CITY MANAGEMENT TAKES TO THE STREETS – LITERALLY!

Wouldn’t it be wonderful if street poles could manage your city for you?

What if, at the same time, they could reduce the crime in your streets by at least 40%?

Well, an Australian street pole, called NEXiPole® can!

... and the City of Stirling, in Western Australia, is the first to use it.

NEXiPole® is a computer disguised to look like a street pole and the crunch power behind it is a neat software package called NEXiTrack®.

NEXiTrack® is an image management system designed to manage your city, from traffic flow to crime and grime – it can even tell you when to cut the grass.

The maxim is this, ‘if your eye can see it and your brain wants to manage it, then NEXiTrack® can do it for you.’

Cameras become an extension of your eye and high-speed computers an appendage to your brain and when all of this technology is put in place, it is known collectively as cityNEX®.

cityNEX® is not an all powerful, all-knowing and all-seeing, whiz-bang automated system ... it requires human in-put and lots of it. It makes residents lives and those of city officials, easier. It can also provide local communities with an impressive street communication system, certain to win hearts, minds and votes!

cityNEX® is provided by a West Australian company, Telemetric Media Information Pty Ltd, (TMI) as a turnkey agreement and at a neutral budget to cities of all sizes.

Ownership, management and servicing of the infrastructure remains with TMI, its client cities and their communities, simply purchase those sections of the technology useful to them on a user pays basis.

Cities choose which parts of the technology they wish to install and which parts they do not. Technologies available to cities include but are not limited to:

- City Management
- Homeland Security (Police, Fire, Ambulance)
- Neighbourhood and Business watch
- Traffic Management (Traffic Flow, Counting, Speed Trapping and Red Light Incident Recording)
- Asset management. (Traffic Signal failures, system failures, street lighting failures)
- Community services

The process:

TMI offers the cityNEX® system to local government as a complete turnkey agreement. As an initial start TMI would be commissioned (at no cost to the city) to conduct comprehensive and detailed feasibility studies.

Aspects such as city and community requirements, capabilities of current city pole suppliers, advertisement and other commercial realities, city management and service, community perceptions and a topographical analysis study are covered.
The goal is to identify the feasibility and applicability of the cityNEX® technology and services to the local government and community while carefully addressing and adhering to the sensitivities of the community groups, state and local laws and statutes. Advertising exposure for revenue generation and visual impact potential for the delivery of emergency and community messages are also taken into account.

TMI is responsible for the entire project from start to finish, including the issue of tenders for local pole and liaison with utility and power companies for the provision of public work requirements. Part of the process would be to negotiate service and maintenance contracts acceptable to all parties.

**The System and Technology**

When designing your cityNEX® system, TMI decides how many poles require fitting with technology in order to deliver a reliable service.

In a typical city that's one in every 120.

Depending upon topography or service type, it could be as many as one in 10.

A NEXiPole® is a stock-standard street pole re-engineered to accommodate our systems hardware. The change to design makes it look a little different to the rest of the poles in the neighbourhood and as a result, TMI usually needs to fund and install an entire lighting suit so that NEXiPole® and the standard poles visually conform. When designing a NEXiPole® TMI works closely with the city and the local pole manufacturer.

The structural compliance of a NEXiPole® usually exceeds the local design specifications for a street pole and the designs are patented. Installations are performed by TMI in accordance with the local authorities guidelines for the environment.

One advantage of NEXiPole® is that it has the facility to install and operate a dynamic message system (NEXiPoster®).

This installation is optional, however, due to the huge benefits of being able to communicate to road users in real time, plus the income opportunities available to the city through street advertising, a typical city installation in Australia would include a number of sites that have NEXiPoster® fitted.

A NEXiPoster® site is a series of five, 12meter (Approx 40ft) NEXiPole® installed along a predetermined path, (median strip or sidewalk) and positioned so as to provide maximum impact and readability to road users without driver distraction or risk to road safety.

Site reserves are normally restricted to commercial areas and then only to high traffic areas.

Advertising is posted to the NEXiPoster® using either the Internet or cityNEX® and emergency messages can transmitted from a control hub or directly from the consoles of emergency or police vehicles.

A NEXiPoster® is designed to compete with direct sunlight during the day, while being gentle in its illumination at night, automatically adjusting brightness illumination levels during the transition from day to night.

Environmental conditions of extreme cold, sub zero temperatures to blazing heat of +40c (+140 Fahrenheit) or high semi cyclonic winds are catered for during the design phase to suit your particular city.

The NEXiPod® also forms the base for the cityNEX® wireless network and Dogie® security system.

A series of carefully selected high and standard definition cameras, which are chosen for the services they will perform, can be installed on the NEXiPole®.

NEXiPole® can be designed to accept an array of clip-on fixtures including traffic signals, camera’s, name plates, directional signage, and posters.
Currently deployed CCTV systems could be incorporated into the Dogie® system but for maximum performance, the default installation uses a selection of cityNEX® enabled, high definition, self contained, wireless cameras, tailored specifically for cityNEX® usage by technical partners.

The cameras are totally portable and can be randomly placed (or removed) by City security, police and any other approved security enforcement agencies, without the need for fixed cabling.

When fixed cameras are needed in strategic locations, semi-permanent installations can be erected which are easily and economically moved once the strategic needs subside.

Shown Left: Senior Constable Lance Munckton (6389) of the West Metropolitan Traffic Patrol (West Australian Police Services) Using his portable console to City camera’s located at Ellen Stirling Boulevard from a location several miles away.

Each of the cameras throughout the city can ‘see’ and transmit vision to security or emergency services on demand, which is an enormous benefit to community policing, neighbourhood watch and business watch.

Pedestrian counting and monitoring can be performed with large or small crowds.

Alarms can be raised when people go into unauthorised areas or are found loitering in areas where pedestrian traffic is prohibited. *Other behavioural patterns can be programmed into the system to be recognised, monitored and trigger alerts.*

Traffic uses include vehicle counting, licence plate recognition and speed monitoring. These features can be user configured or filtered to single out small or large vehicles, identify unique traffic patterns or monitor the average speed of a multilane highway. Traffic counts can be verified through gates or tollbooths. An individual bus number can be read past a checkpoint so that arrival times can be confirmed for commuters.

![Actual screen shot, Ellen Stirling Blvd., car counting and speed check.](image)

The cameras are a combination of PTZ domes and fixed lenses with true day/night capability.

Able to operate at night, with near daylight viewing into dark zones, the chance of being spotted is certain.

Mounting a low profile dome camera such as the Panasonic CW474 makes overt monitoring simple. With a resolution of more than 450 lines in colour/ 500 lines in B/W, these cameras produce a sharp high quality vision stream.

Remote operation of these cameras is through the wireless network.

All PTZ operation, recording function, tracking and diagnostics are done via the wireless network. Fixed cameras are treated the same.

As part of the NEXiTrack® software suite mentioned earlier, all vision is synchronised by a central controller located at the city data centre.

The data centre controls all vision management, distribution and delivery.

This would typically be the local or regional security monitoring station or a multi-agency repository.

The first respondent to an incident is usually the local city security department.

When the incident that is being monitored requires the attendance of police, vision is then passed to the relevant department for action.

The data centre can deliver to multiple users or agencies requiring vision services. Recording for later retrieval can be set for automated distribution or on subscription.

Live delivery of the subscribed vision, is via the cityNEX® wireless network. Full motion video of up to 25 frames per second is delivered to the receiving device, typically a PDA, Tablet, or portable computer for field mobile personnel, or desktop computer(s) and/or multi-view monitors installed at the monitoring centre.
With the correct compression parameters set within the video servers, high quality full motion vision can be obtained with as little as 1 Mb of bandwidth.

Viewing software installed on to the device allows for multi-view of up to 16 cameras, remote PTZ control and recording. Vision is compressed and converted into streaming motion JPEG by the local video server.

The digitised vision from the onsite video server is connected directly into the network and transmitted to the data centre for processing. Once there, the digitised vision is stored, analysed and retransmitted to the monitoring station or authorised devices, as streaming video via the wireless network. To view the vision, authorised devices must be logged on to the network. The operator would enter their username and password to gain access to the network and to the video stream. The level of access assigned varies from operator to operator.

The data centre has multiple functions. As the central command and control hub of the wireless and vision network, a carrier class infrastructure plan has been designed, critically reviewed and configured to minimize the effect of any interruptions.

As standard practice, TMI has implemented security measures and monitoring systems to identify potential sources of failure or interruption.

Key infrastructure components and providers include, computer servers and mass storage devices manufactured by HP. Routers and firewall protection software systems manufactured by Cisco and Enterasys. System monitoring applications from Microsoft, Computer Associates and Network Associates assembled to perform multiple tasks such as system security, configuration, diagnostics, NAS storage, retrieval control and alarm management.

Delivery of all the services is via the cityNEX® wireless network which is reticulated throughout the city and local communities.

First, the establishment of a wireless exchange within the local area is required. This is vital to ensure seamless transmission within the surrounding area.

Radio transceivers are housed within a NEXiPod® sending its radio signal to an array of distribution points. These locations are interconnected to formulate the cityNEX® wireless grid by using a series of point to point, and point to multipoint antennas. On the top of the NEXiPole® located within the community are slim line 180 degree sectored antennas delivering a nominal 3watts EIRP (>30dBm) of power to the local wireless exchange as well as to the residents within its area.

The NEXiPod® is attached to or near the pole, and among other things, houses the local transceivers, video servers and support equipment for the visual display medium.

This antenna and transmitter configuration can be disguised to minimise the visual impact to the public.

Video images are transmitted point-to-point or to a monitoring station, using a combination of the 802.11a/b and soon “g” protocols thus creating a totally wireless environment.

Residents and businesses will benefit from the wireless services offered. Called IntraNEX®, a secure, porn-free, hacker free, virus free, Intranet environment providing a local business directory, local e-commerce facilities, community bulletin boards, local news and community events, public transport timetables, local education knowledge centres with links to local schools and mediated community chat rooms.

Access to the Intranet is available for all to use and to enable community involvement on a different yet personal scale.

It is expected that over time these selected City IntraNEX® services will be available in all major languages, which will be of particularly benefit to tourists.
**Summary**

cityNEX® is a wireless broadband network that gives everyone in the city high-speed computer access to a community LAN and Internet. Communication packages offered to residents and businesses allow connectivity speeds of up to 3Mbps and unlimited portability.

When cityNEX® users are within range of a NEXiPole® they can network user to user.

This could be a short distance, say from your garden to your house or a medium distance, house to office, or long distance local city to overseas city.

A solution exists for every city needing the cityNEX®.

A system can be designed, installed and customised to work with and enhance many operations within a city.

Discussion with local government, law enforcement and city security services enable the efficient and effective deployment of cameras and services.

Cross party agreements can be negotiated for situation monitoring, network deployment and configuration for cities.

CityNEX®, IntraNEX® services as defined enable cross-city envelopment bridging and breaking stereotypical social economic boundaries, empowering the community with tools and services to help them to feel secure.

With such diversity in services offered and the type of infrastructure needed to operate the network, funding cityNEX® may appear out of reach for most cities, however, the total system cost to most cities is cost neutral. TMI offers its cityNEX® network and NEXiTrack® management system to every city as a turnkey agreement with several self-funding solutions.

Revenue generating technologies incorporated within cityNEX® and underwritten by the project development partners, provides cities with useful infrastructure, security and advanced management systems at a totally neutral budget.

Further information:

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