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PROCEEDINGS OF THE 42<sup>ND</sup>  
ANNUAL MEETING OF THE  
TRANSPORTATION RESEARCH FORUM

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Annapolis, MD  
November 29 - December 1, 2000

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Technical Paper Submitted to the Transportation Research Forum's 42<sup>nd</sup> Annual Research and Policy Forum: "*Transportation Research at the Turn of the Century*"

**AN ASSESSMENT OF OPTIONS FOR INTEGRATING TAXICABS  
INTO AN URBAN ENVIRONMENT**

by

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## SUMMARY OF FINDINGS

This study examines the various options available for integrating taxicabs into an urban transportation network. A review of the different ways taxicabs function in urban, rural and non urban environments indicates their rates of success and/or failure. This review provides a basis for determining why taxicabs are successful in certain markets and cities, and if the lessons learned from their experiences are transferable to other urban environments. The following options are recommendations for successful taxicab integration in an urban area similar to that of Houston, Texas:

- Develop jitney services for specific population user niche markets. Such niche markets include rural residents, new immigrants in dense communities, and participants of local welfare to work programs may not be sufficient to justify the existence of a semi-fixed route transportation service.
- Continue, and possibly expand, local paratransit services. Their function would be similar to that of the “traditional” service offered by taxicabs, except for the advanced scheduling and fare repayment system.
- Use taxicabs as a feeder system between rural and non urban communities. A pilot program sponsored by the Houston Galveston Area Council would be the best way to determine if such a ridership demand exists without a major monetary investment.
- Establish a “taxi zone”. Such a dedicated area encourages increased taxicab activity in places like Houston’s CBD and along dedicated congested corridors.

## Abstract

The integration of taxicabs into an urban transportation network has intrigued city and transportation officials for decades. In many cities transportation planners have used taxicabs to augment existing public transit services with varying degrees of success. The guidelines that regulate urban taxicabs are designed to protect the public's safety and provide consistency among the many taxicab companies licensed to operate. In areas without public transit, taxicabs may be the only form of public transportation available. However, this situation is most often found in rural or non urban communities. The challenge in urban environments with existing public transit services and taxicab companies is the identification of options to seamlessly integrate all available modes into an efficient and viable transportation network. The long term objective would be the reduction of congestion and improved local mobility.

This study examines the various options available for integrating taxicabs into an urban transportation network. A review of the different ways taxicabs function in urban, rural and non urban environments indicates their rates of success and/or failure. This review provides a basis for determining why taxicabs are successful in certain markets and cities, and if the lessons learned from their experiences are transferable to other urban environments. This research concludes by presenting strategies for local public and transportation officials in an urban environment to seamlessly integrate taxicab services with existing public transit operations.

# AN ASSESSMENT OF THE OPTIONS FOR INTEGRATING TAXICABS INTO AN URBAN ENVIRONMENT

## INTRODUCTION

The integration of taxicabs into an urban transportation network has intrigued city and transportation officials for decades. In many cities transportation planners used taxicabs to augment existing public transit services with varying degrees of success. The guidelines that regulate urban taxicabs protect the public's safety and provide consistency among the many licensed taxicab companies. In areas without public transit, taxicabs may be the only form of public transportation available. However, this situation is most often found in rural communities. The challenge in urban environments with existing public transit services and taxicab companies is the identification of options to seamlessly integrate all available modes of transportation into a viable network. The long term objective would be the reduction of congestion and improved local mobility.

This study examines the various options available for integrating taxicabs into an urban transportation network. A review of the different ways taxicabs function in urban, rural and non urban environments indicates their rates of success and/or failure. This review provides a basis for determining why taxicabs are successful in certain markets and cities, and if the lessons learned from their experiences are transferable to other urban environments. This research concludes by presenting strategies for local public and transportation officials in an urban environment to seamlessly integrate taxicab services with existing public transit operations.

## TAXICABS AND THE PLANNING PROCESS

Community and transportation officials recognized decades ago that urban sprawl would lead to low density residential development. Additionally, low density would have disastrous effects upon urban environments. Urban sprawl also negatively impacted the services provided by public transit. In the 1970s public transit faced challenges of providing services in urban areas and in many small communities where the travel demand was too small to even support an efficient transit service. It became economically impractical to route and schedule bus transit services where there was little demand. Rail systems were too expensive and technologically unsuited for low volumes of demand, while bus services in low demand areas invariably only served those who were transit dependent. Public transit needed a means to respond to the needs of low density developments economically and efficiently. This led to the introduction of flexible bus and paratransit systems.

Initially, paratransit systems using buses were seen as the answer in providing flexible non urban transportation. However, it became clear when examining institutional and operational difficulties that buses were not efficient in a flexible system. Officials then turned to taxicabs and found that provide better flexibility in responding to low density travel patterns.

Currently, taxicabs are a fixture in many paratransit systems across the country. Paratransit services are either provided by a local social service entity or the area transit authority. There is seldom any coordination between social service transportation providers and transit authorities on the best way to utilize taxicabs. The taxicab can be a

viable addition to the urban transportation network when used as a complement to existing mass transit, not a competitor. However, planners and officials at all levels should show a commitment to their inclusion.

### **The Role of the Metropolitan Planning Organization**

Perhaps the most important function that a Metropolitan Planning Organization (MPO), or any other urban transportation planning agency, can undertake with regard to taxicabs providing a venue for coordination. An important part of cooperative transportation planning is the existence of mutual confidence and respect among the organizations involved. In the case of taxicab planning, the establishment of good relations between the taxicab industry, public transit agencies, local governments, and the general public is imperative for any kind of successful taxicab integration.

Through TEA-21 the MPO is in a position to begin the incorporation of taxicabs into the regular transportation planning process almost immediately. Section 1203 (f) (C) allows MPOs to include accessibility and mobility options within their scope of planning processes. Additionally, TEA-21 provides several funding mechanisms for increased urban mobility. Among these are the FTA's metropolitan planning authorizations of \$73.6 million per year for the six years of TEA-21. This is a total in excess of \$441 million that is available to MPOs for urban mobility programs.

Since there are few barriers to immediate taxicab inclusions, the community will see federal dollars at work instantly. Unlike freeways and transit guideways which generally require elaborate capital financing programs and a construction period of several years, changes in the taxicab systems can take place relatively quickly with little



or no capital investment. The high flexibility and low capital nature of the taxicab industry is perfectly suited for short-range, policy-oriented planning. However, this should not exclude taxicabs from being a significant part of the long range planning processes. Future challenges concerning local regulations, federal subsidization, and suburban mobility are issues that typically dominate long range planning. The inclusion of taxicabs may contribute in answering some of the long term mobility issues facing MPOs.

### **The Role of the Federal Government**

There have been several studies examining the role of the federal government in this nation's public transit services. That role has traditionally been financial in the form of subsidies and funds for capital improvement projects. However, the federal government does provide grants to social service entities to support local/regional paratransit services.

The Department of Transportation (DOT) initiated several programs to aid states and MPOs in addressing local transportation needs. The DOT provides funds for strategies that may include taxicabs in the urban network through these programs. The following are a few of the DOT programs available to MPOs:

- Urbanized Area Formula Grants Program
- Livable Communities
- Job Access and Reverse Commute Program
- Surface Transportation Program (STP)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)

## Integrated Taxicab Options

The literature concerning taxicabs since the late 1960s discusses two primary options for the integration of taxicabs in urban areas, either as a subsidized or unsubsidized (free market) system. The subsidies can come from a variety of sources such as the local transit agencies, local government (city or county), or the area MPO. While the free market option relies solely upon the ability of the taxicab operations to provide an attractive transportation alternative, they still require favorable local ordinances and clearly defined guidelines to protect themselves and the consumers.

### Subsidized Option: Paratransit Systems

By definition the term *paratransit* includes a wide spectrum of demand responsive type transportation alternatives, such as dial-a-rides, jitneys, shared taxis, van pools and commuter buses. There are many examples showing the success and failures of paratransit systems nationwide. The following example shows the establishment of paratransit services established with a taxicab company in a small non urban community in California without existing public transit services. This example is fairly representative of those found throughout the paratransit literature in the absence of public transit. The situation also illustrates how important commitment and cooperation are to the successful initiation of taxicabs as a paratransit service.

The city council in the non urban community received pressure from local groups to establish some form of public transit system. Believing there were not enough potential riders for a traditional transit service, the city council began examining

paratransit-type services. Even though funds were available for a paratransit system, every dollar used for public transit meant less money would be available for the construction or repair of local streets and highways. At the time surface transportation projects, streets and highways, were the highest transportation priority of local officials. Accordingly, the planning staff at the county and state levels found themselves under pressure to develop the most cost-effective service possible.

The two most important aspects of any potential paratransit system involved shared ride operations and compensation of the paratransit provider on a consumed service basis. Paying the provider a fixed fee per ticket collected from the riders addressed the compensation aspect. The ticket system also made it easy to limit eligibility to the elderly and handicapped and eliminated the problem of the operator handling (and possibly mishandling) cash. It was also decided that the provider should supply the vehicles for the system, at least initially, which would allow the services to begin immediately. These principle features of the system's organization, shared ride and available vehicles, clearly were most compatible with the operation of a local taxi company. Not surprisingly, a local taxi company submitted the winning bid.<sup>1</sup>

#### **Subsidized Option: Jitneys**

Extended forms of taxi/jitney service cover a spectrum of public transportation alternatives that range from traditional individualized taxicabs to fixed route services. Jitneys characteristically provide specialized transportation services for small groups of riders. Its great advantage over public transit in this regard is that the services meet the specific needs its target group.

In addition to paratransit services, taxicabs as jitneys provide an inexpensive alternative to public transit in some rural and non urban areas when population size and density are not sufficient to support traditional public transit. Jitneys operate more economically than buses at low-demand commuting times, such as the evening hours, as their capacity is ideal for small passenger loads. Continuation of service over these low demand periods is of special benefit to those in the community who rely entirely on public transit, and the transit authority may choose to contract for the jitney operation as an alternative to serving the routes with buses.

Jitney services are capable of performing an essential role in promoting overall ridership in an integrated transit system. It is especially suited to providing feeder services to regional rail transit and express bus systems, and can relieve some of the peak-period demands on transit facilities along major travel corridors. However, studies show that when jitney services are implemented in competition to public transit rather than coordinated with it, its more personalized mode of service can attract riders away from line-haul systems, especially in lower density areas where existing mass transit service is poor.<sup>2</sup>

#### **Unsubsidized Option: Free Market system**

In a free market environment individual taxicabs compete with one another for riders. Local governing bodies do not subsidize any portion of the potential trip, but may limit the number of taxicabs serving a particular area. The fare structure charged by taxicabs are regulated, in most instances, by local jurisdictions. The basis for most fare structures are the metered systems or the zone fare system, also called "taxi zones". With

the metered system the fares include an initial fee for the first increment of distance traveled and additional fees for each extra mile. In the taxi zone system, there are clearly defined service areas with specific charges for trips that originate and end within one zone, or between two zones.

In the early 1980s the New York City Planning Department studied the urban effects of express and local feeder for-hire taxis on local mobility (many of these taxis used 12-15 passenger vans). Additionally, they wanted to determine the operational, legal, and economic effects and establish City policy that would maximize the benefits while simultaneously decreasing the negative effects. It was assumed that competition between the taxicabs and subsidized transit through normal market responses would improve mobility throughout the city. There was also the assumption that an efficient free market transportation alternative would reduce the need for expanding expensive subsidized transit.

The study identified two type of van services being offered. The first was an express service into and out of the Manhattan CBD. The other was a feeder service to outlying New York City Transit Authority (NYCTA) transit stations. Both services were most widely used during the morning peak hours. The study estimated the total combined daily ridership to be somewhere near 10,000 passengers to and from Manhattan. Another 5,000 daily combined passengers were from the suburban areas.

The study found that the van systems, both the feeder and express routes, increased congestion on the routes they traveled. The congestion in lower and midtown Manhattan became especially serious as vans competed for the limited curb and street space. Many of the van operators illegally used bus lanes adding to the congestion of

over 100 buses that legally operate in these designated lanes. Some vans loaded and unloaded passengers from the street side and hindered access to many of the City's bus stops. During the period of the study, the City estimated lost revenues to NYCTA to be in excess of \$8.5 million annually.

The study's recommendations focused on licensing, enforcement, and street use guidelines. It was generally agreed that the taxi services provided needed increased urban mobility options, even though they reduced NYCTA's overall revenues because of the direct competition in certain corridors. Still, the proliferation of uncontrolled, unlicensed and unregulated vans negatively affected transit operations and urban traffic congestion. However, organized and controlled taxi services operating in non urban areas would complement existing subsidized transit services by increasing mobility in areas with poor accessibility and inadequate transit services.<sup>3</sup>

### OPTIONS FOR TAXICABS IN URBAN AREAS

The organized inclusion of taxicabs in urban areas where existing public transit maintains an extensive network provides a challenge for city and transportation officials. This study chose Houston, Texas, as a case example for discussing options including taxicabs into an urban environment. Houston is a diverse community whose suburban development is consistent with other sunbelt cities. The Metropolitan Transit Authority of Harris County (Houston METRO) provides public transit services through an all bus fleet since its inception in 1978. There have been discussion of including some form of a rail component since the early 1980s and recently Houston METRO identified one of the most congested inner city corridors for the first leg of a new modern light rail system.

Houston METRO serves an area of over 1200 square miles with annual passenger miles of over 533 million miles with annual revenue miles exceeding 48 million. In 1998, Houston METRO operated 934 vehicles in bus operations and purchased another 569 vehicles (440 in demand responsive services and 129 in bus services). Houston METRO does not operate any vehicles in a demand responsive capacity. The following tables illustrate Houston METRO's performance indicators as measured by the Federal Transit Administration's (FTA) 1998 National Transit Databases:

PERFORMANCE MEASURES	BUS	DEMAND RESPONSIVE
Operating Expense/Vehicle Revenue Mile	\$4.91	\$1.55
Operating Expense/Vehicle Revenue Hour	\$70.89	\$32.29
Operating Expense/Passenger Mile	\$0.37	\$1.32
Operating Expense/Unlinked Passenger Mile	\$2.04	\$13.81
Unlinked Passenger Trips/Vehicle Revenue Mile	2.41	.11
Unlinked Passenger Trips/Vehicle revenue Hour	34.83	2.34

As in other cities some taxicabs operate in a coordinated effort with local social service agencies. The Greater Houston Area Chapter of the American Red Cross is one such social agency. The Red Cross provides non emergency transportation services in the Houston area for a individuals who have no other transportation options. They also contract transportation services for wide variety of health and human services agencies.

to expand the transportation service provided arose from the needs of Red Cross' client base. Up to 20 percent of the trips made by the Red Cross are through volunteers, the rest are financed through contracts or state/federal grants. These services are not designed to compete with existing Houston METRO local routes. The Red Cross' unofficial transportation philosophy is that "if someone can ride the bus, get on the bus."

The relationship between the local taxicab companies as a transportation contractor and the Red Cross arose out of the need for additional transportation vehicles. When the demand for transportation services exceeds the Red Cross' capabilities, they contact one of the taxicab companies they have contractual agreements with. The information for a particular trip is faxed to the taxicab company and they dispatch one of their drivers to the location. The patron incurs no cost as the taxicab company forwards an invoice to the Red Cross on a periodic basis.

The major challenge to this arrangement involves the availability of taxicabs to respond to the Red Cross' request. There appears to be no real incentive for coordination on the part of the taxicab companies. Red Cross officials admit that the taxicab companies do not always respond in a timely manner to some of their requests to pick up their clients.

Houston METRO also contracts with taxicab companies in providing paratransit services. Houston METRO provides its customers with vouchers to use with contracted taxicabs. Houston METRO pays the first \$8 of any given trip, while anything over \$9 is the responsibility of the customer. Taxicab officials generally like the voucher system and state that this is also beneficial to Houston METRO as their paratransit services generally cost about \$35 per person while taxicabs provide incur only \$18 dollars per



person. This particular taxicab official has had a contract with Houston METRO since 1982 and typically provides 9,000 trips monthly under the voucher program.

### **Taxicab Options**

Given the general applications of taxicabs in urban areas, either subsidized or unsubsidized, the following discuss each application in Houston and its likelihood of success. The feeder and circulator strategies similar those found in New York are subsidized taxicab services that may find support in Houston. Houston METRO operates 41 transit facilities throughout its service area. Feeder routes could service communities outside the Houston METRO service area through the transit facilities, thus providing seamless coordinated transportation service with the many park & ride and express routes currently operating. Studies have shown that taxicabs operating along a semi-fixed routes, similar to that of jitneys, can actually increase transit ridership in existing transit services.

Houston METRO sponsored a limited jitney project that lasted only two years. From this brief experience there were a few findings that indicate the future of semi-fixed routes, and the integration of taxicabs in a subsidized form. The jitney route operated along the one of the busiest corridors in Houston and in competition to the local route with Houston METRO's highest ridership. This jitney served primarily minority patrons and made connections to a park & ride facility. The failure of the jitney services may not have been due to a lack of ridership support, but the nature of the administrative structure.<sup>4</sup> After extensive political maneuvering, the Houston City Council allowed jitneys to operate legally in Houston after almost 70 years. However, any jitney service

had to be under the auspices of Houston METRO. Therefore, the subsidy to the jitney contractor came from Houston METRO, not the city of Houston or the Houston Galveston Area Council (HGAC), the local metropolitan planning organization (MPO). The fixed route service began under intense local media attention, and ended virtually unnoticed by the public.

For any type of subsidized feeder system to be successful, HGAC should be the lead operating agency serving in a *broker* capacity. In this manner, HGAC would be able to identify the transportation service needs and establish guidelines for potential transportation contractors. They would also ensure that any feeder system would not compete with Houston METRO's established routes, but only serves as a complement. The taxicabs would be given specific times and zones of daily operations and area communities would further be able to personalize the taxicabs serves in their communities.

The other subsidized option, a circulator route in the urban core, may not be as viable an option Houston. Houston METRO operates an extensive network of trolleys in Houston's CBD and midtown areas. CBD employees and visitors can park their vehicles at distant facilities and maneuver around the trolley service area very efficiently without more than an 8-10 minutes delay. A network of circulator taxicabs would only increase congestion and not provide any substantial gains in urban mobility.

The potential for an organized free market option appears more promising than either the feeder or circulator subsidized systems. The establishment of a "taxi zone" by the City of Houston would foster increased taxicab activity in a specific area. Such a zone would have a base fare structure for trips originating and ending in the zone. For

trips that would require travel outside of the zone, a different, consistent fare structure would apply. Local ordinances allowing shared rides would need to be examined to determine if such an arrangement would increase local mobility. The support for a "taxi zone" would need to come from local governmental entities and other business organizations like the Chamber of Commerce, transportation management organizations and possible area civic groups.

The current paratransit system between Houston METRO and the local taxicabs appears to be the most successful current use. This arrangement increases urban mobility to a particular segment of the population that is the most transit dependent. The effects of the taxicab companies are also minimal as the general operation is not consumed by contractual obligation to Houston METRO. The individual taxicab owner operators still have the opportunity to provide voucher services and free market trips.

## CONCLUSION

City and transportation officials have sought to integrate taxicabs into an urban transportation network for decades. In many cities taxicabs augment existing public transit services with varying degrees of success. The guidelines that regulate urban taxicabs protect the public's safety while providing consistency among the many taxicab companies licensed to operate. In areas without public transit, those classified as rural or non urban, taxicabs may be the only form of public transportation available. The challenge in the urban environments that have public transit services and taxicab companies is to seamlessly integrate all available systems of transportation into a viable network. The long term objective would be the reduction of congestion and improved

regional mobility. The following table represents a summary of the options for taxicab integration in Houston.

TAXICAB OPTION	POTENTIAL FOR SUCCESS
Subsidized Feeder System	Medium
Subsidized Circulator System	Low
Free Market "Taxi Zone"	High
Subsidized Paratransit	High*

\*The current method of taxicab integration in Houston

The national resurgence of the jitney as a form of urban transportation in niche markets provide only limited opportunities for the taxicab industry. Such niche markets include rural residents, new immigrants in dense communities, and participants of local welfare to work programs may not be sufficient to justify the existence of a semi-fixed route transportation service. However, government officials recognize the importance of transportation to welfare recipients in accessing employment, and further acknowledge that public transit may not completely provide the needed services.

Most recently, in cities like Houston taxicabs have had measurable successes in providing paratransit transportation. In this manner, they operate on an as-need basis with a customer base that schedules their use either hours or days in advance. As such, their function would be similar to that of the "traditional" service offered by taxicabs, except for the advanced scheduling.

The coordination between Houston METRO and local taxicabs is one that needs further evaluation. However, given the longevity of the relationship, it seems to be very successful. The elderly and handicapped are a special segment of the population whose transportation needs have recently received much needed attention. The Americans with Disabilities Act removed the physical barriers in accessing normal bus services. However, many individuals still cannot use those services some a variety of physical reasons. As such Houston METRO's paratransit services will continue to play a major role in providing mobility. In 1998 Houston METRO purchased the transportation services of 440 vehicles from other transportation providers, including taxicabs. This is more cost effective than actually purchasing 440 vehicles for inclusion into Houston METRO's fleet of vehicles.

The use of taxicabs as a feeder system would only be successful if the surrounding communities would support it. Many of Houston METRO's numerous park & ride facilities extend to the outer limits of their service area and provide comfortable access to the CBD via express and commuter routes. There may not be a sufficient ridership demand for a subsidized fixed, or semi-fixed, route feeder service from non urban communities to Houston METRO's transit facilities. A pilot program sponsored by HGAC would be the best way to determine if such a ridership demand does exist without a major monetary investment.

A subsidized taxicab circulator system does not appear feasible given Houston METRO's extensive network of trolleys in the CBD and midtown areas. The result would be increased congestion and direct competition with Houston METRO. On of the

most important consideration in any taxicab integrated options that should be avoided is direct competition with existing public transit services.

The establishment of a “taxi zone” would encourage increased taxicab activity in a specific area like Houston’s CBD and along dedicated congested corridors. Local ordinances inviting transit patrons to consider taxicabs as a transportation option for limited trips would need to be examined to determine if such an arrangement would increase local mobility. Not only would a specific “taxi zone” be identified, but perhaps dedicated hours during the work day as well.

Nevertheless, grassroots support for increased taxicab integration might influence local governmental officials that options for increased mobility already exists in the form of those yellow vehicles traversing Houston’s city streets. The efforts for coordination must include all governmental entities, the public transit agencies, and civic and business groups. Through Federal legislative initiatives communities have the ability to develop mobility programs that decrease congestion, improve mobility and improve the environment. Those yellow vehicles may be the answer.

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<sup>1</sup> Roger Teal, Steven Rooney, Kia Mortazavi, and Richard Goodhue, *Taxi Based Special Transit Services*, Institute of Transportation Studies @ University of California, Irvine, published by the Office of Policy Development, Urban Mass Transportation Administration, 1983.

<sup>2</sup> Roberta Remak, *Potential for Flexicab Services: Innovative uses of Taxis and Jitneys for Public Transportation*, published by the US Department of Transportation, Office of the Secretary, December 1975.

<sup>3</sup> William Allison, Herbert Levinson, and Arnold Bloch, “New York City’s For-Hire Van Services: Blessing or Curse?”, *Transportation Research Record no. 1103*, p23-32, 1986.

<sup>4</sup> Ronald Goodwin, *An Evaluation of Jitney Services as an Option for Non Urban and Rural Application*, Center for Transportation Training and Research @ Texas Southern University, published by the Southwest Region University Transportation Center, Texas Transportation Institute, May 1999.