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**Date:** April 23, 2007 7:25:00 AM PDT

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**Subject: LMS NPRM: Telesaurus response to Progeny: maintain current ITS wireless & rules**

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[Docket 06-49: LMS-M NPRM](#)

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**To: Commissioners, aids, and Bureau staff:**

(i) [Introduction.](#)

This is being sent to the FCC personnel to whom Progeny has submitted many presentations in recent months. This will be filed on ESFC in this docket. Note: all **Attachments** hereto are in **one** integrated file.

Progeny asserts that this matter is "ripe" for a decision. See **Attachment 3** hereto for a list of parties for NO CHANGE, and the few for change.

We ask for equal time, by your review of this filing, and in personal meetings we will contact your offices to arrange.

*The Progeny LMS-M licenses are invalid under FCC law.* See [item 6](#) below. According to hundreds of pages of documents on Progeny in legal proceedings, recently obtained, the Progeny licenses clearly were obtained by fraud or gross negligence and in violation of fundamental FCC rules, as discussed below. By this evidence, the Progeny licenses are defective and invalid by rule,

and Progeny's actions are otherwise sanctionable (as are those of knowing supporters, and launderers).

Progeny does not speak for LMS-M. It neither speaks for Telesaurus Holdings, nor for any LMS-M license as the Commission intended them: for **Intelligent Transportation Systems**.

LMS-M is the wide-area, sister, Part 90, Subpart M, ITS radio service to short-range DSRC. See [Attachment 1](#): these two radio services are required for nationwide ITS-specific wireless, and can be easily coordinated. No new wireless could be more important for critically needed day-to-day, and major-emergency, land transportation improvements: for safety, efficiency, pollution reduction, alternative fuel facilitation, and other advancements sorely needed. ITS wireless is a key component of ITS being developed worldwide under international and US standards. See our website, [telesaurus](#), and [Attachment 1](#).

LMS-M is also critically needed to augment GSP with terrestrial location, in accord with the US PNT (Position, Navigation and Timing) plans under DOT. This, too, is a critical national need: GSP can be easily jammed and spoofed and does not work in many urban, indoor, and some rural situations, nor is it ideal by itself for constant tracking. LMS-M deployed nationwide for ITS, using standards-based terrestrial pseudolite multilateration, coordinated with GPS, can solve these problems. See our website, [telesaurus](#), and [Attachment 1](#).

LMS-M is one of the best decisions of the Commission. Wide-area ITS-specific wireless is needed, and the spatial and temporal sharing between highway-based LMS-M systems and Part 15 systems focused in the areas of pedestrian uses, creates natural sharing of the band and high spectrum efficiency.

Progeny regularly asserts it has the most LMS-M spectrum. Putting aside the license invalidity issue, the Progeny claim is not accurate measured in available spectrum. While Progeny has the most spectrum by rule, Telesaurus Holdings has nearly as much in MHz Pops, and in geography, and Telesaurus' A block is considerably less used by Part 15 devices than Progeny's C block: see [Attachment 2](#) hereto.

Also, our LLCs have more spectrum, and far more effective spectrum, than Progeny nationwide for LMS-M's purpose: wide-area ITS wireless, combining our LMS-M with our 217-222 MHz spectrum. In addition, our 200 MHz adds greatly to the viability of nationwide wide-area ITS. Our developments, unlike Progeny's secret and proprietary claimed developments, are publicly presented, including on our website, [telesaurus](#). See also [Attachment 1](#) hereto: a joint paper proposed by Telesaurus and University of California's CCIT (ITS center) for the 2007 ITS World Congress.

The below responds to recent ex parte presentations by Progeny and other parties in this proceeding, and adds item 6: license invalidity, and item 7: unconstitutionality of this NPRM.

Our LLC's side with the vast majority of stake holders in 902-928 MHz against any changes to the LMS-M rules. See [Attachment 3](#).

These and other reasons why this NPRM should be terminated are discussed below.

1. LMS-M as an ITS-specific radio service must not be changed. Progeny's rejection (and lack of understanding) of ITS is no basis for rule-- and entire service-- changes.

- Progeny obtained LMS-M licenses at low cost (for the amount of spectrum involved) because of the requirement to use it for pioneering high-public interest Intelligent Transportation Systems uses, and because of the requirement to accommodate and minimize interference with existing Part 15 systems.

- Progeny's rule-change appeal is "bait and switch"-- first certify in auction applications that it will follow the requirements, then pretend that the requirements are defective and "flexible" wireless is needed. There was plenty of other auctions in which Progeny could have competed for such flexible spectrum and paid the prices. What Progeny and Mr. Raj Singh (see Attachment 4 hereto) mean is that they want an unjust windfall: instead of doing the work and incurring the cost of what Progeny signed up for (which is entirely possible for a serious licensee)-- they want to morph the ITS-restricted spectrum into commercial spectrum for a windfall or "jackpot." ITS is a powerful, entirely needed, worldwide development. Progeny simply does not want to do it.

- Progeny is trying to turn on its head almost all of the proper thinking, balancing, and rules created by the Commission in the 1990's based on sound technical studies, market considerations, and that had participation by the interest groups in this band. Doing so would be unprecedented and damaging to the public interest. It should be rejected.

- The Commission was clear in LMS-M rulemaking that LMS-M ITS service is to advance public safety and efficiency on the highways under developing ITS standards. It was decided that LMS-M operators could charge fees for LMS-M service to subsidize the core ITS services: general commercial wireless service was considered and flatly rejected so that (i) core ITS service would be secured, and (ii) LMS-M would not substantially contend with Part 15.

- The Commission had the right idea regarding LMS-M for ITS. It is entirely feasible and is indeed a great business case if one is willing to develop, provide, and secure the public-benefit ITS core services (see our website), just as the Commission had in mind, and as the ITS community internationally plan, regarding ITS wireless.

2. Progeny's single-market study of selective Part 15 use, and related assertions of LMS-M compatibility-- is defective-- and in any case is no basis for diverting dedicated ITS spectrum to unidentified general wireless, damaging ITS in the United States and causing contention with present and future Part 15 use.

- The asserted study, "902-928 MHz Spectrum Utilization Study, submitted in Progeny's March 14, 2007 ex parte presentation, is clearly defective for its purposes and sweeping conclusions of nationwide scope: it would never pass peer review or publication including since:

- (a) It gives author or source for verification and to assess qualifications and objectivity, and to call to account any mistakes or misrepresentation.

- (b) The equipment claimed to be used is not specified.

- (c) The study time is only an alleged 6 day period at a high point in vacation time, and it could easily miss peak use by many Part 15 systems such as meter reading systems polling for monthly use; (iv) one market may be an order or orders of magnitude more or less use than another, due to current implementation of major Part 15 equipment systems, or not, such as for meter reading and similar telemetry;

- (d) Progeny makes no attempt to ascertain and describe how this one market study, for a very short time period, is representative of Part 15 use nationwide for many years into the future:

Progeny could at least have contacted the representatives of the major Part 15 users, who are participating in this docket, to obtain relevant data;

(e) No data is presented: only summary charts and sweeping conclusions.

(f) This study supports LMS-M used for vehicular ITS service-- NOT for general wireless where the end-user devices may be used largely in areas Part 15 devices are most used. The test locations are not correlated to facilities and localities of major Part 15 use, yet Progeny wants to be free to serve those areas. The study is thus ineffective on that basis alone.

(g) The Progeny study is at odds with a National Science Foundation supported study on spectrum use: see [Attachment 2](#) hereto. That study, which was well documented and detailed (as opposed to the Progeny study), and involved several markets, shows that Progeny's C block is relatively busy part of 902-928 MHz (including as compared to the lower Telesaurus A block).

(h) The Progeny study conclusion that its proposed technology and systems will not interfere with the allegedly measured Part 15 use is invalid, since Progeny does not include in its study its half of the equation: its system, either in real life or in a computer model. Any such valid demonstration would have to include the relevant details of the LMS-M technology and systems: equipment types, system architecture, peak and other use patterns, etc. Progeny does none of this.

- The Commission requires LMS-M licensees to cooperatively test with Part 15 systems operators, not conduct and assert before the FCC undocumented unilateral studies as to why LMS-M should be excused from rules, including testing, that were engineered to protect Part 15 while allowing vehicular-centric LMS-M service. As in all its actions in RM-10403 and this NPRM, Progeny here again acts unilaterally, with no attempt to cooperate with Part 15 interests, or the holder of the LMS-M spectrum that is pursuing LMS-M under current rules for its ITS purposes, Telesaurus Holdings. For good cause, Telesaurus has no interest Progeny and its secret studies and technology, and its deceptive actions before the FCC, as if it represents all of LMS-M.

- In sum, this study's investigators are unknown, and its scope, methods, controls, data, and results are not provided, it leaves off entirely half of the equation, and it is at odds with the National Science Foundation study. Also, the study itself contravenes LMS-M rules to make conduct such tests cooperatively with Part 15 interests, and such tests would have to be cooperatively undertaken with other LMS-M licenses if such tests were to be applied to them, as Progeny attempts. *Thus, the study is defective and its conclusions must be rejected.*

- Even if such study was conclusive for what it claims, it does not justify diversion of ITS spectrum for unidentified general wireless, nor does it account for future expanded use of Part 15 equipment in this band, whose representatives claim to be likely. The only way to avoid inevitable contention, and make maximum use of the band nationwide, is to keep the current rules that require LMS-M to be used primarily for vehicle-based ITS wireless, and keep it largely out of the space and time of Part 15 equipment use in facilities and local areas (spacial separation since highways are separated from such localities, and temporal separation since highway peak use is the inverse of peak use in such facilities and local area).

- Where, in this NPRM and the preceding RM-10403, Progeny has acted opposite of the simple requirements for reasonable cooperation it is legally bound to follow in current LMS-M rules, there is no reason to think that Progeny, or any successor in waiting, will do any better if afforded "flexibility" to drop public-interest ITS vehicular wireless, to compete with Part 15 systems in their space and time.

3. [NTIA and Federal agencies maintain priority rights to 902-928 MHz. They did not oppose the band's use-- for ITS. They retain rights to use Progeny spectrum directly, and in agreements with parties seeking to use the spectrum, for high-public interest ITS.](#)

- The FCC should not divert spectrum properly dedicated to ITS, a needed high-public-interest use, for more general wireless that is not needed. The Commission, in the LMS-M rulemaking, explained at length why LMS-M spectrum was the only suitable spectrum in quantity and range for the proposed ITS wide-area radio applications. These are being developed now under US and international standards.

- If the FCC diverts the LMS-M spectrum, Federal agencies and private parties desiring to provide wide-area LMS services to or under direction of Federal agencies, may obtain authorizations from NTIA for said purpose, with priority use.

4. [Progeny's undefined \*secret, proprietary\* technology \(in alleged consideration\)-- is a patently defective basis for a \*public\* rule change proceeding for an \*entire\* radio service.](#)

- In Progeny's April 3, 2007 ex parte presentation, Progeny suggested it may use proprietary technology, not specifically described. Progeny has regularly asserted in this proceeding that it is looking into proprietary technology with Purdue University: none of which is described in this public proceeding. (Also, our LLCs submitted a FOIA request under Indiana law to Pursue, which responded that all of that State University's dealings with Progeny are secret and will not be disclosed. We are contesting this.)

- In Progeny's April 9 2007 presentation, Progeny objects in this public proceeding to disclosure of its badly asserted secret technology. That is nonsense. Progeny chose to foist rule changes on all others in this band. Progeny cannot assert private secrets as a basis for a public proceeding that affects others. This is not a private band: Part 15, Federal and Amateurs use the band. And Progeny is attempting to also force changes on other LMS-M licenses with its smoke and mirrors.

(In contrast, see below: as our website explains, my LLCs are pursuing standards-based technology for all legitimate LMS-M, and doing so in a contract with the University of California: we will be glad to disclose the results and the contract requires disclosure for the public benefit of core results. See also Attachment 1 hereto. ITS is by its nature international and standard based-- not based on secret technology by companies like Progeny with no background or capability in ITS or in wireless. Also, Progeny did not show any due diligence, except some unidentified alleged phone calls, to meet its construction deadline: that is clear in FCC records.)

- Progeny (if it held valid FCC licenses) could have pursued its requests based on its evolving secret ideas via rule waivers when it, or its successor in waiting, settles on something. This public rulemaking for an entire radio service should be dismissed.

5. [Band sharing and spectrum efficiency: current rules required.](#)

- Part 15 excels at what it is designed for: principally short-range, wide-band, high-data-rate wireless, where it can be reused from one facility and location, to nearby ones. Our LLCs plan to use Part 15 equipment in vehicles (whether on 900 MHz or higher bands), for that purpose: to communicate with roadside stations, and with enduser devices in and near the vehicles. With

essentially the same technologies, we will use 4.9 and 5.9 GHz licensed bands for such purposes. See our website, [telesaurus](#), and [Attachment 1](#).

- LMS-M will excel and be sustained at-- **and only at--** what the Commission already determined and fixed in its rules: primary service to vehicles that will be largely separated in space and time from Part 15 uses.

6. [Progeny obtained its LMS-licenses in violation of FCC rules, and without required waivers. The licenses are defective. FCC staff involvement.](#)

- After obtaining this year relevant information, including under FOIA (including FCC records, and hundreds of pages from other legal proceedings), the evidence shows, inter alia, the following:

- Progeny LMS LLC *did not exist* at the time the licenses now in the name of Progeny were bid for. The party now in control of Progeny, Mr. Frenzel, had his legal counsel form this LLC and file its certificate of formation with the State of Indiana after the auction was over, and then misinform the FCC of this fact in order to obtain a grant of the licenses, which took about an extra year in a secret waiver proceeding (that ultimately did not provide any needed waiver).

- Progeny's controlling party and counsel misinformed the FCC in written communications to obtain the licenses by falsely stating that Progeny, and its controlling interest and affiliates were qualified for the 35 % bidding credit that was used in the auction (by a different person who was in control of the auction applicant through the auction) and without the required disclosures of attributable gross revenues.

- There are numerous false assertions involved and numerous fundamental rule requirements violated, which individually and collectively are grounds for disqualification from the auction, of the licenses, and as to character required to be a Commission licensee.

- Extensive documents from non-FCC proceedings involving Progeny indicate that its principals and counsel knew of the FCC rule violations and misinformation employed, noted above. Also, the undersigned informed Mr. Raj Singh of these matters when he, on his own initiative, contacted me. See Attachment 4. Our LLCs will contest laundering.

- *The Progeny licenses are defective since, by the written evidence, they were obtained by fraud or gross negligence.* Counsel for our LLCs will present the evidence to authorities in the near future. The FCC can, on its own, review its public records on this matter, records in the private proceeding involved, State of Indiana and other public records, to confirm principal allegations of fact noted above.

- It is inexplicable as to how the FCC staff involved--*some of whom appear to also be involved in this NPRM--* accepted the Progeny filings and granted the licenses. While the fundamental responsibility rests upon Progeny, *our LLCs question the NPRM on the basis that if said FCC staff granted the licenses, in the noted private proceeding, knowing of the disqualifying rule violations involved (some of which appear hard to miss, and others which appear impossible to miss), then Progeny and said staff have a common interest in not exposing their actions, and Progeny would have influence over said staff in RM-10403 and this NPRM contrary to the public interest and due process.* (Government staff who act under color of their public employment to violate Constitutional rights are personally liable.)

- *As noted,*

(1) The proceeding by which Progeny obtained its licenses was private and the result inexplicably against FCC rules.

(2) Then RM-10403 was "terminated," except Progeny's position was adopted as the basis of this NPRM. The FCC asked the parties in this band for comments, they filed over 100, and then the FCC acted as if the interested parties did not count, only the FCC staff and Progeny counts.

(3) In this NPRM, Progeny is opposed by all in the band with demonstrated legitimate uses and plans. Yet said staff have not dismissed it.

(4) This NPRM purposes to trash-- make futile-- LMS-M for its high-public-interest ITS purpose, for no more than a higher-power version of Part 15 that, per Progeny, will contest in time and space with Part 15 systems.

(5) Progeny has employed from its private license proceeding, to this NPRM, lobbyists with clout rather than valid public-interest showings and arguments and has proceeded in a manner that could not be more at odds with, and with no attempt to find any accord with, others in this band.

*No objective person would believe these series of actions were undertaken "in the public interest," or that they are random error.*

#### 7. The NPRM by itself, and if implemented, is unconstitutional taking Supreme Court precedent, and will be contested in court.

- Our LLCs have spent millions of dollars and additional in-kind contributions on their business plan in reliance upon the current ITS-specific LMS-M rules.

- As our LLCs stated in comments in this proceeding, they plan to contest the NPRM in court, and any rule changes pursuant thereto, as an unconstitutional taking under the Fifth Amendment as described by the US Supreme Court in *Penn Central*, 438 U.S. 104. It is unconstitutional taking when the result fatally damages a company's business plan. Our business plan is exactly what the Commission instructed: wide area ITS wireless, which the proposed rules will fatally damage.

- As I indicated in past filings in this docket, both RM-10403 and this NPRM were inexplicably lacking in due process and in public interest foundation: only Progeny (and apparent affiliates or successors emerging) would benefit. See end of section 6 above.

#### Declaration

I, Warren Havens, declare under penalty of perjury that the factual information in the above, attributed to my personal knowledge, is true and correct, and that I can and will competently testify to all said facts in legal proceedings (at the FCC and/or in other forums), including production of the documentation indicated in item 6 above.

[Attachments](#). 4, as noted above: in one integrated file.

Respectfully submitted,

*[Filed electronically. Signature on file.]*

Warren Havens

President

'Telesaurus'

(see above LLCs list)

[www.telesaurus.com](http://www.telesaurus.com)

## Telesaurus LLCs

Presentation in NPRM, 06-49  
April 22, 2007

### Attachments

#### Attachment 1

**Telesaurus - University of California** CCIT joint ITS research:  
Wide-area ITS Wireless (with integration with DSRC):  
Draft presentation to 2007 ITS World Congress, Beijing.

#### Attachment 2

**National Science Foundation study:** excerpts on **902-928 MHz**.  
Indicates Progeny's spectrum is the most used LMS-M sub-band by Part 15 devices. Also, it is at odds with the Progeny study.

#### Attachment 3

**LMS-M NPRM, WT Docket No. 06-49, Comments and Replies: List of**  
Parties seeking **no change** (vast majority) and those for some changes the NPRM proposed  
(and others it did not propose).

#### Attachment 4

## Attachment 1

Telesaurus - University of California CCIT joint ITS research:  
Wide-area ITS Wireless (with integration with DSRC):  
Draft presentation to 2007 ITS World Congress, Beijing.

Note: Telesaurus has substantial developments apart from its work with CCIT and that is not reflected in the below summary. These developments are in part reflected in the Telesaurus website. Some developments are currently proprietary. The below is aimed at the ITS community, an increasing component of which is involved in ITS wireless.

Attachment 1



14th World Congress on Intelligent Transport Systems  
PAPER SUBMISSION FORM

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Paper Title ITS Wide-Area Wireless Networks  
  
Key Words Wireless, network, environment, communication, VII, deployment  
  
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Topic category (select from list below): 19, 4, 3, 13, 22

- |                                      |   |
|--------------------------------------|---|
| 1. Traffic Management                | 13. Communications and other General Technology |
| 2. Payment Systems                   | 14. Architecture                                |
| 3. Transport Information Services    | 15. Standards                                   |
| 4. Intelligent Vehicle and Highway   | 16. Policy                                      |
| 5. Safety and Security               | 17. Planning                                    |
| 6. Public Transport                  | 18. Evaluation                                  |
| 7. Freight Transport Operation       | 19. Deployment Issues                           |
| 8. Inter-modal Transportation        | 20. International Cooperation                   |
| 9. Traffic Infrastructure Management | 21. Education and Training                      |
| 10. ITS Data Management              | 22. Environment                                 |
| 11. Driver Assistance Systems        |   |
| 12. Vulnerable Road Users            |   |

Email your 2-3 page paper, as a Word or Acrobat document (maximum size 5 megabytes), along with this form, to Tom Costello [tcostello@itsa.org](mailto:tcostello@itsa.org) at ITS America by March 21st.



# ITS WIDE-AREA WIRELESS NETWORKS

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## ABSTRACT

The California-based consortium of Telesaurus LLCs and related nonprofit foundations have acquired FCC radio spectrum licenses throughout the United States for wide-area location, data, voice, and other intelligent transportation systems (ITS) services. Telesaurus intends to partner with government, power utilities and other infrastructure enterprises to offer nationwide wireless ITS services. The California Center for Innovative Transportation (CCIT) is investigating such wide-area wireless ITS networks from public-policy, technical, and economic perspectives. This paper presents the methodology and some early findings. Of particular interest is the possible tight integration between wide-area and short-range ITS wireless networks, specifically Dedicated Short-Range Communications (DSRC).

# MAIN TEXT (DRAFT)\*

## INTRODUCTION

### Background

Over the past several years, a Berkeley California based consortium of Telesaurus LLCs and the related nonprofit Skybridge Spectrum Foundation (together “Telesaurus”), has acquired substantial radio spectrum in the lower 200 MHz and 900 MHz “LMS” ranges authorized for use in the vast majority of the United States (US) for location, data, voice, and other intelligent transportation systems (ITS) services (under Title 47 CFR Part 90 Subpart M). The California Center for Innovative Transportation (CCIT), which focuses on the deployment of transportation technology, and works with researchers, public agencies, and innovative companies, is investigating how this spectrum can be leveraged to deploy wide-area wireless networks for ITS services.

### Vision

The vision that drives the present investigation is a standards-based nationwide ITS-specific wireless network providing ITS services with applications for commuters, travelers, government, commercial fleets, transportation operators, first responders, as well as position, navigation, and timing services. Envisioned network functions include:

- Mobile, high-speed, location-specific, continuous one-way broadcasts of weather, road conditions, traffic, traveler information, emergency alerts, and possible advertising and entertainment. The received data would be stored and retrieved by users through onboard Telematics devices based on their choices;
- Mobile, variable-speed, two-way data between vehicles and the network, for vehicle location and status reporting to the network, and other ITS-specific exchanges;
- TDOA-based terrestrial multilateration to enhance coverage, accuracy, and reliability of the Global Positioning System (GPS), by correlating wide-area terrestrial pseudolites and spaced based systems. This system could also provide a back-up to GPS if it becomes jammed or spoofed;
- Emergency preemption of substantial capacity by government emergency response authorities to broadcast critical information, monitor and control traffic, etc;
- The ITS systems, focused on principal and eventually secondary roadways, could provide fixed wireless data for environmental monitoring in urban and rural regions.

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\* [Draft for submission purposes noted in the transmittal sheet.]

## **Scope**

In partnership with Telesaurus, the goal of the CCIT investigation is to explore the concepts and key features of a wide-area wireless network that would serve transportation and related sectors. Providing ITS services and applications over such a network is an ambitious project that raises a set of fundamental questions: A) What exact services and applications would be provided? B) What technologies would enable the network? C) What value would the network add to existing and planned ITS services and initiatives? D) Who would support or partner to realize the initiative and how?

Answering those questions requires not only analyzing technical and business elements, but also factoring in stakeholders' perspectives, including local and state transportation authorities, the FCC and US DOT, established ITS companies, wireless equipment manufacturers, automobile companies, and the likes.

## **AREAS OF INVESTIGATION**

At this phase of the program, the investigation concentrates on concept exploration to assess the technological, economic, business, and institutional feasibility of the network. We start with needs, then look at technology, and ultimately intend to outline deployment steps.

### **Determine Network Services**

The first question to be asked is what needs or opportunities would the network fill. A wireless network providing wide-area, core ITS services may enhance the safety and security of the transportation system, ease congestion, and reduce pollution in significant ways. The proposed network may provide services to three major groups—the traveling public, transportation operators, and public safety agencies. All three groups currently consume various wireless services, and in order for the proposed network to improve the value delivered to each group, it is necessary to understand current utilization. We will therefore survey and classify existing and planned services to potential users and extrapolate to determine how an ITS-specific wide-area wireless network would add value, either by enhancement or introduction of services.

### **Technology and Standards**

This area of investigation consists of surveying current and developing technologies and evaluating which are best positioned for the envisioned network. The choice of wireless protocols and related technologies will substantially influence what services can be offered on the network. The set of requirements and constraints to be considered include: signal modulation, priority settings, privacy, mixing multiple services and user categories, maintaining bandwidth and reliability, terrestrial-GNSS, etc. We will review technical standards such as ISO TC 204 and 211, CVIS, GMT, mobile wideband digital broadcast, wide-area pseudolites, TETRA releases, integration with commercial wireless networks, WiMax, WiFi, MIMO, etc.

## **Implementation and integration into existing ITS landscape**

Implementation in the ITS world requires more than technology. Identified needs, funding, champions, user acceptance and institutional support is the name of the game. A key implementation question underling the development of a wide-area wireless ITS network is how the network will complement, enhance or replace other networks, existing or planned. This includes the Federal Vehicle-Infrastructure Initiative (VII), networks deployed by state and local transportation authorities, commercial cellular networks, GPS, outfitting government fleets, and other future networks such as municipal broadband and 4G. A clear picture of the interactions with these other networks will be required to move forward.

Another key aspect of the implementation strategy is the necessity to deploy the system in successive, scaled stages. This is necessary because the proposed network concept is large, pervasive, and depends on the adoption and attachment of add-on third-party services. Therefore the analysis will separate what can be accomplished quickly from the longer-term vision, and establish a path between those two points.

## Exhibit 2

From: **National Science Foundation Award Number: ANI-0335272.**

See following pages: these are excerpts from the above study that measure 902-928 MHz spectrum use in urban locations.

These, however, did not purport to measure existing major Part 15 systems in areas they are know to be in operation, and during such systems peak use periods. Such a study can be done. Progeny did not attempt such, nor did this NSF study.

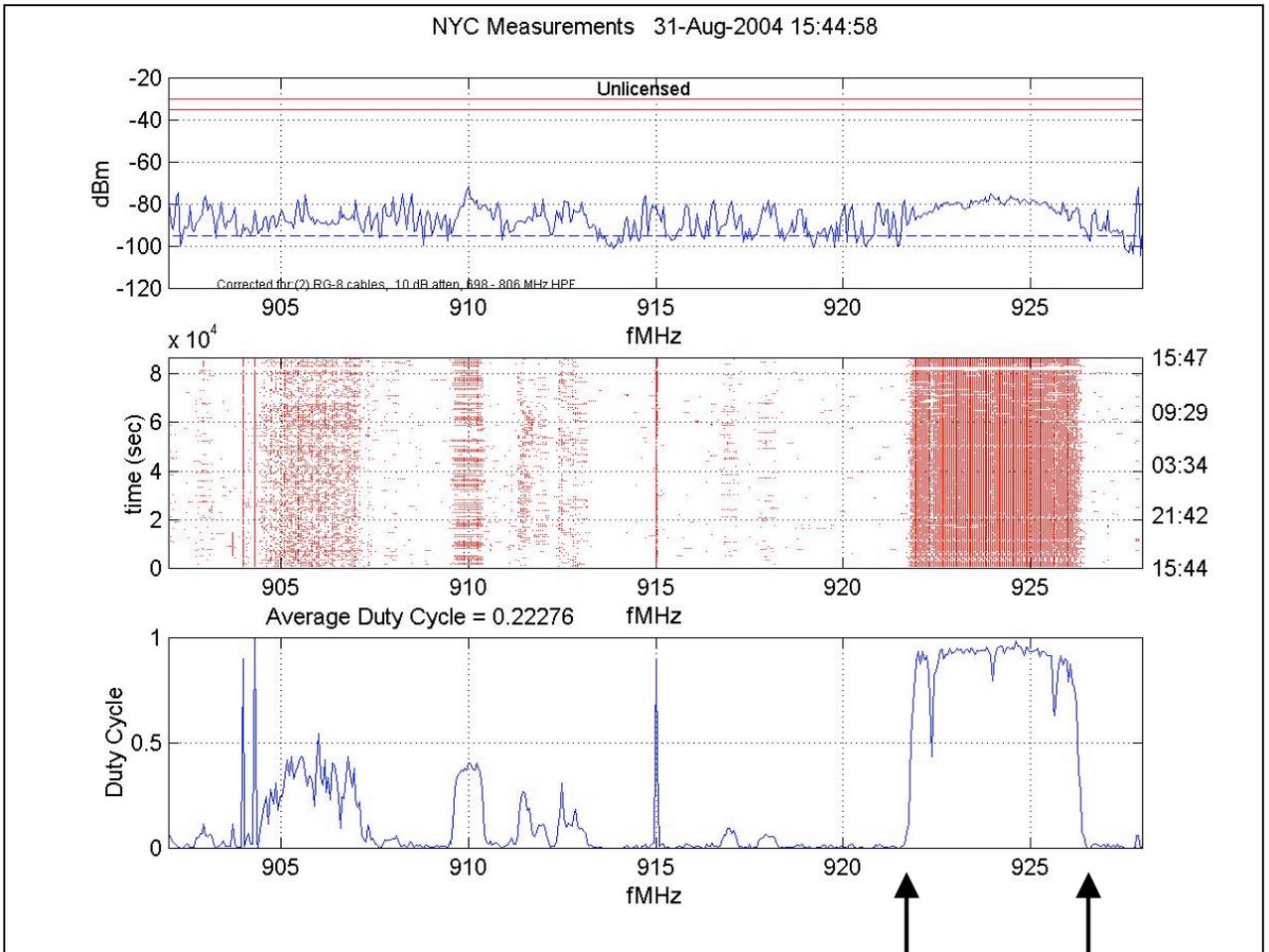
Telesaurus did set up such a study, for a six-figure amount, with Metricom before it went into bankruptcy. The study was cooperative, in accord with the letter and spirit of FCC rules (including §90.353(d)'s last sentence, related rulemaking, and the Order on Reconsideration on this provision).

The attached shows, to the degree this NFS study's locations and measurements below are representative of major urban areas, that the Telesaurus' A block—904–909.75 MHz— is quiet in duty cycle vs. the *Progeny C block, shown here as a busy part of the 902-928 MHz band.*

The reason is at least partly historical: The LMS-M A block was substantially in use for years by Teletrac, successors, and affiliates in several dozen major US markets, and Teletrac held A-block licenses for dozens of other markets. The FCC in the LMS-M rulemaking in the 1990's, advised Part 15 interests to avoid the LMS-M blocks, if they had any concerns of contention with LMS-M systems. Since LMS-M was mainly being developed in the A block, the Part 15 device makers often did not use this block, as partly indicated in FCC equipment type approvals.

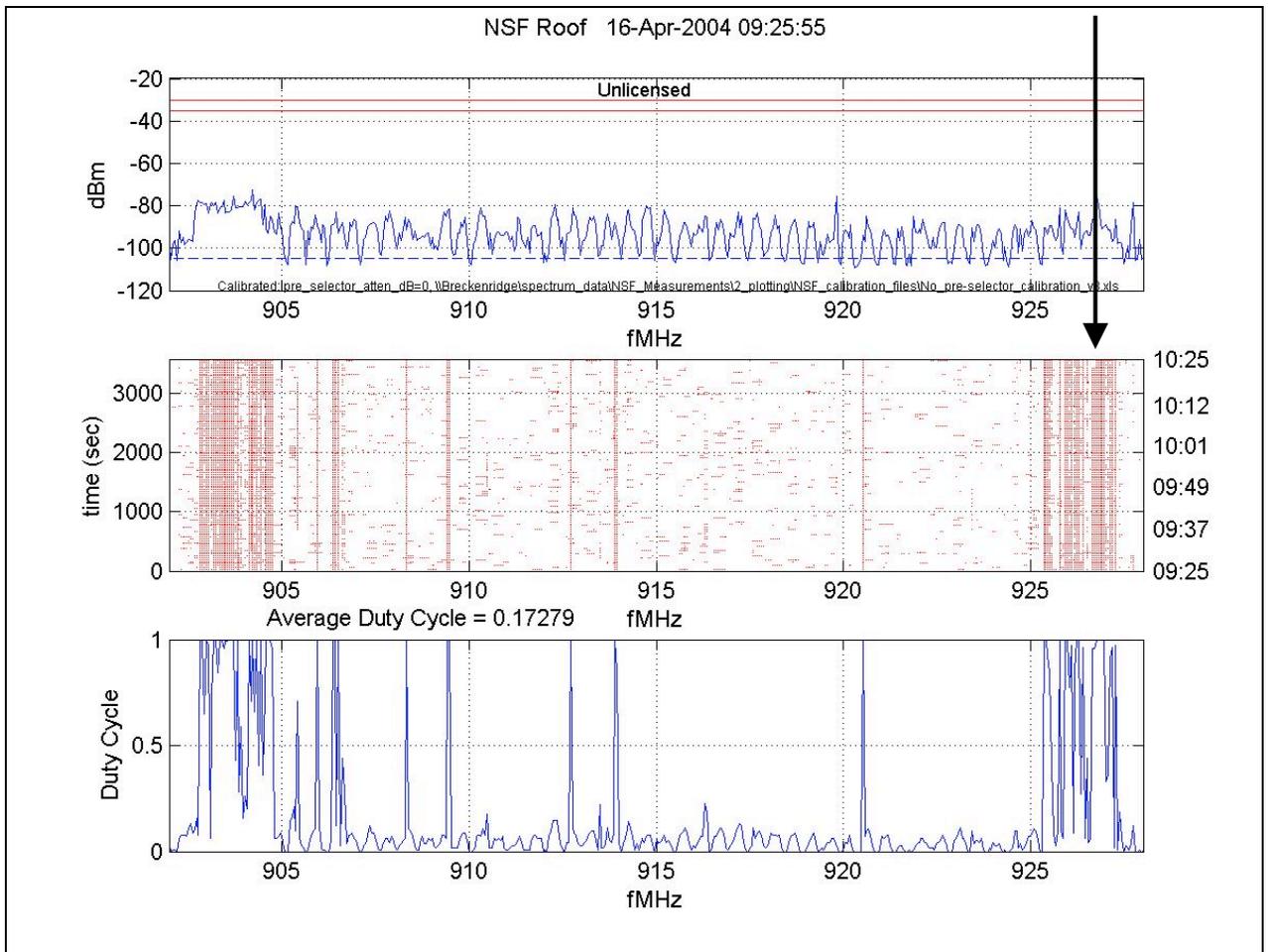
The Progeny study results are at odd with this National Science Foundation study. The NSF study, unlike the Progeny study, has all of the required details needed to withstand peer review and objective verification (starting with an author, and including methods, equipment description, detailed results, etc.).

1. Roof of the Stevens Institute of Technology, Hoboken, NJ, next to New York City.



**Progeny's C block is:  
921.750–927.500 MHz:  
(\$90.537). It is busy.\*\***

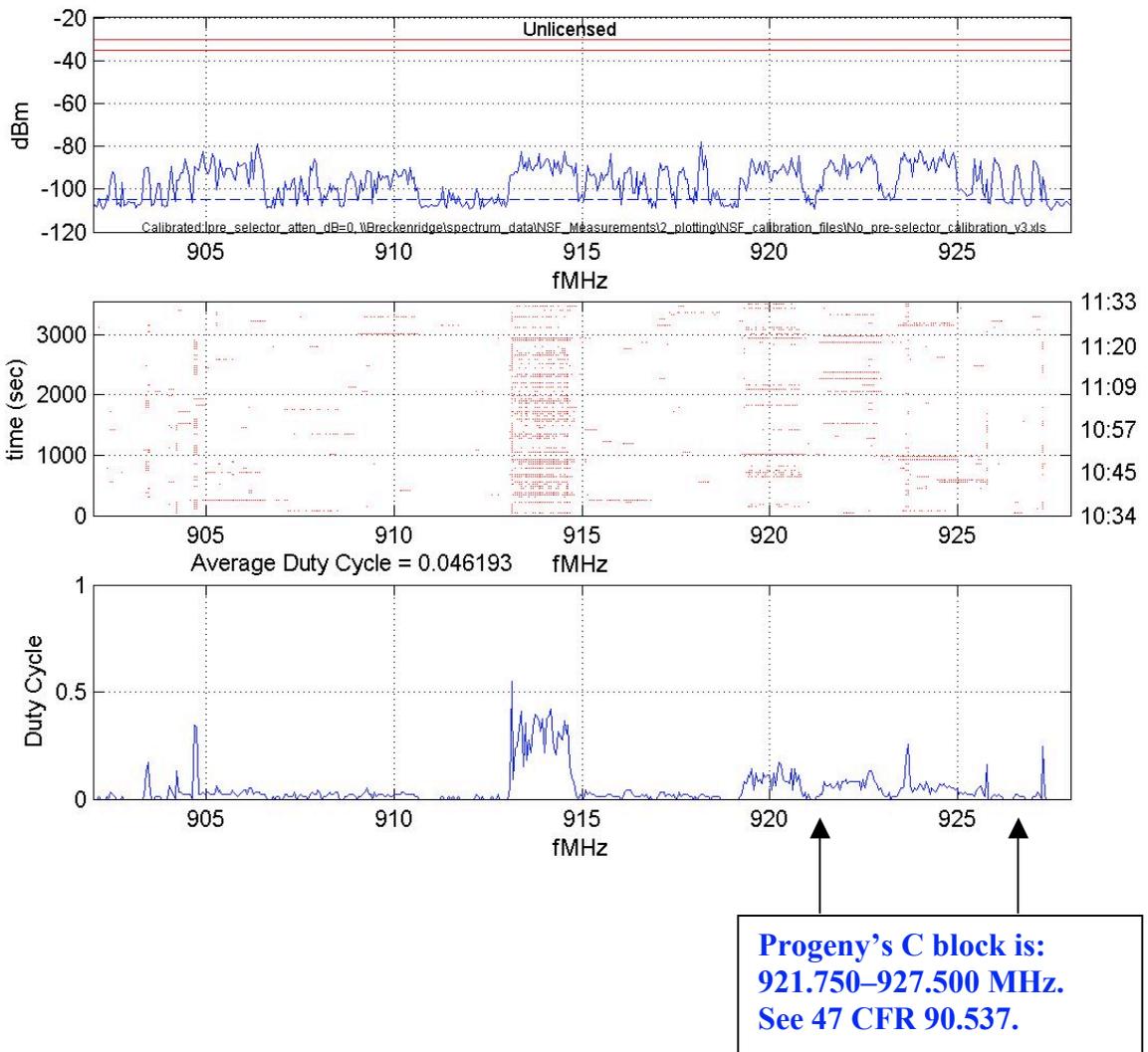
2. Roof of National Science Foundation, Arlington VA.



\*\*Note: Telesaurus' A block—904–909.75 MHz— is quiet in duty cycle vs. the C block.

3. From Tysons Square Center, Vienna, Virginia.

Tysons Corners 09-Apr-2004 10:34:03



Note: Telesaurus' A block—904–909.75 MHz— is quiet in duty cycle vs. the C block.



Part 15 Equipment Manufacturers: & related (some in Coalition also)	Telecommunications Industry Association Consumer Electronics Association IEEE 802.18 Radio Regulatory Technical Advisory Group Motorola, Inc. Itron, Inc. Silver Spring Networks, Inc. FreeWave Technologies, Inc. Wave Wireless Corporation Cellnet Technology, Inc. TriSquare Communications
Wireless Internet Providers:	WISPA (Coalition of Wireless Internet Service Providers) Champaign-Urbana Community Wireless Network Mt. Vernon.Net, Inc. Laura Forlano (NYC wireless) Michael Oh (Boston public WiFi network)
Public Utilities / Related Parties:	United Telecom Council Southern Company Services, Inc. American Water Works Association Southern Connecticut Gas Tampa Electric Company Progress Energy (Florida and Carolinas) Richmond, Virginia Department of Public Utilities Piedmont Natural Gas Company, Inc. The Peoples Gas Light and Coke Company North Shore Gas Company SEMCO Energy, Inc. Charlotte Mecklenburg Utilities Bay State Gas Company Philadelphia Gas Works Duquesne Light Company Philadelphia Water Department
Others:	New America Foundation <i>et al</i> (supports greater Part 15 rights, terminate LMS licenses; falsely lumps Telesaurus in with Progeny)  ARRL (National Association for Amateur Radio)  Alarm Industry Communications Committee (neutral on some proposals)  Members of public: Pareja, Ryu, Atkinson, Owens, Pittman, Falco, Conrad.