

SIGCAP 2

For Windows[®]

SIGnalized Intersection CAPacity Analysis Program

Users Manual

Oregon Department of Transportation
Transportation Development Branch

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Introductions

This document assumes that the user has a basic understanding of Microsoft Windows and the conventions used with keyboard and mouse operations.

Some of the new features in SIGCAP 2 are:

- First major upgrade since 1987.
- Intuitive Windows interface.
- 50 intersections per file.
- 4 scenarios per intersection.
- Better analysis of right turn overlap.
- Metric and English units.
- Output shows lane configurations and red time.

Document Conventions

Pull-down menu options and button titles are shown in **Bold** type, just as they appear on the menu or dialog box, and multiple items are separated by a vertical bar (|). For example:

⇒ Choose **F**ile | **S**ave to save current file.

“Click” means to place the mouse pointer on the object and press the left mouse button. For example:

⇒ “Click” the **OK** button.

Key strokes are shown in **Bold Arial** type. When the key names are separated with a plus sign (+), press the second key while holding down the first. When the key names are separated with a comma (,), press the keys in the order shown. For example:

⇒ To copy the text press **Ctrl+C** (press the C key while holding down the Ctrl key).

⇒ To save the current file press **Alt, F, S** (press the keys in this order).

Important ideas or concepts are set apart with a ✓ and are *italicized*. For example:

⇒ ✓ *Save your work often.*

Window titles are shown in all CAPITAL letters. For example:

⇒ “Click” the **Parameters** button to return to the PARAMETERS screen.

Introduction to SIGCAP

The analysis of signalized intersections is a complex and time-consuming process. When the analysis is done manually, it is easy to make errors in calculations. Automating the process allows several advantages:

- Creates uniformity between analysts by reducing errors in calculations.
- Saves time by allowing the quick and accurate analysis of multiple alternatives.
- Provides informative output for professional-looking documentation.

SIGCAP is an easy-to-operate capacity analysis program intended to assist the engineer or planner with a tool for the analysis of traffic conditions and design alternatives at individual signalized intersections. The program is designed to calculate saturation, volume to capacity ratio (V/C) and Level of Service (LOS) for individual traffic movements based upon traffic demand. Storage lengths, traffic volumes at LOS C and relative green time available are also calculated for each movement.

SIGCAP is primarily intended to provide the analyst with information used in planning applications. However, care was taken in the development of the program so that the results obtained will closely match the final outcome of the actual design of a proposed intersection. This process is particularly advantageous at the preliminary design stage of a project. For planning purposes, the recommended signal timing is as follows:

- *Two phase signal = 60 second cycle,*
- *Three phase signal = 90 second cycle,*
- *Greater than three phases = 120 second cycle.*

SIGCAPs calculations are consistent with methodologies contained in Transportation Research Circular 212 and with theories developed by the Oregon State Highway Division. It also incorporates techniques and procedures acquired from years of experience and field observations.

SIGCAP assumes that the phasing for the signal being analyzed is set to satisfy the traffic demand. SIGCAP will maximize the entire intersection to give the best LOS for the entire intersection being analyzed. If this assumption is not correct for the intersection being analyzed, then the analyst should carefully review the results of the analysis.

Many safeguards were incorporated into the development of the SIGCAP program to assist the engineer/planner with signalized intersection analysis. However, it is important that the user possess a certain amount of knowledge about traffic engineering and analysis since it is not possible to anticipate every possible intersection condition and problem.

Program Features

SIGCAP is an easy-to-use Windows program that:

- Balances timing according to traffic demand.
- Selects and sums the critical v/c values according to user-defined phasing conditions.
- Provides adjustment options for lane width and truck percentages.
- Calculates and reports storage lengths for individual lanes at the intersection.

SIGCAP 2 - Menus, Buttons and Windows. Oh, My!

Open the SIGCAP program group and Double “Click” the SIGCAP icon.



<u>M</u> etric	<u>E</u> nglish	<u>O</u> pen existing file
“Click” the M etric button or type the letter M to create a new file using metric units.	“Click” the E nglish button or type the letter E to create a new file using English units.	“Click” the O pen existing File button or type the letter O to open an existing file.

✓ *SIGCAP files have a (.SIG) extension.*

SIGCAP pull-down menus:

<u>F</u> ile	<u>E</u> dit
N ew	← Begins a new file.
O pen	← Opens an existing file.
S ave A s	← Saves the current file.
P rint P review Ctrl+P	← Begins the print preview and printing.
E xit	← Ends the program.

<u>F</u> ile	<u>E</u> dit				
A dd Ctrl+V	← Adds a new intersection to the current file.				
D elete Ctrl+X	← Removes the current intersection from the file.				
N ext F1	← Displays the next higher numbered intersection in the file.				
P revious F2	← Displays the next lower numbered intersection in the file.				
G oto F3	← Opens a dialog box to display a specific intersection in the file.				
U nits	<table border="1"> <tr> <td>Metric</td> <td>← Changes units to Metric.</td> </tr> <tr> <td>English</td> <td>← Changes units to English.</td> </tr> </table>	M etric	← Changes units to Metric.	E nglish	← Changes units to English.
M etric	← Changes units to Metric.				
E nglish	← Changes units to English.				

✓ *The Units selection is only available from the PARAMETERS window.*

SIGCAP buttons:

PARAMETERS window buttons

Switches to the LANE CONFIGURATION window. _____	Lane Config
Displays the next lower numbered intersection in the file. _____	Previous Int.
Displays the next higher numbered intersection in the file. _____	Next Int.
Opens a dialog box to select a specific intersection in the file. _____	Goto Int.
Calculates the current intersection and displays preview of output. _____	Calc/Print

LANE CONFIGURATION window buttons

Switches to the PARAMETERS window. _____	Parameters
Displays the next lower numbered intersection in the file. _____	Previous Int.
Displays the next higher numbered intersection in the file. _____	Next Int.
Opens a dialog box to select a specific intersection in the file. _____	Goto Int.
Calculates the current intersection and displays preview of output. _____	Calc/Print
Copies volumes from a scenario within an intersection. _____	Copy Volumes

✓ *Copy Volumes cannot copy from intersection to intersection.*

Select scenario 1, 2, 3 or 4 to copy volumes. _____

Copy Volumes From Scenario

1 ↓

OK **Cancel**

PRINT PREVIEW window buttons

Close	Print	Next	Switches to the lower portion of the screen output.
Returns to previous window.	Sends SIGCAP output to printer.	Previous	Switches to the upper portion of the screen output.

SIGCAP windows

PARAMETERS

The PARAMETERS window is the first window that will be displayed. This is where to enter the project and signal information. The following are the entries available and their limitations.

INTERSECTION: Up to 50 intersections per SIGCAP file.

SCENARIO: Four scenarios per intersection. Usually No-Build, Build (base year), Build (intermediate year) and Build (horizon year).

User Inputs:

✓ *None of the following entries are used in the calculations.*

PROJECT: Enter project name (up to 30 characters)

N-S STREET: Enter North-South Street name (up to 25 characters)

E-W STREET: Enter East-West Street name (up to 25 characters)

DESCRIPTION: Enter project and/or scenario description (up to 60 characters)

ANALYST: Enter analysts name (up to 20 characters)

CITY: Enter city (up to 30 characters)

PEAK HOUR: Enter peak hour information (up to 20 characters)

✓ *All of the remaining entries are used in the calculations.*

POPULATION: “Click” the appropriate population.

PED X-ING: Enter curb-to-curb pedestrian crossing distances for the appropriate leg.

% TRUCKS: Enter percentage of trucks if different than the 5% default value.

LANE WIDTH: Enter the lane width.

SIGNAL TIMING

CYCLE LENGTH (sec): Enter the appropriate cycle length between 45 and 200 seconds

- Two-phase signal = 60 seconds,
- three-phase signal = 90 seconds,
- greater than three phase signal = 120 seconds.

AMBER TIME (sec): Enter amber time per phase if different from the 4 second default.

NORTH-SOUTH PHASING

EAST-WEST PHASING

- Left turns not protected (left turns must yield to oncoming traffic)
- Left turns protected, no overlap (left turn phase is completely separate from the through)
- Left turns protected, with overlap (left turn phase may accompany same direction through move)
- Direction Separation (each direction moves separately, commonly called *split phase*)

- Right turn overlap (right turns are permitted with separate signal head in an exclusive turn lane while complementary left turns are proceeding also allowed when direction separation is chosen)

LANE CONFIGURATION

This is the window that allows the user to enter the volumes and intersection geometry. SIGCAP is limited to a three- or four-legged intersection; to analyze a three-legged intersection, leave the number of lanes equal to zero for the missing leg.

✓ *SIGCAP cannot be used to analyze a 5-legged intersection.*

User Inputs:

Number of Lanes: Enter the number of lanes on the selected approach (up to 7 lanes) or “click” the down arrow and select the number of lanes.

The **Clear** button will clear the number of lanes, the lane configuration *and* the volumes already entered.

Lane Configuration: Enter the movement allowed for each lane beginning with lane number 1. Lane configurations can be entered by clicking on the lane number button and then on the appropriate move or by pressing the **Enter** key and then typing the letter associated with the movement.

- a** = Left turn exclusive
- b** = Left-Through combination
- c** = Through exclusive
- d** = Left-Through-Right combination
- e** = Left-Right combination
- f** = Through-Right combination
- g** = Right turn exclusive

Volumes: Enter the peak hour volume for each move (up to 10,000 per movement).

✓ *The **Enter** key will move the highlight in a clockwise pattern (Right, Through, then Left).*

PRINT PREVIEW

This window is accessed by pressing the **Calc/Print** button. The window initially displays the upper portion of the SIGCAP output.

Press the **Close** button to return to the previous SIGCAP window.

Press the **Next** or **Previous** button to view the lower or upper portion of the SIGCAP output.

Press the **Print** button to send the output to the printer.

✓ *SIGCAP will print on a variety of printers, including laser, dot matrix and inkjet.*

SIGCAP Example

Beginning a new file.

1. Double “click” the SIGCAP icon.
2. “Click” on either the **Metric** or **English** button.

PARAMETERS

3. Type the PROJECT name and press **Enter** (up to 30 characters).
4. Type the North-South STREET name and press **Enter** (up to 25 characters).
5. Type the East-West STREET name and press **Enter** (up to 25 characters).
6. Type the DESCRIPTION and press **Enter** (up to 60 characters).
7. Enter the ANALYST and press **Enter** (up to 20 characters).
8. Enter the CITY and press **Enter** (up to 30 characters).
9. Enter the PEAK HOUR and press **Enter** (up to 20 characters).
10. “Click” on the appropriate population.
11. If pedestrians are considered,
 - a. “Click” on the legs that have pedestrians crossing.
 - b. “Click” in the box and enter the curb-to-curb crossing distance.
12. “Click” in the % TRUCKS box and enter value if different than 5% default.
13. “Click” in the LANE WIDTH box and enter value if different than the 12 feet or 3.6 meter default (up to 20 feet or 6.1 meters).
14. “Click” in the CYCLE LENGTH box and enter cycle length in seconds (between 45 and 200 seconds).
 - Two-phase signal = 60 seconds,
 - three-phase signal = 90 seconds,
 - greater than three phase signal = 120 seconds.
15. Enter the Amber time if different than 4 second default (between 0 and 10 seconds).
16. Select phasing information for each direction:
 - Left turns not protected
 - Left turns protected, no overlap
 - Left turns protected, with overlap
 - Direction Separation
 - Right turn overlap
17. “Click” **Lane Config** button.

LANE CONFIGURATION

18. Enter the number of lanes for the North leg or “Click” on the arrow next to the Number of Lanes box and “Click” on the number of lanes for that approach. (Up to seven.)
19. “Click” on the lane movement box or type the letter that corresponds to the movement required for the lane number 1.
20. “Click” on another lane number button.
21. “Click” on the lane movement box or type the letter that corresponds for the movement required for that lane.
22. Repeat steps 3 and 4 until that approach is completed.
23. Repeat process until all legs are complete.
24. “Click” in a VOLUMES box.
25. Enter the peak hour volume for that move.
 - ✓ *Note: All entered volumes require a valid lane movement but not all lane movements require volumes.*

PRINT PREVIEW WINDOW

1. “Click” the **Calc/Print** button to calculate the intersection and view and/or print the output.
 - ✓ *You may be asked if you would prefer to use direction separation for the North-South and/or East-West leg. “Click” **YES** or **NO** for each if appropriate.*
2. “Click” **Close** to return to the previous window.
3. “Click” **Next / Previous** to see the bottom/top portion of the output.
4. “Click” **Print** to send the output to the printer.
 - ✓ *You will be asked to “Make sure that the printer is set to portrait orientation” **once** each session and the print dialog box will open **every** time a print is sent.*

INTERSECTIONS AND SCENARIOS

To add a new intersection:

1. “Click” **E**dit | **A**dd or **Ctrl+V** or **Alt, E, A**
2. Enter a number for the intersection. (Up to 99)
- ✓ *Each SIGCAP file can contain a maximum of 50 intersections.*

SIGCAP will copy PROJECT, ANALYST, CITY, PEAK HOUR and POPULATION information to the new intersections and reset *all* of the other values. Enter all of the intersection information as before.

To add a new scenario to an existing intersection:

1. “Click” on the arrow next to the SCENARIO drop box.
2. Select the next available scenario.
- ✓ *Each intersection can contain up to 4 scenarios.*

SIGCAP will copy all of the information from scenario 1 except; SIGNAL TIMING, SIGNAL PHASING, DESCRIPTION, and VOLUMES.

To copy volumes from one scenario to another:

From the LANE CONFIGURATION window

1. Open the scenario that you want to copy volumes to.
2. “Click” the **Copy Volumes** button.
3. “Click” on the scenario number that has the volumes to copy from.
4. “Click” **OK** to copy or **Cancel** to quit copy volume process.
- ✓ *SIGCAP can only copy volumes within an intersection.*

To save the current file:

1. “Click” **F**ile | **S**ave **A**s or **Alt, F, A**
2. Select the disk drive and directory.
3. Type in the file name. (8 characters maximum)
4. “Click” **OK**.

To create a new file:

1. “Click” **F**ile | **N**ew or **Alt, F, N**
- ✓ *You will be prompted to save the current file. “Click” Yes, No or Cancel.*
2. **Yes** will prompt for a file name.
3. “Click” **OK** to use the current name.
4. **No** will close the current file without saving it.

To open an existing file:

1. “Click” **F**ile | **O**pen or **Alt, F, O**
2. Select the disk drive and directory.
3. “Click” on the file name.
4. “Click” **OK**.

APPENDIX A

INTERSECTION SPECIAL CASES

INTERSECTION SPECIAL CASES

Urban Diamond (Single Point Interchange)

In the case of an urban diamond, Signal Phasing “Left turns not protected” must be used. The left turns and volumes from the freeway must also be coded as through lanes because these left turns are not in conflict with opposing traffic. When this is done SIGCAP will simulate operations observed in the field. It should be noted that because of the size of the single point interchange, additional time should be given to allow all of the vehicles to clear the intersection. It is recommended that all-red time be given to allow for this maneuver, however, SIGCAP does not allow for all-red time. To compensate for this, additional amber (yellow) time may be used to simulate the all-red clearance phase.

Overlapping Left Turns

Signal Phasing “Left turns protected, with overlap” simulates field operations except in one case. A light through movement is not given additional green time in the cycle when it opposes the light left turn movement. This occurs because SIGCAP operates on demand for green time. Since the light through movement will have opportunity to clear with the heavier through movement, it exercises no demand for additional green time. The analyst must be aware that SIGCAP will not simulate true field operations in this case.

U-turn

If U-turns are allowed at the intersection, right turn overlap should not be used, even if a separate turn lane exists. A conflict is created by two vehicles vying for the same lane.

All-Red Time

When an intersection requires the use of an all-red clearance phase, use additional amber (yellow) time to simulate this condition.

APPENDIX B

SIGCAP TECHNICAL DATA

Saturation Capacities

SIGCAP is designed to perform analysis using hourly traffic volumes. Saturation flow rates (vehicles per hour of green) used in the program are listed below. These values assume 5% heavy vehicles, 12' lane width, and no pedestrians.

Saturation Capacity Flow (Vehicles per hour of green per lane)	
Protected Left Turn (Single Lane)* 1740 vphgpl	Through and Right Turn Lanes 1800 vphgpl

*If more than one lane exists for protected turns, each additional turn lane is assumed to have 80% of the capacity of the single protected lane. This is to account for unequal distribution of traffic using multiple turn lanes.

The 1994 Highway Capacity Manual uses 1900 passenger cars per hour of green per lane (pcphgpl), but by incorporating 5% heavy vehicles this equates to approximately 1810 vphgpl. This value essentially equals SIGCAPs saturation capacity flow for a planning level analysis.

Saturation Equation

The saturation value (X) used in this program is the ratio of the green time required to the green time available plus the ratio of the amber time to the cycle length:

$$X = \left(\frac{V \cdot G}{S \cdot g} \right) + \left(\frac{A}{C} \right)$$

where:

- V = Volume on the approach (vehicles per hour)
- G = Total Green time for the entire cycle (seconds)
- S = Saturation or capacity flow rate, i.e., the maximum number of vehicles that could pass if the light was green for an entire hour (vehicles per hour)
- g = Effective green time available for the movement being analyzed (seconds)
- A = Total Amber time for the entire cycle (seconds)
- C = Total Cycle length (seconds)

LEVEL OF SERVICE

Level of Service is an element of intersection capacity analysis which can bring about much discussion among analysts. This is probably due to the nature of the analysis and the interpretation of the results. Refer to the table of Level of Service designations for signalized intersections.

Theory developed for use in SIGCAP tries to account for the concept that traffic conditions in a smaller area may be interpreted as being a worse level of service than the same conditions in a larger area. This concept assumes that drivers from each area are willing to tolerate different degrees of congestion. Level of Service can be defined by a sliding scale. The part of the scale to use depends upon the metropolitan (community) size. The maximum capacity level (E-F), is the same for all areas.

The saturation value (X) is equated to Level of Service using the following table:

Level of Service, Metro Size and Saturation Value (X)

Metro Size and Saturation Value (X)				(LOS)
>500,000	100,000-500,000	20,000-100,000	<20,000	Level-of-Service
0.00-0.55	0.00-0.52	0.00-0.50	0.00-0.48	A
0.56-0.66	0.53-0.64	0.51-0.61	0.49-0.59	B
0.67-0.75	0.65-0.73	0.62-0.71	0.60-0.69	C
0.76-0.79	0.74-0.77	0.72-0.75	0.70-0.73	C-D
0.80-0.86	0.78-0.85	0.76-0.84	0.74-0.83	D
0.87-0.90	0.86-0.89	0.85-0.88	0.84-0.87	D-E
0.91-0.97	0.90-0.97	0.89-0.97	0.88-0.97	E
0.98-0.99	0.98-0.99	0.98-0.99	0.98-0.99	E-F
>1.00	>1.00	>1.00	>1.00	F

Theoretically, Level of Service “F” begins at a saturation value of 1.00. Due to the unpredictable operation conditions at this saturation level, the indicated E-F range has been included for report purposes. Also for report purposes, the saturation values provided on the SIGCAP output have been multiplied by 100 and are reported as percentages.

LEVEL OF SERVICE DESIGNATIONS FOR SIGNALIZED INTERSECTIONS

The concept of level of service is a quantitative measure of the ratio between the existing or projected volumes to the capacity of the roadway at a given location. This ratio is known as Volume to Capacity (V/C). The V/C ratios are broken down into six levels and each level is given a letter designation, from A through F, for identification purposes. The level of service designation "A" represents the best level of service while "F" is the worst. The table below shows the LOS designations for signalized intersections.

**Level of Service Designations for
Signalized Intersections**

Level of Service	Traffic Flow	Comments	Maneuverability
A Desirable	Free	Traffic flows freely with no delays.	Drivers can maneuver easily and find freedom in operation
B Desirable	Stable	Traffic still flows smoothly with few delays.	Some drivers feel somewhat restricted within groups of vehicles.
C Desirable	Stable	Traffic generally flows smoothly but occasionally vehicles may be delayed through one signal cycle. Desired urban area design level.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D Acceptable	Approaching Unstable	Traffic delays may be more than one signal cycle during peak hours but excessive back-ups do not occur. Considered acceptable urban area design level.	Maneuverability is limited during short peak periods due to temporary back-ups.
E Unsatisfactory	Unstable	Delay may be great and up to several signal cycles. Short periods of this level may be tolerated during peak hours in lieu of the cost and disruption attributed to providing a higher level of service.	There are typically long queues of vehicles waiting upstream of the intersections.
F Unsatisfactory	Forced	Excessive delay causes reduced capacity. Always considered unsatisfactory. May be tolerated in recreational areas where occurrence is rare.	Traffic is backed up from other locations and may restrict or prevent movement of vehicles at the intersection.

Minimum Green

When calculating the initial demand time within any signal phase, 6 seconds of green time is used as the minimum. If, however, the intersection being analyzed is operating beyond the saturation level (LOS F), the reported results may indicate that 6 seconds minimum is not attainable with the signal conditions analyzed.

Amber Time

Amber time for each phase is assumed to be 4 seconds. Total amber time for the entire cycle will not exceed 16 seconds.

Truck Adjustments

The analysis procedure within SIGCAP assumes that the traffic volumes represent “normal” traffic conditions and include up to 5% trucks. If the truck percentage exceeds 5%, the new truck percentage should be entered. For the analysis, SIGCAP will adjust the input traffic volumes using a passenger car equivalent of 2.0 for the truck percentage in excess of 5%. If a value of less than 5% is entered, SIGCAP will not make any adjustment and will use the 5% “normal” trucks.

Pedestrians

If pedestrians are present, SIGCAP assumes that pedestrians are present during every cycle. The formula used to calculate the minimum time required for pedestrian crossing is:

$$\text{minimum ped time (sec)} = \frac{\text{Curb - to - curb distance (feet)}}{4 \text{ (feet per second)}} + 5 \text{ seconds} - (\text{Amber time (sec)} - 1)$$

This analysis process allows pedestrian clearance to occur only during green time of the signal and only while the corresponding through traffic is moving. Pedestrians are not allowed to cross during protected left turn movements. SIGCAP determines the pedestrian clearance requirement (ped v/c) from the following ratio:

$$\frac{\text{controlling vehicle v / c values for all phases}}{(\text{cycle length} - \text{amber time})} = \frac{\text{ped v / c}}{\text{ped time (seconds)}}$$

Right Turn Adjustment (Right turn overlap)

When exclusive right turn lanes exist and the complementary approach is **not** permissive phasing, SIGCAP will check to see if the right turn arrow is appropriate. If the arrow is appropriate then SIGCAP will adjust for right turns that can occur unopposed during the complementary phases of the cycle. This is accomplished by calculating the percent of the right turn volume that could be present during those unopposed movement opportunities and subtracting that amount from the initial right turn input volume.

$$\frac{\text{Right turn lane capacity}}{\text{Left turn lane capacity}} = \frac{1800}{1740} \Rightarrow \text{approx. 1.03:1 ratio}$$

If the complementary approach is a protected left turn, then the right turns are dispersed at the rate shown above. However, if the complementary approach is direction separated, then the right turns proceed at either the same rate as the through volumes or the ratio of the complementary lefts, whichever is greater.

Volumes at Level of Service C

After the initial input conditions are analyzed and the resulting saturation value has been determined, SIGCAP reports the traffic volumes, assuming the same demand relationships, that would result in Level of Service C.

Movement Green Time Available

SIGCAP reports the green time available for each traffic movement by proportionally allocating the total green time according to the demand in each signal phase. The total cycle green time is divided proportionally according to demand, and the resulting green time available for each move is used in the analysis.

Movement Red Time

SIGCAP also reports the red time for each traffic movement by subtracting the calculated green time plus the amber time from the total cycle length.

Time Available

The time available for each movement is calculated according to the following formula:

$$g = \frac{m \cdot G}{M}$$

where:

g = green time available for the movement being analyzed (seconds)

m = movement approach v/c, where time available is needed.

G = Total Green time for the entire cycle (seconds)

M = v/c values for all phases.

Storage Distances

Storage Distances are calculated according to the following formulae:

$$L = \frac{(vph/cph) \cdot (2.0) \cdot (1 - (g/C)) \cdot (25 \text{ feet/vehicle})}{N}$$

or

$$L = \frac{(vph/cph) \cdot (2.0) \cdot (1 - (g/C)) \cdot (7.5 \text{ meters/vehicle})}{N}$$

Where:

L = Length (rounded to the nearest unit)

vph = vehicles per hour

cph = cycles per hour

g = green time available for the movement being analyzed (seconds)

C = Total Cycle time (seconds)

N = Number of lanes available for the movement being analyzed.

2.0 = Random arrival rate at 95% confidence (See NCHRP Report 348)

APPENDIX C

MISCELLANEOUS ISSUES

INSTALLATION OF SIGCAP

threed.vbx

If you have installed SIGCAP according to the installation instructions and it still will not work properly the problem may lie with a file located in your WINDOWS/SYSTEM directory. SIGCAP will not overwrite files that already exist on your hard drive. It may be necessary to exit all running applications and delete a file named THREED.VBX in the WINDOWS/SYSTEM directory. Re-install SIGCAP and it should then run properly.

UNITS - METRIC/ENGLISH

You can change units by switching to the PARAMETERS window and selecting **E**dit | **U**nits and choosing either **M**etric or **E**nglish. When switching between units there may be some round-off error in the pedestrian crossing distance and the lane widths. Simply re-enter the correct values. However, it would be best to select the units to use from the startup screen and not switch between English and Metric because errors in the calculations can occur.

LANE CONFIGURATION SAFEGUARDS

Many safeguards have been built into SIGCAP but we cannot anticipate every lane configuration and signal phasing combination. An example of an issue that might arise is: a shared through-left combination lane with “left turns protected” signal phasing. SIGCAP will ask the user if direction separation would be a better choice for this situation, but the user may respond “no.” SIGCAP will calculate the intersection anyway and provide levels of service, but the results are meaningless because it is not possible to protect the left turns from a shared lane. **The user must be responsible to ensure that the lane configurations and signal phasing are appropriate for the intersection being analyzed.**

SAVE vs. SAVE AS

There is no menu item **F**ile | **S**ave there is only **F**ile | **S**ave **A**s. This was done to allow the user an extra opportunity to change the name of an existing file before it is overwritten.

PEDESTRIAN CROSSING DISTANCES

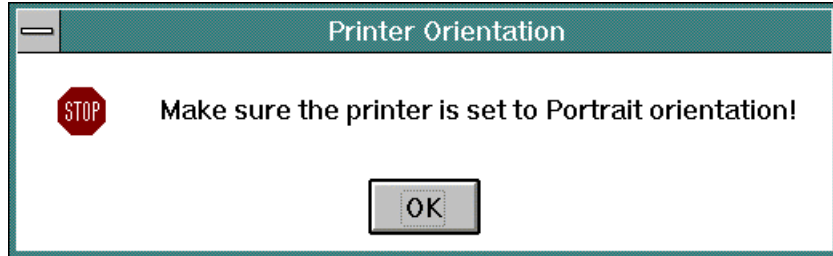
SIGCAP will calculate the pedestrian V/C for the North-South or East-West legs using the greatest distance entered. Even if one of the legs does not have a crossing the pedestrian V/C will be applied to that leg also. SIGCAP also assumes that pedestrians are present for every cycle when the pedestrian box is checked.

WORKFILE & ^TEMP

When SIGCAP runs it creates a file named WORKFILE in the SIGCAP2 directory. This file contains a copy of the data of the last file that was *saved*. SIGCAP also creates a file named ^TEMP on the root directory. This file contains a copy of the data from the last file that was *opened*.

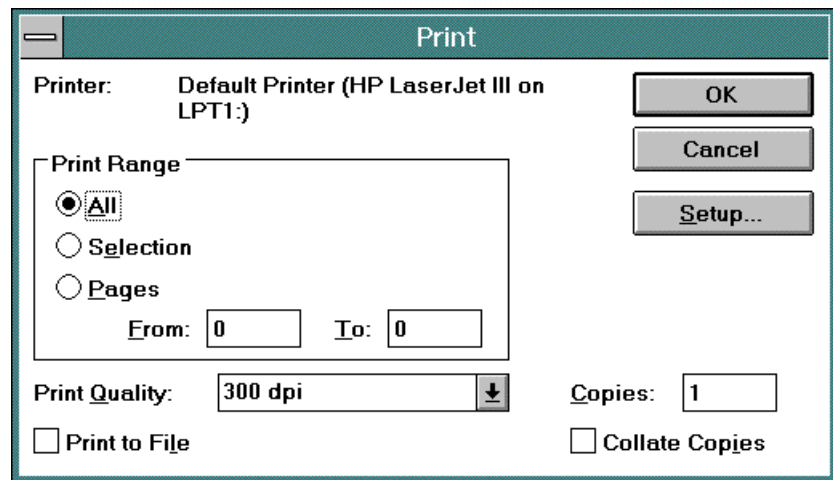
PRINTING

The SIGCAP output is formatted to print in portrait orientation so SIGCAP will ask the user to make sure that the printer is set to portrait orientation only *once* per session.



If the output is printed to landscape orientation, using a laser printer, SIGCAP will fit as much as it can on one page and will print each extra line on a separate page, usually using about ten pages.

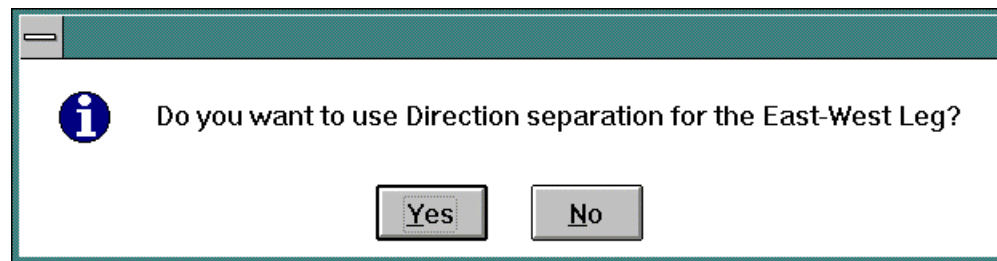
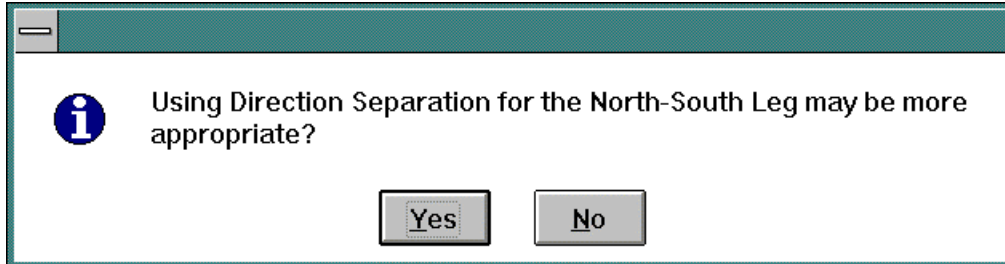
SIGCAP will, however, open a dialog box each and every print. The user can select **OK** to print, **Cancel** to return to the previous screen or **Setup** do select a different printer or access printer settings.



SIGCAP can only print one intersection scenario at a time.

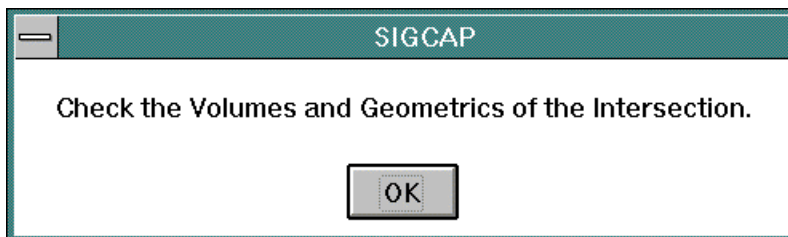
DIRECTION SEPARATION

These error messages will appear when the phasing for one or both of the directions might be better suited to a split phase. The other possibility is that the user has selected an inappropriate lane configuration and signal phasing combination.



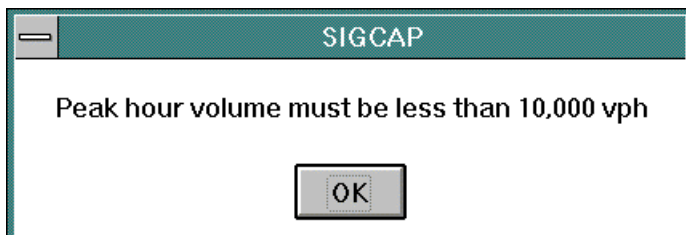
INTERSECTION GEOMETRICS

This error message will appear when there are movement volumes but no lane combination to facilitate that move.



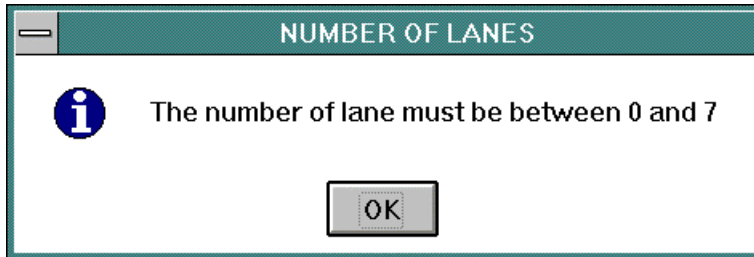
PEAK HOUR VOLUME

The user has entered a peak hour volume greater than 10,000.



NUMBER OF LANES

This error message appears when the user has entered more lanes than SIGCAP can analyze.

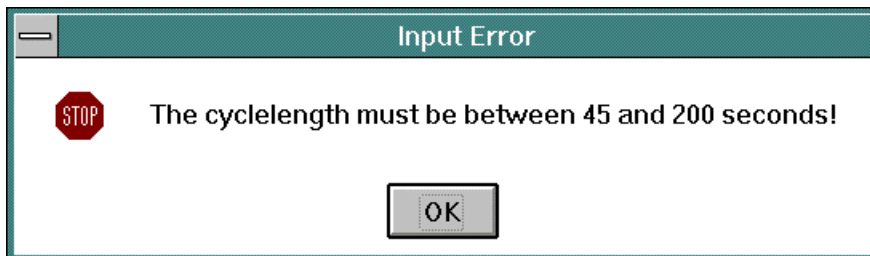


SIGNAL TIMING

This error box is displayed when the amber time entered is greater than 10.



This error message is displayed when the signal cycle length input is less than 45 seconds.



This error message is displayed when the signal cycle length input is greater than 200 seconds.

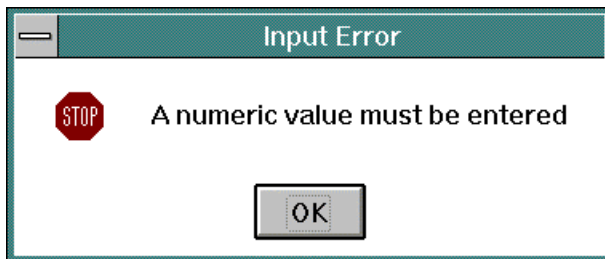


INPUT ERROR

This error message is displayed when the entry contains more characters than is allowed.



This error message is displayed when a letter has been entered where a number should be.



FATAL ERRORS

If either of the following error messages are displayed, something has been entered improperly. SIGCAP will close and all data will be lost.

