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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
An Allocation of Spectrum for the) RM- 9267
Private Land Mobile Radio Services)

TO: The Chief, Office of Engineering and Technology

Reply Comments of the
Taxicab and Livery Communications Council

The Taxicab and Livery Communications Council ("TLCC"), pursuant to section 1.405 of the Commission's rules¹ and the *Order* released June 11, 1998,² and in response to the comments filed in response to the *Public Notice* released April 30, 1998,³ hereby respectfully submits these reply comments to the above captioned petition for rule making.⁴

I. Statement of Interest

1. TLCC is a jointly managed market council of the International Taxicab and Livery Association ("ITLA") and the Industrial Telecommunications Association, Inc. ("ITA"). TLCC was formed to provide a distinct voice to the unique telecommunications interests of the nation's for-hire passenger land transportation services.

¹ See 47 C.F.R. § 1.405.

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² *Order Granting Motion to Extend Reply Comment Date*, DA 98-1103, released June 11, 1998.

³ *Public Notice*, Office of Public Affairs Reference Operations Division Petitions for Rulemaking Filed, Report No. 2272, released April 30, 1998.

⁴ *Petition for Rule Making Submitted by the Land Mobile Communications Council*, In the Matter of An Allocation of Spectrum for the Private Mobile Radio Services, RM-9267, filed April 22, 1998 ("*Petition*").

2. The taxi and livery industry is made up of more than 15,000 companies that operate more than 200,000 vehicles, which transport nearly 2 billion passengers each year. Critical to the efficient operation of any taxi or livery company is a reliable two-way communications system. These two-way communications systems not only provide essential dispatch service but are used for a variety of important support functions, including: public safety referrals; notifying the dispatch office of a driver in distress; vehicle maintenance calls; and verification of passenger credit card information. In fact, other than the vehicles themselves, communications systems represent the most vital -- and substantial -- capital asset of a typical taxicab company.

3. However, because of increased congestion on existing taxicab spectrum allocations, these vital systems have suffered communications quality degradation, and system expansion opportunities have become limited. Accordingly, the TLCC expresses its support for the LMCC petition and registers its opposition to certain statements made by the American Radio Relay League ("ARRL") in its comments on the petition.

4. TLCC also includes a report on the usage of private radio systems by taxicab companies that was commissioned by ITLA. This report was originally submitted to the Wireless Telecommunications Bureau in another proceeding. However, because the report includes detailed information on the unique characteristics of taxicab and livery communications systems, TLCC requests that it be added to the record of this proceeding.

II. TLCC disputes ARRL's "ripeness" argument

5. In its comments, the ARRL challenges the ripeness of the LMCC petition

“because the Commission has just completed its ‘Refarming’ proceeding.”⁵ ARRL states that because the spectrum efficiency benefits of the refarming proceeding have yet to be fully realized it is impossible for the Commission to quantify the needs of the private wireless community and, therefore, the petition should be dismissed.⁶

6. From TLCC’s perspective, this reasoning is flawed. The Commission’s refarming decision applies only to certain channel bands below 800 MHz. The Industrial/Land Transportation radio services, which include taxicab radio services, have spectrum allocations in the 800 and 900 MHz bands which are not affected by the refarming decision. And, as the petition demonstrates, there are no available license authorizations in these bands in any of the top urban markets. The LMCC petition clearly demonstrates that there is extreme congestion and limited channel availability on every band of spectrum allocated to the private radio services. The fact that the Commission is taking some steps to ease congestion and increase spectrum efficiency on one of these bands is irrelevant to the issue of the petition’s ripeness. The TLCC also notes that while public safety entities are subject to the refarming proceeding the Commission is currently in the process of allocating 24 MHz of additional spectrum to public safety eligibles -- apparently undeterred by any concern over the ripeness of its action.

7. Further, certain aspects of the refarming decision may actually **reduce** the number of channels that are useable by taxi and livery licensees. Prior to the adoption of

⁵ Comments of the American Radio Relay League, Incorporated In Response to Petition for Rule Making, filed June 1, 1998 (“ARRL Comments”).

⁶ ARRL Comments at 2.

the refarming *Second Report and Order*, certain taxicab radio service frequencies that were shared with Business radio eligibles were maintained for the exclusive use of taxicab services in the top urban areas.⁷ Because an intermixture of duplex and simplex systems greatly increases the potential for harmful interference, this geographic separation guaranteed that taxicab duplex systems would not be licensed co-channel with business radio simplex systems. Once a simplex system is licensed on a channel it becomes unusable for taxicab duplex applications. ITLA has petitioned the Commission for reconsideration of this decision, but to date no *Memorandum Opinion and Order on Reconsideration of the Second Report and Order* has been released.

8. So, not only is the relief promised by refarming going to be limited, it may be non-existent for the taxicab services. Accordingly, the Commission should reject ARRL's procedural arguments and proceed with a *Notice of Proposed Rule Making* on the LMCC petition.

III. Taxicab and Livery companies' communications needs cannot be effectively met by third-party providers

9. One of the main tenets of the LMCC petition is the proposition that private wireless licensees have distinct and unique communications requirements that cannot be effectively met by commercial service providers. From TLCC's perspective, the Commission need look no further than the taxicab radio services if it seeks confirmation of this assertion. Because of unique technical requirements (the duplex operation mentioned above, as well as asynchronous transmission protocols), priority of

⁷ See former 47 C.F.R. §§ 90.75(c)(a), 90.93(c)(1),(2), deleted by *Second Report and Order*, PR Docket No. 92-235 (FCC 97-61), released March 12, 1997.

communications requirements, and locality of demand, taxicab and livery companies must maintain proprietary communications systems. While commercial service providers can address some of the communications needs of taxicab companies -- it is not uncommon for some drivers to supplement their dispatch systems with cellular phones -- they are simply unequipped to meet the full range of unique needs of these companies.

10. Because the ITLA report that is attached to these comments addresses these issues in detail, TLCC will not expound on them here. However, TLCC urges the Commission to conduct a full review of the distinct needs of taxicab and livery companies within its overall review of the private wireless industry. Taxicab and livery companies provide a valuable public service that requires access to specialized communications systems. Without such access prices will rise; service will suffer; and the public interest, convenience, and necessity will be disserved. Accordingly, the TLCC urges the Commission to act quickly on the LMCC petition and begin a rule making proceeding for an allocation of spectrum for the private wireless services.

IV. TLCC would support efficiency-based lease fees for new spectrum

11. TLCC observes that the most vocal comments in opposition to the LMCC petition have come from the amateur radio community which opposes the potential reallocation of the spectrum for which it is authorized. The amateur's opposition is quite understandable. However, because nearly all of the spectrum reallocated from the federal government to the FCC has been slated for auction, the LMCC was left with very few options for identifying spectrum. From TLCC's perspective, the contention over the bands

of spectrum identified in the LMCC petition could be greatly relieved if the Commission were to request authority from Congress to allocate some of the unlicensed "auction" spectrum to private wireless users. For example, the FCC could propose to allocate a portion of the 36 MHz of commercial spectrum at 746-806 MHz for private systems.

12. In its comments, the Industrial Telecommunications Association ("ITA"), urges the Commission to request lease fee authority from Congress as a way of compensating the federal treasury for any new allocation of spectrum.⁸ TLCC would support these lease fees if they were used as a mechanism for access to spectrum that has been identified for auction and were based on spectrum efficiency rather than strictly on budget requirements. TLCC would oppose the implementation of lease fees on existing spectrum assignments.

V. Conclusion

13. For the foregoing reasons, the Taxicab and Livery Communications Council urges the Commission to act on the LMCC petition in a manner that is consistent with the views set forth herein.

Respectfully Submitted,

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W.H. Smythe, IV, Chairman

Date: July 16, 1998

⁸ Comments of Industrial Telecommunications Association, Inc. at 7.

CERTIFICATE OF SERVICE

I, Barbara J. Levermann, do hereby certify that on the 16th day of July 1998, I forwarded to the parties listed below a copy of the foregoing Reply Comments of the Taxicab and Livery Communications Council, by first-class mail, postage pre-paid:

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Comments
of the
International Taxicab and Livery Association
to the
Wireless Telecommunications Bureau
of the
Federal Communications Commission

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Prepared by:
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May 10, 1996

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EXECUTIVE SUMMARY

- The International Taxicab and Livery Association (ITLA) is a nonprofit trade association that has represented taxi and livery companies since 1917. The ITLA is the FCC-designated frequency coordinator for the Taxicab Radio Service.
- The taxi and livery industry is made up of over 15,000 companies that operate over 200,000 vehicles and provide work for over 350,000 men and women who transport 2 billion passengers per year (20% of all public transit service without subsidy).
- Approximately 60% of taxi passengers are elderly, disabled, low income and other people without access to an automobile or other forms of public transit. The other 40% of taxi passengers are business travelers who are vital to commerce.
- Taxis serve 2,000 communities, 24 hours per day, 365 days per year. Taxi passengers are distributed by geographic area as follows: urban - 39%; suburban 17%; small city - 30%; and rural 14%.
- Taxi service is vital to commerce, health, safety and societal well-being. The distribution of taxi trips is as follows: business - 26%; social - 21%; airport - 15%; when in a hurry or no other public transportation available - 9%; medical - 8%; grocery shopping - 7%; car in shop - 2%; to run errands - 2%; to pick up children - 1%; emergency - 1%; safety at night - 1%; and all other reasons - 7%.
- In non-exclusive, shared-use circumstances, taxi and livery users manage interference which allows greater utilization of frequencies than is accomplished with commercial systems.
- Taxi single channel utilization efficiency (number of users served) is higher since the taxi user tolerates more blocking than a commercial entity whose utilization efficiency is dictated by the service quality demands of the average customer.
- An asynchronous transmission protocol is standard for most taxi and livery operators. This configuration is atypical of commercial systems and would require major modification or dedication of channels to permit this mode of transmission.

- ITLA members are service providers of last resort to the general public. Private communications systems allow them to fulfill that need in a cost effective and timely manner.
- Private radio systems allow the licensee to prioritize traffic in times of heavy load or emergency. For all practical purposes, a commercial provider can only prioritize by price.
- ITLA members utilize private radio to serve their locally-franchised and licensed area of operation. Elimination of private radio, and a forced migration to commercial systems, will strand many operators in positions of insufficient radio coverage or insufficient peak capacity.
- The rapid pace of technological innovation, and the Commission's preference not to mandate specific technical standards, creates the very real possibility that private users forced onto multiple commercial systems to get the coverage they need will be faced with incompatible technologies.
- Any required move to more efficient spectrum utilization techniques requires replacement of the mobile radio. For large fleet operators, this expense dwarfs base station and other infrastructure costs.
- At present prices, a commercial system may be 10 times as costly as private radio system.
- At the present time, if price is the only consideration -- which it is not -- only smaller or more rural ITLA members could consider commercial providers as a viable alternative to in-house systems.
- Even if commercial prices fall precipitously, a dramatic increase in overall expense for private users is predicted.
- Prices for commercial wireless services -- in the long run -- can never fall below a level where an adequate investment return can be realized. Consequently, for significant taxi fleets price will not drop to a point where it is more economical to purchase service from a commercial provider.
- Price wars are chaotic, businesses fail. If former private radio users are forced onto commercial systems that ultimately fail, service to the public will be adversely affected.

INTRODUCTION

The International Taxicab and Livery Association (ITLA) is a nonprofit trade association that has represented private sector providers of public ground transportation since 1917. ITLA is the only national association that represents all types of community-based, for-hire, passenger carrying fleets — taxicabs, executive sedans, limousines, vans, minibuses, and paratransit. For nearly half a century, ITLA has served as the FCC-designated frequency coordinator for the Taxicab Radio Service.

INDUSTRY OVERVIEW

There are approximately 15,000 private companies providing public transportation in the United States. These passenger-carrying fleets operate well over 200,000 vehicles, provide work for over 350,000 men and women, and transport over 2 billion passengers per year. Without subsidy, this industry provides 20% of all public transit service in the United States. Of critical importance is the fact that these private companies provide transit service 24 hours per day, every day of the year, serving not only the finest hotels, but also the poorest of inner city housing projects.

The industry is a critical element in meeting local commerce, health, safety, and welfare transportation needs. The transit service provided is vital to meeting the mobility needs of the business traveler whose activities are critical to local and national commerce, as well as to the low income person who needs to get to the hospital, but has no car or other means to get there. Nearly two-thirds of all taxi customers are elderly, disabled, low income, or other transportation disadvantaged individuals who do not have access to an automobile or to other form of public transportation.

Today, 39% of all taxicab service is provided in urban areas, 17% in suburban areas, 30% in small communities, and 14% in rural areas. The industry serves all social and economic classes. Disabled persons and seniors receive essential transportation service from taxis and paratransit vans. Taxis provide parents a safe alternative for taking children to after-school activities and back home. Lonely and isolated elderly people depict taxicabs and paratransit vans as lifesavers that are their connections to the world. Dialysis patients see taxi and livery service as the difference between life and death.

On the basis of an anonymous telephone call, the taxi and livery industry often provides immediate transportation service at two o'clock (a.m. or p.m.) in the central business district or the most crime ridden area of the community. This may account for the fact that the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services has

determined that driving a taxicab is the job with the highest rate of occupational homicide in America. Taxicab drivers experience a homicide rate of 15.1 murders per 100,000 workers. The second highest homicide rate was for law enforcement officers at 9.8 murders per 100,000 workers.

Characteristics of Taxi Riders and Trip Purpose

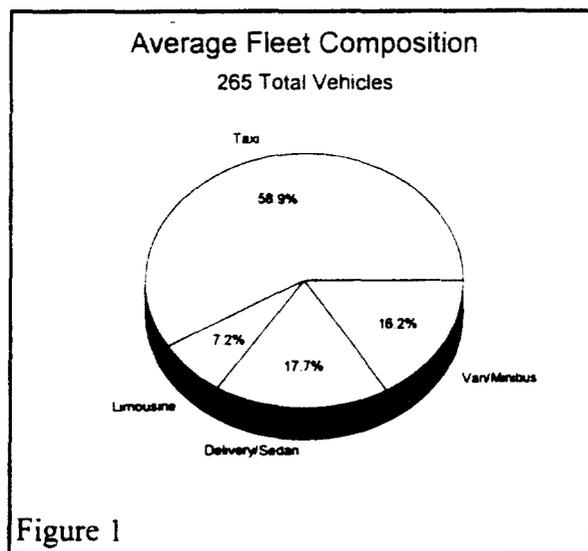
The Gallup Organization, Inc., Princeton, New Jersey, studied the characteristics of the typical taxicab passenger and typical taxicab trip. From these user characteristics we can determine that elderly persons, low income persons, minorities, and females rely quite heavily on taxicabs to meet their local transportation needs.

The typical taxicab trip for all users was determined by The Gallup Organization to be for: business - 26%, social - 21%, airport - 15%, when in a hurry or no other public transportation available - 9%, medical - 8%, grocery shopping - 7%, car in shop - 2%, to run errands - 2%, to pick up children - 1%, emergency - 1%, safety at night - 1%, all other reasons - 7%. Of course, the typical trip purpose for any segment of the population will vary based on their needs. For example, 24% of taxi trips for the elderly are taken for medical visits.

ITLA Member Survey of Communications System Function & Usage

ITLA recently surveyed members and requested information about their communications systems and how they were used. In general, respondents operate in medium and large markets in the U.S. However, it must be stressed that ITLA members do not have exclusive, *i.e.*, monopolistic territories. Consequently, one should be mindful that the results presented herein, represent the average statistics of a taxi and livery company, and not the total need for service in a particular market.

All of the respondents own their own communications system. The average respondent had over 265 vehicles in their fleet: fleet composition is shown in Figure 1. According to the survey, the average number of passengers transported per day per company is in excess of 4,300.



In-house communications systems are used for a variety of functions as shown in Figure 2. Recently, many ITLA members have installed analog data dispatch systems, to improve the efficiency of communications and message throughput as well as to provide such services as credit card verification for payment.

Peak busy hour load averages over 5,600 one-way transmissions per hour. For every passenger carried, there are approximately 15 unique transmissions between the vehicle and the dispatch center. On average, total transmissions per vehicle per day are well over 300. This figure is probably understated since it presumes that every vehicle was in use every day and does not reflect time-out-of-service.

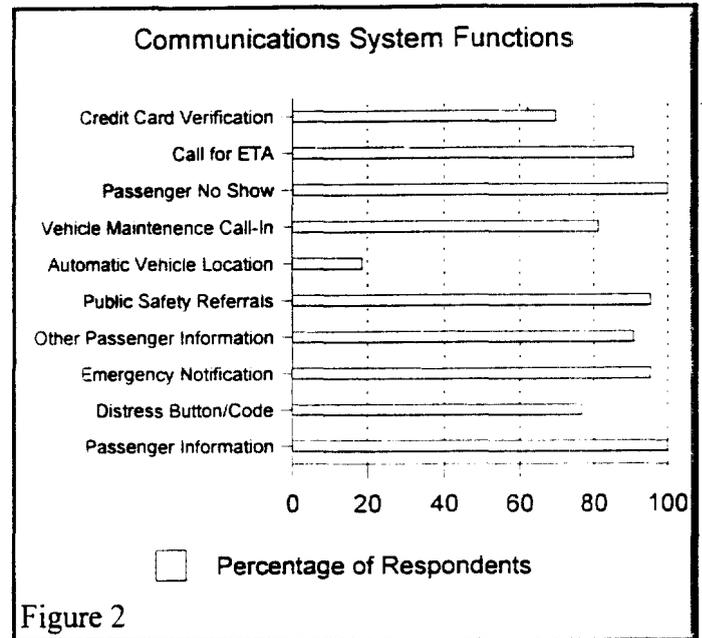


Figure 2

On average, survey respondents had invested approximately \$575,000 in their communications system. This includes expenditures for base station transmitters and infrastructure, mobile radios, and computerized dispatch systems.

The average respondent employs 17 dispatchers and telephone operators on a normal weekday. Annual operating expenses of a typical company for the dispatch center and communications system average over \$410,000¹.

EFFICIENCY

Throughout the history of the Commission, its mandate has been to allocate frequencies in a manner which promotes spectrum efficiency and, hence, the public interest, convenience and necessity.

¹ It should be noted that most of these expenses would not be eliminated by a forced move to a commercial provider. Most of the expense is associated with maintenance of the mobile radios, dispatch center equipment, and salaries for telephone and dispatch operators. Service air-time costs would be in addition to the foregoing.

However, in order to provide a framework for discussion, the definition of efficiency must be clarified; only then can one analyze the relative efficiency of alternatives. From the pure regulatory aspect, there are two components of efficiency: spectral efficiency and channel utilization efficiency.

Spectral efficiency is a function of reuse efficiency, channel width, and to a lesser extent modulation method, *i.e.*, digital vs. analog. Traditionally, the Commission has focused on channel width and modulation. Reuse efficiency is a function of the first two parameters determined by a required carrier to interference (C/I) ratio and balanced by the need for geographic coverage.

Channel utilization efficiency refers to the amount of time that an RF channel is occupied and how many customers it serves. In the abstract, there is no difference in efficiency for a channel used by one customer for 30 minutes versus a channel used by 30 customers for 1 minute each.

Shared Use Licensing

In the private radio services, and specifically the Taxicab Radio Service, which is of particular concern to the ITLA, the frequencies are licensed on a non-exclusive, shared basis. This non-exclusivity presumption means that licensees must be prepared to share the frequency with other qualified users within the confines of reasonable engineering parameters.

Consequently, the taxi and livery user of these frequencies must tolerate interference and manage potential blocking² to a much greater level than frequencies allocated to commercial services which are typically licensed on an exclusive basis.

Shared frequencies have no presumptive "protected service area" or minimum mileage separation between co-channel stations. Consequently, reuse efficiency is -- by definition -- higher than for services which have strict separation criteria. Frequencies allocated on a shared basis squeeze in more base stations by looking at each situation on a case-by case basis. ITLA, and other industry coordinators, attempt to balance the needs of multiple operators based upon required capacity and coverage moderated by tolerable levels of interference. Consequently, usable geographic coverage, *i.e.*, coverage which actually meets the needs of an operator, is more likely to be provided. However, this process, by necessity, creates a level of interference greater than a commercial operator could tolerate in providing service to the general public.

² The likelihood that a channel will be occupied and in use at the time an attempt is made to utilize the channel.

Channel Loading

The Commission has traditionally specified a minimum channel loading of 70 mobiles per channel for conventional paired frequencies. In the SMR service, for trunked systems, the threshold rises to 100 mobiles per channel. ITLA, in coordinating new frequencies for applicants and existing licensees, tries to achieve at least 100 units per channel if no unencumbered frequencies are available.

However, commercial operators, *e.g.*, cellular, SMR, PCS, *etc.*, must be conscious of the grade of service³ (GOS) being offered to their customer. Using the standard Erlang B⁴ traffic tables one can conclude the following:

1. The potential for delay or the denial of service is higher on private systems due to greater loading, a delay which is tolerable since the private system controls the scheduling of the transmissions and:
2. Commercial systems, whether conventional or trunked, leave RF channels idle for a significant part of the time in order to minimize the potential for blocking.

In commercial services, a paying customer expects that a radio channel will be available when service is requested. Yet an ITLA member, because of the limited amount of available frequencies, must schedule its radio transmissions in the most efficient manner. Transmissions can be delayed for a short period of time depending upon the number of required communications, and the priority of such communications in the queue. Calculated blocking rates, using standard traffic engineering tables, show that blocking in private services is much higher compared to commercial services. But high blocking rates utilize the channel more efficiently, *i.e.*, the channel is occupied far more often than a similar channel with low blocking rates.

In actual practice, based upon our survey of ITLA members, occupancy of their single channel systems in the busy hour exceeds 50%.

³ Grade of service is synonymous with blocking.

⁴ Erlang B is one of the three most commonly used formulas for sizing telecommunications systems.

Practice in Commercial Industry

Commercial providers build to average busy hour load, not to the peak load of any customer. The "busy hour" is generally an average of the busiest hours of some number of the busiest traffic days in a year. Infrastructure to maintain the required GOS is built to satisfy the average need of the customer base.

It is axiomatic that if a commercial operator's customers would tolerate a lower GOS -- a higher rate of blocking -- then the operator could delay additional investments in capital equipment and increase overall profitability. The same is true for the private user: additional expenditures on their communications systems detract from the overall profitability of their core business.

The commercial provider -- who has a differentiated subscriber base -- cannot prioritize among customers. In a competitive environment, it must maintain service quality. However, a specific customer's peak load -- which degrades service to all users -- creates a dilemma for the commercial service provider. Specifically, does the cost associated with increasing capacity to handle one customer's peak load -- and prevent degradation of service across the board -- generate sufficient revenue so that the company's overall return on investment is not negatively impacted?

Absent an affirmative answer to the foregoing question, communications capacity will not be available. Commercial mobile carriers are reluctant to incur costs which may be necessary to serve a customer whose peak load requirements are significantly above average.

Message Content and Utility

If we compare a single cellular channel or two-way channel in use for 1 hour by one or many calls with a typical ITLA member's use -- hundreds and in many cases thousands of transmissions per hour which are critical to the servicing of the public-- this is a far more efficient usage of the spectrum.

Commercial providers are ambivalent to message content. Yet, the creation of the private radio services indicates the public policy conclusion that all content is not equal: that the finite resource -- the radio frequency spectrum -- had to be managed so that important communications needs are served. If a measure of efficiency is the number of individual users who derive benefit from the provision of service within a finite time frame, then private radio and ITLA members are certainly efficient users of the radio frequency spectrum.

Efficiency Conclusions.

All things being equal, private systems are efficient because they load more users per channel than comparable commercial systems.

Private users manage interference and tolerate blocking to minimize their investment in radio communications relative to their overall business. Consequently, channel utilization efficiency is higher than a commercial entity whose utilization efficiency is dictated by the service quality demands of the average customer.

UNIQUENESS AND SPECIALIZED NEEDS

Asynchronous Mobile/Base

ITLA members use the allocated paired frequencies in a unique way. Taxi and livery fleets generally use the paired frequencies in an asynchronous mode. Specifically, a mobile unit can transmit a message to the base station without restricting the base from transmitting a message to a different mobile unit. With the advent of analog data dispatch systems, this mode of communications has become even more important. Reviewing actual traffic statistics from one ITLA member shows that over 62% of the message traffic is from the mobile to base.

This transmission mode is an outgrowth of the needs and circumstances of taxi and livery fleets. There are specialized business reasons for this technical arrangement, *e.g.*, preventing drivers from conversing with each other, ensuring that passengers assigned to a particular vehicle are actually served by that vehicle, *etc.* Moreover, because of channel congestion on the limited frequencies available, this method increases usage efficiency.

With most commercial systems, when communications is initiated both mobile and base frequencies are unavailable for use until such time as the channel pair is released. Consequently, the availability of the channel pair is limited by the duration of the longest message segment on the in-use frequency, regardless of activity on its counterpart. The taxicab and livery industry's configuration does not have this limitation and this allows for greater efficiency.

Analog data dispatch systems take advantage of asynchronous transmission to dramatically increase the throughput of the system. Messages to and from drivers are handled faster and with less air-time when sent by a data dispatch system operating in this mode. Hence, companies use their

communications system to exchange more message content, and therefore can provide more services with no increase in granted spectrum.

Priority of Communications

The very existence of private radio services indicates a recognition in the past that there was a public policy interest in providing for these communications services. The conclusions drawn were that either 1) these services could not be provided economically by commercial operators; 2) these services would not be provided economically by commercial operators; or 3) communications were of such a critical nature, *i.e.*, time sensitive, proprietary or confidential, *etc.*, to mandate a separate allocation even if commercial providers could and would provide service.

If we assume that today the first two conclusions are no longer true, that commercial providers can and will provide service at an attractive price -- a doubtful proposition -- the issue of criticality would still remain.

ITLA members are the service providers of last resort for many citizens: those who lack access to public transportation, the elderly, disabled, and others who do not own or are unable to drive their own cars. Moreover, taxi and livery companies are necessary for the efficient functioning of the U.S. transportation system. One out of five public transit trips are provided by taxi.

However, if we imagine that private radio services no longer exist, then all users of communications services are lumped together in the commercial provider's customer base. How can a commercial provider prioritize between taxi and livery services who may be transporting patients to hospitals, electrical utility employees attempting to restore service after a major storm, television field crews attempting to communicate with their studios during a live remote broadcast, and numerous other specialized users as well as the general public? Each user feels their need is most critical.

None is most critical: all are critical.

There are a few commercial communications systems which allow prioritization of channel allocation and message traffic. Generally, prioritization must be input to the system as part of the user's profile. Dynamic prioritization, by users, has been shown to fail since every user believes his or her message content to be most critical and all simultaneously attempt to increase their priority level when channels are congested. This unfortunate fact returns the commercial operator to the position of prioritizer of message traffic, *i.e.*, adjudicating whose message is most important on a

real-time basis. Commercial entities are unable and unwilling to do so; indeed it may be unlawful for them to do so. The commercial provider can only ration by price.

Actual statistics for a major market ITLA member show -- as one would expect -- a dramatic increase in requests for service during bad weather, and by consequence, message traffic. Normal weekday dispatched calls are approximately 4,700. During bad weather this figure increases by 10-15%. In terms of channel loading and congestion, calculated system delays increase more than this. Yet, this problem is manageable since the entire communications system is under the control of the taxi company. However, if other entities also see message traffic increase dramatically, and the aforementioned groups are all loaded onto the same commercial system, the system will temporarily collapse.

Most important, driver safety must be considered. It is unfortunate, but true, that driving a taxi is the most hazardous job in the U.S.; more murders per capita than any other occupation. Taxi and livery operators maintain their own communications systems -- many with full hot-standby capability -- in part to provide for immediate emergency communications between the driver and sources of aid. Virtually all taxi companies have special communications procedures to assure quick response to a life-threatening situation.

Locality of Demand

Private radio licenses in the Taxicab Radio Service are currently awarded on a point-specific basis. While this entails an administrative burden on both the coordinator and the Commission, it is a practice which was developed precisely due to its targeted specificity to a potential licensee's communications needs.

Licensees define their coverage criteria, dependent upon the area of their business operations. This can take the form of single site or multiple site systems, depending upon the geographic area to be served and the availability of spectrum.

It has been suggested that wide-area licensing of previously private spectrum to commercial operators would provide the same depth and breadth of coverage in a more spectrally efficient manner. In the abstract, the foregoing proposition may be true, providing the following caveat is never forgotten: the radio coverage provided must be in the economic interest of the commercial entity.

Radio coverage required for business operations is not defined by arbitrary licensing boundaries (MSAs, MTAs, BTAs, EAs, *etc.*). ITLA members are generally licensed by local governmental and regulatory bodies and are allowed to serve passengers only within those boundaries. Political subdivisions, the authorized area of operation for taxi and livery companies, may or may not conform to the radio service area provided by commercial entities -- and would seldom correspond to the wide-area geographic licenses typically put up for bid by the Commission.

Commercialization of the heretofore private radio spectrum would force ITLA members to subscribe to commercial services. A number of scenarios present themselves regarding what service would be available:

1. Full radio coverage is available from a single commercial entity.
2. Full radio coverage is available but only from multiple commercial operators (due to the arbitrary geographic boundaries).
3. Only partial radio coverage is available from any one provider.
4. No radio coverage is available.

While full radio coverage may be available from a single entity, monthly subscription fees associated with that service may be prohibitive. The commercial provider will price their service to recoup the cost associated with the entire network, whereas the private company only needs a portion of that infrastructure and is paying far in excess of its value to the user.

Certainly, there would be few areas where there was a need for service and none available so we can generally dismiss the fourth scenario. Only partial radio coverage being available from any provider is a real possibility in the more rural areas of the U.S. since commercial entities will concentrate their investment in capital equipment and infrastructure in those areas with the greatest population density and potential for revenues.

Finally, wide-area licensing has the greatest potential for requiring ITLA members to subscribe to multiple service providers. The member would be required to pay multiple subscription fees per unit for voice dispatch service or multiple fees for packet data transmission services. It would require the installation of individual trunks from the member's dispatch center to each service provider's point of presence. Of most concern is the potential for technical incompatibility between commercial providers equipment.

One can easily imagine the hypothetical circumstance of a Laurel, MD taxi company, forced to procure service from separate Washington and Baltimore commercial service providers. Coverage in the city of Laurel itself may be less than satisfactory if the two commercial operators have been unable to agree on technical standards and degree of overlap between their two systems⁵. Of additional concern is whether sufficient channel capacity is available in the interstitial area. The commercial operator(s) will have to balance the need for additional capacity in this area against their need for capacity in more densely utilized areas of their system(s). They must coordinate with adjacent operators on the use of these frequencies. It is quite possible that a geographic area will be continuously under-served if the economics of both operators demand frequency reuse in other areas⁶.

Uniqueness Conclusions

An asynchronous transmission protocol is standard for most taxi and livery operators. This configuration is atypical of commercial systems and would require major modification or dedication of channels to permit this mode of transmission.

ITLA members are service providers of last resort to the general public. Private communications systems allow them to fulfill that need in a cost effective and timely manner.

Private radio systems allow the licensee to prioritize traffic in times of heavy load or emergency. For all practical purposes, a commercial provider can only prioritize by price.

ITLA members utilize private radio to serve their locally-franchised and licensed area of operation. Elimination of private radio, and a forced conversion to commercial systems, will strand some operators in positions of insufficient radio coverage or insufficient peak capacity.

⁵ In particular, one recalls the numerous applications the Commission was forced to adjudicate regarding *de-minimis* overlap between adjacent cellular providers. While the IS-41 networking standard and the revenues to be derived from roaming have forced operators to cooperate, it was for some time a considerable irritant.

⁶ In the cellular industry, there have been a number of instances where smaller RSA operators, sandwiched between major metro areas, have only been able to use a portion of their licensed spectrum due to an inability to coordinate frequencies. The smaller operator was forced to sectorize or cell-split to increase the capacity of its system.

TECHNOLOGY CONCERNS

In a simpler, analog-only world, incompatibility of equipment was generally not a problem. The Commission mandated modulation method, emission, and numerous other technical parameters to insure compatibility. One could reasonably argue the success of the cellular industry was partially due to the mandating of standards, *e.g.*, customers knew the phone would work wherever they traveled in the U.S. One could also argue that the lack of standards is the reason that AM stereo does not exist today⁷.

The Commission is searching for a mechanism to incent the users of the spectrum to more efficient transmission methods. The short list includes narrowband techniques and digital. However, it must be noted that the Commission has mandated minimal technical standards for new services such as narrowband or Broadband PCS⁸ and IVDS. Almost 2 years after the IVDS auctions, no system is in operation.

There is an ongoing war for the equipment dollars of the Broadband PCS auction winners. The competing technologies include direct sequence spread spectrum (CDMA) in variations proposed by Qualcomm and Interdigital, *Groupe Speciale Mobile* (GSM), up-banded TDMA, pioneer preference winner Omnipoint's proprietary air interface, as well as PACS, a variant of the European digital cordless technology, all incompatible with the analog AMPS standard. There are at least two competing protocols being proposed for Narrowband PCS. Motorola's iDEN system for digital dispatch is incompatible with the GE/Ericsson EDACs system and E.F. Johnson's digital LTR format. A discussion of the pros and cons is unnecessary: what is obvious is that there is a tremendous potential for the complete "Balkanization" of heretofore nationwide standards.

From the perspective of the private radio community, a migration to other technologies will render worthless the most numerous and expensive portion of their communications system, namely the mobile radio. Of additional concern, is the potential lack of technical standards in the future. If

⁷ The counter-veiling argument is that technical standards inhibit innovation (which may be true). The perpetual question is, what is the greater good?

⁸ There is nothing in the Rules requiring a Broadband PCS auction winner to use the most spectrally efficient methods. If they so choose, they can use the most woefully inefficient, outdated transmission methods. The "market" will decide if their choice is valid.

geographic licensing is a concern due to availability of radio coverage, then the likelihood that adjacent system operators will choose incompatible technologies is also a serious concern. Using our Laurel, MD example, a taxi company forced to subscribe to two separate commercial services would need two different radios in each vehicle, if the providers choose different technical equipment or were unable to agree on other standards and degree of overlap between their two systems.

ECONOMICS

Proponents of commercialization of private radio services argue that by increasing the supply of commercial mobile radio providers, prices will fall. Two questions are raised: 1) from the perspective of ITLA members and private radio licensees, and assuming all other considerations can be adequately addressed (capacity, uniqueness of need, prioritization, etc.) -- which they can't be -- how far must prices fall before commercial providers become a viable alternative to in-house systems and; 2) from the perspective of the commercial provider, how far can prices fall before the company is placed in the untenable situation of "what I lose on every sale I make up in volume?" There is a third consideration, too often forgotten by parties discussing supply and demand laws, but obvious to every businessperson and first year finance student: what level of profits will satisfy the firm's required rate of return .

The following is a brief overview of available commercial service alternatives and average pricing. Since ITLA members utilize both voice systems and analog data dispatch systems both types will be discussed.

Pricing of Alternatives

Specialized Mobile Radio (SMR)

SMR, in general, offer similar service to that required by the taxi and livery industry. Nationwide, monthly usage fees for analog voice dispatch service are in the range of \$12-\$16 per mobile unit. This fee commonly includes unlimited air-time; however in major metropolitan areas there is an upper limit on usage due to capacity constraints. Digital dispatch services, most notably Nextel, have service pricing easily double the foregoing figure.