



# ArcView<sup>®</sup> Network Analyst

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# ArcView Network Analyst

## An ESRI White Paper

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# ArcView Network Analyst

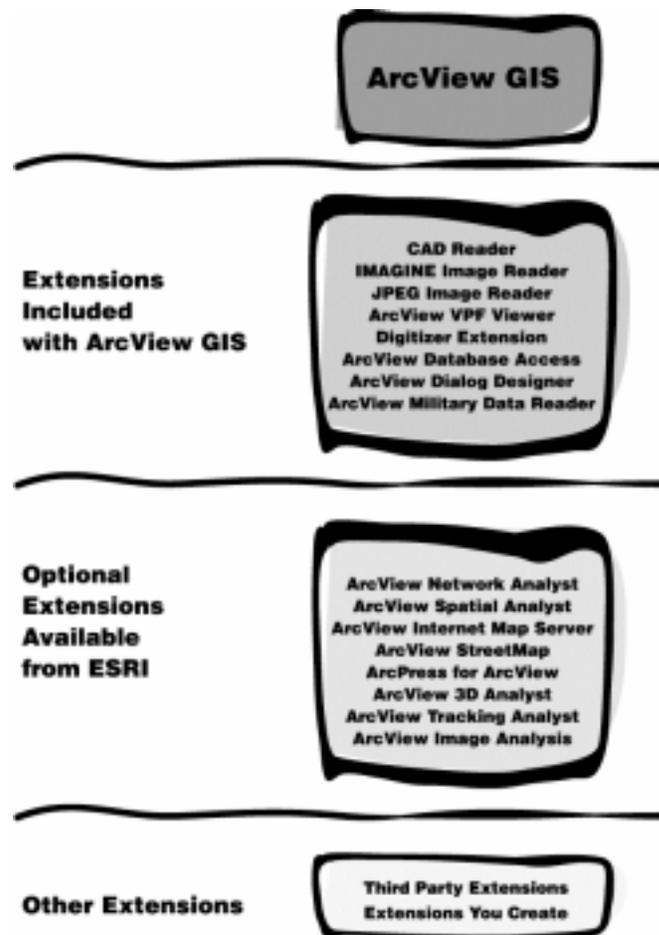
## **ArcView GIS Extensions: Easy-to-Add Capabilities**

ArcView® GIS software lets users see, explore, and analyze spatial data on their desktop. Its basic mapping functionality and advanced geographic information system (GIS) capabilities allow you to create maps showing your data and integrate and see data in powerful new ways.

ArcView GIS enables you to present your work attractively. You'll find that communicating geographically is a powerful way to inform and motivate others. Working geographically enables you to understand relationships between the forces that drive your business, so you'll make better decisions and get the power you need to solve problems faster.

ArcView GIS software's extensible design makes it easy to add new capabilities when you need them. These extensions are plug-ins to ArcView GIS that you can load and unload at any time as you work. In addition to the set of extensions that come with ArcView GIS, numerous optional extensions are available.

The diagram below shows the numerous extensions for ArcView GIS. Note that some extensions are not available for all platforms.



ArcView GIS gives you tools for visualizing, analyzing, and presenting your data. The optionally available ArcView Network Analyst extension to ArcView GIS provides additional analytic capabilities. These new capabilities can solve problems you encounter every day, helping you make more informed decisions, saving time and money.

To tap into this level of geographic analysis technology, users previously had to purchase high-end, professional GIS software. Now you can integrate it into the already proven capabilities of ArcView GIS. You can perform complex analysis of geographic data from your desktop all within the intuitive, easy-to-use ArcView GIS graphic user interface.

Let's take a closer look at ArcView Network Analyst.

## ArcView Network Analyst Extension

ArcView Network Analyst solves problems associated with any network. Users can

- Access geographic network data based on ARC/INFO® coverages, ESRI shapefiles, or computer-aided design (CAD) drawings.
- Find the most direct route between two locations, or find the best way to visit several locations.
- Find the nearest facility.
- Perform drive-time analyses.
- Use Avenue™ software, ArcView GIS software's object-oriented scripting language, to automate tasks, add new capabilities, and build applications.

## Using ArcView Network Analyst

### *Life and Style Furniture*

Life and Style Furniture tried once before to expand into the potentially lucrative Orange County market. The site selection committee thought they had found the ideal spot, but time proved that people weren't willing to drive there. Now they have an opportunity to try again. They want to know, as much as possible, if customers will come to their store.



ArcView Network Analyst lets the committee do a drive-time analysis to estimate the number of potential customers based on a five-minute window around the site. ArcView Network Analyst takes into account one-way streets, turning times, and speed limits—discovering actual drive times, not as-the-crow-flies distance.

Shopping Centers Drive Time Report

Date: 8/26/96

Center Name	Address	City	State	Square Footage	Stores	Parking	Drive Time (min)
LA MANCHA SHOPPING CENTER	HARBOR BLVD. & VALLEY VIEW AVE.	FULLERTON	CA	103,904	14	375	1
SUNRISE VILLAGE	EUCLID & ROSECRANS	FULLERTON	CA	113,000	30	530	4
FULLERTON TOWN CENTER	NE HARBOR BLVD. & ORANGETHORPE	FULLERTON	CA	420,491	40	0	4
ORANGEFAIR MALL	HARBOR BLVD. & ORANGETHORPE	FULLERTON	CA	525,000	50	2,500	4
GATEWAY SHOPPING CENTER	NWC IMPERIAL HWY & BREA BLVD.	BREA	CA	180,000	0	800	5
FULLERTON METRO CENTER	1361 HARBOR BLVD.	FULLERTON	CA	444,794	48	0	5
BREA MALL	NWC 57 FWY & IMPERIAL HWY.	BREA	CA	1,250,000	160	6,115	6

Life and Style can also look at the demographics of the area and at other stores and attractions that could bring potential customers into the area.

Site Demographic Report

Date: 8/26/96

<b>Population</b>			
1990	84,957	Married	51.3%
Current	90,320	Female Divorced	12.3%
5 Yr Projected	96,065	Male Divorced	5.7%
		Single Female	13.0%
		Single Male	17.8%
<b>Households</b>			
1990	30,011	Persons Per Household	3
Current	32,160	Households with Child(ren)	117
5 Yr Projected	33,927		
<b>Income</b>			
Avg Household Income	68,528	Per Capita Income	25,657
Med Household Income	57,102		

*Cool Boy Restaurant Supply*

Cool Boy has recently gained so many clients that it will have to either hire a lot of new couriers and buy a lot of new trucks or get much more efficient with the ones it now has. With ArcView Network Analyst to help plan routes, Cool Boy will be able to maintain its current level of service without breaking the bank. Cool Boy's dispatchers need only call up an area map on their desktops and designate destinations.



ArcView Network Analyst can be used to route deliveries. Dispatchers can then give couriers detailed directions and instructions and send them on their way.

If a rush order crops up, the dispatcher can use ArcView Network Analyst to determine which of the couriers is closest and provide directions immediately.

## Key Features

### *Gives You the Power to Solve Your Network Analysis Problems*

ArcView Network Analyst enables you to solve a variety of problems based on geographic networks (i.e., streets, highways, rivers, pipelines, utility lines). Solve problems such as finding the most efficient travel route across town, generating travel directions, finding the closest emergency vehicle or service facility to an incident, or defining service areas or sales territories based on travel time.

### *Find the Best Routes*

Improve the efficiency of your operations by finding the best routes around town or across the country. Delivery locations can be added by interactively pointing at locations, using mapped locations, or even geocoding an address or street intersection on the fly. ArcView Network Analyst can even reorder your deliveries optimizing their order as needed.

You can find the best routes based on the shortest distance or shortest time between destinations. You can even find the best routes during rush hour and at midnight by changing weighting factors for route calculations.

To solve your problem you need clear directions. ArcView Network Analyst allows you to generate detailed directions across your route, providing as-you-need-it solutions for common problems.

### *Locate the Closest Facilities*

Eliminate guesswork—locate the closest available resource instantly. Dispatch the closest vehicle to a location, or find the nearest valve in critical situations. Weight your decisions on the information that matters most to you—cost, time, and distance.

Locate the closest facility(s) by time or distance. You can even have ArcView Network Analyst report the closest five facilities within a ten-minute drive. ArcView Network Analyst will help you avoid construction and other obstacles, provide the best route for you, and give you clear, accurate directions.

### *Build Service Areas*

Create a service area around your facility, defined by distance or time. Plan for the future by examining where the "holes" are in existing services. Analyze customer profiles by overlaying planned service areas and census information, showing the areas of potential growth. Build travel areas that can be served by your facilities in five, ten, or fifteen minutes.

### *Give Clear Directions*

ArcView Network Analyst lets you create clear directions customized to suit your needs. You can also specify what data are used to generate and the distance units used in the directions.

ArcView Network Analyst also lets you use additional landmark points within your directions. The directions will include these additional data, giving clear easier-to-understand information (e.g., "go one mile past Jefferson School on your left").

*Answer Your Questions Based on Different Criteria*

ArcView Network Analyst can use any cost field for its calculations. You can solve your questions based on drive time, street length, traffic conditions, or any of a number of criteria. You can move beyond simple distance-based routing and make use of the additional information available today.

*Use Your Data to Answer Your Questions*

ArcView Network Analyst supports all of ArcView GIS software's line data. This means you can transparently create routes across your CAD data, ESRI® shapefiles, or ARC/INFO coverages.

*Build Custom Solutions*

ArcView Network Analyst adds extra functionality to ArcView GIS and to Avenue. You can build complete customized solutions from simple tools to complete applications using the power of Avenue and ArcView Network Analyst.

*Technical Specifications**Designed for Power*

- True 32-bit architecture.
- Multiplatform portable design (Windows [NT and 95] and UNIX).
- No limits to size of the network problem.
- Networks are persistent with the data, reducing solve time.

*Integrate Data*

- Use existing ArcView GIS features directly.
- Use your existing ARC/INFO networks, CAD drawings, and ESRI shapefiles.
- Build data-driven networks.

*Solve Your Problems*

- Find the shortest path between any number of points.
- Determine the closest facility for any location.
- Generate service areas around any location.
- Build clear directions using points as landmarks for your directions.

*Find the Shortest Path*

- Enter your "stops" using their addresses or by pointing.
- Reorder the "stops" automatically to find the best order.
- Return to your starting location for a round-trip route.
- Solve based on distance, time, or other variables.

*Determine the Closest Facility*

- Determine the closest facility(s) from any given point.
- Enter your "stops" using their addresses or by pointing.
- Use cut-off distances/times as criteria.
- Change the travel direction.
- Solve based on distance, time, or other variables.

*Generate Service Areas*

- Evaluate multiple service centers.
- Set multiple service areas based on time, distance, or other variables.
- Change the service areas based on travel direction.
- Enter your service center using their addresses or by pointing.
- Generate results as polygons and/or lines.

*Give Clear Directions*

- Specify which attributes to form directions from.
- Use existing landmark information within the directions.
- Save directions to an ASCII file.
- Set the measurement units to use in the directions.

*Build Complete Solutions*

- Develop complete applications based on ArcView Network Analyst.
- Build custom tools and solutions solving your problems.

**ArcView Network Analyst and ARC NETWORK**

ARC NETWORK™ software is a network package that works with ARC/INFO, ESRI's professional GIS software. ArcView Network Analyst is a subset of the ARC NETWORK package, integrated with ArcView GIS and packaged as an optional extension with an easy-to-use graphic user interface.

ArcView Network Analyst runs on UNIX, Windows NT, and Windows 95, while ARC NETWORK runs on UNIX and Windows NT.

ArcView Network Analyst provides an intuitive, interactive, easy-to-use, stand-alone interface for calculating travel routes, finding the closest facility, reporting the results as directions and finding service areas. ArcView Network Analyst is easy to use because the majority of the functionality people typically use is provided in a graphical interface as part of the ArcView GIS interface with which most users are already familiar.

On the other hand, ARC NETWORK contains tools to do additional complex analyses including resource allocation, tracing analysis, spatial clustering for vehicle routing, gravity modeling and interaction, and location-allocation. ARC NETWORK also contains ARC/INFO software's geocoding capabilities.



For more than 25 years ESRI has been helping people manage and analyze geographic information. ESRI offers a framework for implementing GIS in any organization with a seamless link from personal GIS on the desktop to enterprisewide GIS client/server and data management systems. ESRI GIS solutions are flexible and can be customized to meet the needs of our users.

ESRI is a full-service GIS company, ready to help you begin, grow, and build success with GIS.

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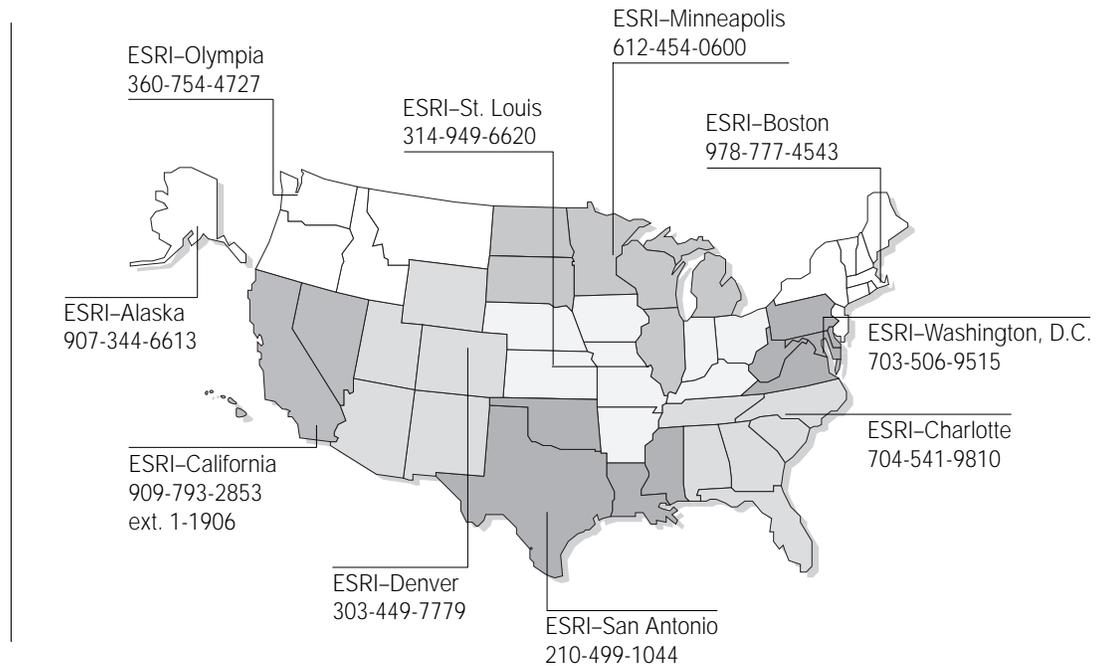
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