

# Agilent N9384A Intelligent Traffic Video Detection Workstation

## Realizing the Potential of Traffic and Transportation Networks

### Introduction

With the ever increasing traffic flow around the world today, the need for ways to intelligently and efficiently manage road utilization and road traffic infrastructure has become more and more apparent. Transportation authorities around the world have been proactively installing large number of traffic surveillance cameras. The vast amount of data that comes out of these surveillance cameras means that an intelligent system needs to be in place to extract data and systematically analyze it for next level actions. Agilent's N9384A Intelligent Traffic Video Detection Workstation aims at realizing these objectives and more.



*Agilent N9384A Intelligent Traffic Video Detection Workstation*



**Agilent Technologies**

## How it works

Agilent's N9384A Intelligent Traffic Video Detection Workstation is a new concept in digital traffic analysis. The workstation takes real-time traffic video and transforms it into digital data, from which critical information for analysis and traffic management can be easily harvested.

The key strength of the N9384A system lies in its flexibility. It can be integrated into virtually any traffic camera network simply by connecting live traffic video feeds into the system's video inputs. Coupled with its easy to use configuration interface and automated traffic data presentation, the system aims at helping to reduce operating expenses and bring out the best value from traffic camera networks.

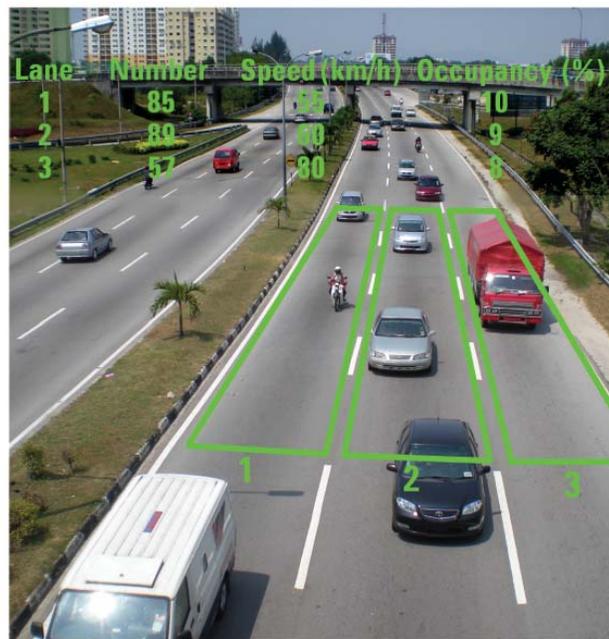
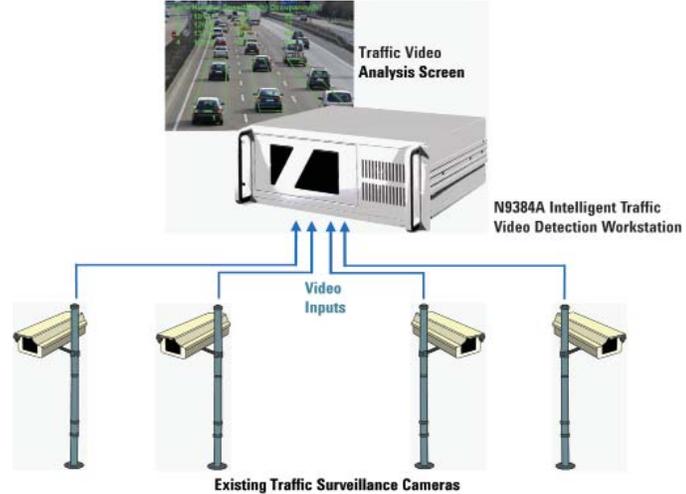


Figure 1 : Example of the Traffic Monitoring Screen of the Agilent N9384A system

The N9384A system easily plugs into any traffic camera networks and takes in video feeds from the traffic cameras for processing. Video images from the traffic cameras are fed into the workstation; the built-in software then harvests data from the video for processing. Applying Agilent's patented Video Processing Algorithm, the system is able to analyze and extract critical traffic data for various management and control purposes such as variable speed limit controls, traffic announcements and many more.

## Flexibility and Power

The real power lies in the system's flexibility - not only does it accept real time analog video feeds from conventional traffic cameras, it can also decode digital video feeds from Internet Protocol (IP) cameras. Alternatively pre-recorded video clips can also be fed directly to the system's software. With its user friendly software interface, a few simple setup steps will enable the monitoring and analysis of traffic data can be started in a matter of minutes. Depending on the hardware configurations, the system has the bandwidth to handle 4 to 8 channels, each channel catering to one video feed.

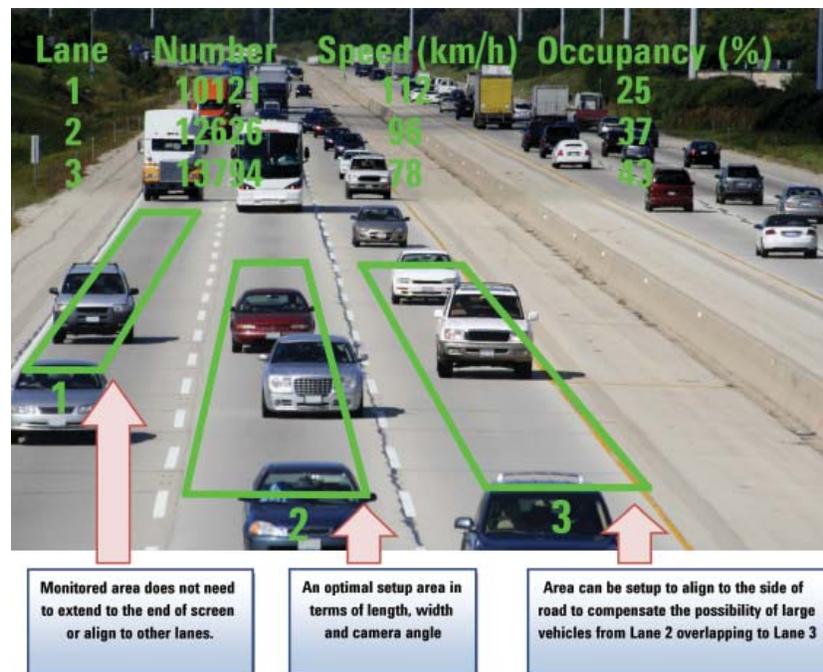
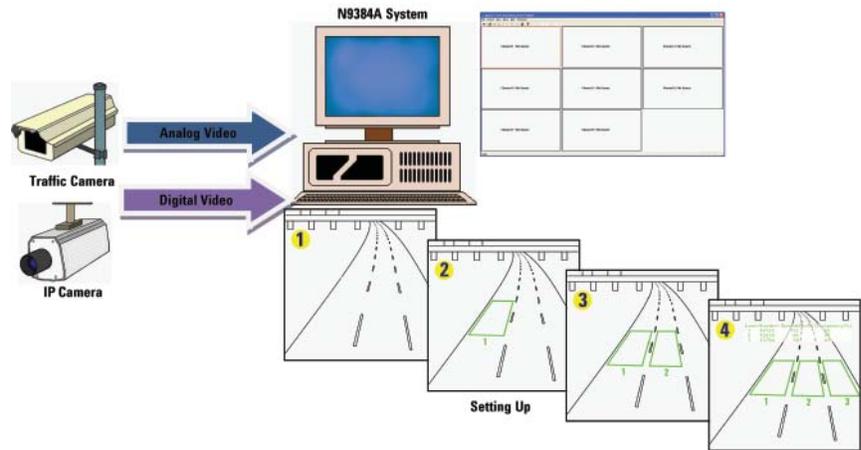


Figure 2 : Demonstration of the system's flexibility in handling different camera angle and position

# Key Traffic Data and Analysis Results Collection

The traffic data and analysis results are split into 2 categories  
- Basic Parameters and Enhanced Parameters.

## Basic Parameters

- Traffic Counts
- Average Traffic Speed
- Traffic Occupancy

## Enhanced Parameters

- Vehicle Classification
  - Classifying traffic into categories based on vehicle length
  - Presenting real time vehicle counts of each category
- Incident Detection
  - Detection of stalled vehicles (breakdown, accident etc)
  - Detection of vehicles doing illegal stops
  - Detection of vehicles travelling in the wrong direction
  - Detection of queued traffic (tolls, bridge entrances, tunnel entrances etc)
  - Congestion detection

## Key Features

- Quick visual information
- Multi-parameter traffic analysis
- Multiple lane analysis
- History log record with screen captures for detected incidents
- User defined data acquisition rate (eg. 1 minute)
- Remote configuration and diagnostics
- Traffic report generation
- Historical data storage

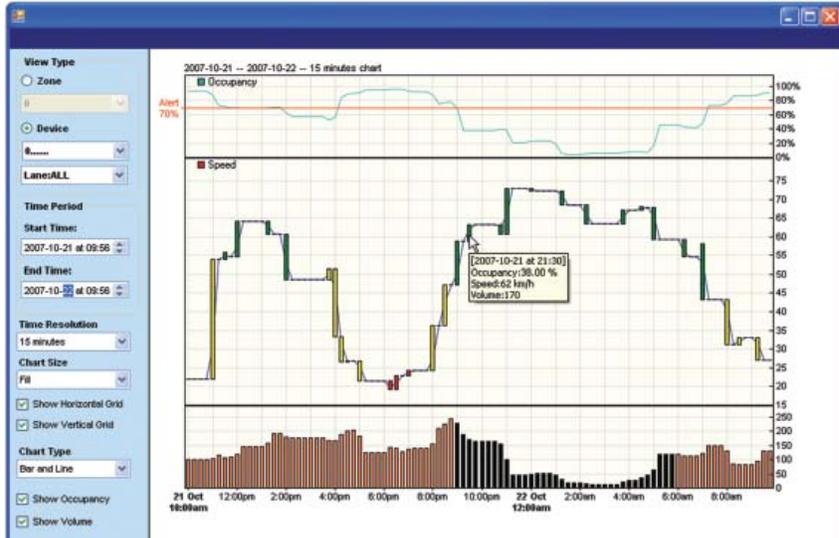


Figure 3: Example of how data analysis can be performed from the harvested traffic data

### City Traffic

Traffic in urban areas has always been a critical aspect of traffic management and control. With the ever increasing number of vehicles in towns and cities, monitoring traffic in a manual fashion within a control room has become a demanding task, especially when faced with multiple cameras in various areas under rush hour conditions. With the N9384A system, the automated monitoring and data presentation offers a quick and detailed overview of the traffic situations at each camera. This information can then be utilized for other purposes such as traffic announcements to road users, congestion alerts, and even incident alerts through various media.



### Highways and Bridges

Highways and bridges are an important means of allowing vehicles to travel from one place to another at relatively high travelling speeds; hence traffic flow, vehicle counts and traffic occupancy become important aspects. The N9384A system not only achieves these at high accuracy, monitoring can be further enhanced by incident detection and congestion detection. The harvested information can be further used for extended functions such as travel time estimation and speed limit controls.



One of our key references is the Penang Bridge in Malaysia, to which the Agilent N9384A Intelligent Traffic Video Detection Workstation was introduced to the regulatory authority in February 2008 and has since been converting live CCTV footage into traffic analysis data. Currently, the workstation provides not only real-time vehicle count, average speed and lane occupation, but also easy data storage for long term analysis. The real-time and historical information continue to enable the Penang Bridge Authority to thoroughly analyze bridge traffic without special cameras, equipment and lane closures.

## Application Areas (continued)

### Tunnels

Tunnels are important passageways for travelling and as such, a smooth and uninterrupted traffic flow needs to be maintained in order to ensure safety and convenience to users. This is where the N9384A system's incident detection and congestion detection capabilities play an important role. This detection will allow better traffic and incident management in tunnels. Further usage can be applied to tunnel entrances for queue detection, where it could be possible to divert traffic to other routes if needed.



### Intersections, Tolls and Traffic Lights

These are areas where the N9384A system can be effectively deployed by using queue detection. The monitoring results can be used for assessments to gauge and control traffic lights, opening of service or emergency lanes in long queue situations, or even to deploy traffic police for directing traffic.



### Key Strengths

- System can be deployed to existing camera networks without the need for new cameras
- System is capable of handling digital video feeds from IP cameras
- Rapid setup, monitoring and analysis can be configured with just a few easy clicks
- Real time traffic monitoring; data can be obtained on the fly
- Simple installation and ease of use
- Reduces maintenance and infrastructure costs
- Automated monitoring and data presentation

# System Specifications

## Industrial PC Specification

Processor	Intel Core 2 Duo 2.66 GHz
Memory	2 x 1 GB DDR2-667
Backplane	13 slots PICMG 1.3
LAN	Dual Gigabyte Ethernet
Hard Drive	320 GB Serial ATA
Misc. Drives	LiteON DVD-RW Drive, 3.5" 1.44 MB floppy drive
Size (W x H x D)	482 x 177 x 502 mm (19" x 7" x 19.76")
Weight	20.0 kg <sup>1</sup>

## Video Capture Specification

Video Standard	Composite for NTSC/PAL
Video Input Channels	4 – 8 <sup>2</sup>
Video Connector	BNC <sup>3</sup>
Compression Format	MPEG4, H.264
Image Processing	Hardware adjustments for hue, contrast, saturation and brightness

## Environment

Working Temperature	0 ~ 40 °C
Relative Humidity	10 ~ 80%
Packaging Standards	Standard IPC Packaging

## Regulatory

CE, FCC, C-TICK, CCC, UL

## Warranty Support

One-year warranty  
Extended warranty available  
Support provided by Agilent  
trained technical support staff

1. Approximate weight, dependant on the addition of additional hardware
2. Standard N9384A comes with a minimum of 4 channels
3. BNC Connectors are for analog video, digital video from IP cameras are transmitted via LAN cables



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