4,755	104 Ac.	3,698	887	200	91	55	16	4,948	7,841
		2035	16,280	4,874	107 Ac.	3,791	909	205	94	57	16	5,072	8,037
		2036	16,687	4,996	110 Ac.	3,886	932	210	96	58	16	5,199	8,238
		2037	17,104	5,121	112 Ac.	3,983	956	215	98	60	17	5,328	8,444
		2038	17,532	5,249	115 Ac.	4,082	979	221	101	61	17	5,462	8,655
		2039	17,970	5,380	118 Ac.	4,184	1,004	226	103	63	18	5,598	8,872
		2040	18,420	5,515	121 Ac.	4,289	1,029	232	106	64	18	5,738	9,093
Future Rat	0.50%	2041	18,512	5,542	122 Ac.	4,310	1,034	233	107	65	18	5,767	9,139
Estimate		2042	18,604	5,570	122 Ac.	4,332	1,039	234	107	65	18	5,796	9,185
		2043	18,697	5,598	123 Ac.	4,354	1,045	235	108	65	18	5,825	9,231
		2044	18,791	5,626	123 Ac.	4,375	1,050	236	108	66	18	5,854	9,277
		2045	18,885	5,654	124 Ac.	4,397	1,055	238	109	66	18	5,883	9,323
		2046	18,979	5,682	125 Ac.	4,419	1,060	239	109	66	19	5,912	9,370
		2047	19,074	5,711	125 Ac.	4,441	1,066	240	110	67	19	5,942	9,417
		2048	19,169	5,739	126 Ac.	4,464	1,071	241	110	67	19	5,972	9,464
		2049	19,265	5,768	127 Ac.	4,486	1,076	242	111	67	19	6,002	9,511
		2050	19,362	5,797	127 Ac.	4,508	1,082	244	111	68	19	6,032	9,559

MIPCOM Development

Improvements:

Some things you might expect in the future:

Future versions of MIPCOM will contain a more detailed breakout of incremental costs that will show what exactly the public sector will be financially responsible for within a new development.

Additional scenarios could be developed that include costs for school bus service, garbage collection, emergency response, and other services communities are expected to provide.

The inclusion of a third base scenario to immediately compare the results of one future development with an alternative.

Streamline the data-entry process by incorporating the Estimator Toolkit more directly into the Input Modules.

MIPCOM is a work in progress. We welcome comments and suggestions for improvements. Contact Brian Carver at the Utah Governor's Office of Planning and Budget.

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