HOGAN & HARTSON

Hogan & Hartson LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
+1.202.637.5600 Tel
+1.202.637.5910 Fax

www.hhlaw.com

March 24, 2010

Michele C. Farquhar
Partner
202-637-5663
mcfarquhar@hhlaw.com

VIA ELECTRONIC DELIVERY

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Room TWA325
Washington, DC 20554

Re: Notice of *Ex Parte* Presentation
GN Docket No. 09-51, WT Docket No. 06-150, PS Docket No. 06-229

Dear Ms. Dortch:

Yesterday Bo Pyskir, President of LEMKO Corporation ("LEMKO"), and I, counsel to LEMKO, met with John Leibovitz from the Wireless Telecommunications Bureau and Tom Peters from the Omnibus Broadband Team. During the meeting, we discussed LEMKO's 4th generation core network and deployable technology platforms, and the benefits of this technology for rural deployment and public safety applications. We also distributed the attached materials, which discuss LEMKO's On Demand Cellular solution for: (1) deployable public safety applications; and (2) extreme rural public safety deployments.

Pursuant to Section 1.1206 of the Commission's rules, this letter is being filed via ECFS with your office.

Respectfully submitted,

/s/ Michele C. Farquhar

Michele C. Farquhar
Counsel to LEMKO Corporation

cc: John Leibovitz
Tom Peters

On Demand Cellular™
for Deployable
Public Safety Applications

------ for ------
Federal Communications Commission

March 12, 2010

Lemko's On Demand Cellular™ Solution

Deployable Communication Systems

Disaster mitigation is largely dependent on one factor: time. In emergency situations, whether caused by an act of God or manmade, speed is crucial. Rapid response saves lives and minimizes damage to property. The first few hours following the disaster are the most critical and, by definition, are almost always the most confusing as local authorities and organizations battle to gain an accurate assessment of the situation, prioritize efforts, and initiate recovery and relief operations.

The situation in a disaster zone is often further aggravated by a loss of telecommunications service in the immediate and adjacent areas. Damaged telephone lines and destroyed cellular antenna towers and infrastructure not only impede public safety officials and other emergency personal from their efforts to quickly establish command and control in the disaster zone, but also deny the affected populace access to life saving services.

Reliability, availability, ubiquity of coverage and portability are the reasons why most mobile users view their mobile phones as not just a convenience, but as a key safety item for themselves and their families.[1] The aforementioned characteristics have also led public safety and disaster response service organizations to supplement and augment their private push-to-talk and/or radio communications systems with public mobile services. An operational mobile broadband system is vital to stabilizing a disaster situation quickly.

The ideal system for deployable communication must be a complete and self contained mobile broadband system that provides a host of public safety features. It must be compatible with existing communication systems, including the mobile handsets with which victims may be using to call for help. The solution must be able to operate in the harsh environment found in disaster zones and extremely remote areas. Additionally, must be small enough and light enough to be easily transported and deployed via a public safety vehicle, in a small SUV, light trailer or even in a small aircraft such as a helicopter.

Lemko On Demand mobile broadband system meets all of the requirements mentioned above. Below is a summary of the capabilities of Lemko's ODC solution.

- ODC operates in 700 MHz frequencies, including the D band and the adjacent Public Safety Spectrum Trust (PSST) band
- ODC is a complete and self contained mobile broadband system. No connections to other networks are needed to provide full mobile broadband and emergency service communication. The software-based solution follows next generation network requirements, meaning it will provide the most technologically advanced solution today and into the future, a critical cost point for public safety and homeland security operation.
- While Lemko's On Demand Cellular is a powerful stand-alone communication system, ODC's greatest strength is in its networking capability. Connected ODC nodes

[1] The tragic events of September 11th only reinforced this trend.

automatically recognize each other and determine routing options; features that are unique to Lemko's ODC solution. They automatically discover when another ODC is added to the network and when one is taken out of service, surrounding nodes take over subscribers and power up to fill in the coverage gap.

- ODC provides a full suite of and emergency communication features. Commanders have priority call ability so critical information is disseminated. High speed data is supported so images and video can be shared with medical personnel or structure information can be shared with engineers. Group call, 911 emergency calls and location data are all supported, even when only one system is deployed.
- The ODC can be deployed as an extension of a fixed network. A vehicle based unit can link to a fixed macro-cell and provide an instant network extension. Public safety personnel working in an area surrounding the vehicle will have full mobile broadband services available.
- ODC is reliable, rugged and robust. It is designed to operate in harsh environments as seen in natural and man-made disasters, as well as in geographical locations with extreme atmospheres.
- ODC is light weight and transportable. It may be placed inside a vehicle or in a light trailer and stored in 'stand-by' mode until a situation occurs. Lemko's solution can be easily brought to where communication is required. Additionally, the ODC can be configured to operate while in motion, assisting in the location of victims or in the communication and coordination of various response teams. It is easy to use, and may be operational in less than 20 minutes in deployable configurations.
- ODC is based on industry standards and operates with mobile devices used by subscribers. No software modifications to the handsets are needed. This insures that emergency calls can be received by the public safety agency as well as insures area citizens will receive emergency broadcasts and messages.
- ODC is an affordable and sustainable solution. The system's use of commercial platforms and standards based components keep the capital expense low. The distributed architecture eliminates the need to backhaul to a core network center, and the low power and small size drive down operation costs. Further, ODC's software approach means users can remotely obtain upgrades and updates, minimizing technician visits to extreme rural locations.
- The ODC was designed to be operated by military and public safety personal on a as needed basis. The ease of setting up the system and operating keep training requirements to a minimum.

System Description

Lemko's On Demand Cellular™ or ODC™ solution delivers an all IP, 4G core mobile broadband solution that delivers high speed data, voice, SMS and public safety services for extreme rural and harsh environments. It provides an entire mobile broadband network at every cell site by local completion of all switching, control, authentication and billing record creation. This approach eliminates backhaul, dramatically lowers expenses, and provides local control and connections to support first responder organizations. Each ODC utilizes data-friendly IP lines to the cell site.

The ODC is designed on next generation mobile network principals known as System Architecture Evolution (SAE). ODC meets the requirements set forth by the ITU for fourth generation systems which include: all IP network with low latency and high data throughput, a simplified, flat

architecture, distributed control, and low total cost of ownership. It is particularly important for rural markets and public safety organization to deploy the most technologically advanced system available to deliver services that are better than many available in large urban areas.

The ODC solution provides all of the functions of an eNodeB (radio access plus radio network controller), all of the functions of an EPC (enhanced packet core) for data and all of the functions of a legacy mobile network (MSC, HLR/VLR, AAA, AuC, CDR creation, SMSC and OAMP) for voice. ODC provides entire mobile broadband cellular network located at each cell site to cost effectively serve small rural and remote areas.

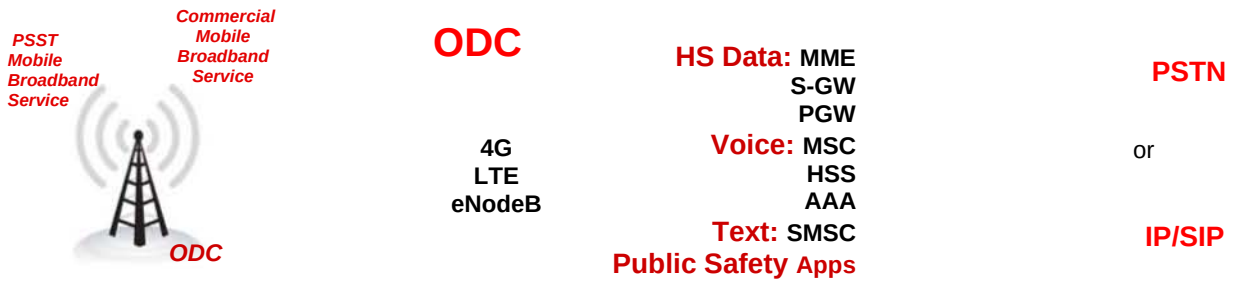

Figure 1 – ODC Functionality Diagram

Basic Software Functionality
The ODC provides cellular based mobile broadband services. Each ODC provides the following core features.

- Toll quality voice
- Short Messaging Service (SMS)
- High speed data based on air interface technology deployed
- Calls between ODCs
- Calls to other mobile systems
- Calls to wireline or PSTN systems
- Supplemental services including Call Forwarding, Call Waiting, Caller Identification and Call Barring
- Stand-alone operation
- Use of standards based handsets and devices

Public Safety Suite
Lemko understands the importance of delivering the capabilities deemed important by public safety organizations. Each ODC system is secure, reliable, and based on commercially available platforms to control costs while speeding availability. Its user friendly interface speeds set-up and minimizes training requirements.

ODC's Public Safety software suite provides many user features identified by Association of Public Safety Communications Officials (APCO) for emergency requirements. Additionally, ODC delivers

unique capabilities like single site operation and mobile operation. The following Public Safety and Homeland Security applications are supported on each ODC.

- Single site E911 Phase II capabilities
- Multiple levels for Priority calling
- Group call, 1 to many, full duplex; also conference calls
- Emergency alerts via text message (SMS)
- Secure phone support
- Local control of applications
- Full stand-alone operation

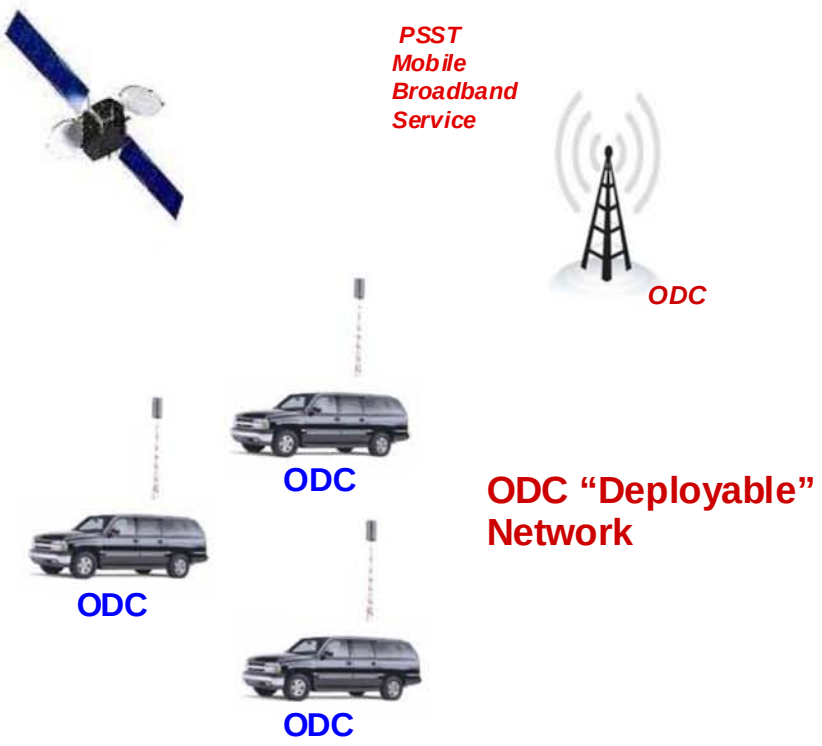

Figure 2 – ODC "Deployable" network configuration showing interconnect via IP satellite and terrestrial microwave.

Hardware Platforms

Servers. Lemko's ODC software is designed to operate on numerous hardware platforms in order to meet the environment requirements and price points desired by its operator. Options include a basic Internet server for indoor use, a rugged PC platform for use in moving vehicles, a module that fits inside the radio transceiver (BTS) for outdoor deployments, and a carrier grade fully redundant IP server.

Radio Base Stations. Lemko's On Demand Cellular solution operates with the d3900 Digital Base Station. the d3900BTS, is a digital base station that simultaneously supports multiple modes and multiple frequencies. Operators can deploy 2G GSM or 3G UMTS/CDMA-2000/HSPA services today and upgrade their network to 4G LTE via software in the future.

Lemko's d3900BTS delivers mobile broadband services in a single BTS frame. Supported frequencies include 700MHz, 800 MHz cellular and 1850-1990 MHz PCS bands.

Optional Ancillary Equipment

Antennas. Antenna requirements depend on the geographical environment in which they service is desired and the size of the coverage area. Various antennas are optionally available for the different deployment scenarios, whether on a shared tower, or mounted on a vehicle for deployable communication

Inter-connect. Lemko's ODC provides an IP interface for connections to other networks. The physical transportation medium depends on the distance covered, terrain and type of network to which it must connect. The system supports microwave, satellite, other wireless and wireless methods of transport. Additionally, the system can be equipped to provide a repeater-like function back to an existing cell site.

Containment. The ODC may be packaged into a variety of containers. For rural and extreme rural environments, Lemko optionally supplies an outdoor cabinet that withstand wide temperature ranges and includes power options, temperature control and other features. Equipment may also be configured for indoor installation via racks or cabinets. For deployable options, the entire ODC system plus ancillary equipment can be placed in the of a public safety vehicle, an SUV or in a trailer. The ODC is small and light enough to even be placed in a drone or aircraft to aid in the search of lost hikers or disaster victims.

Power options. Since the ODC is based on commercially available platform, it supports numerous power supply options. Standard 110/220V power input is supported, which may be sourced through the power company or via 'green' alternate energy methods including solar and wind generators. An ODC may also be powered by the vehicle in which it is mounted. Power supply filters are optionally provided, depending on the requirements and specifications.

Benefits

The On Demand Cellular provides numerous benefits to those who deploy the solution. The benefits include self-contained single site deployments, high reliability, low latency and local control.

High reliability. ODC's distributed architecture provides many benefits. Since all the functions of a mobile voice and data network are at the cell site, the system is not impacted by availability of backhaul connections to another network or system component. A distributed approach increases reliability by reducing the impact of a single failure. It also increases throughput and shortens response times.

Local call control. With ODC's distributed approach, all traffic remains on the local carrier's network. Public safety communication goes directly to local stations for swift reaction time. The feature set and options are determined by the local agencies who utilize the system, allowing each ODC to be fully customized and optimized for a particular market or application.

Lower Latency. A distributed architecture lowers latency by reducing the number of 'hops' data must traverse in order to reach its destination. This increases response time and improves customer satisfaction.

IP-based Design. IP will support new, future applications, so it is the optimal choice for future networks. ODC's all-IP approach is designed to easily supports the bandwidth hungry video and file requirements of today's mobile networks and the traffic demands often seen in emergency response scenarios.

Continuous Local Service. Local service continues even if the inter-connect line goes down. Call detail records / billing records continue to be generated so revenue is not lost when the line goes down. This is particularly important in remote areas that depend on satellite for connections.

Economic advantages

The challenge for rural and extreme rural markets is to overcome the high costs and economic barriers to providing mobile broadband services to the citizens in their geographic regions. These areas have a low population often spread over a large area. The ideal solution must cover a large area at a small price point. Lemko ODC overcomes this challenge b providing the lowest total cost of operation while delivering the most advanced solution to mobile carriers and organizations. The required capital expense is kept low through its software design and use of commercially available platforms. Operations expenses are minimal by eliminating backhaul and utilizing IP links for inter-connect to other networks. Below is a more detailed explanation of Lemko's lowest total cost approach.

Low Capital Expense

- *Software approach* – Each ODC provides an entire cellular network via software. There are no custom ICs or hardware.
- *Entire system at each site* – no additional equipment is required while delivering the entire functions of a cellular voice system and a broadband data system. There is less equipment and fewer connection lines.
- *Commercially Available Platforms.* Costs are also lowered through the use of IP servers and routers. There are many commercially available, off-the-shelf servers that are available for the fraction of the cost of traditional telecom hardware and platforms.
- *High availability radio access; user devices*. Lemko takes advantage of the cost curve and availability of standard cellular base stations and user devices, driving costs down at the same rate as the rest of the cellular ecosystem.
- *Software upgrades:* ODC is software upgradeable to future air interfaces like LTE. New features, applications and capabilities may be remotely added to keep the system as advanced, usable and reliable as possible.

Low Operations Expense

- *No backhaul to a central core* -- All functions take place at access point, so backhaul to a central core is not required for operation. Even authentication, management and billing record creation take place at the cell site, so no signaling or management backhaul is necessary.
- *IP Technology* -- IP technology provides numerous benefits. A 10 Mbps IP line costs little more than a single T1 line but provides 6.5 times the capacity. The capacity increases even more when one takes into account the efficiency or packet based transmission versus circuit based transmission. Additionally, IP is designed to transport data, improving the quality of service.

- *Low Power Requirements* -- The power requirements or an ODC system are those of a typical Internet server plus the radio access (BTS) system. Since the power drain is so low, sites do not typically require air conditioning, depending on the environment in which it is deployed. Having minimal HVAC requirements further drives down power requirements and facility space requirements.
- *Low maintenance and support costs*: ODC reduces labor costs associated with installation, training, support and maintenance as it operates on a standard internet server instead of custom, proprietary hardware. Remote upgrades and updates drive operation costs lower.

System Components (Basic Configuration)

Vehicle	Basic installation and use supported by vehicle options such as light SUV or trailer. Aircraft configuration also available. Larger vehicles will support enhanced capabilities such as higher antenna masts or larger generator configurations.
Generator	Low power requirements allow for low cost and small generator use. Low power base station configuration can operate off of vehicle power.
Mast	Light vehicle or trailer can support mast height of 40 feet.
ODC Unit	Integrated base station and server unit available in multiple configurations – power and environmental considerations.
RF Antenna and Components	Multiple configurations available based upon coverage, capacity and mast specifications.
Microwave	Microwave base station can support up to five mobile units. Antenna configurations (120 or 60 degree beams) available to extend range.
Satellite	VSAT terminal can be deployed to support IP interconnect via satellite for more remote areas.

On Demand Cellular™
for Extreme Rural
Public Safety Deployments

------ for ------
Federal Communications Commission

March 12, 2010

Lemko's On Demand Cellular™ Solution

Public Safety Communication for Rural Markets

Rural communities must have access to critical public safety and mobile broadband applications. With ODC, the United States can provide a rural mobile broadband smart grid that connects rural and remote market to each other and to urban areas. It is fully compatible with and will inter-operate with all mobile broadband and legacy cellular systems. And since ODC delivers an entire mobile broadband system at each site, it results in a resilient and robust mobile broadband communication system based on industry standards and next generation technology.

The On Demand Cellular™ solution provides mobile broadband services that are augmented with a suite of public safety features and applications. This is ideal for rural and remote areas where service is sparse, or mobile broadband is not available.

For rural markets the ODC may be used to provide public safety communications combined with commercial service. The system operates in the 700 MHz 'D' band along with the adjacent PSST frequencies. Priority features and use of separate IP links protect safety services and insure they receive the priority necessary to respond in a timely manner.

An ODC solution can be used in a variety of applications such as stand-alone rural and remote cellular, an extension to an existing cellular network, for temporary capacity increase situations and for public safety applications. The ODC can be readily installed in a vehicle to provide rapid extension of coverage for emergency response. The vehicle installed ODC can be rapidly interconnected to the existing public safety mobile broadband system. Public safety personnel working an outlying area will have access to full mobile broadband services.

- Operates in 700 MHz frequencies, including the D band and adjacent Public Safety Spectrum Trust (PSST)
- Supports multiple IP links to simultaneously provide public safety communication on a secure link and public mobile broadband service on a public or commercial link
- Interoperates with existing legacy mobile and public safety systems
- Delivers critical public safety features including E911 emergency call, location based services, priority call, group call and emergency alerts
- Economically provides mobile broadband, voice and text communications with just one cell site.
- Authorities can use the Lemko solution to broadcast emergency messages to all like-bearer phones.
- ODC is a fourth generation mobile system designed for LTE. 2G and 3G transceivers can be added to support handsets in commercial service today. No software modifications to handsets are needed and phones can be pre-provisioned to operate on the system during an emergency.
- Easy to operate, maintain, and administer.

System Description

Lemko's On Demand Cellular™ or ODC™ solution delivers an all IP, 4G core mobile broadband solution that delivers high speed data, voice, SMS and public safety services for extreme rural and harsh environments. It provides an entire mobile broadband network at every cell site by local completion of all switching, control, authentication and billing record creation. This approach

eliminates backhaul, dramatically lowers expenses, and provides local control and connections to support first responder organizations. Each ODC utilizes data-friendly IP lines to the cell site.

The ODC is designed on next generation mobile network principals known as System Architecture Evolution (SAE). ODC meets the requirements set forth by the ITU for fourth generation systems which include: all IP network with low latency and high data throughput, a simplified, flat architecture, distributed control, and low total cost of ownership. It is particularly important for rural markets and public safety organization to deploy the most technologically advanced system available to deliver services that are better than many available in large urban areas.

The ODC solution provides all of the functions of an eNodeB (radio access plus radio network controller), all of the functions of an EPC (enhanced packet core) for data and all of the functions of a legacy mobile network (MSC, HLR/VLR, AAA, AuC, CDR creation, SMSC and OAMP) for voice. ODC provides entire mobile broadband cellular network located at each cell site to cost effectively serve small rural and remote areas.

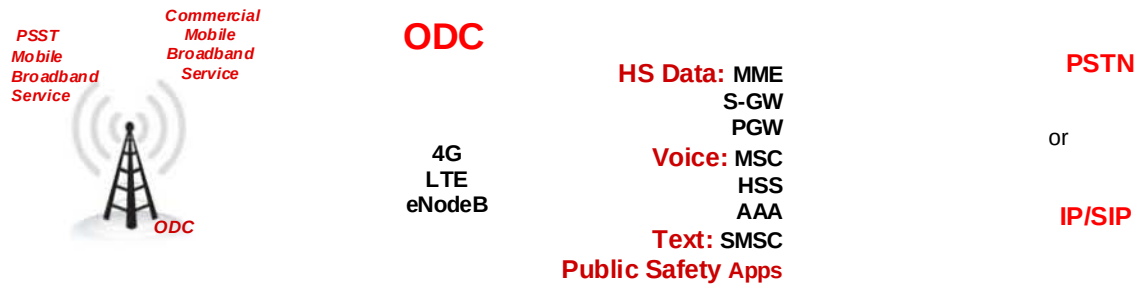

Figure 1 – ODC Functionality Diagram

Basic Software Functionality
The ODC provides cellular based mobile broadband services. Each ODC provides the following core features.

- Toll quality voice
- Short Messaging Service (SMS)
- High speed data based on air interface technology deployed
- Calls between ODCs
- Calls to other mobile systems
- Calls to wireline or PSTN systems
- Supplemental services including Call Forwarding, Call Waiting, Caller Identification and Call Barring
- Stand-alone operation
- Use of standards based handsets and devices

Public Safety Suite
Lemko understands the importance of delivering the capabilities deemed important by public safety organizations. Each ODC system is secure, reliable, and based on commercially available platforms to control costs while speeding availability. Its user friendly interface speeds set-up and minimizes training requirements.

ODC's Public Safety software suite provides many user features identified by Association of Public Safety Communications Officials (APCO) for emergency requirements. Additionally, ODC delivers unique capabilities like single site operation and mobile operation. The following Public Safety and Homeland Security applications are supported on each ODC.

- Single site E911 Phase II capabilities
- Multiple levels for Priority calling
- Group call, 1 to many, full duplex; also conference calls
- Emergency alerts via text message (SMS)
- Secure phone support
- Local control of applications
- Full stand-alone operation

Hardware Platforms

Servers. Lemko's ODC software is designed to operate on numerous hardware platforms in order to meet the environment requirements and price points desired by its operator. Options include a basic Internet server for indoor use, a rugged PC platform for use in moving vehicles, a module that fits inside the radio transceiver (BTS) for outdoor deployments, and a carrier grade fully redundant IP server.

Radio Base Stations. Lemko's On Demand Cellular solution operates with the d3900 Digital Base Station. the d3900BTS, is a digital base station that simultaneously supports multiple modes and multiple frequencies. Operators can deploy 2G GSM or 3G UMTS/CDMA-2000/HSPA services today and upgrade their network to 4G LTE via software in the future. Lemko's d3900BTS delivers mobile broadband services in a single BTS frame. Supported frequencies include 700MHz, 800 MHz cellular and 1850-1990 MHz PCS bands.

Optional Ancillary Equipment

Antennas. Antenna requirements depend on the geographical environment in which they service is desired and the size of the coverage area. Various antennas are optionally available for the different deployment scenarios, whether on a shared tower, or mounted on a vehicle for deployable communication

Inter-connect. Lemko's ODC provides an IP interface for connections to other networks. The physical transportation medium depends on the distance covered, terrain and type of network to which it must connect. The system supports microwave, satellite, other wireless and wireless methods of transport. Additionally, the system can be equipped to provide a repeater-like function back to an existing cell site.

Containment. The ODC may be packaged into a variety of containers. For rural and extreme rural environments, Lemko optionally supplies an outdoor cabinet that withstand wide temperature ranges and includes power options, temperature control and other features. Equipment may also be configured for indoor installation via racks or cabinets. For deployable options, the entire ODC system plus ancillary equipment can be placed in the of a public safety vehicle, an SUV or in a trailer. The ODC is small and light enough to even be placed in a drone or aircraft to aid in the search of lost hikers or disaster victims.

Power options. Since the ODC is based on commercially available platform, it supports numerous power supply options. Standard 110/220V power input is supported, which may be sourced through the power company or via 'green' alternate energy methods including solar and wind generators. An ODC may also be powered by the vehicle in which it is mounted. Power supply filters are optionally provided, depending on the requirements and specifications.

Benefits

The On Demand Cellular provides numerous benefits to those who deploy the solution. The benefits include self-contained single site deployments, high reliability, low latency and local control.

High reliability. ODC's distributed architecture provides many benefits. Since all the functions of a mobile voice and data network are at the cell site, the system is not impacted by availability of backhaul connections to another network or system component. A distributed approach increases reliability by reducing the impact of a single failure. It also increases throughput and shortens response times.

Local call control. With ODC's distributed approach, all traffic remains on the local carrier's network. Public safety communication goes directly to local stations for swift reaction time. The feature set and options are determined by the local agencies who utilize the system, allowing each ODC to be fully customized and optimized for a particular market or application.

Lower Latency. A distributed architecture lowers latency by reducing the number of 'hops' data must traverse in order to reach its destination. This increases response time and improves customer satisfaction.

IP-based Design. IP will support new, future applications, so it is the optimal choice for future networks. ODC's all-IP approach is designed to easily supports the bandwidth hungry video and file requirements of today's mobile networks and the traffic demands often seen in emergency response scenarios.

Continuous Local Service. Local service continues even if the inter-connect line goes down. Call detail records / billing records continue to be generated so revenue is not lost when the line goes down. This is particularly important in remote areas that depend on satellite for connections.

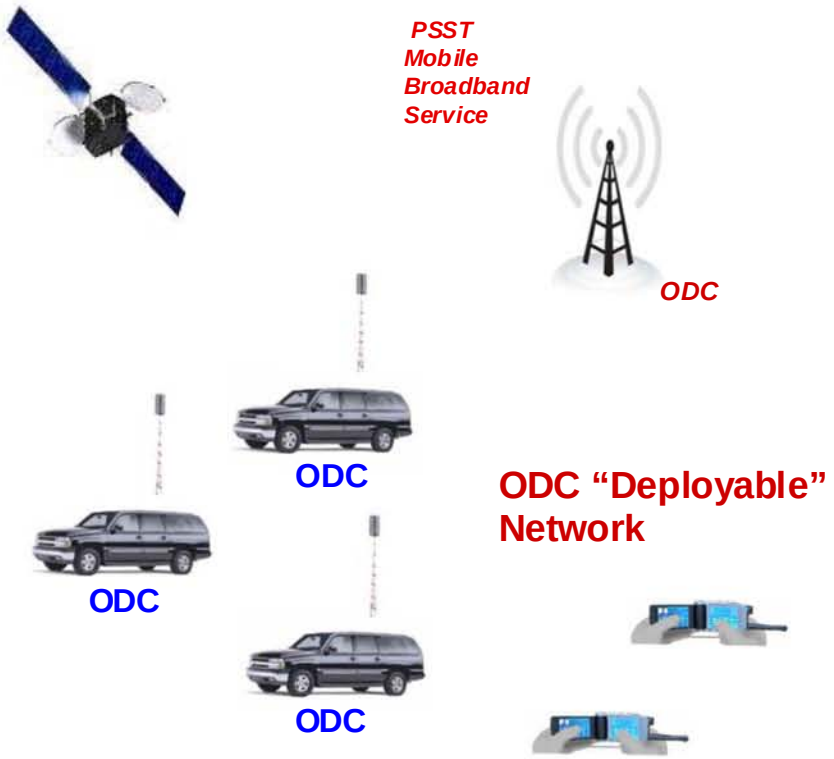

Figure 2 – ODC deployable units shown as a coverage extension for extreme rural areas

Economic advantages

The challenge for rural and extreme rural markets is to overcome the high costs and economic barriers to providing mobile broadband services to the citizens in their geographic regions. These areas have a low population often spread over a large area. The ideal solution must cover a large area at a small price point. Lemko ODC overcomes this challenge by providing the lowest total cost of operation while delivering the most advanced solution to mobile carriers and organizations. The required capital expense is kept low through its software design and use of commercially available platforms. Operations expenses are minimal by eliminating backhaul and utilizing IP links for inter-connect to other networks. Below is a more detailed explanation of Lemko's lowest total cost approach.

Low Capital Expense

- *Software approach* – Each ODC provides an entire cellular network via software. There are no custom ICs or hardware.
- *Entire system at each site* – no additional equipment is required while delivering the entire functions of a cellular voice system and a broadband data system. There is less equipment and fewer connection lines.
- *Commercially Available Platforms.* Costs are also lowered through the use of IP servers and routers. There are many commercially available, off-the-shelf servers that are available for the fraction of the cost of traditional telecom hardware and platforms.
- *High availability radio access; user devices*. Lemko takes advantage of the cost curve and availability of standard cellular base stations and user devices, driving costs down at the same rate as the rest of the cellular ecosystem.
- *Software upgrades:* ODC is software upgradeable to future air interfaces like LTE. New features, applications and capabilities may be remotely added to keep the system as advanced, usable and reliable as possible.

Low Operations Expense

- *No backhaul to a central core* -- All functions take place at access point, so backhaul to a central core is not required for operation. Even authentication, management and billing record creation take place at the cell site, so no signaling or management backhaul is necessary.
- *IP Technology* -- IP technology provides numerous benefits. A 10 Mbps IP line costs little more than a single T1 line but provides 6.5 times the capacity. The capacity increases even more when one takes into account the efficiency or packet based transmission versus circuit based transmission. Additionally, IP is designed to transport data, improving the quality of service.
- *Low Power Requirements* -- The power requirements or an ODC system are those of a typical Internet server plus the radio access (BTS) system. Since the power drain is so low, sites do not typically require air conditioning, depending on the environment in which it is deployed. Having minimal HVAC requirements further drives down power requirements and facility space requirements.
- *Low maintenance and support costs*: ODC reduces labor costs associated with installation, training, support and maintenance as it operates on a standard internet server instead of custom, proprietary hardware. Remote upgrades and updates drive operation costs lower.