

Improving Performance

Computer specifications for optimal performance

Cube operates on any machine running Microsoft Windows. However, upgrading the computer's hardware and operating system can significantly improve Cube's run time and the user experience.

This document describes computer system specifications that optimize Cube performance.

CPU

Model run time is almost a linear function of processor speed for a given CPU architecture. (You cannot compare AMD Athlon clock speeds to Intel Centrino clock speeds.) A CPU that is twice as fast will run a model in almost half the time. For models with more than 500 zones, Citilabs recommends using a Pentium 4-class CPU of 2.0 GHz or higher.

Multiple processors

With Cube Cluster, you can use multiple processors, located on one or multiple PCs, to run Cube Voyager models. In many cases, you can dramatically reduce run times. Cube Cluster reduces run times with two forms of distributed processing:

- Intra-step distributed processing — Cube Cluster splits the zone-based processing from a single step into zone groups, and distributes each group to an available processor. For example, when running a

mode choice model, Cube Cluster might process origin zones 1-100 on one PC and origin zones 101-200 on a second PC.

- Multistep distributed processing — Cube Cluster distributes blocks of one or more independent modeling steps among available processors. For example, Cube Cluster might run the trip generation model on one PC and the network building and skimming on a second PC.

Dual-core processors

With a dual-core processor, you can run two model scenarios simultaneously without significantly degrading the performance of either scenario. However, a dual-core processor will not inherently reduce the run time of an individually run scenario. To take maximum advantage of a machine with a dual-core processor, Citilabs recommends that you install Cube Cluster. With Cube Cluster, you can reduce the run time of an individually run scenario on a dual-core processor by up to fifty percent.

NOTE: Cube Cluster performance may vary, depending on the model's structure and the specific configuration of the machine or machines. Varying CPU speeds, storage device read/write performance, and networking traffic or performance can affect a model's run time.

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Hard disk

Because the software reads and writes very large files to the hard disk, Citilabs recommends a hard disk that operates at 7,200 RPM or faster. For larger models, use a hard disk or storage array operating at 10,000 RPM or faster. To maximize disk storage and permit files larger than 2GB, use an NTFS file system with compression. Citilabs recommends a hard disk of at least 100 GB for medium-size models and 200 GB for larger models. Adequate hard disk space ensures that users can run and store several alternatives using all of Cube Voyager's output files, including the PATH file, which can be several gigabytes.

Memory (RAM)

Smaller models can run effectively with 1 GB of RAM, while larger models require more. If sufficient RAM is not available, Cube uses virtual memory, which results in significantly slower run times. 32-bit operating systems limit available RAM to 2 GB, accessible to all running applications. To effectively run concurrent

instances of memory-intensive Cube models (that is, the application's memory usage will exceed 2 GB), use a 64-bit operating system.

Video

Video memory can significantly impact screen refresh speed. Citilabs recommends 128 MB of video RAM for those using Cube Base and 256 MB of video RAM for those using Cube Dynasim to ensure smooth animations of large-scale simulations.

Operating system

Cube runs on 32-bit operating systems:

- Windows XP
- Windows Server 2003

Cube also runs on 64-bit operating systems:

- Windows XP Professional x64 Edition
- Windows Server 2003 x64 Edition

Cube will run on both the 32-bit and 64-bit versions of Windows Vista, when released.

Cube is an innovative and market-leading solution developed by Citilabs—the leader in transportation planning software solutions.