

Warren C. Havens
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August 31, 2002

To: Each Commissioner, Federal Communications Commission, via US Mail
Also filed as Ex Parte filing in RM-10403 on ECFS

Re: (i) RM-10403, considering rulemaking in 902-928 MHz.
(ii) "ATLIS" proposal for nationwide multi-band wireless service for Homeland Security, Public Safety and Critical Infrastructure, with adjacent Private Enterprise wireless supportive thereof: Use of 902-928 MHz, 217-225 MHz, and 4.9 GHz.

Dear Commissioners, and staff:

Progeny LMS LLC and parties who filed comments in RM-10403 have met with or provided copies of their filings to your offices. In response, LMS Wireless provides the following, which includes a comprehensive proposal for optimizing the 902-928 MHz band for greatest public benefit.

Pursuant to competitive bidding, I hold (in my name and via Telesaurus Holdings GB LLC, in which I have controlling interest) A-block licenses (904-910 MHz) in the 902-928 MHz Location and Monitoring Service ("LMS") band in approximately 80% of the nation. This is much of the spectrum subject of RM-10403. I also hold interests in many VHF Public Coast, 220 MHz, and AMTS licenses.

LMS Wireless' Comments and Reply Comments in RM-10403 are on the FCC website's ECFS. Related thereto and attached hereto is a Summary of our "ATLIS" proposal referenced above. This document is summarized in the email to Paul Kolodzy, head of your Spectrum Task Force, also in the Attachment.

I would appreciate the opportunity to discuss both this proposal and related RM-10403 matters with your staff in person or by phone after a period of initial review by Public Safety and Critical Infrastructure entities, Mr. Kolodzy's office, and Gerald Hurt at NTIA.

Sincerely,

Warren C. Havens
President

cc: At FCC: Paul Kolodzy, David Furth
LMSW advisors: Ralph Haller, Michele Farquhar

Attachment

Subj: **Summary proposal re 902-928 MHz (&217-225 & 4.9 GHz)**

Date: Wednesday, August 28, 2002 12:54:54 PM

From: wchavens

To: pkolodzy@fcc.gov, dfurth@fcc.gov, rarsenau@fcc.gov, ghurt@ntia.doc.gov, jo@htgm.com, pmarshall@darpa.mil,

cc: rhaller@frci.com, mcfarquhar@hhlaw.com, jstobaugh@telesaurus.com

All,

Attached is a summary of a white paper regarding above-referenced spectrum bands that I will soon complete and file with the FCC Spectrum Task Force, and in dockets regarding these bands, including the "Progeny" proceeding regarding 902-928 MHz (already filed with my petition for reconsideration, 8-26-02, in docket 92-257 regarding AMTS 217-220 MHz). I have spoken to all of you in the past regarding this proposal and will send you (and others) the final.

The current proposal has major changes from what I outlined to you in the past (it increases benefits to Public Safety and Critical Infrastructure, reduces conflicts with Part 15 entities that serve CI, etc.) and reflects the nearly complete white paper.

The purpose of this Summary is to provide to key persons and entities whose approval is needed or participation is proposed a chance to review the key elements of the proposal and then give me any feedback they would like prior to my completing the white paper which I plan to do by mid to late next month.

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- The proposal is for a multi-band Public Safety ("PS")/ Critical Infrastructure ("CI") wireless service with exclusive licensing/use (half to PS and half to CI) of 13+4 MHz of spectrum in above-referenced 900 + 200 MHz ranges, and priority access to equal amounts of adjacent for-profit spectrum in operation.**

- Thus, 26 + 8 MHz, for urban and rural wide-area networks.

- This spectrum available now or soon (sooner than the 700 MHz is cleared of TV use).

- No cost (auction and fee exempt to both PS and CI), and direct and indirect financial subsidies to PS for deployment and operation.

- Licensing and use of this spectrum could be coordinated with the 4.9 GHz band (and perhaps similar in the 5.9 GHz ITS band, which could serve PS, CI, and for-profit functions, along with Intelligent Transportation Systems DSRC roadway/roadside applications).

- These networks (including 902-928 MHz) could be testbeds for, and major users of, the DARPA XG technology, at least for second-generation equipment (commencing with

appropriate adaptations of best current technologies such as Project 25, Tetrapol, W-OFDMA, etc.).

** (For large emergencies, PS needs many times its day-to-day capacity. Instead of it paying to build and operate that [virtually cost prohibitive], per our plan, it would "call up the reserves"--use the capacity of systems (VPN's) on the for-profit spectrum.

The proposal is very responsive to current priorities for "Interoperability," "Homeland Security," spectrum efficiencies, spectrum availability for PS and CI, priorities of Chairman Powell and key issues of the Task Force, secure VPN's in shared public-private networks, creative approaches and market mechanisms for new efficiencies, etc.

As noted in the attached, the proposed service would also provide ideal wide-area networks for public and private Intelligent Transportation System functions, and for environmental monitoring (hazardous releases [accidents or terrorism], point-source pollution, and ecosystem health indicators, etc.) Also, if implemented, it could provide a basis for solving the interference issues in 800 MHz.

Equipment vendors and system integrators including SAIC, Motorola, EADS-EDSN, Microwave Data Systems, and Wi-Lan have been briefed and have interest. I expect participation once there is sufficient initial interest from FCC, NTIA, PS, CI.

Federal government/ NTIA would get appropriate "credit" (in terms Federal/non-Federal spectrum allocations/reallocations) for agreeing to the plan, in as much as it calls for lessening certain current priority use rights of the Federal government in the 902-928 MHz (the rights exist but are not substantially used). Mostly, the plan would benefit Federal (as well as State and local) Public Safety--it would greatly increase, not decrease actual Federal use, as a prime band for Homeland Security/Interoperability--and by such, the called-for lessening of the current priority use rights would be justified.

I have sent or will soon send the attached to the major PS and CI organizations: APCO, UTC, others, to get their feedback.

I would very much appreciate initial feedback from you, or others to whom you may refer this matter. I may be contacted at this email (with cc to jstobaugh@telesaurus.com, on this email) or at the phone numbers below.

Sincerely,
Warren Havens
President, Telesaurus Holdings GB LLC
Berkeley, California
Office: 510 841 2220. Cell phone: 510 914 0910

Summary, 8-25-02

ATLIS White Paper
Regarding Use of 902-928 MHz
Supplemented by 217-225 MHz and 4.9 GHz
for Public Safety and Homeland Security, Critical Infrastructure, and Private Enterprise:
an Advanced-Technology Land Infrastructure and Safety Service
("ATLIS")

Warren C. Havens and
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This is a summary of the above-captioned proposal LMSW will submit soon to the FCC, (including as Ex Parte filings in dockets regarding the subject spectrum), UTC, NTIA, Federal public safety and homeland security entities, APCO, ITS America and others.

This ATLIS proposal is designed to provide major contributions to meeting the needs of US public safety ("PS") and critical infrastructure entities ("CI")¹ for:

- Additional exclusive spectrum,
 - Interoperability, and
 - Advanced wireless networks,
- and the same for business enterprises and certain Intelligent Transportation System ("ITS") functions served in ATLIS by for-profit private-enterprise licensees ("PE").

The proposal is structured for efficiency and financial viability including via:

- (i) No cost of spectrum to PS and CI.
- (ii) Network sharing among multiple PS, CI, and PE via secure VPN's, with
- (iii) PE providing at it cost, via priority preemption, the large interoperable capacity reserve needed by PS and CI for major emergencies.²

¹ Herein "Public Safety" ("PS") means traditional public safety as described in Section 337(f) of the Act, and "Critical Infrastructure" ("CI") means entities described in Section 309(j)(2) of the Communications Act (the "Act").

² Regarding the above stated needs, and the above items (ii) and (iii) as major components of a solution, see (i) Viktor Mayer-Schönberger, "Emergency Communications: The Quest for Interoperability in the United States and Europe," John F. Kennedy School of Government, Harvard University, March 2002; available at <http://ksgnotes1.harvard.edu/BCSIA/Library.nsf/pubs/VIKTOR0203>; (ii) PSWN's *Progress Report*

- (iv) Appropriate multiple bands: (a) each with RF propagation characteristics and spectrum amounts well suited for respective requirements, from rural coverage and basic wide-area voice and data, to urban coverage, “hot-spot” broadband, and point-to-point links, and (b) which provide the new spectrum needed for new technologies that are more spectrum efficient and for traditional and new applications at lower costs.
- (v) Simple national coordination for the PS and CI spectrum allocations.
- (vi) Other PE and certain CI support of the PS component (described below).
- (vii) Scope and solutions worthy of major Federal and State funding of the PS component including for Homeland Security goals for capital and operating costs.
- (viii) Ability to use/ leverage advanced, cost-effective components and technology from the GSM/UMTS 900 MHz band (the most used mobile spectrum in the world).

The proposed ATLLIS involves, in brief:

New exclusive nationwide spectrum allocations for PS and CI comprising:

- (i) Half of 902-928 MHz (one-quarter [6.5 MHz] each to PS and CI), with PS and CI priority access to the other half.³ The other half licensed to for-profit entities. (See table and discussion in Exhibit 1 below.)

on Public Safety Spectrum (November 2001), page 20, Conclusions and Recommendations); (iii) *The 4.9 GHz Band. . . , WT Docket No 00-32, Second R&O & FNPRM, FCC 02-47 (2-27-02)*, ¶ 46; (iv) *FCC Staff Report on NTIA’S Study of Current and Future Spectrum use by the Energy, Water, and Railroad Industries. . . (7-30-02)*, Conclusion section; (v) Bill Moroney (President of UTC), “Critical Infrastructure Needs Exclusive Spectrum,” (Radio Resources, June 2002); (vi) *Options for Upgrading Utility Wireless Networks*, (KPMG study for UTC, July 2002). Also, in planning future PS wireless, TIA-ETSI comment: “. . . Project MESA . . . reflects the vision of a mobile broadband-shared network that can be simultaneously accessed by multiple users, with multiple applications in a specified geographical area fully independent from availability of public networks and supply of electrical power.”

³ Re 902-928 MHz, see §90.350 *et. seq.* which describes this “Location and Monitoring Service” (“LMS”) band, thus-far allocated primarily for a broad range of “Intelligent Transportation System” (“ITS”) applications, private and governmental. Regarding these two halves: see §90.357 (see also Table in Exhibit 1 below): the half we propose for PS and CI is the spectrum now used for “Non-multilateration” systems; the other half is what has been licensed by auction for “Multilateration” systems. LMSW (Havens and Telesaurus) holds geographic licenses for the Multilateration A-Block sub-band (the first listed sub-band in §90.357) in about 80% of the nation. One other entity, Progeny LMS LLC, holds over 90% of the rest of the Multilateration spectrum (the next two listed sub-bands).

The Non-multilateration spectrum is currently licensed only for very short-range systems along highways and railways for ID “tag” readers (passive or active transponders on vehicles) for toll collection and other ID purposes. In the vast majority of the nation, this spectrum is unused by licensed operations. Also, the 75-MHz-wide ITS 5.9 GHz band has been recently allocated by the FCC for advanced dedicated short-range communications (similar allocations in other nations for same ITS purposes), and once 5.9 GHz is licensed and developed, operations on 900 MHz

- (ii) Half of 217-225 MHz (one-quarter [2 MHz] each to PS and CI), with PS and CI priority access to the other half.⁴ The other half are licensed to for-profit entities. (Regarding availability, see discussion in Exhibit 1 below.)
- (iii) A similar arrangement for the 4.9 GHz band: PS, CI, and PE allocations, for shared networks (details to be provided soon in an Ex Parte filing in WT Docket No. 00-32 based on the ATLIS white paper).

This 200, 900, and 4900 MHz spectrum (and possibly other)⁵ would be used (probably with integration of a MSS)⁶ for multi-band shared networks: often, not always, (i) sharing in

Non-multilateration spectrum should migrate to 5.9 GHz. By use of the entire 26-MHz wide 902-928 MHz band for wide-area mobile systems, as we propose, there will always be channels available even in the localities where Non-multilateration systems are still in operation. Part 15 devices use this band, but will not pose a major problem under the ATLIS plan (see next footnote and Exhibit 2 below).

⁴ This white paper will show that these particular 900 and 200 MHz bands, contrary to common perceptions, are not substantially used, including by Part 15 unlicensed devices in 902-928 MHz, Amateurs in 222-225 MHz, and apparent licensed operations in 217-222 MHz. Also see Exhibit 1 below.

Regarding dealing with current users of 902-928 MHz under ATLIS, see Exhibit 2 below.

⁵ Possible other spectrum: (i) the VHF Public Coast (“VPC”) band: 350 to 500 kHz of paired channels in 157/162 MHz. Formerly licensed (with few exceptions) only along the US coastlines, but per FCC auctions in recent years, now licensed also for land mobile throughout the nation. Havens holds the VPC licenses (1 license per area) in most of the Rocky Mountain state areas, and Maritel holds virtually all of the rest of the VPC licenses for land and coastal areas. There is a 50-kHz (two 25-kHz channels, or four 12.5-kHz channels) public safety set aside in the middle of (and in addition to) this auctioned spectrum. Railroad VHF adjoins this VPC band. If Railroads became stakeholders in/ user of multi-band ATLIS networks (with appropriate secured rights and control for their needs), they may, in time, be able to “trade” their substantial VHF spectrum for use rights in ATLIS networks. (ii) The 75-MHz wide 5.9 GHz band allocated for Intelligent Transportation Systems (“ITS”). Besides use for ITS-specific roadway and roadside Dedicated Short Range Communications (“DSRC”), we propose that it could also be used on a non-interfering basis under the ATLIS plan for coordinated PS, CI, and PE use, including “broadband” applications contemplated for the 4.9 GHz band and network point-to-point links. (The DSRC roadway/ roadside uses will leave most of the spectrum (on a MHz-Pop, and MHz-Land Area basis) unused. ITS functions are primarily for public safety (in the broad sense of combined §337(f) and §309(j)(2)) and the proposed ATLIS use of 5.9 GHz would be a natural extension. A description of the relationship between and need to coordinate advanced ITS and PS wireless is in the Project MESA Statement of Requirements, including in §8.6 “Transparent network and system access” in the ETSI draft V.10 at <http://www.projectmesa.org/SoR.htm> .

⁶ Mobile Satellite Service, such as Globalstar or Iridium, could be useful for coverage remote areas where terrestrial coverage would be too expensive, in some areas before terrestrial coverage is provided, as well as for redundancy and special applications (see the white paper).

building and operating secure digital network infrastructure for virtual private networks, and (ii) using all or several of these bands for integrated technology and networks and/or multi-band end-user devices.

Such sharing would be among the three classes of licensees in each band, PS, CI, and PE: for-profit licensees serving businesses needing mission critical communications. Large economies of scale would be achieved yielding lower capital and operating costs, quicker and stronger development, etc.

ATLIS PE would be permitted to lease or otherwise use its spectrum and network capacity without limit to serve ATLIS PS and CI (in addition to private enterprise and individuals); ATLIS CI could lease its excess network capacity to ATLIS PS and PE, and (while less likely) ATLIS PS could do likewise to ATLIS CI and PE.

The core 902-928 MHz spectrum (which would probably carry most of the traffic) is in the GSM 900 band, which has about half of all mobile phones in the world:⁷ ATLIS would

For this purpose, some ATLIS radios would also have MSS-capability. LMSW has met with these two MSS operators. They are seeking to provide these niche functions as part of their core business, especially for large terrestrial service with major-entity users as the proposed ATLIS. Also, via bankruptcy and financial restructuring, most of the billions of dollars in original equity and debt has been extinguished, and they are now able to price far more attractively, as has been widely reported in the trade press.

⁷ See: <http://www.gsmworld.com/news/statistics/index.shtml>, and <http://www.gsmworld.com/news/statistics/substats.shtml> :

GSM 900 (GSM using 900 MHz)⁷ has 361 million users. GSM 900 components are also in all phones of all GSM 900/1800 subscribers, another 223 million, totaling 584 million out of a total 684 million all GSM subscribers which have GSM 900 RF components. This is 85.4% of all GSM subscribers (April '02). GSM accounts for 71% of all world digital subscribers. Thus, GSM 900 MHz components are in 58% (85.4% x 68%) of all CMRS subscriber phones worldwide.⁷ This is roughly two orders-of-magnitude larger than the US market for public-safety and other mission-critical wireless.

Regarding leveraging and adapting GSM 900: One example is GSM-R for railroads (see: <http://gsm-r.uic.asso.fr/>): it uses European allocations in 876 - 915 MHz and 921 - 960 MHz, begun in late 1990's, currently being deployed in linked nationwide systems in Europe leveraging and adapting standard GSM 900 technology and components for mission-critical railroad communications. The same could be done for land-mobile mission critical communications utilizing newer "3G" on GSM 900, in fact, the GSM-R association (see <http://gsm-r.uic.asso.fr/faq.html>) writes: "if we were to start from scratch now we would embrace other possible solutions . . . software radio . . . or UMTS [commercial mobile 3G technology]. Also . . . TETRA has no allocation in the railway spectrum range in the 900MHz band."

Further, DARPA in the US has a "4G" wireless technology development project called "XG." (See: <http://www.darpa.mil/ato/programs/xg.htm> , It is being developed for both US military and non-military wireless. Dr. Paul Kolodzy, now head of the FCC Spectrum Task Force, was the

leverage for its use the advanced cost-effective technology and components developed for this GSM band.

In addition to above-noted cost savings by the large economies of scale involved, direct and indirect financial support would be provided to the PS licensees/ users for initial construction and ongoing operation by:

- (i) The CI licensees/ users, by providing for the shared networks use of CI antenna sites, fiber, power, right of way, maintenance, etc. on an at-cost basis or other attractive rate. (PS would also provide on the same basis use of the facilities it owns for the shared networks.)
- (ii) The PE licensees, and licenses, by providing:
 - (a) At no cost, the above-noted priority access.
 - (b) At no cost, use of PE (Multilateration) spectrum in the 902-928 MHz range where the PS spectrum is used by Non-multilateration operations (this provided also by PE to CI.
 - (c) Proceeds of PE ATLLIS-spectrum auctions provided to PS towards its ATLLIS capital and operating costs.⁸
- (iii) Monthly fees paid to PS towards its ATLLIS costs from monthly fees charged to users of CMRS devices for the safety capabilities of mandated ATLLIS RF-chips in all CMRS devices to be used for E911, basic ITS vehicular functions, and other critical safety functions (emergency broadcasts, etc). See description in Exhibit 3 below.
- (iv) Major Federal financial support (including for state and especially local PS which most needs additional funding) including for the Homeland Security and interoperability functions.

Together, the above support would greatly offset costs to PS for development and use of its component of ATLLIS.

initial head of this XG project. I have spoken with Dr. Kolodzy and the current director, Preston Marshall, concerning use of the 902-928 MHz band (and perhaps the other spectrum proposed for ATLLIS) as a test bed for, and a major ultimate home for widespread deployment of, the DARPA XG technology.

In any case, initial and future-generation technology for the ATLLIS bands would be selected by stakeholder consensus, including public safety. In my view, logically, it would commence with current-generation technology as used in P25, Tetrapol, and narrowband telemetry, and migrate to a mission-critical implementation of 3G or 4G technology developed for commercial wireless, perhaps, as noted, that derives from the DARPA XG project.

⁸ LSMS is proposing for the 4.9 GHz and 5.9 GHz that parts be auctioned to PE licensees via bids (after opening cash bids from up front payments) that constitute obligations to pay a certain percent of gross income from the wireless services using the bid-for spectrum, with such revenue stream being paid (not to US Treasury) but to the PS ALTLIS coordinator for use by ATLLIS PS functions (construction, operations, upgrades, etc.) This will not only help PS funding, but also motive PS and PE to cooperate, along with CI, for efficient shared networks.

In exchange for their contributions noted above and herein to PS and CI, ATLIS PE licensees would receive:

- (i) Rights to use, at no (further) cost, the common network infrastructure: antenna systems, backhaul, switches and nodes, power, etc. provided by PS and CI (see above). LSM-M would secure and pay for the base-station radios and any other equipment specific to operation on its ATLIS spectrum.
- (ii) Rights to use, on an at-cost basis, PS and CI infrastructure (antenna and equipment sites, backhaul, etc.) suitable for expansion of the LMS-M networks beyond what PS and CI may be operating in a given area and time. This right would be subject to a reciprocal right of the PS and CI entities with this infrastructure to share in this LMS-M network expansion if they chose to at a later date, on the same at-cost basis.

To be most effective, there would be one nationwide authority for PS (for spectrum assignments, technology selection, system deployments, network sharing arrangements with the other participants, etc.), logically, a Federal Homeland Security function, but which looks to APCO, AASHTO, and other PS organizations, and one authority for CI as UTC, AAR, and other CI entities may decide.⁹

In addition to basic and advanced communications for PS, CI, and PE customers, other high-public-benefit functions, and PS-funding mechanisms, proposed for ATLIS are summarized in Exhibit 3 below.

This ATLIS proposal is closely aligned with the key published goals of the FCC Spectrum Task Force and statements by Chairman Powell on spectrum policy priorities, as well as the demands of current communication applications and technology: i.e., due to their increasing complexity, magnitude, and cost, they increasingly call for (i) larger higher-capacity networks hence either major public-access networks, or as per the ATLIS proposal, major non-public networks shared by multiple entities in secure VPN mode, and (ii) multiple bands that are in frequency and amount suitable for the various types of coverage and applications involved.

The proposal is clearly responsive to current priorities for "Interoperability," "Homeland Security," spectrum efficiencies, spectrum availability for PS and CI, and advanced applications and technologies (which need new spectrum to deploy).

⁹ Also, regarding PE licensees in these bands, it would be relatively easy for these to cooperate to implement ATLIS functions since: (i) There would be one 4.9 GHz PE license, and one 5.9 GHz PE license, each awarded by auction (see footnote ___ above) and conditioned upon all ATLIS requirements. (ii) There are only two LMS Multilateration licensees (LMSW [Havens and Telesaurus] and Progeny LMS LLC) that hold over 85% of all LMS Multilateration spectrum (half of the 902-928 MHz), and even if Progeny does not participate, LMSW participation is sufficient. (iii) There are a handful of licensees that hold the vast majority of all geographic or multi-site licenses issued in the 217-222 MHz range (and few pre-auction licenses are still operational and valid). (What is not licensed yet would be set aside for PS, and the 222-225 would be reallocated from Amateur to PS use.) Accordingly, it would be relatively easy for the small number of PE licensees involved to coordinate participation in various ATLIS networks with the PS and CI ATLIS authorities.

Equipment vendors and system integrators including SAIC, Motorola, EADS-EDSN, Microwave Data Systems, and Wi-Lan have been briefed and have interest in participation in ATLAS planning stages, subject to a showing of interest by the targeted stakeholders, FCC, and NTIA.

In sum, realization of the ATLAS proposal (even the core 902-928 MHz component) would substantially fulfill the critical needs for new wireless spectrum, applications, technology, and systems for Public Safety and Critical Infrastructure as well as provide viable Private Enterprise wireless for private businesses and a host of ITS functions.

Respectfully,

Warren Havens
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Three Exhibits follow

[Minor edits, for clarity, made in above text after 8-25-02.]

Exhibit 1

ATLIS Spectrum

900 MHz Core Spectrum for the proposed ATLIS service

| Block* | Wide band | Narrow band | Total | <i>Under ATLIS Proposal</i> |
|------------------------------------|-----------------|-----------------|-----------|---|
| <u>N-1</u> | 902.00 - 904.00 | | 2.00 MHz | <u>PS & CI Exclusive**</u> |
| M-A | 904.00 - 909.75 | 927.75 - 928.00 | 6.00 MHz | PE, but <u>PS&CI access & priority</u> |
| <u>N-2</u> | 909.75 - 919.75 | | 10.00 MHz | <u>PS & CI Exclusive</u> |
| <i>N-3 & M-B (current)</i> | 919.75 - 921.75 | 927.25 - 927.50 | | |
| <u>N-3 (per ATLIS)</u> | 919.75 - 920.75 | | 1.00 MHz | <u>PS & CI Exclusive</u> |
| M-B (per ATLIS) | 920.75 - 921.75 | 927.25 - 927.50 | 1.25 MHz | PE, but <u>PS&CI access & priority</u> |
| M-C | 921.75 - 927.25 | 927.50 - 927.75 | 5.75 MHz | PE, but <u>PS&CI access & priority</u> |
| <u>Total</u> | | | 26.00 MHz | |

Regarding the 4.9 GHz band, LMSW proposes a similar 50-50 spectrum allocation (as per above chart) between, on the one hand, PS and CI, and on the other, PE.

There would be a similar split in the 217-225 MHz band.

Despite appearances, this 217-225 MHz spectrum is largely available for the proposed ATLIS use:

- (i) 217-218 and 219-220 MHz is licensed to AMTS: per FCC filings by the subject licensees, most AMTS licenses issued to date were not placed in operation by the construction deadline, nor did they meet the coverage requirement. They are thus terminated under §1.946 and §1.955. The FCC has planned but not yet scheduled an auction of AMTS spectrum. Rather than hold such auction, this spectrum should be licensed under the ATLIS proposal, for joint PS-CI use.

* From Table: Block key: “N” means “Non-multilateration” spectrum blocks, numbered here by LMSW as “1,” “2,” and “3.” “M” means “Multilateration,” and “A,” “B,” and “C” are the block designations of the FCC. Note: N-3 and M-A are the same: this spectrum is currently a shared allocation between Non-Multilateration and Multilateration operations. §90.357 sets forth these Multilateration and Non-multilateration spectrum blocks.

** Prior to moving to the 5.9 GHz band, Non-multilateration systems (very short-range systems principally on roadway [e.g., “EZ Pass”] and other transportation systems) would be protected. The ATLIS networks would use the Multilateration spectrum to provide coverage within and near Non-multilateration systems.

- (ii) Spectrum in 218-219 MHz has been only partially licensed, and this, only nominally developed.
- (iii) 220-222 MHz has been licensed in 5-kHz channel pairs (aggregation allowed) per auctions, but only a nominal amount (under auctioned and pre-auction licensing) is in actual operation: the 5 kHz equipment vendors, SEA and Securicor, both failed (see, e.g., granted request for extension of construction deadline of Warren C. Havens on ULS for Call Sign WHV211). It is highly doubtful that licensees would maintain, at large financial loss, operations of systems with few if any customers using equipment that is no longer being sold and supported and never had substantial success in the marketplace. In any case, these licensees are looking for a viable use of their spectrum, and the ATLIS plan presents such.

Also, there is 150 kHz in this band set aside for Public Safety.

- (iv) 222-225 is currently an Amateur band. It could be allocated exclusively for PS and CI use under the ATLIS proposal.

Exhibit 2

Other Users in 902-928 MHz under ATLIS

1. Low-power unlicensed Part 15 devices: see §90.361: Part 15 devices used in wireless systems (such as for wireless meter reading) for critical infrastructure would be switched to Part 90 status, and would operate under the CI spectrum allocation in the ATLIS 902-928 MHz band (tuned off of the PS allocation), and other Part 15 devices, such as indoor consumer cordless phones, and LANS (most of which are now on the 2.4 and 5 GHz bands using 802.11 variations) would be phased out: no further sales after a cut-off date.

It is a waste of ideal mobile spectrum to use it for Part 15 devices, especially when they have orders of magnitude more spectrum and capability via 2.4 GHz, 5 GHz UNII, unlicensed PCS, and Ultra Wide Band which promises to exceed the traditional unlicensed equipment in capability and cost. In any case, the importance of the ATLIS uses warrant these modifications of Part 15 use.

2. Federal and ISM use: see §90.353(a): Federal entities, via NTIA, have priority rights in 902-928 MHz for radiolocation but have used the band only lightly (Navy ship radar, some wind-profile radiolocation, and occasional other use). Under my proposal, Federal public safety use along with other public safety would be wide-scale, and for such ends, NTIA would coordinate and contain any other Federal use as needed so they would not interfere (appropriate NTIA-FCC rule changes would implement this).

ISM devices use 902-928 MHz, but they do not receive and do not intentionally or substantially transmit, thus pose little problem.

3. Amateurs' use: see §90.361: Amateurs also may use this band on a secondary non-interfering basis to LMS (and Federal) operations but only slightly use it. A reasonable amount of use may be helpful in civil defense, especially if coordinated with the Amateur community (e.g., if they had mobile radios capable of basic interoperation with the ATLIS radios upon trigger by public safety). If Amateur use becomes a problem, the licensed ATLIS users would have good cause for grant of remedial restrictions or phase out by the FCC.

Exhibit 3

Additional ATLIS Functions and PS Funding Mechanisms

Note: in items 1, 2, and 3 below, the ATLIS-enabled CMRS devices or the ATLIS radios would have integrated location capability (network and/or GPS) (a core capability in all 3G wireless and beyond):

ATLIS-enabled CMRS for E911, basic ITS functions, etc.

1. ATLIS networks, once sufficiently built out (equal or better coverage than CMRS), could replace and improve on CMRS for E911. CMRS devices and would all have FCC-mandated ATLIS RF chips for E911 calls, and by such they could be connected not only to PSAP's but via PSAP's to responders in the field (PS, and if needed, CI) heading to or at the incident location. Also, unlike CMRS-based E911, such ATLIS E911 would allow for group calls to the victims: often, responders will include a number of entities, such as police and medical, police and fire and medical, etc. This arrangement would save CMRS money (E911 is costing CMRS billions of dollars to launch, and eventually more to maintain) and lessen fears and insurance costs regarding liability: This savings would offset cost of the mandated ATLIS RF chip and (see text above). (CMRS could, of course, pass on the net costs, if any, to their subscribers.)
2. The same ATLIS RF chips would be DOT-mandated for installed or docked radios in all roadway vehicles (in most cases included in Telematics devices providing for communications, location, information, computing, and entertainment) to allow for "electronic license plates" and other basic safety functions, e.g.:
 - a. Authorization, by "smart" highway corridors, to qualified vehicles to use HOV and LEC highway lanes/ time slots (others get tickets automatically), or variable charges of highway lanes and time slots depending on the level of its noxious emissions, level of passengers per vehicle class.
 - b. "Push" and "pull" notification of dangerous or congested road conditions ahead (and disabling entertainment and [other] communications where warranted).
 - c. PS one-way broadcasts of voice and data messages in certain emergencies.
 - d. Other functions under the general capability provided whereby vehicles on the road can interact with PS and the (increasingly "intelligent") highway systems, saving tens of thousands of life per year and (per ITS America) and billions of dollars in lost workforce productivity, mitigating environmental impact, etc.

In short, ITS wireless should not be left to a patchwork of CMRS and small private systems.¹⁰ ATLIS can make ITS wireless effective as a principal goal: PE ATLIS can carry

¹⁰ See: Paul Najarian, "Is a Wireless Architecture the Future of ITS?" in *ITS View* (journal of ITS America), July 2001 Issue, available at below Web link.

most of the ITS traffic. This was clearly contemplated by the FCC when allocating the Location and Monitoring Service in the 902-928 MHz band.¹¹ See also the TIA-ETSI Project MESA's description of the need to coordinate advanced ITS and PS wireless is in the Project MESA Statement of Requirements, including in §8.6 "Transparent network and system access" in the ETSI draft V.10, at <http://www.projectmesa.org/SoR.htm> .

Regarding items 1 and 2 above, the owners of the ATLIS-enabled devices would be charged a monthly fee (collected by the CMRS provider) for the Federally mandated capabilities and use of all Federally mandated functions. (If, e.g., \$1/month/device, and assuming 120 million devices, and 10¢/device collection and handling fee to CMRS, then the net proceeds would be \$1.3 billion/year.) If PS ATLIS network capability is solely used for these functions, then all the net proceeds would go to PS; if PE capability is involved, then it would obtain a prorata amount of the proceeds. In addition, CMRS users electing to use the ATLIS capability for certain ITS-functions or other functions provided by PE ATLIS would pay use fees to PE (per collection arrangement with CMRS or direct billing by ATLIS PE).

Greater Back-up Capacity. Via the arrangements described above (whereby all CMRS phones would be capable of operating on the ATLIS network, at least for certain basic voice and data functions), in a large-scale emergency, if there were not sufficient ATLIS radios in the affected area,^{12 13} then PS, and the various other persons involved in emergency responses (professional and volunteer) working under PS, could use the ATLIS-enabled CMRS phones (again, while these would not have all of the functions of an ATLIS radio, they would be serviceable in such cases), and by such, keep communications interoperable on the ATLIS network.

<http://www.itsa.org/ITSView.nsf/ff53871fee52042a85256a6e00096b5b/73f38dc16296b185256a6f000b816c?OpenDocument> . Mr. Najarian, at the time of writing the article, was the ITS America director of Telecommunications and also directed its ITS Public Safety and Telematics. This article discussed the need for a dedicated communications architecture and infrastructure, including its wireless infrastructure components, for Intelligent Transportation System applications, discussed how this need is not being met by existing plans and available networks and technologies, and proposes steps toward meeting this need. ATLIS would in large part provide for these needs, in conjunction with the new 5.9 GHz DSRC services.

¹¹ See FCC releases in PR Docket No. 93-61. Available in the LSM auction "Bidder Package" at: <http://wireless.fcc.gov/auctions/21/releases.html#bip> .

¹² In such case, ATLIS radios could be borrowed from other areas, but this could take time, and would have limits that may be exceeded in some cases.

¹³ Per the priority-access arrangement described in the text above (whereby PS and CI would have priority access to all PE ATLIS network capacity in defined emergencies), the more PE network capacity is built out, the more back-up *network* capacity is available for PS. But to use this PE network capacity, PS needs reserve radios. Since they will probably only keep modest reserve radios for day-to-day and "routine" emergencies, the issue is: where to get a larger pool of reserve radios in especially large-scale emergencies. The above is a solution.

3. Asset tracking for Homeland Security. Tracking assets, including large shipping containers and their contents, besides having major commercial value, presents one of the major unsolved problem areas for Homeland Security due to the potential for using them as means to deliver contraband and for terrorism. This was discussed at the annual meeting of the Intelligent Transportation Society at the session on 4-30-02 "Tracking and Tracing Assets, Cargo, and Operators." Currently, there are inadequate means at US borders and internally to check container contents, assure that locks and seals are not broken after inspection on route, etc. Once ATLAS is sufficiently built out, it can provide the needed functions, probably in conjunction with an integrated Mobile Satellite Service (see footnote ___ in text above).
4. Wireless links for remote environmental monitoring: of water, air, ozone, etc., for point source pollution and overall ecosystem health; for certain wildlife monitoring; and for detection of intentional or accidental pollution via chemical, biological, or nuclear releases. For this, foundation and corporate vendor co-funding grants would be sought, in conjunction with uses by research institutions and other educational functions.
5. Nextel swap of 800 and 900 MHz for public safety 700 MHz (when the TV's are cleared off), thus consolidating public safety at 800 to 900 MHz (including 902-928 MHz). This could save billions of dollars in potential relocation costs to PS and CI under currently discussed plans for mitigation of interference in 800 MHz. Also, 900 MHz is used in Europe now for mission-critical communications: the GSM-R band (in 876 - 915 MHz and 921 - 960 MHz) (GSM 900 itself is 880-915 MHz and 925-960 MHz), and as 3G CMRS develops worldwide on new UMTS spectrum, it is possible that in time some current GSM 900 spectrum will be available for PS and CI, thereby increasing the market for products developed on the ATLAS 900 MHz component spectrum. In this regard, a goal of the TIA-ETSI Project MESA for advanced PS wireless is uniform spectrum in the US and Europe.