SIM CITY

THE ORIGINAL CITY SIMULATOR

CLASSIC™

USER'S MANUAL

MAXIS

USER MANUAL

by

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Dedicated to Cassidy and Maxine the Cow.

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Introduction

WELCOME

Enter SimCity and take control. Be the undisputed ruler of a sophisticated real-time City Simulation. Become the master of existing cities such as San Francisco, Tokyo, and Rio de Janeiro, or create your own dream city (or dream slum) from the ground up.

Whether you take over an existing city or build your own, you are the Mayor and City Planner, with complete authority.

Your city is populated by Sims–Simulated Citizens. Like their human counterparts, they build houses, condos, churches, stores and factories. And, also like humans, they complain about things like taxes, mayors, taxes, city planners, and taxes. If they get too unhappy, they move out; you collect fewer taxes, the city deteriorates.

The next few sections will explain the overall concept of SimCity and give information that will help you win Scenarios and design and build better cities.

ABOUT SYSTEM SIMULATIONS

SimCity is the first of a new type of entertainment/education software, called **System Simulations**. We provide you with a set of **Rules** and **Tools** that describe, create and control a system. In the case of SimCity the system is a city.

The challenge of playing a **System Simulation** game is to figure out how the system works and take control of it. As master of the system, you are free to use the TOOLS to create and control an unlimited number of systems (in this case, cities) within the framework and limits provided by the **Rules**.

In SimCity, the **Rules** to learn are based on city planning and management, including:

Human factors - residential space and amenities, availability of jobs, and quality of life;

Economic factors - land value, industrial and commercial space, unemployment, internal and external markets, electric power, taxation, and funding for city services;

Survival factors - strategies for dealing with disasters, crime, and pollution; and

Political factors - public opinion, zoning, and keeping residents and businesses satisfied with your city and your performance.

The **Tools** provide you with the ability to plan, lay out, zone, build, bulldoze, re-zone, and manage a city.

Plan - Mapping systems give physical and demographic overviews of the entire city.

Layout - Design living and working areas, road and transit systems, and recreational areas.

Zone - Set zoning boundaries for parks, residential, commercial and industrial areas.

Build - Place roads, rails, airports, seaports, fire and police stations, sports stadiums, and power plants.

Bulldoze - Clear forests for city growth, build landfill along waterways, clear and re-zone developed areas.

Manage - Using the mapping and graphing systems, gather up-to-date information on traffic density, population trends, power grid status, pollution, crime, land value, police and fire department efficiency, and cash flow. Set the tax rate and funding levels for city services.

But the most important Tool of all is the Simulator itself. Test your plans and ideas as you watch the city grow or shrink through the immigration and emigration of industrious Simulated Citizens. Sims will move in and build homes, hospitals, churches, stores and factories in the zones you provide, or move out in search of jobs or a better life elsewhere. The success of the city is based on the quality of the city you design and manage.

SIMULATOR REACTION TIME

The simulator is a very complex multi-tasking piece of software. It is constantly performing many checks, calculations, and updates, as well as keeping watch on the mouse and keyboard to respond to your demands. When you load in a city, give the simulator a few minutes to compile its data and update the maps, graphs, population levels, etc. Some of the other times when the simulator lags behind you are when powering zones and updating the city services map after installing police and fire stations.

Simulator reaction time is also greatly affected by your computer's clock speed and type of microprocessor.

THE GOALS OF SIMCITY

There are many goals to be pursued and reached in SimCity.

SCENARIOS

Each of the eight included Scenarios is actually a game in itself, with an unlimited number of ways to win–or lose.

Each Scenario is a city that is either the victim of horrible planning or about to be the victim of a natural disaster. After you load in a Scenario, you will have a limited amount of time to correct or repair the problems. If you are successful, you will be given the key to the city. If not, you may be ridden out of town on a rail.

YOUR DREAM CITY

Perhaps the main goal of SimCity is for you to design, manage and maintain the city of your dreams.

Your ideal place to live may be a bustling megalopolis, lots of people, lots of cars, tall buildings: high-energy, high-density living. Or it may be a small rural community, or a linked group of small communities providing slow-paced country living.

As long as your city can provide places for people to live, work, shop and play, it will attract residents. And as long as traffic, pollution, overcrowding, crime or taxes don't drive them away, your city will live.

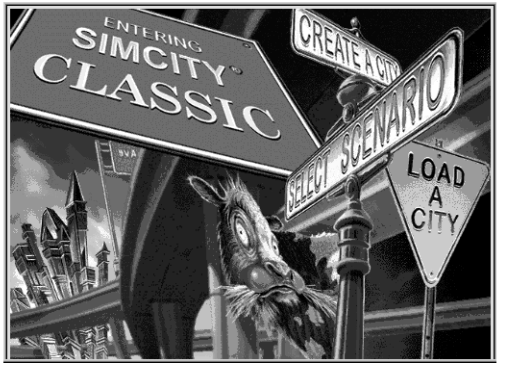
If one strategy doesn't work, try another. There are a million stories in each city, and you write them.

TUTORIAL

A WALK THROUGH YOUR CITY

After you have installed SimCity as instructed by the Quick-Start Guide, double-click the SimCity icon to start building.

Soon you will see a dialog box giving you the following choices: Start New City, Load a City, and Select Scenario. (Windows users will also have a beautiful picture of Maxine the Cow.) Click on **Start a New City**.



Windows SimMayors will be asked to name their city and select a Game Play Level. Go ahead and name your city, and select “Easy” level. You’ll be given randomly generated terrain to build your city.

Macintosh users will see an over-view of randomly generated terrain first, and be given the choice to **Generate New Terrain** or **Use This Map**. Click **Use This Map**. Next, You’ll be allowed to select a Game Play Level. Make this tutorial easy on yourself by clicking the button next to Easy, then click **OK**. Finally, you’ll be able to name your city. The default name is SimWhere. Leave it or change it as suits your whim, then click **OK**.

There are two overlapping windows for you to build your city. The small window in front is the Map window. The larger window in back is the Edit window. If you're using Windows, you have two toolboxes, one labeled Edit and one labeled Map. Macintosh users have these same tools across the top of the Edit and Map windows. In either case, the tools are used to build your city or display different demographic views of your city. We'll play with them later.

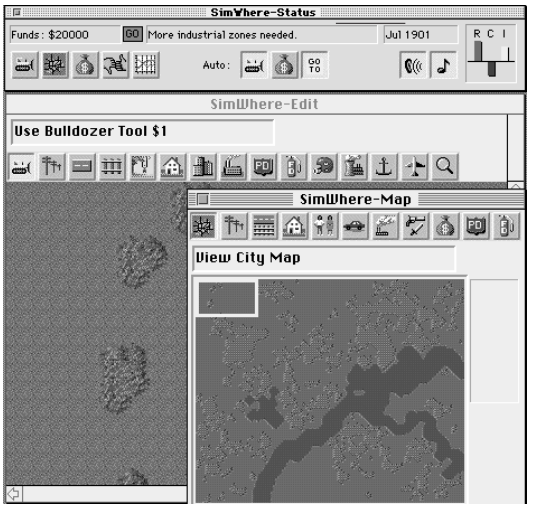
Maps Window

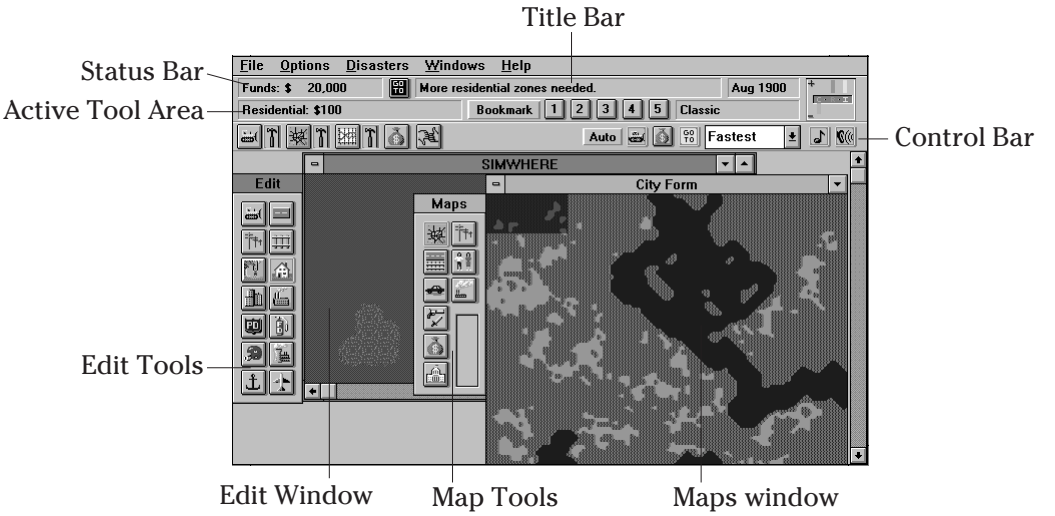
The Map window give you an overall view of your city's terrain. What you see is approximately 10 miles on a side. The small flashing box located somewhere on the map indicates the portion of your terrain that will be visible in the Edit window. Click and drag the box around the map to choose the area you wish to work on.

When you're ready to start building a city, click on the Edit window to bring it to the front.

Note: The Budget Window will pop up once a year in "city" time. When it does, just click on "Go With These Figures."

MACINTOSH





Edit Window

You are now in the Edit Window, looking at a close-up view of the area in the box in the Maps Window. Windows users should note the icons in the Toolbox labeled “Edit.” (The Windows Control Bar is described in the Windows section of the Manual Quick-Start-Guide.) Macintosh users should notice the icons across the top of the Edit Window.

Each set of tools works like icons in various draw and paint programs on the market.

You can use the scroll boxes along the right side and bottom of the window to move the window quickly around the terrain. To scroll over the terrain, use the arrows on each end of the scroll bars.

You have three types of terrain for building your city. The brown areas are clear land, the green areas are forests and shrubs, and the blue areas are water. (In black and white, these areas are light for land, gray for forests, and dark for water). You can build only on clear land, although you can put roads, rails and power lines across water. You can clear forest and extend coastlines with your bulldozer.

To clear the terrain, click the bulldozer icon in the upper-left corner of your group of Edit Tools. The “pointer” is a small square, outlining the area that will be bulldozed every time you click the mouse. Move your bulldozer pointer over some forest land and click. The forest section under your pointer is now clear land. Now, hold the button down and move slowly across the forest. Clear a large area of land to prepare for building.

Click the house icon, then mouse back to your terrain. Your pointer is now a larger square outline. This outline indicates how much clear space you will need to create a residential zone. Clicking the mouse button in clear terrain “zones” the land.

The “R” in the center of the zone indicates that it is a residential zone. The flashing lightning symbol indicates that the zone has no power. Place a few more residential zones adjacent to the first one.

Now decide where to position a power plant in your city. Point to the power plant icon and hold down the mouse button. A small menu will appear, giving you the option of choosing a coal or nuclear plant. For now, choose the coal power plant. Then place it in some open space near your residential zones.

If your power plant is not directly adjacent to a residential zone, you will have to run a power line from your power plant to the residential zone. To do this, click the power line icon. Using your mouse pointer and button, lay power lines from your power plant to your residential zones. Adjacent power line sections will automatically connect themselves to one another.

Roadways and transit lines connect in the same manner.

In a moment, the flashing symbols will disappear, indicating that your zones have been powered. Any zones that are adjacent to a powered zone do not need separate power lines run to them. Soon you will see small houses start to appear. The Sims have started to move in.

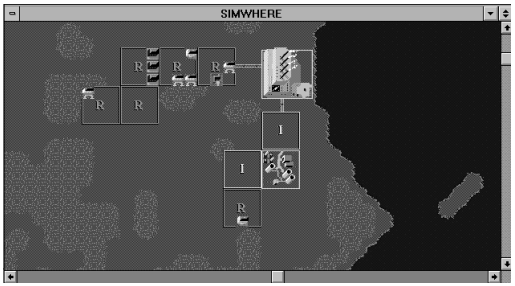
Note: When you zone land, you designate where building is allowed. It is the Sims who actually build.

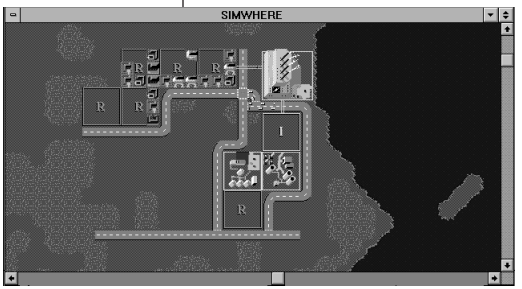
Now that you have a few residential zones, you're ready for commercial and industrial areas. Select the commercial icon and place a few commercial zones near your residential ones. Then select the industrial icon and map out some industrial zones. Connect all necessary power lines.

Note: There is a delay between the time you connect power to a zone and the time the flashing lightning symbol disappears. This delay gets longer as your city grows.

Notice that when you select different icons, the icon description and its associated cost will be displayed in the Active Tool Area of the Edit Window. The message bar across the top of the Edit Window displays your total funds available. If you do not have enough money in your treasury to pay for a certain function, that icon will be "ghosted" on your screen and is unavailable for use.

Before your new city can really begin to develop, you need roads. Click on the **Road** icon and add roads from your residential housing to the commercial and industrial areas to allow the Sims to commute to work. Road sections connect themselves like Power Line sections. Once you have roads, traffic will be generated, and zones will develop.





Now select **Budget** from the Windows Menu. This is where you set the level of funding for your fire, police, and transportation departments. Click the up or down arrows to change the funding level. You can also adjust the current property tax rate. If you have no police or fire departments, they don't need funds. Click **Go With These Figures** when you are done.

Now select **Maps** from the Windows Menu. By clicking on the Map Window icon, you can see different demographic views of your city. You will need this information to build and adjust conditions in your city. For example, you can pinpoint the areas with the highest crime to determine locations for new police stations.

Additional information can be gained through the **Graphs** selection from the Windows Menu. Unlike the maps, which only show the current state of your city, the graphs give you a record of the past so you can gauge trends and cycles.

This is all the basic information you need to run SimCity, but we suggest reading on. The User Reference section explains in detail how to use each program function. Inside SimCity explains the inner workings of the simulator, and gives some hints and tips for using it. There is also an essay, on *The History of Cities and City Planning*, and a bibliography for serious City Planners.

TERRAIN

There are three types of terrain in the Edit Window: Open Land, Trees, and Water. Open Land is where you can zone and build. Depending on the type of monitor and graphics card you have, it is brown, or as a very light shade with speckles.

Trees and Forests are green, or a medium shade. You cannot zone or build on trees. You may Bulldoze trees and forests to turn them into clear land. While some bulldozing is necessary, clearing away too much green area will result in lower property values.

Water is blue, or a dark shade. You cannot zone or build on water. You must bulldoze coastlines to create landfills before you can build or zone there. Roads, rails and power lines can be built across water, with no turns or intersections.

THE KEYBOARD

Keyboard equalivants for menu items are displayed next to the item in the menu. For information on an area in your city, put your cursor over the area, hold down the “Q” Key, and click the mouse button.

MENUS

File Menu

LOAD GRAPHICS brings up a dialog box that lists available Graphics Sets, and allows you to change the architecture of your city. Graphic Sets (Ancient Cities and Future Cities) are an optional add-on to SimCity Classic. Call Maxis for information on where to buy these Alternate Graphic Sets.

LOAD SCENARIO brings up a menu of Scenarios, which are special cities with problems to solve.

START NEW CITY generates a new, empty terrain, and clears existing city (if any) from memory. You will be given a chance to go back and save the old city first. You will also be able to set the Game Play Level, and name your city.

LOAD CITY brings up a File Loading Dialog Box and lets you load a previously saved city. If you have an existing city in progress, SimCity will first ask if you want to save changes to your old city before loading another.

SAVE CITY saves the scenario or city in progress to disk. Use this option to save a city under the same name and to the same place that it has already been saved. If you wish to change the name or location of a city, use the Save City As... option. The first time you choose Save City, you will be asked to name the city and indicate where to save it.

SAVE CITY AS... also saves a city in progress for later use. Use this option to save a city for the first time, or to save a previously saved city under a different name, or to a different disk or subdirectory.

NOTE: Once you have loaded a scenario, it can be saved and reloaded, like any city, without the impending disaster.

PRINT CITY Under Windows, this menu option lets you save your city as a paint file in PCX format (which will load into many paint programs, including Paintbrush, which comes with Windows). Once in the paint program, you can add street names, borders, etc. to your city and print it out.

Under Macintosh, this menu option prints your city in either of two sizes, on one page or a three-page by two-page poster. You'll need an ImageWriter or PostScript LaserWriter printer for this.

EXIT (**QUIT** on Macintosh) ends your SimCity session.

Options Menu

Most of the options set in this menu are saved with the city. When an option is active, there will be a checkmark to the left of the option.

AUTO-BULLDOZE allows you to place zones, roadways, etc. directly on top of trees and shoreline without manually bulldozing first. You will be charged the same as for manual bulldozing.

AUTO-BUDGET keeps your budget at the same percentage settings without asking for approval every year. If there isn't enough money to meet the budget, then funds will be allocated first to the Transit system, then to the Fire Department, then to the Police.

AUTO-GOTO automatically transports you to disasters and major events.

SOUND EFFECTS (**SOUND ON** for Macintosh) toggles the sound effects on and off. The simulation runs slightly faster with the sound off

ANIMATE ALL (**UPDATE ALL WINDOWS** for Macintosh) activates animation and updating in all windows. When it is not active, only the front window will be animated or updated. When this option is off, the simulation runs faster. This option is not saved with a city.

The following Option menu items are for Windows only:

MUSIC toggles the background music on and off. The simulation runs slightly faster with the music off.

SPEED brings up a sub-menu allowing you to set the simulation speed. **Fastes**t sets city time to the maximum

speed possible on your machine. **Pause** stops time. Zoning and building are possible in paused time, but there will be no city growth or evolution.

FREQUENT ANIMATION sets the frequency that the simulation stops crunching numbers and animates the screen. When this option is off, the simulation, and therefore time, will run faster.

STATUS BAR toggles the display of the **Status Bar** on and off.

CONTROL BAR toggles the display of the **Control Bar** on and off.

MINIMIZE PAUSED automatically pauses the game when it is minimized.

SAVE OPTIONS saves your current options settings to disk as the new default. The next time you start SimCity for Windows these options will be in effect.

Game Speed Menu (Macintosh only)

FAST sets city time to maximum speed

MEDIUM is the default setting, about three times slower than FAST.

SLOW sets the speed about seven times slower than FAST.

PAUSE stops time. Zoning and building are possible in paused time.

Disasters Menu

The **Disasters Menu** allows you to set natural disasters loose in your city. Use these disasters to test your ability to deal with emergencies in your city or just to release some aggression. More information on disasters, their causes, and

dealing with them is presented later.

Warning: It is a good idea to save your city to disk before you set a disaster loose–just in case.

FIRE starts a fire somewhere on the map.

FLOOD causes a flood to occur near the water.

AIR DISASTER causes a plane to crash. If there are no planes in the air, one will be generated.

TORNADO causes a tornado to appear somewhere on the map.

EARTHQUAKE causes a major earthquake.

MONSTER sets a monster loose in your city.

DISABLE eliminates the random disasters.

Windows Menu

MAPS opens the Map Window.

GRAPHS opens the Graphs Window.

BUDGET opens the Budget Window.

EDIT opens the Edit Window.

EVAL opens the Evaluation Window.

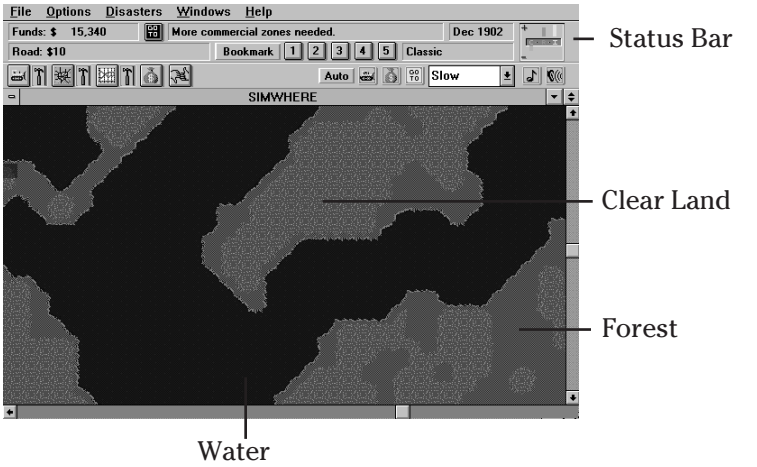
Help Menu (Windows version only)

HELP... opens the on-line Help for SimCity.

ABOUT SIMCITY brings up a screen giving fascinating and vital information about SimCity and Maxis.

EDIT WINDOW AND TOOLS

You build and zone your city in the Edit Window, using the Edit tools.



Scrolling

Only part of your city will show at any one time in the Edit Window. You can scroll to different parts of your city by using the scroll bars. (Windows users can also use cursor and Numeric Keypad keys.)

Using Tools and Placing Zones

The Edit Window has 14 different tools that you use for building and editing your city. The tools are selected by clicking on them with the mouse. (Windows users should click the left mouse button.) The active tool and its cost to use are displayed in the Status Bar. If you don't have enough funds to use a tool, its icon will be ghosted. When a tool is selected, the pointer becomes a rectangle to indicate the area of land that will be affected.

BULLDOZER clears trees and forests, creates landfill along the water, levels developed, existing zones and clears rubble caused by disasters. The Auto-Bulldoze option works on natural terrain, power lines, roads and rails, but not on zones. Bulldozing the center of a zone will destroy the whole zone. Bulldozing one section of land costs $1.

ROADS connect developed areas. Intersections and turns are automatically created. Lay continuous roads by clicking and dragging your pointer. Be careful-if you accidentally lay a road in the wrong place you will have to pay for bulldozing and rebuilding. Holding down the **Shift** key while laying roads will constrain them to a straight line.

Roads may not be placed over zoned areas. They may be placed over trees, shrubbery, and shoreline only after bulldozing or activating the Auto-Bulldoze function from the **Options Menu**. Roads can cross over power lines and rails only at right angles. Laying roads across water creates a bridge. Bridges can only be built in a straight line-no curves, turns or intersections. Shorelines must be bulldozed prior to building a bridge, unless the Auto-Bulldoze function from the **Options Menu** is active.

Roadways are maintained by the transit budget, and wear out if there is a lack of funding. The amount of yearly funding requested by the transportation department is $1 for each section of road, $4 for each section of bridge. It costs $10 to lay one section of road and $50 to lay one section of bridge.

POWER LINES carry power from power plants to zoned land and between zones. All developed land needs power to function. Power is conducted through adjacent zones. Unpowered zones display the flashing power symbol. There is a delay between the time you connect power to a zone and when the flashing symbol disappears that grows longer as the city grows larger.

Power lines cannot cross zoned land, and can be built over trees, shrubbery, and shoreline only after bulldozing, or after activating the Auto-Bulldoze function from the **Options Menu**. Holding down the **Shift** key while laying power lines will constrain them to a straight line.

Junctions and corners are automatically created. Lay continuous power lines by clicking and dragging your pointer. Power lines across water must be horizontal or vertical–no turns, curves or intersections. Power lines consume some power due to transmission inefficiencies. It costs $5 to lay one section of power line on land, $25 on water.

TRANSIT LINES create a railway system for intra-city mass transit. Lay continuous transit lines by clicking and dragging your pointer. Intersections and turns are created automatically. Holding down the **Shift** key while laying tracks will constrain them to a straight line. Tracks laid under rivers will appear as dashed lines. These are underwater tunnels, and must be vertical or horizontal–no turns, curves or intersections.

Transit lines are maintained by the transit budget. The level of funding affects the efficiency of the system. The amount of yearly funding requested by the transportation department is $4 for each section of rail, and $10 for each section of tunnel. It costs $20 per section of track laid on land, $100 per section under water.

PARKS can be placed on clear land. Parks, like forests and water, raise the land value of surrounding zones. Parks can be bulldozed as fire breaks or to reserve space for later mass transit expansion. Holding down the **Shift** key while building parks will constrain them to a straight line. It costs $10 to zone one park.

RESIDENTIAL ZONES are where the Sims live and build houses, apartments and community facilities such as schools, hospitals and churches.

Most Residential zones develop into one of four values: slums, lower middle class, upper middle class, and upper class. They can range in population density from single-family homes to high-rise apartments and condominiums. Some Residential zones will automatically develop into Churches and Hospitals. Factors influencing residential value and growth are pollution, traffic density, population density, surrounding terrain, roadway access, parks and utilities. It costs $100 to zone one plot of land as Residential.

COMMERCIAL ZONES are used for many things, including retail stores, office buildings, parking garages and gas stations. There are four values for commercial property, and five levels of growth, from the small general store to tall skyscrapers. Factors influencing the value and growth of commercial areas include internal markets, pollution, traffic density, residential access, labor supply, airports, crime rates, transit access and utilities. It costs $100 to zone one plot of land as Commercial.

INDUSTRIAL ZONES are for heavy manufacturing and industrial services. There are four levels of industrial growth, from small pumping stations and warehouses to large factories. Factors influencing industrial growth are external markets, seaports, transit access, residential access, labor supply and utilities. It costs $100 to zone one plot of land as Industrial.

POLICE DEPARTMENTS lower the crime rate in the surrounding area. This in turn raises property values. Place these in high-density crime areas as defined by your Crime Rate map. The efficiency of a station depends on the level of police department funding. It costs $500 to build a Police Station. Full yearly maintenance of each Police Station is $100.

FIRE DEPARTMENTS make surrounding areas less susceptible to fires. When fires do occur, they are put out sooner and do less damage if a station is near. The effectiveness of fire containment depends on the level of fire department funding. It costs $500 to build a Fire Station. Full yearly maintenance of each Fire Station is $100.

STADIUMS encourage residential growth, once a city has become fairly large. You may build a stadium in a smaller city without negative (or positive) effect. Stadiums indirectly generate a lot of revenue, but create a lot of traffic. Properly maintaining a stadium requires a good road and transit network. It costs $3000 to build a Stadium.

POWER PLANTS can be coal or nuclear, chosen from a sub-menu provided when you activate the Power Plant icon. The nuclear plant is more powerful but carries a slight risk of meltdown. The coal plant is less expensive, but less powerful, and it pollutes. All zoned land needs power to develop and grow. When developed land loses power, it will degenerate to barren ground unless power is restored. Connecting too many zones to a Power Plant causes brownouts.

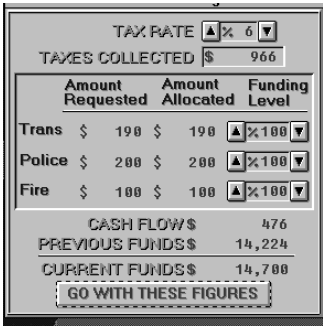
Coal power plants cost $3000 to build, and supply enough energy for about 50 zones. Nuclear plants cost $5000 and supply electricity for about 150 zones.

SEAPORTS increase the potential for industrial growth. They have little effect in a small city, but contribute a lot to industrialization in a large city. Seaports should be placed on a shoreline. The shoreline must be bulldozed prior to zoning a Seaport, unless Auto-Bulldoze is active. Once the port is operational, you may see ships in the water. It costs $5000 to zone land for use as a Seaport.

AIRPORTS increase the growth potential of your commercial markets. Once a city starts getting large, commercial growth will level off without an Airport. Airports are large and expensive and should not be built unless your city can afford one. Position Airports to keep flight paths over water whenever possible, lessening the impact of air disasters. Once you build an Airport you will see planes flying above your city to and from the Airport. There is also a traffic helicopter that alerts you to heavy traffic areas. It costs $10,000 to zone land for use as an Airport.

THE BUDGET WINDOW

At the end of each year taxes are collected, and the **Budget Window** will appear (unless you select the Auto-Budget function). You will be asked to set the funding levels for the fire, police and transportation departments, and to set the property tax rate.



When Auto-Budget is active, all the funding levels will remain at full funding, or at your last setting. If there is not enough money to completely fund the budget, money will go to the Transit Department first, then to the Fire Department, then to the Police Department.

You can raise and lower budget levels by clicking on the little arrows that correspond to each category. A percentage indicator will display the level of funding that will be maintained if you turn on the Auto-Budget function. You may adjust your tax rate by clicking on the arrows next to the tax rate indicator. Click on "GO WITH THESE FIGURES," or hit **Return** to exit the Budget Window.

Note: When you first load in a city, all the Budget amounts will be zeroed out until the next January. This first year is a "grace period," and all City Services will be considered completely funded.

TAX RATE

The maximum tax rate you can set is 20%.

The minimum tax rate you can set is 0%.

The optimum tax rate for fast growth is between 5% and 7%.

To slow city growth without actually shrinking, set the tax rate to 8% or 9%.

The tax collection from each zone is based on the following formula:

Tax = Population x Land Value x Tax Rate x a Scaling Constant.

The scaling constant changes with the difficulty level of the game.

FUNDING LEVELS

The amount of yearly funding requested for the fire and police departments is $100 per station. Until you actually build fire or police stations, you cannot fund them. You cannot allocate more than 100% of the requested funding for fire and police departments–SimCity police officers and fire inspectors are honest and will not accept your bribes. Allocating less than the requested amount will decrease the effective coverage of the police or fire station.

The amount of yearly funding requested for the transportation department is $1 for each section of road, $4 for each section of bridge (roads over water), $4 for each section of rail, and $10 for each section of tunnel (underwater rails). You cannot allocate more than 100% of the requested funds.

Funding transportation maintenance slightly below 100% will cause slow, minor deterioration of the transit system–an

occasional pothole or bad track section. Funding between 90% and 75% will cause noticeable damage–many sections of road and rail will be unusable. Funding below 75% will cause rapid deterioration of your transit system.

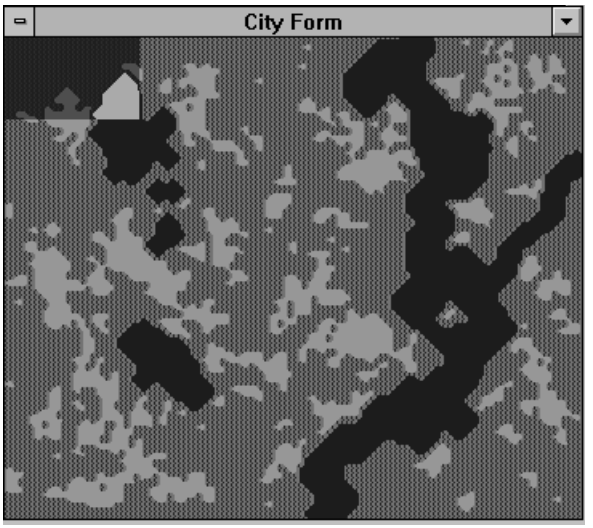
CASH FLOW

Cash Flow = Taxes Collected – Total Allocated Funds. It will be a negative number if your yearly maintenance costs are greater than your yearly tax intake.

A major difference between SimCity and a real city is that SimCity does not allow budget deficits. If you don't have the money, you can't spend it. Try not to let your city run with a negative cash flow.

THE MAPS WINDOW

The **Maps Window**, which can be opened from the Windows Menu gives you various overviews of your city.



Somewhere in the map is the **Edit Rectangle**. This rectangle shows the area of the map that is visible in the Edit Window. You can move the rectangle around the map with the mouse or cursor keys to change the area that the Edit Window displays. The rectangle will stop at the borders of your city. If the entire map isn't displayed, moving the rectangle to the edge of the window will cause the map to scroll.

Macintosh users can double-click this rectangle to open their Edit window to the area defined by the rectangle.

You may also notice letters on the map. These are markers to let you know where moveable objects are. An **"S"** marks the location of a ship. An **"R"** marks the location of a railroad train. An **"H"** marks the location of a helicopter. An **"A"** marks the location of an airplane. An **"M"** marks the location of a Monster, and a **"T"** marks the location of a Tornado.

MAPS WINDOW TOOLS AND MAPS

There are nine tools you can use on the Maps Window. Each tool shows a different view of your city. A Density Key is used when these views use colors or gray scales to show density, rate, or comparative levels of some city aspects.

The **CITY FORM MAP** shows the physical shape of your city, showing developed and non-developed areas. Use this map to plan city expansion.

The **POWER GRID MAP** shows the power network of your city. Use this map to locate unpowered zones and breaks in the power lines.

The **TRANSPORTATION MAP** is a road and rail map of the city. Use this map to examine traffic access to all parts of the city and plan further expansion of the network.

Click and hold on the **POPULATION MAPS** icon to bring up a sub-menu offering two map views.

The **POPULATION DENSITY** view displays the average number of people occupying an area each day. Use this map to locate under-utilized areas and overpopulated areas.

The **POPULATION GROWTH** view shows the most recent growth (positive or negative) of your city, and where it is occurring.

The **TRAFFIC DENSITY MAP** shows the amount of traffic on the roads. Spot traffic problems and determine where new roadways are needed.

The **POLLUTION INDEX MAP** shows levels of pollution throughout the city. Pollution is generated primarily by industry, traffic, and coal power plants.

The **CRIME RATE MAP** shows the level and location of crime in your city. Crime is calculated from population density, land value, and proximity of police stations.

The **LAND VALUE MAP** shows the relative value of land within the city limits. Land values are used to establish the amount of revenue generated by taxes.

Click and hold the **CITY SERVICES** icon to bring up a sub-menu offering views of police or fire services.

The **POLICE INFLUENCE MAP** displays the effective radius of Police Stations based on their location, power, funding levels, and access.

The **FIRE PROTECTION MAP** displays the effective radius of Fire Stations based on their location, power, funding levels, and access.

USING THE MAPS

The Map Window should be constantly referred to in all stages of city planning, building and managing. Printing the map and sketching in your plan with pencil or pen can save a lot of bulldozing and re-zoning and rebuilding.

BEFORE YOU BUILD

Use the map before beginning a new city to plan:

where you want your city center,

where you want the high-value waterfront residential areas,

where you will cross water with bridges, power lines and tunnels,

where to place power plants,

where to place large industrial sections away from the residential sections,

and the general layout of the city.

DURING CITY GROWTH

Use the map to guide your city's growth around forest areas, to preserve the trees and improve property values.

Use the transportation map along with the traffic density map to plan traffic control and expansion.

Use the city map to make sure you have the proper ratio of residential to commercial to industrial zones.

Use the pollution map to detect problem areas, and disperse the industrial zones and/or replace roads with rails.

Printing out the map in various stages of development and doing some preliminary expansion planning with a pencil can be useful. Printouts can also be used for city historical records.

DURING CITY MAINTENANCE

Use the power grid map to locate zones that have lost power.

Use the city services maps to evaluate the effective coverage of your police and fire departments.

Use the crime rate map to locate problem areas that need more police protection.

Use the pollution map to locate problem areas.

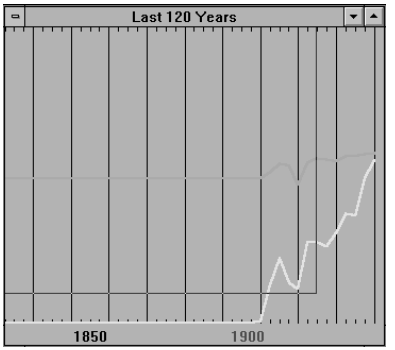
Use the transportation and traffic density maps to determine where to replace roads with rails.

Use the land value map to locate depressed areas for improvement or replacement.

Use the city map to maintain the proper ratio of residential to commercial to industrial zones.

GRAPHS WINDOW

The Graphs Window gives you time-based graphs of various city data. It is opened through the Windows Menu.



There are eight Graph Window icons, six of which select different graphs of city data. The other two select the time range the data covers.

Multiple graphs can be viewed at once. Each graph is a different color. Active icons are outlined in the same color as their corresponding data line in the graph.

THE GRAPHS ICONS

The **RESIDENTIAL POPULATION GRAPH** shows the total population in residential zones.

The **COMMERCIAL POPULATION GRAPH** shows the total population in commercial zones.

The **INDUSTRIAL POPULATION GRAPH** shows the total population in industrial zones.

The **CRIME RATE GRAPH** shows the overall crime rate of the entire city.

The **CASH FLOW GRAPH** shows your city's cash flow: money collected in taxes minus money it took to maintain your city. The line in the center of the CASH FLOW GRAPH represents a cash flow of zero. Do not build more infrastructure (roads, rails, police departments, fire stations) than you can support with tax revenues.

The **POLLUTION GRAPH** shows the overall average pollution reading of the entire city.

You may view graphs for time periods of either the last 10 years or the last 120 years by clicking on the 10 YEAR or 120 YEAR buttons.

USING THE GRAPHS

The Graphs give information on many of the same factors as the Maps, but show the information over time. Graphs are for locating trends in city life that won't be noticeable in a Map. If you look at a Map, for example the crime rate map, once every year, a very slight rise in the crime rate will not be noticeable. But on a Graph, you could easily locate the upward trend in crime because you will be viewing the levels for a number of years at the same time.

Residential, commercial and industrial population growth and/or decline can be tracked and displayed. If you notice a downward trend in any of these, refer to the User Reference Card to locate potential problems and solutions.

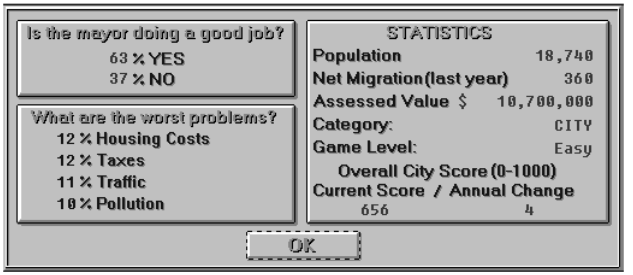
Crime rate can be displayed, revealing slight but consistent upward or downward trends.

Use the Cash Flow Graph to track your city's efficiency as it grows. If your maintenance costs are higher than your tax revenues, you will have a negative cash flow.

Use the Pollution Graph to catch rising levels of pollution before they reach a problem level.

THE EVALUATION WINDOW

The EVALUATION WINDOW gives you a performance rating.



PUBLIC OPINION is presented in poll form, rating your overall job as mayor and listing what the public regards as the city's most pressing problems. You are advised to keep your residents happy or they might migrate away, and you will be left with a "ghost town."

In general, if more than 55% of the populace thinks you are doing a good job, then you can feel secure about keeping your job.

If 10% or less of the people think something is a problem, then it's not too bad.

These are most of the problems that citizens complain about, and how to correct them:

Traffic	Replace dense sections of roads with rails
Crime	Add police stations and/or raise property values
Pollution	Replace roads with rails, disperse industrial zones
Housing	Zone more residences
Housing costs	Zone more residences in low property value areas
Fires	Build more fire departments
Taxes	Lower taxes (if you can)
Unemployment	Zone more commercial and industrial areas

STATISTICS on **Population, Net Migration** and **Assessed Value** are displayed, along with the city's **Game Level** and the **Overall City Score**. This data is calculated once a year at budget time.

POPULATION is the number of residents in your city.

The **NET MIGRATION** statistic provides a rating of the desirability of your city. If people are leaving in droves, then you know something is rotten in SimCity.

The **ASSESSED VALUE** is the combined value of all city-owned property: roads, rails, power plants, police and fire stations, airports, seaports, parks, etc. It does not include residential, commercial and industrial zones.

The **CATEGORIES** are defined by population as follows:

Village	0 to 1,999
Town	2,000 to 9,999
City	10,000 to 49,999
Capital	50,000 to 99,999
Metropolis	100,000 to 499,999
Megalopolis	500,000 and above

OVERALL CITY SCORE is a composite score based on the following factors (some positive, some negative):

MAJOR FACTORS - Crime, pollution, housing costs, taxes, traffic, unemployment, fire protection, unpowered zones, city growth rate.

MINOR FACTORS - Stadium needed (but not built), seaport needed (but not built), airport needed (but not built), road funding, police funding, fire department funding, and fires.

A large population is not necessarily a sign of a successful city. Population size does not affect the overall city score, since low population could indicate a new or growing city.

Since city growth rate does affect the overall city score, a city in which growth has been intentionally stopped for environmental or aesthetic reasons will have a slightly lower score.

DISASTERS

Disasters will randomly occur as you play SimCity. At higher game levels the disasters will happen more often. Most disasters can be activated from the **Disasters Menu**. Random disasters can be eliminated by the **Disable** option on the Disasters Menu.

FIRES can start anywhere in the city. Fires spread fairly rapidly through forests and buildings, and more slowly over roadways. Fire will not cross water or clear land.

The effectiveness of the fire department (which can be viewed in the Maps Window) is based on how close it is to the fire, and its funding levels. Fires inside this effective radius will be extinguished automatically. If you have no operational fire departments in the area, you can try to control the fire yourself. Since fire will not spread across clear terrain, you can build fire breaks with the bulldozer. Just surround the fire with clear areas and it will stop spreading and eventually burn itself out.

Note: You cannot directly bulldoze a fire.

FLOODING occurs near the water. Floods gradually spread and destroy buildings and utilities. After a while the flood waters recede, leaving behind cleared terrain.

AIR CRASHES can happen anywhere in the city if an airport is operational. This happens whenever aircraft collide with things, such as tornadoes or another aircraft. When a crash occurs, a fire will start, unless the crash is on water. A good strategy is to locate the airport away from the central city to minimize the fire damage.

TORNADOES can occur anywhere on the map at any time. Very fast and unpredictable, they can appear and disappear at a

moment's notice. Tornadoes destroy everything in their path, and can cause planes, helicopters, trains, and ships to crash.

EARTHQUAKES are the most devastating disaster. This is a major Earthquake–between 8.0 and 9.0 on the Richter Scale. It will destroy buildings and start fires. The initial damage will vary with the severity of the earthquake, and the eventual fire damage depends on your fire-control efforts.

When an Earthquake occurs, you will see the Edit Window shake for a while. When it stops, you will have to take charge and control the scattered fires. Use the bulldozer to contain the largest fires first and work your way down to the smaller ones.

MONSTER ATTACKS are provoked by high levels of pollution. A monster destroys everything in its path, starts fires, and causes planes, helicopters, trains and ships to crash.

MELTDOWNS are only possible if you are using a nuclear power plant. If a meltdown occurs, your nuclear plant will explode into flames. The surrounding area will be unusable for the remainder of the simulation due to radioactive contamination. Meltdowns are not available on the Disasters Menu.

SHIPWRECKS can occur once you have an operating seaport. They can cause fires where the ship crashes into a shore or bridge. Shipwrecks are not available on the Disasters Menu.

SCENARIOS

The Scenarios provide both real and hypothetical problems for you to deal with in seven famous (and one not-so-famous) cities. They present various levels of difficulty. Some

problems are in the form of disasters which will occur some time after you start. Other problems are more long-term, such as crime. Your task is to deal with the problem at hand as well as possible under the circumstances. After a certain amount of time the city residents will rate your performance in a special election. If you do very well you may be given the key to the city. However, if you do poorly, they just might run you out of town.

NOTE: To avoid the disaster which is tied to a scenario, save it to disk and reload the city from the saved file.

DULLSVILLE, USA 1900–BOREDOM

Things haven't changed much around here in the last hundred years or so and the residents are beginning to get bored. They think Dullsville could be the next great city with right leader. It is your job to attract new growth and development, turning Dullsville into a Metropolis by the 21st century.

Difficulty: Easy

Time Limit: 30 years

Win Condition: Metropolis

SAN FRANCISCO, CA 1906 8.0–EARTHQUAKE

Damage from the earthquake was minor compared to that of the ensuing fires, which took days to control. Fifteen hundred people died. Controlling the fires should be your initial concern here. Afterwards, clearing the remaining rubble will allow the city to start rebuilding.

Difficulty: Very Difficult

Time Limit: 5 years

Win Condition: Metropolis

HAMBURG, GERMANY 1944–FIRE

Allied fire-bombing of German cities in WWII caused tremendous devastation and loss of life. People living in the inner cities were at greatest risk. You must control the firestorms during the bombing and then rebuild the city after the war.

Difficulty: Very Difficult

Time Limit: 5 years

Win Condition: Metropolis

BERN, SWITZERLAND 1965–TRAFFIC

The roads here are becoming more congested with automobile traffic every day, and the residents are upset. They demand that you do something about it. Some have suggested a mass transit system as the answer, but this may require major rezoning in the downtown area.

Difficulty: Easy

Time Limit: 10 years

Win Condition: Low Average Traffic Density

TOKYO, JAPAN 1957–MONSTER ATTACK

A large reptilian creature rose from Tokyo Bay and rampaged through the city, destroying much of the industry along the bay.

Difficulty: Moderately Difficult

Time Limit: 5 years

Win Condition: City Score above 500

DETROIT, MI 1972–CRIME

By 1970, competition from overseas and other economic factors pushed the once "automobile capital of the world" into recession. Plummeting land values and unemployment increased crime in the inner-city to chronic levels. You have just been elected after promising to reduce the crime and rebuild the industrial base of the city.

Difficulty: Moderately Difficult

Time Limit: 10 years

Win Condition: Low Average Crime Density

BOSTON, MA 2010–NUCLEAR MELTDOWN

A major meltdown is about to occur at one of the new downtown nuclear reactors. The area in the vicinity of the reactor will be severely contaminated by radiation, forcing you to restructure the city around it.

Difficulty: Very Difficult

Time Limit: 5 years

Win Condition: City Score above 500

RIO de JANEIRO, BRAZIL 2047–FLOOD

In the mid-21st century, the greenhouse effect raised global temperatures 6 degrees F. Polar icecaps melted and raised sea levels worldwide. Coastal areas were devastated by flood and erosion. Unfortunately, some of the largest cities in the world are located on the coasts.

Difficulty: Moderately Difficult

Time Limit: 10 years

Win Condition: City Score above 500

GAME PLAY LEVEL AND GROWING A CITY

When you first start a new city you must pick a difficulty level. Once a city is started you cannot change the game play level; it remains at your initial setting for the life of the city. The game level setting is displayed in the evaluation window.

This level–Easy, Medium, or Hard–adjusts the simulation to your current abilities by altering several factors. A harder setting will increase the chance of disasters, make residents more intolerant of taxation, cause maintenance costs to grow, etc.

While growing a city, refer often to the chart of City Dynamics. It shows how all factors of city life and growth are related.

The main points to keep in mind while growing a city are:

Grow slowly. Watch your money.

All zones must be powered to develop.

Zones must be developed to generate tax money.

Roads or rails must provide access to and from each zone for it to fully develop.

There is a yearly maintenance cost for each section of road, rail, bridge and tunnel. This can add up. Don't build too many roads and rails and generate high maintenance costs before your city can generate enough tax revenues to support them.

Extra power plants and redundant power lines are expensive, but can keep zones from losing power during a disaster or emergency and deteriorating.

Rails can carry much more traffic than roads. While building and zoning an area that you predict will generate heavy traffic, install rails instead of roads in the early stages of development.

If you get a lot of heavy traffic warnings, replace roads with rails. You can even build an entirely roadless city.

Grouping zones together, four or five in a row touching each other, can eliminate a lot of power line segments.

Airports, seaports and stadiums won't help a small city grow-so save your money until the city gets larger. The Sims will tell you when they need these things.

Place zones, roads, etc. carefully–they cannot be moved, and you will have to pay to bulldoze them and rebuild.

As a rule of thumb, the number of residential zones should be approximately equal to the sum of commercial and industrial zones. When your city is small, you will need more industrial zones than commercial, and when your city gets larger, you will need more commercial zones than industrial.

Separate the residential areas from the industrial areas.

Proximity to forest, parks, and water increases land value, which increases the taxes collected. Don't bulldoze any more forest than you must. Natural shoreline increases property values more than landfill shoreline.

Keep in mind that proximity to downtown raises property values. The simulator defines the downtown area as "the center of mass of the population density." It calculates the average geographical center of the population.

A bigger, more populous city is not necessarily better. Having a self-supporting, profitable city with pleasant

surroundings is better than a huge city that is always broke and has no forest or shoreline.

Use the various maps and graphs to plan city growth, locate problems, and track your progress. Look for areas that need police and fire coverage as you go, so you don't have to go back and bulldoze developed zones to make room for police and fire stations.

Save your city to disk before trying any major new policy so you can go back if your plan doesn't work.

Print out your city in different stages of evolution to track and plan growth.

Check the Evaluation Window often. The Sims will let you know how you are doing. Also the statistics can be useful; if your population is shrinking, don't go zoning new areas that may never develop, look for problems in the existing zoned areas, and spend your time and money solving them.

SAVE YOUR CITY OFTEN!!!

Note: There is only one animated train car at a time in SimCity. It will not necessarily cover every section of track. This does not mean that the tracks are not working. Don't worry, everything is OK.

Use this chart along with the Query function to identify and investigate individual zones.

CITY DYNAMICS CHART

The City Dynamics Chart lists the factors of city life and growth and shows how they interrelate. Use this chart to guide you in designing your city. It will help you find solutions to the Sims' complaints, and to problems you discover from the maps and graphs.

Inside SimCity

HOW THE SIMULATOR WORKS AND STRATEGIES FOR USING IT

Many factors influence the chance of your city's prospering or floundering: both internal factors (the structure and efficiency of your city) and external factors (the regional economy, disasters, etc.).

ZONES

Your city is divided into three primary zones: residential, commercial and industrial. These zones symbolize the three basic pillars upon which a city is based: population, industry, and commerce. All three are necessary for your city to grow and thrive.

RESIDENTIAL ZONES are where the Sims live. Here they build houses, apartments and community facilities such as churches and schools. Sims are the work force for your city's commercial and industrial zones.

INDUSTRIAL ZONES are used to site warehouses, factories, and other unsightly and polluting structures which have a negative impact on surrounding zones. One of the major goals of planning is to separate these "nuisances" from the areas where people live. In this simulation, industrial zones represent the "basic" production of your city. Things

produced here are sold outside the city to an "external market," bringing money into the city for future growth.

COMMERCIAL ZONES represent the retail stores and services in your city, including gas stations, grocery stores, banks, and offices. Commercial areas are mainly dedicated to producing goods and services needed within your city. This is called "non-basic" production or production for the "internal market."

POPULATION - RESIDENTIAL

The major factors controlling residential population are birthrate, availability of jobs and housing, unemployment, and quality of life within the city.

Birthrate as used here, is actually a combination of the birthrate (+) and the deathrate (-). Within SimCity there is always a positive birthrate.

Availability of jobs (the employment rate) is a ratio of the current commercial and industrial populations to the total residential population. As a rule of thumb, the number of commercial and industrial zones together should roughly equal the number of residential zones.

If there are more jobs in your city than residents, new settlers will be attracted. If the job market declines during a local recession, your people will migrate away in search of jobs.

Housing for your residents is built in the residential zones. These zones must be powered and connected to the places of employment by roads. The structures built in residential zones are influenced by land value and population density.

Quality of life is a measure of relative "attractiveness" assigned to different zone locations. It is affected by negative

factors such as pollution and crime, and positive factors such as parks and accessibility.

EXTERNAL MARKET–INDUSTRIAL

Thousands of variables influence your city. You can influence all these variables by your actions, except for of one.

The external market (the economic conditions that exist outside of your city) is controlled by the simulation–there is nothing you can do to change it. In many ways, this external market is the original source of all city growth. Towns frequently begin as production centers (steel towns, refineries, etc.) that service a demand in the surrounding region. As time passes, the external market grows to reflect the regional growth going on around your city.

The industry in your city will attempt to grow as the external market grows. For this to happen there must be room for expansion (more industrial zones) and an adequate labor supply (more residential zones).

INTERNAL MARKET–COMMERCIAL

The internal market is completely influenced by the conditions within your city. Internal production, created in the commercial zones, represents all the things purchased and consumed within the city. Food stores, gas stations, retail stores, financial services, medical care, etc.– all depend on a nearby population to service. Within SimCity, the size of the internal market determines the rate at which commercial zones will prosper. Commercial zones need enough zoned land to build on and an existent, sufficient work force to employ. The structures built in commercial zones are mainly influenced by land value and population density.

Commercial zones grow and develop to serve the expanding internal market. Commercial growth will usually be slow at

first, when the population is small and needs very little. As your city grows, commercial growth will accelerate and the internal market will become a much larger consumer of your total city production. This accelerating effect, when the external/industrial production is overtaken by the accelerating internal/commercial sector, can turn a sleepy little town of 50,000 into a thriving capital of 200,000 in a few short years.

TAX RATE

The tax rate you set controls the amount of income generated by your city. As taxes are collected each year (simulation time), the Budget Window will appear, giving you the fiscal details of your city and a chance to adjust rates. The simulation determines the amount of revenue collected by assessing each zone an amount based on its land value, current level of development and the current tax rate.

The tax rate has a global affect on your city's growth rate. If you set it low (0–4%), growth will be brisk but the city income will be low. If you set it high (10–20%), you will collect a lot in the short run but in the long run tax income will decrease along with the population. You must keep tax income high enough to invest in new development, but low enough not to scare off residents and businesses. A high tax rate is one way to control city growth, should you want to experiment with "growth control measures."

BUDGETING

City budgeting affects the way your city grows. City infrastructure cost is represented by three departments: police, fire, and transportation. You may set the funding levels separately for each. All three departments will request a certain level of funding each year. You may supply all or part of the requested funds, in the attempt to balance safety needs and budgetary concerns.

POLICE DEPARTMENTS

Police stations lower the crime rate within a territory. The effective radius of your police station is related to the amount of funding allocated to the police department.

FIRE DEPARTMENTS

Fire departments prevent and extinguish fires. The level of funding determines the effective radius of a fire department. Fire departments put out fires within this radius much sooner than outside it, and decrease the chance that they will start in the first place. Fire departments cost $100 per year to fund.

TRANSPORTATION DEPARTMENT

When you build roads and rail systems you are charged for construction and yearly maintenance. The larger your transportation network, the more it will cost for upkeep. If you decide not to or are unable to pay this maintenance cost, roads will slowly deteriorate and become unusable. The maintenance cost for each piece is: Road - $1, Bridge - $4, Rail - $4, Rail tunnel - $10.

POWER

Electrical power makes modern cities possible. Efficient and reliable power transmission to all zones is the goal of good “power management.”

The entire power grid of your city is periodically checked in the simulation for links to power. If a zone is connected (by other zones or power lines) to a power plant, the zone is considered powered.

Zones must be powered for development to occur. Many things (such as fires, tornadoes, earthquakes and bulldozers)

can knock down power lines and cause blackouts in parts of your city. Development will stop in unpowered zones, and if power is not quickly restored, the zone will decline back to its original state of emptiness.

Redundant Power Plants and power connections can make your power grid more reliable, but running more line adds construction costs.

TRANSPORTATION–TRAFFIC

One of the most important elements of city structure is the transportation network. It moves Sims and goods throughout your city. Roads typically occupy as much as 25%–40% of the land in urban areas. Traffic along these roads indicates which sections of your road system are used the most.

Traffic levels are simulated by a process known as "Trip Generation." Over time, each populated zone in the city will generate a number of trips, depending on the population. Each generated trip starts at the origin zone, travels down the road, and if a "proper destination" is reached, ends at the destination zone–otherwise, the trip fails. Trip failure indicates inaccessibility of a zone and limits its growth.

The majority of generated trips represent people commuting to and from work. Additional traffic is generated by residents traveling to shopping, recreation, etc. When analyzing traffic, the simulator tests the following traffic routes:

From: ORIGIN ZONE	To: DESTINATION ZONE
Residential	Commercial zones and Industrial
Commercial	Residential zones and Industrial
Industrial	Residential

When Sims drive away from an origin zone, they have a limited "trip range" in which to find a destination zone. Heavy traffic decreases the trip range. If the destination zone is too far away, the trip is unsuccessful. Repeated unsuccessful trips will cause the Sims to move out of the origin zone.

Each road has a limited capacity for traffic. When this capacity is exceeded traffic jams will form. Traffic jams drastically lower the capacity of a road, compounding the problem and frustrating drivers.

Traffic conditions fluctuate quickly. Avoid traffic problems by providing several routes for the traffic to take.

A road must be adjacent to a zone for the zone to be connected to the traffic pattern. Zones do not conduct traffic the way they conduct power.

POLLUTION

Pollution levels are tracked in all areas of your city. This is a general "nuisance level" that includes air and water pollution, noise pollution, toxic wastes, etc. Pollution has a negative impact on the growth of residential areas.

The primary cause of pollution is industrialized zones. The level of pollution created by an industrial zone increases with its level of growth.

Traffic is another cause of pollution. There are limited means of combating the pollution level. Lowering traffic density, limiting industrial development, and separating the pollution from the residential areas will help.

CRIME

Crime rates are influenced by population density, local law enforcement, and land values. As population density increases in an area, the number of crimes committed increases. Crime will also increase in areas of low land value.

The most effective way to deal with high crime rates is to introduce a police station into the area. Based on its level of funding, the police station will reduce the rate of crime in its sphere of influence. A long-term approach to lowering crime is to raise the land value of the area. One way to do this is to demolish and rezone (urban renewal).

LAND VALUE

Land value is one of the most fundamental aspects of urban structure. The land value of an area affects how that area is used. In this simulation the land value of an area is based on terrain, accessibility, pollution, and distance to downtown.

The farther the residents have to go to work, the lower the land value where they live, due in part to transportation costs. The value of commercial zones depends greatly on accessibility by the populace.

Land value is also affected by surrounding terrain. If land is closer to water, trees, agricultural areas, or parks, its value will rise. Creative placement of zones within the terrain, with little bulldozing, can make good use of this natural advantage.

HISTORY OF CITIES AND CITY PLANNING

by Cliff Ellis

Introduction

The building of cities has a long and complex history. Although city planning as an organized profession has existed for less than a century, all cities display various degrees of forethought and conscious design in their layout and functioning.

Early humans led a nomadic existence, relying on hunting and gathering for sustenance. Between 8,000 and 10,000 years ago, systematic cultivation of plants and the domestication of animals allowed for more permanent settlements. During the fourth millennium BC, the requirements for the "urban revolution" were finally met: the production of a surplus of storable food, a system of writing, a more complex social organization, and technological advances such as the plough, potter's wheel, loom, and metallurgy.

Cities exist for many reasons, and the diversity of urban forms can be traced to the complex functions that cities perform. Cities serve as centers of storage, trade, and manufacture. The agricultural surplus from the surrounding countryside is processed and distributed in cities. Cities also grew up around marketplaces, where goods from distant places could be exchanged for local products. Throughout history, cities have been founded at the intersections of transportation routes, or at points where goods must shift from one mode of transportation to another, as at river and ocean ports.

Religious elements have been crucial throughout urban history. Ancient peoples had sacred places, often associated with cemeteries or shrines, around which cities grew. Ancient cities usually had large temple precincts with monumental religious buildings. Many medieval cities were built near monasteries and cathedrals.

Cities often provided protection in a precarious world. During attacks, the rural populace could flee behind city walls, where defense forces assembled to repel the enemy. The wall served this purpose for millennia, until the invention of heavy artillery rendered walls useless in warfare. With the advent of modern aerial warfare, cities have become prime targets for destruction rather than safe havens.

Cities serve as centers of government. In particular, the emergence of the great nation-states of Europe between 1400 and 1800 led to the creation of new capital cities or the investing of existing cities with expanded governmental functions.

Washington, DC, for example, displays the monumental buildings, radial street pattern, and large public spaces typical of capital cities.

Cities, with their concentration of talent, mixture of peoples, and economic surplus, have provided a fertile ground for the evolution of human culture: the arts, scientific research, and technical innovation. They serve as centers of communication, where new ideas and information are spread to the surrounding territory and to foreign lands.

Constraints on City Form

Cities are physical artifacts inserted into a preexisting natural world, and natural constraints must be respected if a settlement is to survive and prosper. Cities must conform to

the landscape in which they are located, although technologies have gradually been developed to reorganize the land to suit human purposes. Moderately sloping land provides the best urban site, but spectacular effects have been achieved on hilly sites such as San Francisco, Rio de Janeiro, and Athens.

Climate influences city form. For example, streets have been aligned to take advantage of cooling breezes, and arcades designed to shield pedestrians from sun and rain. The architecture of individual buildings often reflects adaptations to temperature, rainfall, snow, wind and other climatic characteristics.

Cities must have a healthy water supply, and locations along rivers and streams, or near underground watercourses, have always been favored. Many large modern cities have outgrown their local water supplies and rely upon distant water sources diverted by elaborate systems of pipes and canals.

City location and internal structure have been profoundly influenced by natural transportation routes. Cities have often been sited near natural harbors, on navigable rivers, or along land routes determined by regional topography.

Finally, cities have had to survive periodic natural disasters such as earthquakes, hurricanes, tornadoes, and floods. The San Francisco earthquake of 1906 demonstrated how natural forces can undo decades of human labor in a very short time.

Elements of Urban Structure

City planners must weave a complex, ever-changing array of elements into a working whole: that is the perennial challenge of city planning. The physical elements of the city can be divided into three categories: networks, buildings, and open spaces. Many alternative arrangements of these

components have been tried throughout history, but no ideal city form has ever been agreed upon. Lively debates about the best way to arrange urban anatomies continue to rage, and show no signs of abating.

NETWORKS

Every modern city contains an amazing array of pathways to carry flows of people, goods, water, energy, and information. Transportation networks are the largest and most visible of these. Ancient cities relied on streets, most of them quite narrow by modern standards, to carry foot traffic and carts. The modern city contains a complex hierarchy of transportation channels, ranging from ten-lane freeways to sidewalks. In the United States, the bulk of trips are carried by the private automobile, with mass transit a distant second. American cities display the low-density sprawl characteristic of auto-centered urban development. In contrast, many European cities have the high densities necessary to support rail transit systems.

Modern cities rely on complex networks of utilities. When cities were small, obtaining pure water and disposing of wastes was not a major problem, but cities with large populations and high densities require expensive public infrastructure. During the nineteenth century, rapid urban growth and industrialization caused overcrowding, pollution, and disease in urban areas. After the connection between impure water and disease was established, American and European cities began to install adequate sewer and water systems. Since the late nineteenth century, cities have also been laced with wires and conduits carrying electricity, gas, and communications signals.

BUILDINGS

Buildings are the most visible elements of the city, the features that give each city its unique character. Residential

structures occupy almost half of all urban land, with the building types ranging from scattered single-family homes to dense high-rise apartments. Commercial buildings are clustered downtown and at various subcenters, with skyscrapers packed into the central business district and low-rise structures prevailing elsewhere, although tall buildings are becoming more common in the suburbs. Industrial buildings come in many forms ranging from large factory complexes in industrial districts to small workshops.

City planners engage in a constant search for the proper arrangement of these different types of land use, paying particular attention to the compatibility of different activities, population densities, traffic generation, economic efficiency, social relationships, and the height and bulk of buildings.

OPEN SPACES

Open space is sometimes treated as a leftover, but it contributes greatly to the quality of urban life. “Hard” spaces such as plazas, malls, and courtyards provide settings for public activities of all kinds. “Soft” spaces such as parks, gardens, lawns, and nature preserves provide essential relief from harsh urban conditions and serve as space for recreational activities. These “amenities” increasingly influence which cities will be perceived as desirable places to live.

Evolution of Urban Form

The first true urban settlements appeared around 3,000 BC in ancient Mesopotamia, Egypt, and the Indus Valley. Ancient cities displayed both “organic” and “planned” types of urban form. These societies had elaborate religious, political, and military hierarchies. Precincts devoted to the activities of the elite were often highly planned and regular in form. In contrast, residential areas often grew by a slow process of

accretion, producing the complex, irregular patterns that we term "organic." Two typical features of the ancient city are the wall and the citadel: the wall for defense in regions periodically swept by conquering armies, and the citadel-a large, elevated precinct within the city-devoted to religious and state functions.

Greek cities did not follow a single pattern. Cities growing slowly from old villages often had an irregular, organic form, adapting gradually to the accidents of topography and history. Colonial cities, however, were planned prior to settlement using the grid system. The grid is easy to lay out, easy to comprehend, and divides urban land into uniform rectangular lots suitable for development.

The Romans engaged in extensive city-building activities as they consolidated their empire. Rome itself displayed the informal complexity created by centuries of organic growth, although particular temples and public districts were highly planned. In contrast, the Roman military and colonial towns were laid out in a variation of the grid. Many European cities, including London and Paris, sprang from these Roman origins.

We usually associate medieval cities with narrow winding streets converging on a market square with a cathedral and city hall. Many cities of this period display this pattern, the product of thousands of incremental additions to the urban fabric. However, new towns seeded throughout undeveloped regions of Europe were based upon the familiar grid. In either case, large encircling walls were built for defense against marauding armies; new walls enclosing more land were built as the city expanded and outgrew its former container.

During the Renaissance, architects began to systematically study the shaping of urban space, as though the city itself were a piece of architecture that could be given an

aesthetically pleasing and functional order. Many of the great public spaces of Rome and other Italian cities date from this era. Parts of old cities were rebuilt to create elegant squares, long street vistas, and symmetrical building arrangements. Responding to advances in firearms during the fifteenth century, new city walls were designed with large earthworks to deflect artillery, and star-shaped points to provide defenders with sweeping lines of fire. Spanish colonial cities in the New World were built according to rules codified in the Laws of the Indies of 1573, specifying an orderly grid of streets with a central plaza, defensive wall, and uniform building style.

We associate the baroque city with the emergence of great nation-states between 1600 and 1750. Ambitious monarchs constructed new palaces, courts, and bureaucratic offices. The grand scale was sought in urban public spaces: long avenues, radial street networks, monumental squares, geometric parks and gardens. Versailles is a clear expression of this city-building model; Washington, DC is an example from the United States. Baroque principles of urban design were used by Baron Haussmann in his celebrated restructuring of Paris between 1853 and 1870. Haussmann carved broad new thoroughfares through the tangled web of old Parisian streets, linking major subcenters of the city with one another in a pattern that has served as a model for many other modernization plans.

Toward the latter half of the eighteenth century, particularly in America, the city as a setting for commerce assumed primacy. The buildings of the bourgeoisie expanded along with their owners' prosperity: banks, office buildings, warehouses, hotels, and small factories. New towns founded during this period were conceived as commercial enterprises, and the neutral grid was the most effective means to divide land up into parcels for sale. The city became a checkerboard on which players speculated on

shifting land values. No longer would religious, political, and cultural imperatives shape urban development; rather, the market would be allowed to determine the pattern of urban growth. New York, Philadelphia, and Boston around 1820 exemplify the commercial city of this era, with their bustling, mixed-use waterfront districts.

Transition to the Industrial City

Cities have changed more since the Industrial Revolution than in all the previous centuries of their existence. New York had a population of about 313,000 in 1840 but had reached 4,767,000 in 1910. Chicago exploded from 4,000 to 2,185,000 during the same period. Millions of rural dwellers no longer needed on farms flocked to the cities, where new factories churned out products for new markets made accessible by railroads and steamships. In the United States, millions of immigrants from Europe swelled the urban populations. Increasingly, urban economies were being woven more tightly into the national and international economies.

Technological innovations poured forth, many with profound impacts on urban form. Railroad tracks were driven into the heart of the city. Internal rail transportation systems greatly expanded the radius of urban settlement: horsecars beginning in the 1830s, cable cars in the 1870s, and electric trolleys in the 1880s. In the 1880s, the first central power plants began providing electrical power to urban areas. The rapid communication provided by the telegraph and the telephone allowed formerly concentrated urban activities to disperse across a wider field.

The industrial city still focused on the city center, which contained both the central business district, defined by large office buildings, and substantial numbers of factory and warehouse structures. Both trolleys and railroad systems converged on the center of the city, which boasted the

premier entertainment and shopping establishments. The working class lived in crowded districts close to the city center, near their places of employment.

Early American factories were located outside of major cities along rivers that provided water power for machinery. After steam power became widely available in the 1830s, factories could be located within the city in proximity to port facilities, rail lines, and the urban labor force. Large manufacturing zones emerged within the major northeastern and midwestern cities such as Pittsburgh, Detroit, and Cleveland. But by the late nineteenth century, factory decentralization had already begun, as manufacturers sought larger parcels of land away from the congestion of the city. Gary, Indiana, for example, was founded in 1906 on the southern shore of Lake Michigan by the United States Steel Company.

The increasing crowding, pollution, and disease in the central city produced a growing desire to escape to a healthier environment in the suburbs. The upper classes had always been able to retreat to homes in the countryside. Beginning in the 1830s, commuter railroads enabled the upper middle class to commute in to the city center. Horsecar lines were built in many cities between the 1830s and 1880s, allowing the middle class to move out from the central cities into more spacious suburbs. Finally, during the 1890s electric trolleys and elevated rapid transit lines proliferated, providing cheap urban transportation for the majority of the population.

The central business district of the city underwent a radical transformation with the development of the skyscraper between 1870 and 1900. These tall buildings were not technically feasible until the invention of the elevator and steel-frame construction methods. Skyscrapers reflect the dynamics of the real estate market; the tall building extracts

the maximum economic value from a limited parcel of land. These office buildings housed the growing numbers of white-collar employees in banking, finance, management, and business services, all manifestations of the shift from an economy of small firms to one of large corporations.

THE FORM OF THE MODERN CITY IN THE AGE OF THE AUTOMOBILE

The city of today may be divided into two parts: (1) an inner zone, coextensive with the boundaries of the old industrial city, and (2) suburban areas, dating from the 1920s, which have been designed for the automobile from the beginning.

The central business districts of American cities have become centers of information processing, finance, and administration rather than manufacturing. White-collar employees in these economic sectors commute in from the suburbs on a network of urban freeways built during the 1950s and 1960s; this "hub-and-wheel" freeway pattern can be observed on many city maps. New bridges have spanned rivers and bays, as in New York and San Francisco, linking together formerly separate cities into vast urbanized regions.

Waves of demolition and rebuilding have produced "Manhattanized" downtowns across the land. During the 1950s and 1960s, urban renewal programs cleared away large areas of the old city, releasing the land for new office buildings, convention centers, hotels, and sports complexes. Building surges have converted the downtowns of American cities into forests of tall office buildings. More recently, office functions not requiring a downtown location have been moved to huge office parks in the suburbs.

Surrounding the central business area lies a large band of old mixed-use and residential buildings that house the urban poor. High crime, low income, deteriorating services, inadequate housing, and intractable social problems plague

these neglected areas of urban America. The manufacturing jobs formerly available to inner-city residents are no longer there, and resources have not been committed to replace them.

These inner-city areas have been left behind by a massive migration to the suburbs that began in the late nineteenth century but accelerated in the 1920s with the spread of the automobile. Freeway building after World War II opened up even larger areas of suburban land, which were quickly filled by people fleeing central city decline. Today, more people live in suburbs than in cities proper. Manufacturers have also moved their production facilities to suburban locations that have freeway and rail accessibility.

Indeed, we have reached a new stage of urbanization beyond the metropolis. Most major cities are no longer focused exclusively on the traditional downtown. New subcenters have arisen round the periphery, and these subcenters supply most of the daily needs of their adjacent populations. The old metropolis has become a multi-centered urban region. In turn, many of these urban regions have expanded to the point where they have coalesced into vast belts of urbanization-what the geographer Jean Gottman termed "megalopolis." The prime example is the eastern seaboard of the United States from Boston to Washington. The planner C.A. Doxiadis has speculated that similar vast corridors of urbanization will appear throughout the world during the next century. Thus far, American planners have not had much success in imposing a rational form on this process. However, New Town and greenbelt programs in Britain and the Scandinavian countries have, to some extent, prevented formless sprawl from engulfing the countryside.

THE ECONOMICS OF URBAN AREAS

Since the 1950s, city planners have increasingly paid attention to the economics of urban areas. When many

American cities experienced fiscal crises during the 1970s, urban financial management assumed even greater importance. Today, planners routinely assess the economic consequences of all major changes in the form of the city.

Several basic concepts underlie urban and regional economic analysis. First, cities cannot grow if their residents simply provide services for one another. The city must create products that can be sold to an external purchaser, bringing in money that can be reinvested in new production facilities and raw materials. This "economic base" of production for external markets is crucial. Without it, the economic engine of the city grinds to a halt.

Once the economic base is established, an elaborate internal market can evolve. This market includes the production of goods and services for businesses and residents within the city. Obviously, a large part of the city's physical plant is devoted to facilities for these internal transactions: retail stores of all kinds, restaurants, local professional services, and so on.

Modern cities are increasingly engaged in a competition for economic resources such as industrial plants, corporate headquarters, high-technology firms, and government facilities. Cities try to lure investment with an array of features: low tax rates, improved transportation and utility infrastructure, cheap land, and a skilled labor force. Amenities such as climate, proximity to recreation, parks, elegant architecture, and cultural activities influence the location decisions of businesses and individuals. Many older cities have had difficulty surviving in this new economic game. Abandoned by traditional industries, they are now trying to create a new economic base involving growth sectors such as high technology.

Today, cities no longer compete in mere regional or national markets: the market is an international one. Multinational

firms close plants in Chicago or Detroit and build replacements in Asia or Latin America. Foreign products dominate whole sectors of the American consumer goods market. Huge sums of money shift around the globe in instantaneous electronic transactions. Cities must struggle for survival in a volatile environment in which the rules are always changing. This makes city planning even more challenging than before.

Modern City Planning

Modern city planning can be divided into two distinct but related types of planning. Visionary city planning proposes radical changes in the form of the city, often in conjunction with sweeping changes in the social and economic order. Institutionalized city planning is lodged within the existing structures of government, and modifies urban growth processes in moderate, pragmatic ways. It is constrained by the prevailing alignment of political and economic forces within the city.

VISIONARY OR UTOPIAN CITY PLANNING

People have imagined ideal cities for millennia. Plato's Republic was an ideal city, although lacking in the spatial detail of later schemes. Renaissance architects designed numerous geometric cities, and ever since architects have been the chief source of imaginative urban proposals. In the twentieth century, Le Corbusier, Frank Lloyd Wright, Paolo Soleri, and dozens of other architects have designed cities on paper. Although few have been realized in pure form, they have influenced the layout of many new towns and urban redevelopment projects.

In his "Contemporary City for Three Million People" of 1922 and "Radiant City" of 1935, Le Corbusier advocated a high-density urban alternative, with skyscraper office buildings and mid-rise apartments placed within park-like open spaces.

Different land uses were located in separate districts, forming a rigid geometric pattern with a sophisticated system of superhighways and rail transit.

Frank Lloyd Wright envisioned a decentralized low-density city in keeping with his distaste for large cities and belief in frontier individualism. The Broadacre City plan of 1935 is a large grid of arterials spread across the countryside, with most of the internal space devoted to single-family homes on large lots. Areas are also carefully set aside for small farms, light industry, orchards, recreation areas, and other urban facilities. A network of superhighways knits the region together, so spatially dispersed facilities are actually very close in terms of travel time. In many ways, Wright's Broadacre City resembles American suburban and exurban developments of the post-WWII period.

Many other utopian plans could be catalogued, but the point is that planners and architects have generated a complex array of urban patterns from which to draw ideas and inspiration. Most city planners, however, do not work on a blank canvas; they can only make incremental changes to an urban scene already shaped by a complicated historical process.

INSTITUTIONALIZED CITY PLANNING

The form of the city is determined primarily by thousands of private decisions to construct buildings, within a framework of public infrastructure and regulations administered by city, state, and federal governments. City planning actions can have enormous impacts on land values. From the point of view of land economics, the city is an enormous playing field on which thousands of competitors struggle to capture value by constructing or trading land and buildings. The goal of city planning is to intervene in this game in order to protect widely shared public values such as health, safety, environmental quality, social equity, and aesthetics.

The roots of American city planning lie in an array of reform efforts of the late nineteenth century: the Parks movement, the City Beautiful movement, campaigns for housing regulations, the Progressive movement for government reform, and efforts to improve public health through the provision of sanitary sewers and clean water supplies. The First National Conference on City Planning occurred in 1909, the same year as Daniel Burnham's famous Plan of Chicago. That date may be used to mark the inauguration of the new profession. The early city planners actually came from diverse backgrounds such as landscape architecture, architecture, engineering, and law, but they shared a common desire to produce a more orderly urban pattern.

The zoning of land became, and still is, the most potent instrument available to American city planners for controlling urban development. Zoning is basically the dividing of the city into discrete areas within which only certain land uses and types of buildings can be constructed. The rationale is that certain activities or building types don't mix well; factories and homes, for example. Illogical mixtures create nuisances for the parties involved and lower land values. After several decades of gradual development, land-use zoning received legal approval from the Supreme Court in 1926.

Zoning isn't the same as planning: it is a legal tool for the implementation of plans. Zoning should be closely integrated with a Master Plan or Comprehensive Plan that spells out a logical path for the city's future in areas such as land use, transportation, parks and recreation, environmental quality, and public works construction. In the early days of zoning this was often neglected, but this lack of coordination between zoning and planning is less common now.

Two other important elements of existing city planning are subdivision regulations and environmental regulations.

Subdivision regulations require that land being subdivided for development be provided with adequate streets, sewers, water, schools, utilities, and various design features. The goal is to prevent shabby, deficient developments that produce headaches for both their residents and the city. Since the late 1960s, environmental regulations have exerted a stronger influence on patterns of urban growth by restricting development in floodplains, on unstable slopes, on earthquake faults, or near sensitive natural areas. Businesses have been forced to reduce smoke emissions and the disposal of wastes has been more closely monitored. Overall, the pace of environmental degradation has been slowed, but certainly not stopped, and a dismaying backlog of environmental hazards remains to be cleaned up. City planners have plenty of work to do as we move into the twenty-first century.

Conclusion: Good City Form

What is the good city? We are unlikely to arrive at an unequivocal answer; the diversity of human needs and tastes frustrates all attempts to provide recipes or instruction manuals for the building of cities. However, we can identify the crucial dimensions of city performance, and specify the many ways in which cities can achieve success along these dimensions.

A most useful guide in this enterprise is Kevin Lynch's A Theory of Good City Form (Cambridge, MA, MIT Press, 1981). Lynch offers five basic dimensions of city performance: vitality, sense, fit, access, and control. To these he adds two "meta-criteria," efficiency and justice.

For Lynch, a vital city successfully fulfills the biological needs of its inhabitants, and provides a safe environment for their activities. A sensible city is organized so that its residents can perceive and understand the city's form and function. A city with good fit provides the buildings, spaces,

and networks required for its residents to pursue their projects successfully. An accessible city allows people of all ages and backgrounds to gain the activities, resources, services, and information that they need. A city with good control is arranged so that its citizens have a say in the management of the spaces in which they work and reside.

Finally, an efficient city achieves the goals listed above at the least cost, and balances the achievement of each goal with all the others. They cannot all be maximized at the same time. And a just city distributes benefits among its citizens according to some fair standard. Clearly, these two meta-criteria raise difficult issues which will continue to spark debates for the foreseeable future.

These criteria tell aspiring city builders where to aim, while acknowledging the diverse ways of achieving good city form. Cities are endlessly fascinating because each is unique, the product of decades, centuries, or even millennia of historical evolution. As we walk through city streets, we walk through time, encountering the city-building legacy of past generations. Paris, Venice, Rome, New York, Chicago, San Francisco-each has its glories and its failures. In theory, we should be able to learn the lessons of history and build cities that our descendants will admire and wish to preserve. That remains a constant challenge for all who undertake the task of city planning.

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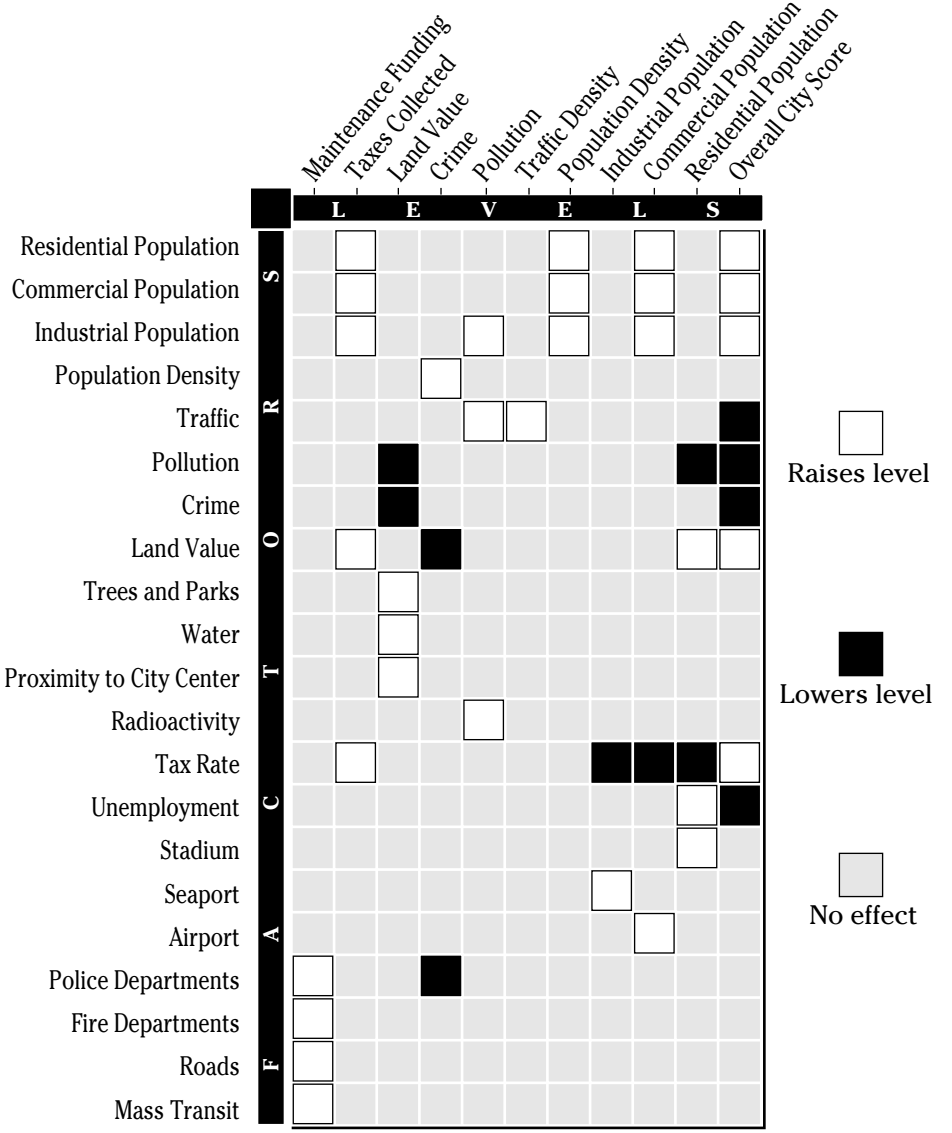
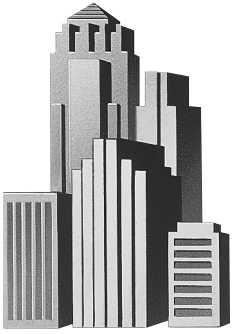
City Dynamics Chart





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