THE CITY OF BOSTON

TAXI CONSULTANT REPORT

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NELSON
NYGAARD

IN ASSOCIATION WITH:
TAXI RESEARCH PARTNERS

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EXECUTIVE SUMMARY

ES.1 STUDY BACKGROUND AND PURPOSE

The City of Boston commissioned the Nelson\Nygaard consulting team to prepare this analysis of the City of Boston's taxi industry. The team was charged with undertaking a comprehensive review of the taxi system's operations and regulations; assess recent changes in the taxi and for-hire market, including for-hire vehicles through smartphone applications; and make recommendations to improve the operations and regulations of the City's taxi system.

The purpose of this analysis is to provide data and information to the City to make informed decisions regarding a number of changes to the industry and to understand how these changes would impact taxi drivers and customers. The study seeks to address the following issues and potential changes to the taxi industry:

- Demand for and availability of taxis in all City neighborhoods, including minority neighborhoods, waterfront areas, and the City's Innovation District
- Demand for and availability of taxis during the late evening hours
- Discriminatory practices
- The relationship between radio associations, medallion owners, and drivers
- Treatment of taxi drivers
- Oversight and enforcement of taxi regulations

ES.2 APPROACH AND METHODOLOGY

The team's approach includes a substantial quantitative data analysis effort as well as a qualitative, subjective analysis through stakeholder interviews and surveys. The data-based analysis needs to be balanced by an on-the-ground understanding of how taxis do and should

serve Boston; therefore, these two types of data supplement each other and help to explain "the story behind the story" on different perspectives presented.

Stakeholder Interviews

The Nelson\Nygaard consulting team conducted in-person and/or telephone interviews with representatives of the Mayor's Office, Boston Police Department Commissioner and Hackney Carriage Unit staff, Commission for Elder Affairs, Commission for Persons with Disabilities, Office of Neighborhood Services, Massport, MBTA Accessibility Office, Greater Boston Convention and Visitors Bureau, Massachusetts Convention Center Authority, MASCO, Boston Onein3, radio associations, Steelworkers Union/Boston Taxi Drivers Association staff and executive board, Boston Taxi Advisory Group, new electronic hailing services companies[1] (Hailo), several large and small medallion owners and managers, and shift drivers.

Service and Financial Data Analysis

Several raw data sources were compiled and summarized:

- **Hackney Carriage Unit medallion data** that shows medallions by radio association, medallion ownership, vehicle type and model year, etc.
- **Data on Wheelchair Accessible Vehicles (WAVs)** supplied by the City of Boston's Disability Commissioner
- **Taxi trip data** from credit card processing vendors (CMT and Verifone) from January through August 2013, including pick-up and drop-off locations and times, mileage, fare/fees/tips, etc. (this includes all trips, not just the trips paid for by credit cards)
- **Dispatch data** from radio associations, as available (the only radio association that supplied usable data was Boston Cab)
- **Driver survey results** from a paper and online survey that sought service, income and cost data, as well as driver perspectives on various issues
- **Taxi stand observations** that documented wait times for both taxi drivers and customers at various taxi stands around the city
- **Massport/Logan Airport taxi pool data** that was analyzed to show taxi wait times in the pool and passenger wait times at the curb
- **Massachusetts Convention Center Authority data** that included sample event attendance and number of taxi pick-ups/drop-offs and anecdotal comments from show attendees

Data was also requested from some Transportation Network Companies (companies that use computer-based and smartphone apps which allow customers to request a trip directly from drivers); however, none was supplied to the study team.

[1] Uber opted to not participate in this study.

Policies and Handbooks

The team also reviewed in detail the Boston Police Department's Rule 403: Hackney Carriage Rules and Flat Rate Handbook (August 29, 2008) and subsequent published amendments and notices. Supplemental documents, such as lease agreements, Hackney Driver applications and forms, vehicle standards forms, medallion renewal application forms, and other related documents were also collected and reviewed.

ES.3 STUDY FINDINGS

Taxi Supply

There are 1825 taxis licensed in Boston. The method of licensing is called a medallion. The 1825 medallions are owned by individuals or ownership groups. Only "medallioned" taxis, where a Boston medallion is affixed to the rear of the taxi, are permitted to pick-up a customer at a taxi stand in Boston, from a street hail, or at the taxi queue lines at the airport at each terminal. In most cases, a Boston taxi medallion owner typically does one of the following:

- Buys or leases a vehicle, affixes the medallion to the vehicle, and "shifts" the medallioned taxicab out, usually to two licensed taxi drivers respectively working a 12-hour day shift and a 12-hour night shift – **48%** of the 1825 taxis.
- Buys or leases a vehicle, affixes the medallion to the vehicle, and operates the vehicle him/herself; the medallion owner in this case is known as an owner operator – **25%** of the 1825 taxis.
- Lease the medallion to a vehicle owner, who affixes the medallion to his/her taxi and operates the taxi – **20%** of the 1825 taxis.
- Hires a manager to manage his/her medallions – either by shifting a medallioned taxicab or leasing the medallion to a vehicle owner -- **5%** of the 1825 taxis.

Most of Boston's taxis are environmentally-friendly "green" taxis; these green taxis, which are almost all hybrids, total 1287 or 70% of the fleet. The most common taxi vehicle overall is a Toyota Camry Hybrid (1036 or 57% of the fleet and 81% of the hybrid taxis).

One hundred (100) of the 1825 medallions are specifically designated as wheelchair accessible vehicles (WAVs). Of these, there are 59 retrofitted Toyota Siennas and 41 retrofitted Dodge Caravans. Three of the 59 Siennas are hybrid.

By City regulation, medallion owners must affiliate with a radio association. There are seven radio associations authorized by the City. The primary function (among many) that the radio associations provide is the dispatching of trips that are requested by customers through the radio associations. The largest of the radio associations is Metro Cab (527 taxis) followed by Boston Cab (473 taxis), City Cab / Top Cab (426 taxis), ITOA (303 taxis), 617-TAXI CAB (57),

and Tunnel Taxi (4 taxis). (The affiliations of others are either unknown, are exempt from the affiliation requirements, or are in probate.)

Taxi Drivers and Income

Taxi drivers are licensed by the Hackney Unit, which is responsible for reviewing and processing new and renewal taxi driver applications and training taxi drivers. Hackney Unit staff reported that as of August 15, 2013, there were 6,347 active drivers (and 152 suspended drivers). This is not to say that all of these drivers are actively driving taxis. In three days sampled, there were between **2700 and 2950 drivers** providing taxi service. There are likely additional drivers who are active and who are not included in this range; these might include part-time drivers who pick-up a Sunday shift and/or fill in for a regular driver when he/she is not driving.

Drivers fall into the following categories:

- **Owner operators** – These are drivers who own their medallion, own/lease the vehicle, and operate the taxicab – Based on information from the Hackney Unit, there are **453** owner operators.
- **Leased medallion drivers** – These are drivers who lease a medallion (from an owner or manager), and provide and operate their own vehicle. Number of such drivers is **unknown**.
- **Shift drivers** – These are drivers who neither own or lease a medallion nor own a vehicle; most shift drivers "rent" a medallioned taxicab over a weekly or 12-hour shift, paying the owner in cash for the rental. For weekly shifts, the drivers typically pay the shift rental fee upfront. For 12-hour shift drivers, the drivers typically pay for their shift rental fee after the shift is completed. Number of shift drivers is **unknown**, although most active drivers likely fall into this category.

From the data analyzed, the average taxi carried 22 trips per day bringing $478 in revenue. On a typical day, each cab is driven by about 1.6 drivers, which means that an average driver takes in about $300 in revenue, before considering expenses. Net annual driver income can range from about $35,000 (part-time driver) to about $67,000 (shift driver, weekly lease) and averages about $60,000.

Figure ES-1 Current and Predicted Income by Driver Group

Driver Working Hours	Ownership Category	Estimated Annual Pre-tax Income after Costs		
		2013	2017	2022
Part Time	Shift Driver	$35,883	$38,252	$40,512
Full Time	Owner driver with Medallion	$53,971	$57,533	$60,933
Full Time	Shift Driver, 12-hour lease	$59,193	$63,623	67,383
Full Time	Shift Driver Weekly, Lease for 2	$65,675	$70,009	$74,147
Full Time	Owner driver Leases Medallion	$51,910	$55,337	$58,607
Extended Time	Shift Driver, 24-hour lease	$62,451	$66,573	$70,507
Extended Time	Shift Driver, Weekly Lease	$67,701	$72,169	$76,435

Taxi Ridership, Availability and Utilization

Based on data gathered from the credit card processing vendors, the Hackney Unit estimated that taxis provided 14.6 million trips in 2012, or about 40,000 trips per day. Data available for this study confirms these estimates.

The spatial and temporal distribution of trips is shown below in Figures ES-2 through ES-5.

Figure ES-2 shows the locations of every pick-up on January 9, 2013. Not surprisingly, most pick-ups are in Boston proper. A concentration of pick-ups is also at Massport/Logan Airport. Taxi pick-ups in the other neighborhoods of Boston are more sparse.

Figure ES-3 shows taxi trips per hour on three different days reflecting low ridership (29,470 trips), medium ridership (41,595 trips) and high ridership (48,373). The two weekday charts show a mismatch between supply and demand in the p.m. peak. The Saturday chart shows a mismatch between supply and demand from 10 p.m. through 2 a.m.

Figure ES-2 Taxi Pick-Up Locations

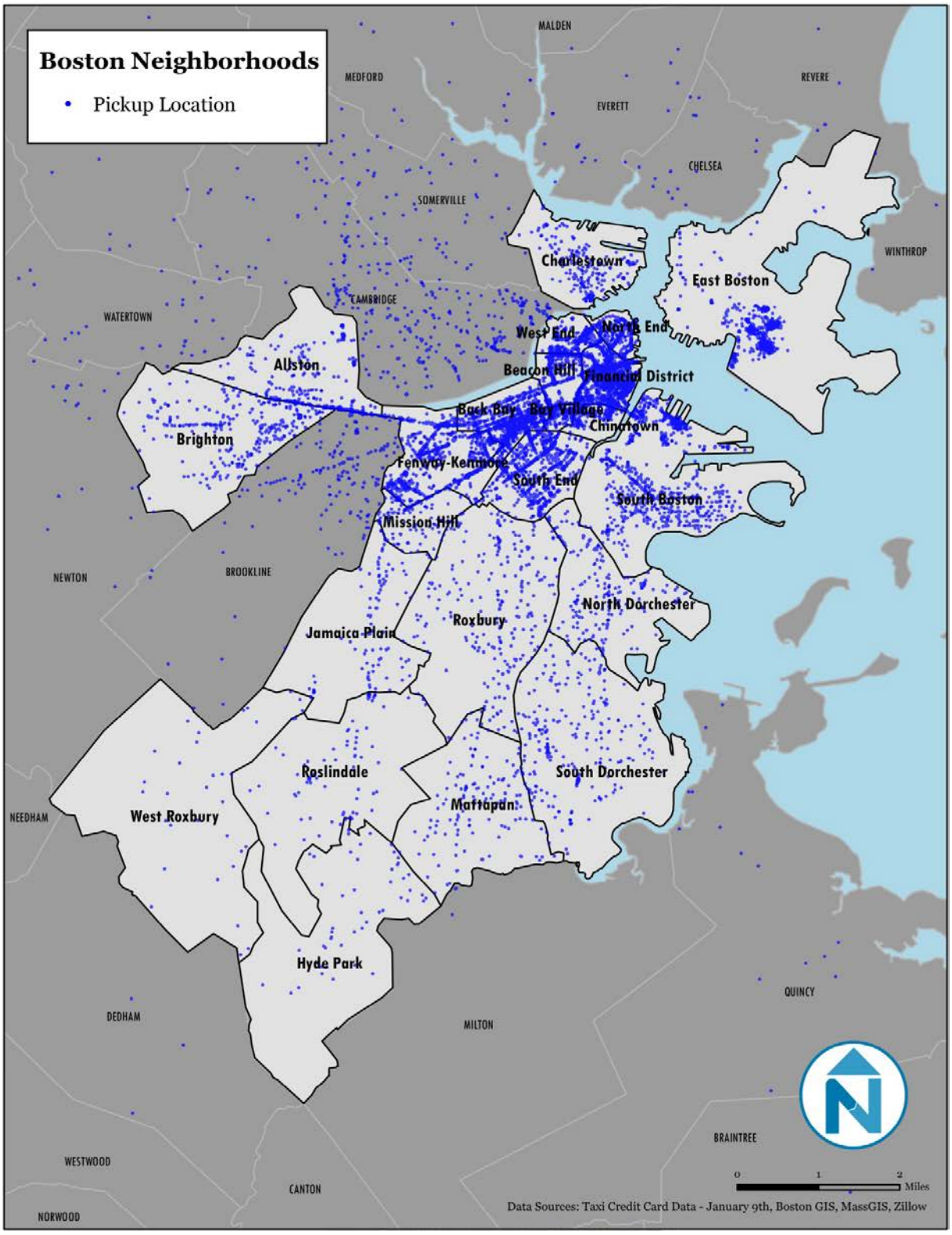
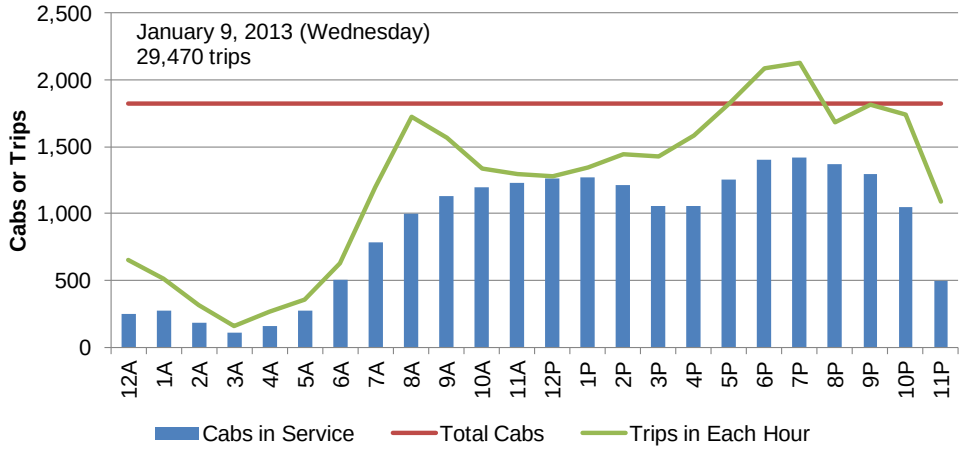
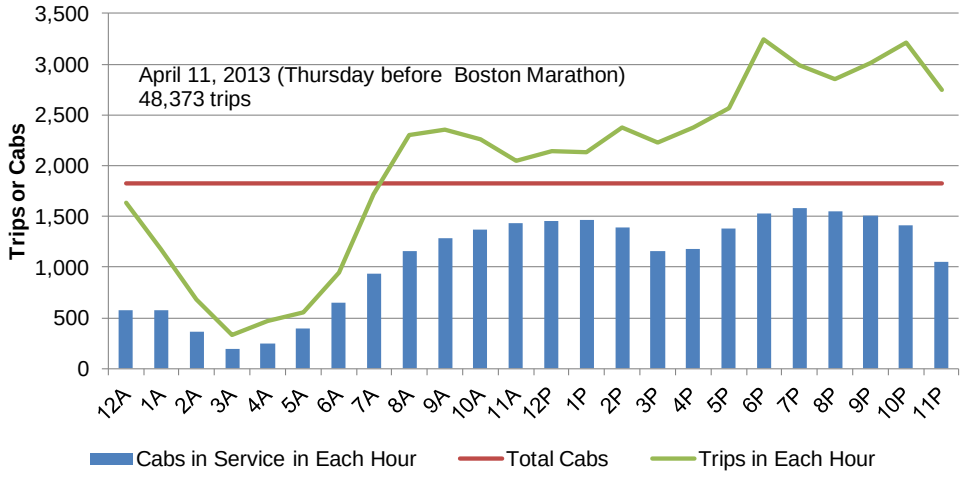


Figure ES-3 Hourly Ridership

Wednesday, January 9, 2013



Thursday, April 11, 2013



Saturday, July 13, 2013

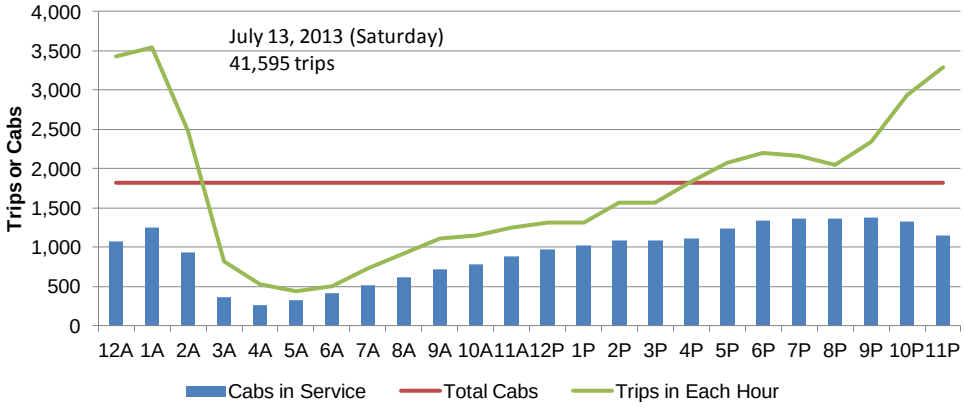


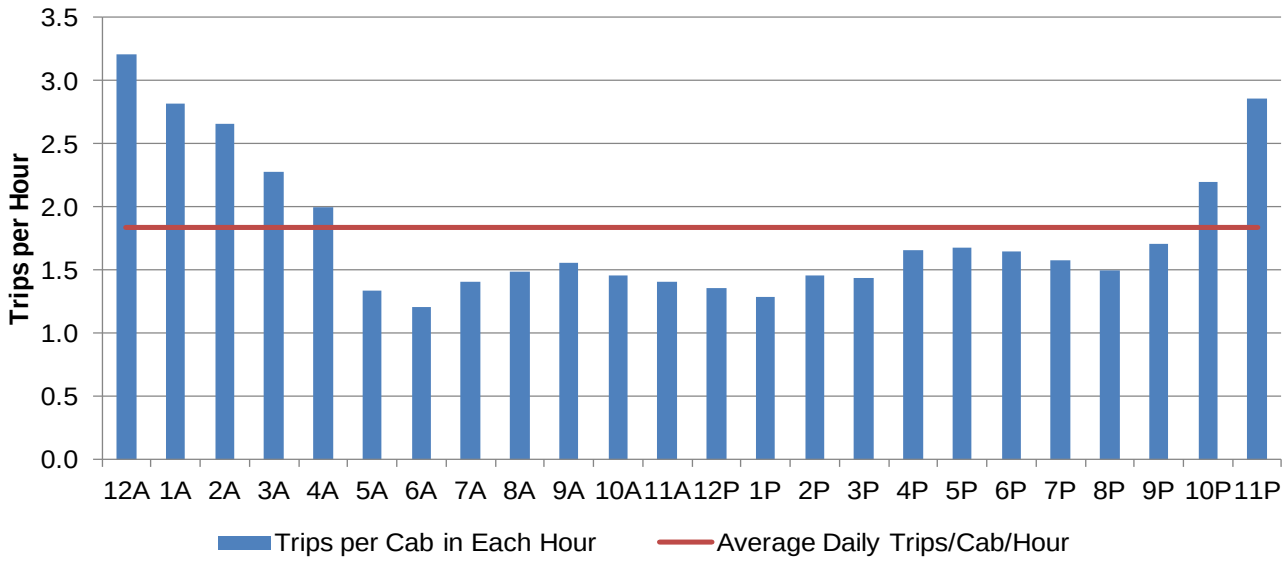
Figure ES-4 shows utilization in terms of productivity, typically measured in trips per hour. As shown, productivity ranged from 1.4 trips per hour on the light weekday to 1.8 trips per hour on the heavy weekday. Above 1.5 trips per hour driven (i.e. 1.5 trips per hour per taxi) is considered a good level of productivity, at which there *might* begin to be a need for additional taxis to serve demand.

Figure ES-4 Taxi Utilization on Three Days

Date/Day of Week	Drivers	Cabs	Hours Driven	Hours Occupied	Trips	Trips per Hour Driven	Pct. of Time Occupied	Hours per Driver
January 9 (Wednesday)	2,746	1,768	21,053	5,254	29,453	1.4	25%	7.7
April 11 (Thursday)	2,927	1,778	25,584	9,452	47,006	1.8	37%	8.7
July 13 (Saturday)	2,702	1,732	22,032	7,386	41,432	1.9	34%	8.2

Figure ES-5 shows the hour by hour productivity for Saturday, June 13.

Figure ES-5 Hourly Utilization (July 13, 2013)



Taxi Responsiveness

Taxi availability is difficult to measure, and due to a lack of dispatch data provided by the radio associations and "holes" in the data from CMT and Verifone, we have measured taxi availability in the following ways: filled dispatch requests, responsiveness, and field observations. The most important key finding of determining taxi availability is that there is a lack of data collected, and thus Hackney should work with radio associations and credit card companies to collect more refined datasets.

Data from one radio association's dispatch system was provided to Nelson\Nygaard for analysis. The findings are shown in Figure ES-6 through Figure ES-8. Recognizing that this data reflects only about 25% of the fleet and only one radio association, the primary take-away from these figures is that the responsiveness of taxis to requests for service (not a hail or a taxi stand) is not great; approximately 22% of the request were not served at all, and 87% of the served trips were within 20 minutes. Because of the limited data availability, it would be somewhat of a leap to make definitive conclusions about the spatial and temporal responsiveness because other radio associations may have a different spatial pattern of availability. The other take away is that these figures demonstrate the potential of a more thorough analysis if the full complement of dispatch data were made available to the City.

Figure ES-6 shows that on average, a request is fulfilled three out of four times, but that response varies based on neighborhood.

Figure ES-7 shows that of all trips requested, the percentage of trips that are served within 20 minutes varies significantly neighborhood to neighborhood.

Figure ES-6 Dispatch Requests Served by Neighborhood

Neighborhood	Requests per Day	% Served
Allston	29	78%
Back Bay	133	83%
Bay Village	10	77%
Beacon Hill	37	83%
Brighton	69	82%
Charlestown	83	88%
Chinatown	8	78%
East Boston	6	81%
Fenway-Kenmore	306	76%
Financial District	102	84%
Hyde Park	18	70%
Jamaica Plain	63	82%
Mattapan	14	52%
Mission Hill	8	64%
North Dorchester	42	63%
North End	61	82%
Roslindale	13	73%
Roxbury	92	67%
South Boston	151	81%
South Dorchester	33	59%
South End	122	81%
West End	52	78%
West Roxbury	5	78%
Total	1,457	78%

Figure ES-7 Dispatch Responsiveness in Boston Neighborhoods

(Four weeks of data from one dispatch association)

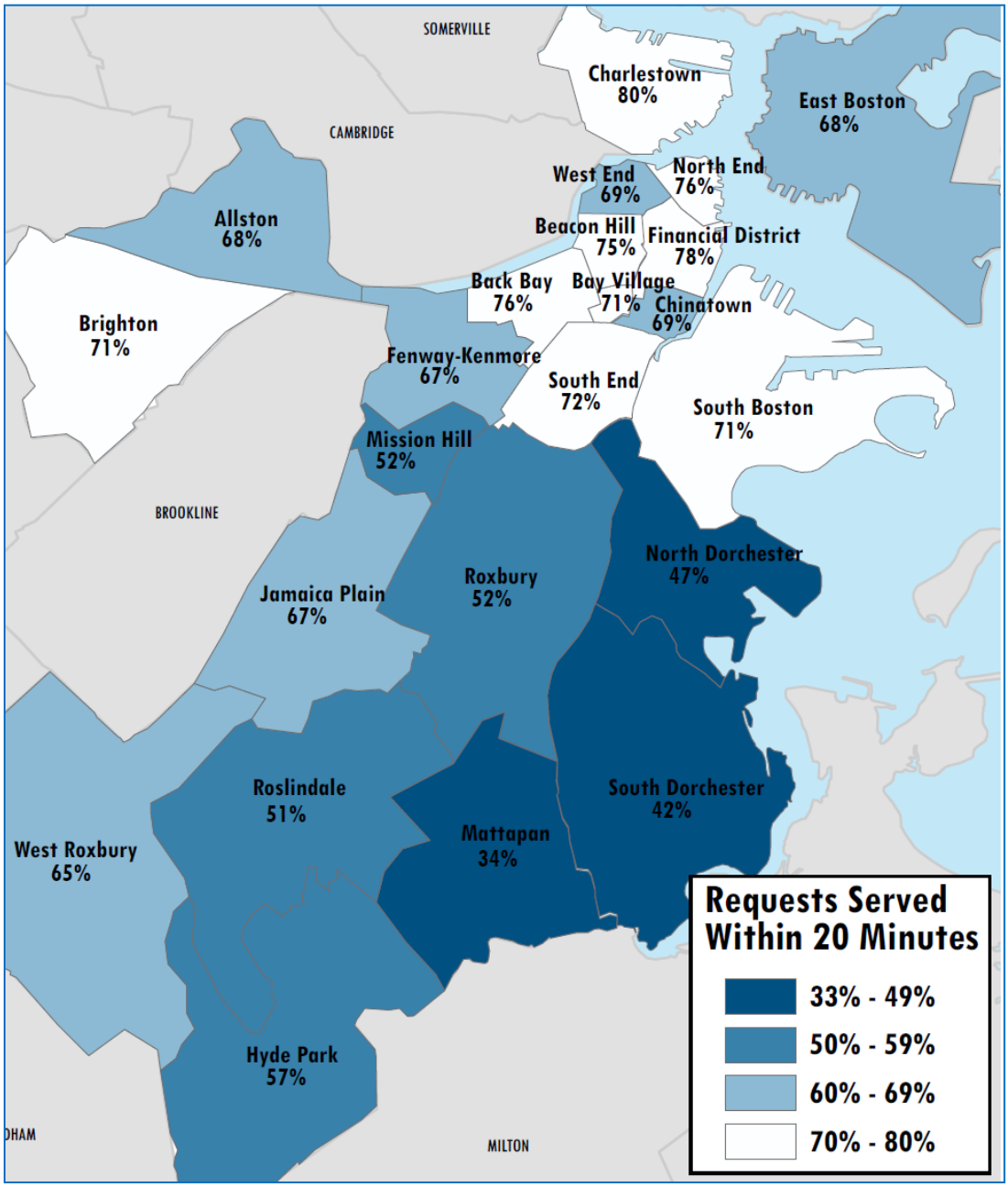
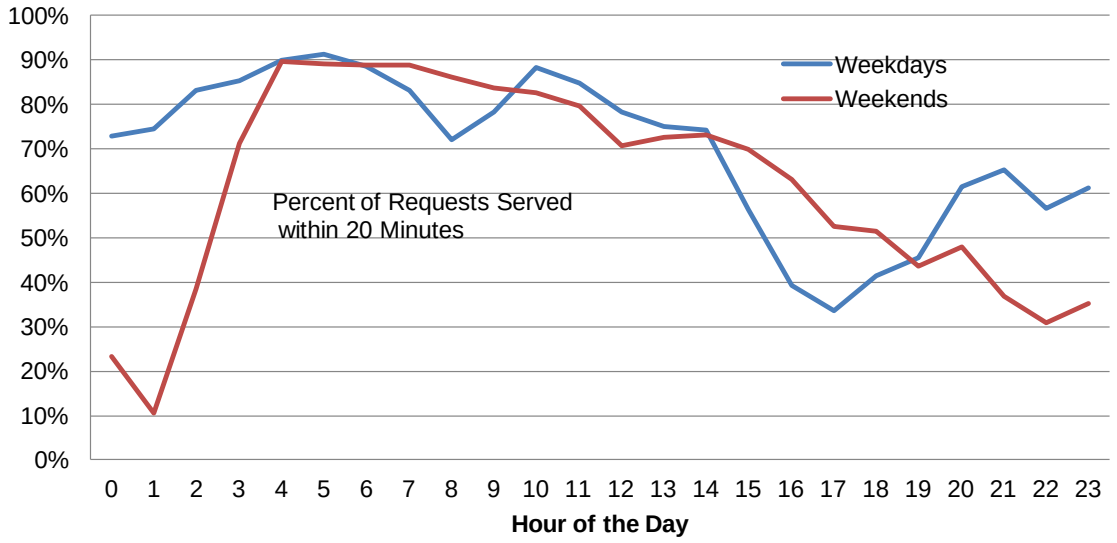


Figure ES-8 shows that responsiveness not only varies spatially, but by time of day. Averaged over the whole city, responsiveness is between 70% and 90% from about 4 a.m. to 2 p.m. After 2 p.m., responsiveness declines continuously into the evening hours. In many areas of Boston, the chances of getting a taxi within 20 minutes are less than 50% between 6 p.m. and 3 a.m.

Figure ES-8 Responsiveness by Time of Day



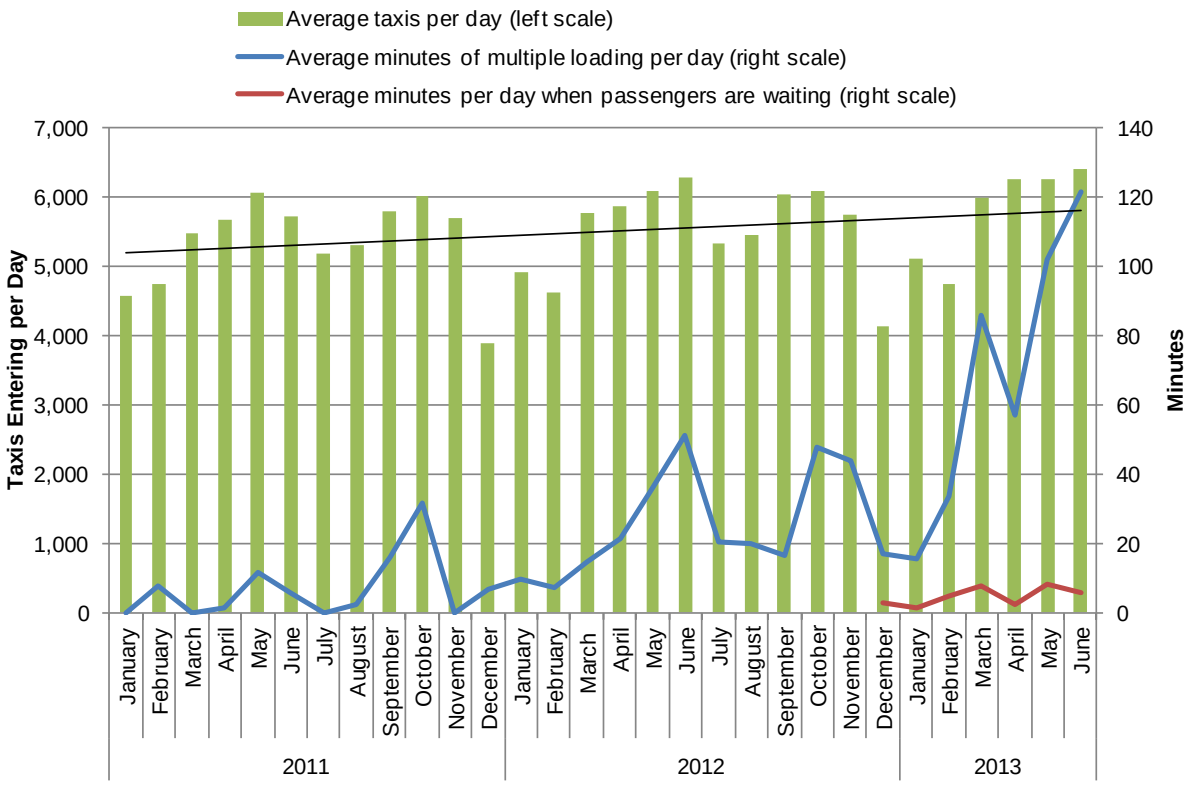
Data from taxis stands and from Massport's Logan Airport was also collected. As shown in Figure ES-9, the data from taxi stand observations indicate that wait times vary but average just under one minute; however, wait times in the late nights/early mornings are substantially longer.

Figure ES-9 Average Passenger Wait Time at Taxi Stands

Location and Time Period	Average Wait Time (m:ss)
Back Bay Station 4:45 - 6:00 p.m.	0:31
Boylston St outside Hynes Convention & Prudential Ctr 12:01 - 2:30 a.m.	4:12
Park Plaza on St. James Ave 11:00 a.m. - 2:30 p.m.	0:00
Dorchester - Ashmont Station 3:15 - 6:10 p.m.	0:12
Downtown - Pearl St 11:00 a.m. - 1:35 p.m.	0:00
South Station on Atlantic Ave 2:30 - 3:10 p.m.	0:16
South Station on Atlantic Ave 2:45 - 4:35 p.m.	0:12
South Station on Atlantic Ave 3:00 - 7:00 p.m.	0:00
North End - Hanover St 5:00 - 6:00 p.m.	0:00
South Boston - East Broadway between L St and K St 12:00 - 1:35 p.m.	0:00
Average of All Wait Times of All Observations	0:53

The data from Massport in Figure ES-10 shows that the number of taxis entering the taxi pool has been growing at around 4% per year, comparing each month to the same month in the previous year. Not only has the number of taxis serving the airport increased, airport staff have been increasing their use of multiple loading, especially in 2013, reaching an average in June of two hours per day when multiple loading was in effect. In December 2012, Massport began reporting the average wait time for passengers when no cabs were available. From December 2102 through June 2013, the average wait time observed was 5 minutes when no cabs were available. During such time, Massport's starters had to resort to multiple loadings. The worst case was on Thursday, March 7, when passengers had to wait an average of 31 minutes; on this day there was a three hour period when multiple loading was in effect.

Figure ES-10 Logan Airport Taxi Trends



SOURCE: Massport

Prominent Issues

A summary of prominent issues as identified by City officials, stakeholder organizations, radio associations, and taxi drivers (through the driver survey and focus groups) are identified below.

Issues for Taxi Customers and other Organizational Stakeholders

- **Poor performance in response to trip requests.** When a customer requests a trip via the telephone or a smartphone application through a radio association, only 78% of the requests are completed, and only 87% of the served trips are picked up within 20 minutes of the call, based on data from one dispatching system representing 25% of the fleet.
- **There is unmet demand during peak hours.** Regardless of what neighborhood needs service, many report that during rush hour, late nights on weekends, and during inclement weather, it is difficult to get a cab either via street hail or through the dispatch. Generally, this impact is on the ONEin3 population (more than one-third of Boston's population). This unmet demand for taxi service has partially been accommodated by transportation network companies (such as Uber) that have partnerships with taxi drivers and livery vehicle drivers. However, it is difficult to discern how large this potential market is. Some customers use TNCs such as Uber or Lyft, other customers, in particular the elderly, may not have other options.
- **Rates are either difficult to access, are not in Rule 403, or are confusing.** While base rates – but not all charges – are displayed on the passenger information monitor (PIM), some customers have difficulty finding the rates, and those that are able to find the rates may not realize they are displayed over multiple "pages." Also, how you access that information is different depending on the PIM used. Thus, if there is a dispute at the end of the trip, it is not easy to support point because the supporting data is not easily accessible or not there. Additionally, there is specific confusion over (1) large vehicle charge of $6:00; (2) distinctions between Logan Airport and East Boston that affect an additional $2.75 charge ; and (3) the $2.25 Massport pool entry fee to customers. Massport staff indicated a desire to have a flat rate structure to/from airport, as they have received complaints from out-of-towners. Staff reports that the first question visitors in the taxi queue ask is "What will the fare be to (a specific location)?"
- **Insufficient, undersized, and unknown taxi stands.** Taxi customers and taxi drivers alike could benefit from additional and strategically located taxi stands that are better marked and better advertised.
- **Little assistance and public education/information.** Visitors and local customers alike have little guidance (except perhaps for taxifarefinder.com) as to the approximate fares between the Airport and popular locations. There is little information available to Boston residents and employees and no public education efforts. While rates are posted on the Hackney Unit's website and are available on the PIMs, there is no information

available about rules and regulations regarding out-of-town pick-ups, TNCs, driver behavior, etc. that is available for public consumption.

- **WAVs are not compliant with City of Boston standards, are not regularly inspected, and are not readily available.** The City's Disability Commissioner initiated a recent (June 2013) inspection of 98 WAVs per Hackney requirements and found that only one vehicle met the City's WAV standards. Correct specifications are not being used to retrofit vans, and there have been no compliance inspections of WAVs prior to being put in service. The City's Disability Commissioner also reported that persons requesting a WAV through radio associations have found it challenging and frustrating: even it a WAV is successfully dispatched, it may be unusable.
- **Driver training.** Stakeholders have expressed mixed reviews on driver training; some think that the system works well as is; others think the system needs a complete overhaul.
- **TNCs and livery vehicles are not regulated.** TNCs (such as Uber) and livery service operators (who are licensed by the Commonwealth and receive a Business Certificate from the City) do not have a regulatory body providing oversight. Some TNCs already comply with Hackney regulations regarding background checks, etc.; others do not. This poses several issues, in addition to those voiced above by drivers, medallion owners and the radio associations:
  - **Customer safety:** Stakeholders are concerned that livery service drivers do not have to undergo a standard criminal and driving record background check and include former taxi drivers who are no longer allowed to drive a taxicab because of violations.
  - **Pricing:** Stakeholders voiced concerns of unfair practice that Hackney licensed taxis may only charge customers the fare rates outlined in Rule 403, and unregulated services may charge customers a surcharge depending on the time of day/week, and some charge the drivers a certain percentage of the trip.
  - **Access:** Stakeholders expressed that many seniors, persons with disabilities, low income persons, and tourists do not own or have access to smartphones or the web, and therefore are unable to access these types of services.
- **Complaint management/response.** On the Hackney Unit website, it states that staff will respond to customer complaints within 10 business days. Some customers have reported that it often takes up to a month to be contacted. Also, the window of time to discuss a complaint – sometimes a specific two hour period on a specific day -- can be unreasonable.
- **Little outsourcing of Hackney functions.** Many stakeholders reported that some Hackney functions are ineffectively operated in-house by a uniformed officer and may be able to be handled more effectively by a contractor. Functions include license renewals, inspections, and training. Others suggest that having uniformed officers perform some of these functions is effective, as drivers respect and obey a uniformed officer.

- **No forum or process for stakeholder input.** Many stakeholder organizations voiced that they have been left out of the process of providing input to taxi issues and regulatory matters. There hasn't really been a reliable and objective forum or any process to do this, and many suggested a desire to be on such a "task force" or "committee" if one is formed. Some stakeholder organizations stated that their interview held in the course of this study was the first time they had been asked to voice an opinion.
- **Not enough taxis serving Massport at peak times.** Massport staff reported that at peak times, there can be 100 or more customers waiting for a taxi at each terminal. They report that the worst time is Friday nights, when it's raining, and on college graduation weekends when multiple loading – and the use of livery vehicles – is required. Massport staff reports that multiple loading periods can sometime last for hours (the most recent data from June 2013 shows that an average day has about two hours of multiple loading).
- **Institutional users perceive there to be a lack of taxi availability.** Users such as BCEC and MASCO (representing hospitals and institutions in the Longwood Medical Area) are not provided service at the level of their need. User needs (and their respective institutional needs) are unlikely to be served by TNCs for operational, licensing, and perceived safety reasons, but they do not have a way to communicate effectively to the taxi industry. Individual arrangements and communication protocols have been established but not always achieve desired results.

Issues for Taxi Drivers, Medallion Owners and Radio Associations

- **Lease agreements cause disputes between medallion owners and lessees.** Medallion lease agreements are only for one to two years; however, lessees often purchase a vehicle that they expect will last up to six years. When a medallion owner does not renew a lease agreement, the lessee is "stuck" with an outfitted taxi but no medallion. In some cases, the medallion owner has helped to finance the vehicle. When the same medallion owner does not continue the lease, it forces the driver to sell his vehicle. Often, the medallion owner is the only option, but the offer is to buy the vehicle for a fraction of its worth. The driver may have to do this to continue being able to drive a taxi. Once the medallion owner buys the vehicle, he shifts it back to the driver.
- **No receipts for cash payments.** Some shift drivers have indicated that they have been unfairly charged for various circumstances from previous shifts and do not have an itemized receipt to support their argument. Rule 403 Section 6 mandates that medallion owners, managers, or lessees shall provide immediate receipts to drivers for all payments and transactions; in addition, Rule 403 Section 7 reads that radio associations shall provide an immediate receipt to medallion owners, managers, and lessees for all payments and transactions. There is inconsistency on when receipts are issued and what information is included on the receipt. Some use them; some don't. A lack of a receipt makes it impossible for a driver or other to have proof of payment for various payments,

resulting in "he-said/she-said" issues. (The Hackney Unit has been working on a universal receipt form.)

- **Dispatcher tipping.** According to driver survey and interviews, tipping radio dispatchers (e.g. to get a long trip) or tipping window dispatchers (e.g. for non-regular drivers to move to the head of the waiting line to get a taxi) does happen in some instances. From the survey, 1.3% of the driver survey respondents mentioned this issue. This response suggests that tipping may not be a dominant feature of driver-dispatcher-owner interactions; still, it should nonetheless be watched out for and addressed where it happens.
- **Illegal pick-ups are not enforced.** There are on-going illegal pick-ups in Boston by livery vehicles, out-of-town taxis, and "gypsy" taxis (sedans or vans painted to look like a taxi or livery vehicle, but they are unlicensed) who "act" as taxicabs. Issues include:
  - Legal requested pick-ups via illegal street hails within the City of Boston
  - Curbside pick-ups at or adjacent to taxi stands (vehicles often wait in between the taxi stand and building entrance/exit)
  - Paint schemes, logos, decals, and company names that mimic Boston radio association schemes to attract customers
  - Little to no enforcement at taxi stands, hotels, and on street to minimize illegal pick-ups

  [Note: Data provided by the Hackney Unit indicate that over 300 citations in 2011, almost 400 citations in 2012 and over 500 citations in 2013 year-to-date were issued for such incidents; however, taxi drivers suggest that the incidence of illegal pick-ups is much more prevalent.]
- **Not enough taxi stands.** Drivers also are in favor of additional taxi stands and would like to some of the existing taxi stands expanded and better marked. Drivers also mentioned a desire to establish "temporary" taxi stands at Fenway Park.
- **Designated public rest rooms.** Taxi drivers would like to see the City designate specific public restrooms which they would be allowed to use.
- **New car premium fee is confusing and ineffective.** Fees assessed to shift drivers for new cars (defined as four model years old or less) are excessive and unnecessary since all vehicles are six years old or less, and as of June 2013, only about 13% are more than four years old.
- **Radio association dues are seen as inequitable; required affiliation seen as unnecessary.** Required affiliation with radio associations is required but mainly functions as an (important) avenue for electronic trip level data collection – through their contracts with credit card processing vendors. There are many drivers who accept dispatch trip offerings, but many do not or accept very few, but still have to pay the weekly association dues. Some of the associations do not actively advertise, do not assist with disputes, and with the exception of dispatch, do not provide any meaningful

services to medallion owners or drivers. Some drivers are supportive of removing the requirement for radio association affiliation or keeping the requirement but changing to a "per trip" dispatch fee. If the latter, some drivers have also suggested that the long-term financial commitments that come with affiliation should be removed.

- **Excessive financial obligations.** When a medallion owner signs on with a radio association, a 10-year financial obligation to the associated credit card processing vendor would appear to become part of this affiliation contract, and there also appears to a fairly stiff penalty for a medallion owner disestablishing relations with the credit card vendor. In cases where a medallion owner sells his/her medallion and the buyer chooses not to associate with the same radio association, for example, the seller may owe the credit card vendor $1500 per year for the remaining years of the 10-year contract. We think this financial obligation applies to CMT and not to Verifone, but are not 100% certain. We also do not know whether the obligation would be applied to cases where the buyer affiliates with another radio association who has a relationship with CMT. More investigation into this issue is warranted.
- **5% to 6% fee (and other fees) for credit card transactions.** Drivers would like to see the percentage for credit card transaction processing fees reduced. Some drivers report that there is some inconsistency over what specific elements of the transaction amount are considered in this calculation, i.e., is the tip included? Are tolls included? Are additional fees such as the large vehicle charge included? Drivers also mentioned that the limitations and fees associated with accessing credit card trip reimbursement payment from designated ATMs and banks can be onerous, and that they would like direct control over choosing the banks to which credit card reimbursements would be deposited.
- **8% fee for voucher processing.** Rule 403 permits radio associations to assess an 8% fee to drivers who receive voucher payments from employees of organizations to which the association has distributed such vouchers. This seems excessive to drivers.
- **Paper-coupon program for seniors is cumbersome.** The senior coupon program, which subsidizes taxi rides for seniors, utilizes a paper coupon, which (1) is cumbersome to administer and use; (2) causes additional administrative labor for the City and for the radio associations which often wait a few months to get reimbursed for coupons submitted to the City, and (3) is susceptible to fraud.
- **Logan Airport charges.** Drivers would like to see a mechanism put in place where they are credited for a $2.25 taxi pool fee and/or do not have to pay the $5.25 tunnel toll if they respectively return from the airport taxi pool or from the airport without a fare.
- **Advertising revenues do not go to the medallion owner or driver.** Taxi advertisements generally come in two ways: (1) the rooftop signage and (2) video advertising on the PIMs. Neither medallion owners nor drivers receive any benefits from these revenues; the rooftop signage revenue goes to the radio dispatch association, noting that some radio dispatch associations do offer discounted weekly dispatch fees to

medallion owners that advertise via rooftop signage. It is unclear who receives the video advertising revenue.

- **Competition from unregulated TNCs.** Medallion owners, drivers and radio associations all mentioned that Uber and other TNCs that partner with livery vehicle and other private for hire operators are "stealing" business from taxis while not having to undergo or abide by the same regulations as the taxi industry.
- **Specific Perceived Shortcomings of the Hackney Unit**
  - **Inconsistency in enforcing Rule 403.** Some rules are consistently enforced (such as radio association membership) and others are not (such as receipts for payment and WAV standards). There are also rules that are not in Rule 403 that are enforced, including that a radio association must be located within the City of Boston.
  - **Lack of enforcement in protecting taxis.** Medallion owners and drivers view the BPD as focused on taxi driver violations, and that that effort is not in balance with the lack of effort put toward protecting taxis from out-of-town taxis, bandit/gypsy taxis, and cruising livery vehicles acting as Boston taxis, i.e., responding to hails and picking up passengers in taxi stands in Boston. [See history of relevant citations discussed above.]
  - **Decision-making has little to no input from radio associations, medallion owners, and drivers.** Stakeholders report that many regulations are implemented without seeking input from the industry and are mandated to be implemented "overnight", or on short time frames, yet no systems are established. This includes Rule 403, implementation of credit card payment technology, and the driver training program. There is no documented or followed procedure to get rules changed or updated.
  - **Inconsistency of Hackney leadership.** The effectiveness of the Hackney Unit with a "revolving door" of leadership (8 Captains/Lieutenants and 8 Sergeants since 1997) has been inconsistent. It is also difficult to discern who is in charge of what issues (i.e. Civilian Leadership or the Captain). Without a clear point of contact, questions/issues have gone unanswered. There are no identified individuals/departments to address issues regarding associations, drivers, leases, the public, etc.
  - **Is the Hackney Unit the right entity to regulate the taxi industry?** Some drivers are supportive of the keeping taxi regulation under the auspices of the Hackney Unit. The United Steelworkers Union's Boston Taxi Driver Association, which represents several taxi drivers (we heard varying numbers) has suggested that the Hackney Unit is not be the right entity for taxi oversight (because of the issues above), and would prefer a civilian commission.

Issues from the Hackney Unit's Perspective

- **Labor for Dispute Resolution.** An overabundance of Hackney Unit staff labor is spent resolving disputes between drivers and medallion owners, especially over lease agreements and payment due. The Hackney Unit has been brought into these discussions because the City provides the lease agreement forms, and because there paper receipts for cash payments have been lacking in detail. See above.
- **Confusion over Definition of Maximum Vehicle Age.** Rule 403 is not clear in identifying what a "model year" is. According to Mark Cohen, the maximum age of the vehicle (i.e., no more than 6 years old) is based on of January 1 of the model year, regardless of the date of the purchase. This seems reasonable. However, Rule 403 does need to be updated with this definition.
- **Customer fees that are not in Rule 403.** It is the drivers' understanding that they may pass along – and they do pass along -- the Massport/Logan Airport taxi pool fee of $2.25 to customers upon picking them up in from the of the terminals. This is not specified in Rule 403. Moreover, Hackney Unit staff has stated that it has no control over whether this $2.25 fee is charged to the passenger or not. There is also a $6.00 customer fee that is charged to a customer who requests a large taxi. This is not specified in Rule 403, nor is a large taxi defined. The type of request is also not defined. For example, can a driver charge the $6.00 fee to a group of 4 passengers who hails a 5-passenger taxi?
- **East Boston vs. Logan Airport.** Hackney Unit staff – and drivers and customers alike-- are lacking clarity on the circumstances under which the $2.75 fee may be charged on a trip from Boston to Logan Airport. Indeed, this lack of clarity has resulted in complaints. Rule 403 states that the $2.75 fee can be charged on trips to the airport, and that it cannot be charged for trips from Boston to East Boston. Clarity is needed however on what exactly is considered the airport and what is in "East Boston." For example, are the Hilton Airport, the Hyatt Hotel, and the new rental car facility considered "airport" or "East Boston" locations?
- **Reporting of Data.** Trip level data is accessible on line from the credit card processing vendors for complaint/dispute resolution or to follow-up with an official incident. And there is some very high-level reporting conducted by a data analysis contracted by the Hackney Unit. However, there is an abundance of reporting that could be available and that could be used to perform many of the analyses from this study that is not being requested. The issue is a bit murky because there is no direct contractual relationship between the City and the credit card processing companies.

ES.4 RECOMMENDATIONS

The table below summarizes identified Boston taxi industry issues and recommendations (explained in more detail in Chapters 6-7). Recommendations are offered for short-term implementation—within a one-year time-frame—and for long-term implementation. Long term recommendations require more time because of their complexity or are dependent on the results of the short-term recommendations.

Issue	Short-Term Recommendation	Long-Term Recommendation
Customer-Oriented Issues		
Poor performance in response to trip requests	Consider incentives for drivers to take dispatch calls Reports and data from radio associations Funnel taxi fines to a new fund to test incentives	Centralization of radio dispatch functions
Unmet demand during peak hours	Consider incentives for drivers to take dispatch calls Implement an annual process to review meter rates and medallion supply Consider peak period surcharges (Chapter 5 analysis shows that a $2 nighttime surcharge would increase annual driver income by about $3,000) Funnel taxi fines to a new fund to test incentives	Centralization of radio dispatch functions
Confusion over extra charges ($2.25 Massport/Logan Airport Taxi pool charge; $2.75 charge from Boston to the airport; $6.00 “large vehicle” charge)	Explore alternatives for a flat fare from Logan Airport Redefine airport trips and non-airport trips in Rule 403 Add all charges to Rule 403, the Hackney website, backseat monitors, and the fare decal	
Rates are either difficult to access or not displayed	Make taxi rates more accessible to customers Information at airport Public education campaign Add all charges to Rule 403, the Hackney website, backseat monitors, and the fare decal	
Insufficient, undersized, and unknown taxi stands	Taxi stand expansion, improvements, and advertising Institute temporary taxi stands at Fenway events	

Issue	Short-Term Recommendation	Long-Term Recommendation
Lack of visitor assistance and public education/information	Make taxi rates more accessible to customers Information at airport Transfer lost and found item management to radio associations Public education campaign Funnel taxi fines to a new fund to test incentives	One paint scheme Flat fare(s) between Logan Airport and Boston proper
WAVs are not compliant and not readily available	Outsource WAV inspections Upgrade WAVs so they are compliant with City specs Funnel taxi fines to a new fund to test incentives to replace non-compliant WAVs early and to replace non-accessible taxis with WAVs	Allow for extended vehicle usage
Driver training	Outsource/upgrade taxi driver training Funnel taxi fines to a new fund to test incentives	
Transportation Network Companies (TNCs) and livery vehicles are unregulated	Create a new license for transportation network companies	Explore the creation of an independent taxi and livery department or commission Establish regulations for livery oversight if TNC licensing is not enough
Complaint management/response	Upgrade reporting of complaints Establish a taxi advisory committee (TAC)	
Little outsourcing of Hackney functions	Outsource driver training Outsource/upgrade taxi inspections (Chapter 5 analysis shows that longer service lifetimes of 1-2 years does not result in substantial income gain/loss)	Allow for extended vehicle usage for taxis that pass more rigorous inspections
No forum or process for stakeholder input	Establish a Taxi Advisory Committee Transfer dispute resolution functions to a city ombudsman and existing taxi appeals board	

Issue	Short-Term Recommendation	Long-Term Recommendation
Not enough taxis at peak times	Consider incentives for drivers to take dispatch calls; funnel taxi fines to a new fund to test incentives Consider a peak period fare surcharge (Chapter 5 analysis shows that a $2 nighttime surcharge would increase annual driver income by about $3,000) Create a new license of transportation network companies	Centralization of radio dispatch functions
Institutional users have a persistent lack of taxi availability	Consider incentives for drivers to take dispatch calls; funnel taxi fines to a new fund to test incentives Upgrade WAVs Create a new license of transportation network companies	Centralization of radio dispatch functions
Taxi Drivers, Medallion Owners, and Radio Associations		
Lease agreement conflicts	Transfer dispute resolution functions to a city ombudsman and taxi appeals board	Explore the creation of an independent taxi and livery commission
No receipts for cash payments	Require printed driver receipts	
Dispatcher tipping	Education about driver rights	Centralization of radio dispatch functions
Illegal pick-ups are not enforced	Progressive fines or impoundment for illegal poaching Taxi stand signs to include fine information Funnel taxi fines to a new fund to test incentives	Establish regulations for oversight of livery operators
Not enough taxi stands	Taxi stand expansion, improvement, and advertising; TAC to identify locations for new taxi stands; temporary stands for Fenway events	
No designated public rest rooms	Create a map or list of public rest rooms for drivers	
New car premium is confusing and ineffective	Reduce the new car premium in Rule 403	
Radio association dues are seen as inequitable; required affiliation seen as unnecessary		Centralization of radio dispatch functions
Excessive financial obligations	Consider requiring all medallion leases to be for the life of the vehicle	Centralization of radio dispatch functions

Issue	Short-Term Recommendation	Long-Term Recommendation
5% to 6% fee (and other fees) for credit card transactions	Consider setting a cap on credit card processing fees or issuing an RFQ to pre-qualify credit card processing vendors. Drivers should have control over choosing ban accounts in which credit card trip reimbursement is deposited.	
8% fee for voucher processing	Eliminate processing fees for radio association vouchers	
Paper-coupon program for seniors is cumbersome	Automate the senior taxi coupon program and eliminate driver fees for coupon processing	
Logan Airport charges	Make taxi rates more accessible to customers and add all fees to Rule 403	Explore alternatives for a flat fare from Logan Airport
Advertising revenues do not go to the medallion owner or driver	Needs further investigation	
Competition from unregulated TNCs that partner with livery operators	Progressive fines or impounding for illegal poaching Create a new license for transportation network companies	Explore the creation of an independent taxi and livery department or commission if short recommendations do not have desired results Establish regulations for oversight of livery operators
Inconsistency in enforcing Rule 403/ Clarity of Rule 403/ Rule 403 is out of date	Place a BPD Officer in Charge of the Hackney Unit Add a Lieutenant to the Hackney Unit Make clarifications to Rule 403 Establish a taxi advisory committee Make taxi rates more accessible to customers and add fees to Rule 403	Explore the creation of an independent taxi and livery commission Overhaul Rule 403
Lack of enforcement in protecting taxis	Progressive fines or impoundment for illegal poaching Establish a taxi advisory committee Better monitoring of complaints	Establish regulations for oversight of livery operators
Decision-making has little to no input from radio associations, medallion owners, and drivers	Establish a taxi advisory committee	

Issue	Short-Term Recommendation	Long-Term Recommendation
Inconsistency of Hackney leadership	Place a BPD Officer in Charge of the Hackney Unit Add a Lieutenant to the Hackney Unit Maintain leadership continuity	
Is the Hackney Unit the right entity to regulate the taxi industry?	Keep regulatory oversight with BPD–for now	Explore the creation of an independent taxi and livery commission if Hackney Unit is unable to implement short-term recommendations
Issues from the Hackney Unit's Perspective		
Labor for dispute resolution	Transfer dispute resolution functions to a City Ombudsman and Taxi Appeals Board Outsource support functions	
Confusion over definition of maximum vehicle age	Policy governing vehicle age should be clarified in Rule 403 based on January 1 of model year	
Customer fees that are not in Rule 403	Add all charges to Rule 403, the Hackney website, backseat monitors, and the fare decal	
East Boston vs. Logan Airport	$2.75 charge and Logan Airport/East Boston distinction	
Reporting of data	Require reports and data from radio associations	Alternative strategies based on ongoing analysis

1. STUDY PURPOSE, APPROACH, AND REPORT ORGANIZATION

1.1 STUDY BACKGROUND AND PURPOSE

The general purpose of this study is to conduct a review of Boston's taxi industry. In its Request for Proposals (RFP), the City identified the following topics to be examined, noting that, in part, the study and its objectives stemmed from local press coverage about taxi service in Boston.[1]:

- Oversight and enforcement of taxi regulations
- The financial relationship between the radio associations, medallion owners, and drivers
- The treatment of taxi drivers and discriminatory practices
- The spatial and temporal demand for and availability of taxis in the City's neighborhoods.
- The relationship between the taxi industry, and new smartphone / internet-based services that are used to request taxi service and/or other for-hire (livery) services.

In order to address these issues, the City in its RFP very appropriately requested a broad and "comprehensive review of the City of Boston's taxi system, its operation, regulation, and oversight." As these are all connected, the potential solutions could involve changes in:

- The rules governing how medallion owners, radio associations, and drivers interact
- Rules governing the provision of service
- Data provided to the City and how it used
- How taxi service is monitored and the staff and tools needed to perform that function

The number of medallions, the number of drivers, and the fundamental economics of taxi operation all have a major impact on all of the issues the City has raised. The rates of fare and

[1] "Driven to the Edge," Parts 1-3, *The Boston Globe* Spotlight Team, 31 March 2013 - 02 April 2013; subsequent *The Boston Globe* articles in Spring/Summer 2013.

lease rates that are controlled by the City, the demand for taxi service at the current rates of fare, and the City-established limit on the number of medallions all have a major impact on drivers' ability to earn a living, their relationship with cab and medallion owners, opportunities for discrimination, and the kind of service customers can expect. For this reason, the study undertook an economic analysis of the current earnings potential of drivers and medallion owners, and also how potential regulatory and market changes would change these earnings.

With press coverage focusing on the treatment of drivers, the City has an interest in ensuring that drivers are not mistreated, not only for humanitarian and social justice reasons, but also because the treatment of drivers has a direct bearing on the level and quality of service that is available to the public. If driving a taxi is not an attractive occupation, then the quality of service available to the public is likely to suffer.

Levels of taxi service likely differ from neighborhood to neighborhood in Boston. Differences may be especially pronounced compared to downtown. *Perceptions* of taxi availability probably vary to an even greater degree. As Boston continues to evolve and enliven, a number of changes will continue to affect the demand for taxi service:

- Commercial growth outside the downtown, especially in the Seaport/Innovation District and Longwood Medical Area
- Continued growth in hotel space throughout the city
- Growing residential neighborhoods around the city with a significant population of young adults needing transportation options (35% of Bostonians are between the ages of 20-34 and 58% of these "ONEin3" Bostonians take public transportation, bike, or walk to work)[2]
- Consistent need to provide access to all in a non-discriminatory fashion, especially where public transportation is unavailable, unreliable, or is outside service span

As noted above, the City also asked the consultant to "assess recent changes in the taxi and for-hire market, including recent growth of competing services such as for-hire vehicles, technological advances, and smartphone applications." Taxi drivers, taxi vehicle and medallion owners, and radio associations have long complained about competition from for-hire vehicles (i.e. livery vehicles), especially when such vehicles and companies do not operate under the same set of regulations. In some cases this competition is entirely legitimate, but in many cases non-taxi for-hire vehicles act in a way that is almost indistinguishable from taxicabs. In particular, the advent of new app-based services blurs the line between taxis and other for-hire vehicles even more. For example, when a customer orders a livery vehicle using a smartphone app, this might be viewed as a form of pre-arrangement. But if a customer uses the same app or a similar one to order a taxicab with a smartphone app, that can be viewed as "electronic hailing."

This raises issues regarding protecting taxi drivers and medallion owners from perceived unfair competition, and whether the City should protect the monopoly it has given them. Typically, it is

[2] http://www.onein3boston.com/wp-content/uploads/2009/07/ONEin3DemographicBreakdown_12.12.12.pdf

argued that taxi drivers and medallion owners have a right to expect the City to protect them from competition because taxis are mandated to provide a universal, equal-access service, available to everyone at all times, with City-imposed limits on fares, drivers and many other rules. However, it is unclear whether taxis in Boston are in fact providing universal service throughout the City at all times.

Issues have also been raised about public safety, as the background checks, driver training, and vehicle requirements and inspections that are required for taxi drivers and taxicabs are not required for livery vehicle drivers, and drivers of so-called ridesharing services.

Beyond the contentious issue of quasi-hailing of livery and other private for hire vehicles, the growth of hailing apps for traditional taxicabs potentially changes the economics of operating a taxicab, the relationship between radio associations and drivers, the strategies that drivers employ to find business, and the availability of taxicabs to the public.

Examination of all these issues required a substantial data gathering effort. This involved gathering data from credit card vendors, which collect fare and GPS information for all trips (and not just credit card trips), dispatch system data, data from Massport/Logan Airport and BCEC, and from observations at taxi stands and other key locations. The team also administered a taxi driver survey. All of this data was used to provide insight into taxi drivers' costs and earnings, taxi availability and utilization, and how long customers have to wait to get a taxi.

As part of the study, the consulting team also gathered more subjective information to understand the perspective of all parties on the above issues. This was done by interviewing representatives of the Mayor's Office, Boston Police Department Commissioner and Hackney Carriage Unit staff, Commission for Elder Affairs, Commission for Persons with Disabilities, Office of Neighborhood Services, Massport, MBTA Accessibility Office, Greater Boston Convention and Visitors Bureau, Massachusetts Convention Center Authority, MASCO, Boston Onein3, radio associations, Steelworkers Union/Boston Taxi Drivers Association staff and executive board, Boston Taxi Advisory Group, Hailo, several large and small medallion owners and managers, and shift drivers.

Lastly, the consulting team also weighs-in on the ways that the City of Boston has upgraded the taxi fleet to include green taxis (and new vehicles) and wheelchair accessible taxis.

1.2 WORK PLAN SUMMARY

Stakeholder interviews

In-person interviews were held with representatives from various stakeholder organizations and groups:

City of Boston officials

- City of Boston Mayor's Office staff
- Boston Police Department's Commissioner
- Boston Police Department's Hackney Carriage Unit staff

- Hackney Carriage Unit Civilian Director (on administrative leave)
- City of Boston Commission for Elder Affairs
- City of Boston Commission for Persons with Disabilities
- City of Boston Office of Neighborhood Services
- Boston Onein3

Other Governmental Organizations

- Massport
- MBTA Accessibility Office

Civic Organizations

- Greater Boston Convention and Visitors Bureau
- Massachusetts Convention Center Authority

Other Stakeholder Organizations / Customer Groups

- MASCO (non-profit planning organization in Longwood Medical Area)

Taxi Industry Organizations / Representatives

- Five of the seven authorized radio associations (representatives from ITOA and Tunnel Taxi opted not to participate in the study
- Steelworkers Union/Boston Taxi Drivers Association staff and members of its executive board (two different meetings)
- Boston Taxi Advisory Group
- Representatives from large and small medallion owners
- A group of 10 shift drivers, randomly chosen, at the Boston Cab garage

Transportation Network Companies

- Hailo
- Uber (opted not to participate in the study)

Brief telephone interviews were also conducted with representatives of MART, the regional broker for the Massachusetts Department of Human Services' Office of Transportation Services and with brokerage staff for the Veteran Affairs Medical Center's transportation office in Jamaica Plain. In both cases, the brokerage managers confirmed that they currently do not use any Boston-based taxis.

Our interviews with the Hackney Carriage Unit staff and Massport staff focused on gathering information about:

- Duties, responsibilities, challenges and staffing levels
- Any limitations of existing authorities under current laws and rules
- What type of service data is readily available and ways to collect any additional needed data
- Issue that they would like to be addressed

Interviews with radio association representatives, large and small medallion owners, and taxi driver representatives focused on gaining an understanding of functions and responsibilities, relationship between radio associations, medallion owners, and shift drivers, the number of taxis and drivers that associated with these organizations, the weekly fees paid for dispatch services, the lease fees and other fees paid by weekly and 12-hour shift drivers, the relationships with PIM/credit card processing vendors, and the use of dispatching software systems. Also discussed were perceptions of trends in the taxi business, relationships with the Hackney Carriage Unit, limitations of current City administration and oversight, suggestions for improvement, and what internal practices have been used to ensure fair treatment of drivers.

Interviews with other City representatives focused on service quality and availability, including finding a cab on the street or at a cab stand, response time, vehicles, drivers, willingness to accept credit cards, and adherence to the established flat fare rules, and de facto patterns of discrimination.

While the notes from the interviews remain confidential, the information, perspectives and themes are all noted in different parts of this document.

Data Collection - service supply and demand, dispatch performance, financial data, and driver issues

The consulting team's approach to collecting service and financial data included the following:

Information on Medallions

The Hackney Carriage Unit provided the consulting team with a database of 1,825 medallions. Information for each medallion included owner type, number of medallions owned, radio dispatch affiliation, vehicle make, model and year. This database is provided in the Appendix. Additional information on WAVs (wheelchair accessible vehicles) was provided by the City's Disabilities Commissioner who, as part of a joint effort with the Hackney Carriage Unit, undertook a compliance review of the 100 WAVs in the Boston taxi fleet.

Service Data

Creative Mobile Technologies (CMT) and Verifone are the two primary credit card processing vendors, which through contracts with the radio associations, provide in-vehicle equipment capable of recording trip data (e.g., can number, trip date, pick-up location and time, drop-off location and time, mileage, fare, fees, tips, etc.) on all trips, and not just the trips paid for by credit cards. Both CMT and Verifone have given the Hackney Carriage Unit permission to access this data. The Consulting Team utilized this access to collect seven months worth of trip data (January through July 2013). Samples from this data were used to analyze taxi availability, taxi productivity, spatial and temporal demand, and as input to the analysis of driver revenue and cost information.

Dispatch Data

Dispatch data was requested from the radio associations and their dispatch system vendors for four non-holiday weeks at various times of year. Three radio associations provided data, but only one data set was usable. This data applies only to trips order by phone or internet through the radio associations. It was used for analysis of response times in neighborhoods.

Driver Survey Data

In addition to collecting electronic service and dispatch data, the consulting team also sought to elicit service, revenue and cost data, as well as attitudinal perspectives, concerns and suggestions, via a driver survey. The survey was designed with the assistance of the Hackney Carriage Unit staff. The survey was administered in various ways: consulting team staff and City of Boston interns administered the survey in key locations, including the Hackney Carriage Unit office, Massport/Logan Airport, various taxi stands, and other high-demand areas. Survey forms were also distributed in taxi garages and at the taxi inspection site, with directions to complete the survey and mail it back to the Hackney Carriage Unit or complete a survey on-line. The on-line survey was also advertised though radio association announcements and through the Carriage News. The survey return was less than expected, but did provide driver feedback on various issues. Because of the limited response, driver cost information was calibrated with similar data collected from previous and pertinent taxi studies, plus complemented by in-person focus groups with drivers.

Airport Taxi Holding Area

The Massport Taxi Pool at Logan Airport is the holding area for taxis waiting to be sent to terminals for passengers. This holding area can accommodate up to 400 taxicabs at any one time. Drivers receive a ticket when they enter the Taxi Pool, for which they are charged $2.25 by an EZ Pass system at the entrance. Massport provided electronic data for a week in December 2012 and a week in January 2013 with taxi entrance time, dispatch time, ticket number, amount charged, and which terminal the taxi was dispatched to. This data was then analyzed to show waiting time per day and per time of day. Massport also provided two years of daily totals of Taxi Pool tickets.

Massachusetts Convention Center Authority Data

The Massachusetts Convention Center Authority (MCCA) owns and oversees the operations of the Boston Convention & Exhibition Center (BCEC) and the John B. Hynes Veterans Memorial Convention Center, as well as other facilities. This data analysis focuses on taxi availability at BCEC, located at 415 Summer Street in Boston's Seaport District, where taxi issues are more prevalent. Data about taxi availability at BCEC was provided by MCCA, whose transportation agents manage a curbside taxi stand with capacity for 50 taxis on Summer Street. Usable data was provided for a sample of 2012 event attendance and taxi pick-ups and drop-offs during the events.

Observations at Taxi Stands

Consulting team staff and City of Boston interns documented wait times for both taxi drivers and customers at various taxi stands at various times. In total, approximately 500 observations were made, of which 300+ were usable. This data shows how many taxis are available for customers at these locations, how long taxis wait for customers at these locations, and how long customers had to wait for taxis at these locations.

1.3 REPORT ORGANIZATION

This Final Report is organized as follows:

Executive Summary

Chapter 1: Study Purpose, Approach and Report Organization

Chapter 2: Taxi Regulations in Boston

Chapter 3: The Boston Taxi Industry and Transportation Network Companies

Chapter 4: Taxi Ridership and Performance

Chapter 5: Driver Income

Chapter 6: Prominent Issues

Chapter 7: Recommendations

2. TAXI REGULATION IN BOSTON

2.1 INTRODUCTION

The regulation of taxis in the City of Boston is the responsibility of the Boston Police Department's Hackney Carriage Unit. A description of the Hackney Carriage Unit, i.e., its responsibilities, how it is organized, and what licensing, enforcement, and inspection efforts represent the bulk of its activities, is presented in this section. Also described are the more pertinent aspects of Rule 403 of the Boston Police Department, the "Hackney Carriage Rules and Flat Rate Handbook." The version of Rule 403 that is available on line and given to us in hard copy has an effective date of August 29, 2008 (or approximately five years ago). Rule 403 is supplemented by amendments and notices released by the Boston Police Department. In addition, Massport issues Rules and Regulations for ground transportation at Logan. These are also included in the discussion below.

2.2 BOSTON POLICE HACKNEY CARRIAGE UNIT

The Boston Police Department's Hackney Carriage Unit (referred to hereafter as the Hackney Unit) is responsible for regulating the hackney industry in Boston. The term "hackney" includes taxis, pedicabs, Segways, horse and carriage, duck tours, and other sightseeing buses and vehicles. The Hackney Unit is one of three units within the Licensing Division (which also includes the License Unit and the Public Service Unit). Captain Steven McLaughlin is the acting Director of the Licensing Division. Julie Susi is the Office Manager for the Licensing Division and supervises two Police Clerks/Typists. Within the Hackney Unit there is a day squad and a night squad. The day squad is lead by Sergeant Mark Fleming who oversees seven Police Officers and one Head Clerk Secretary. The night squad is lead by Sergeant Kevin Rodday who oversees five Police Officers. The following discussion focuses on their roles pertinent to taxi licensing, oversight, enforcement, and complaint management.

Unit Officers are responsible for reviewing and processing new and renewal taxi driver applications. Approximately five new applications are received each day. Driver application renewals are completed annually based on the driver's birthday. Officers process approximately 25 renewals per day and between 6,200 and 6,300 per year, noting that not all of these 6,300 drivers are active. Staff from the Hackney Unit estimate that about half of these drivers are active.

The Hackney Unit is responsible for inspecting taxis. Vehicle inspections are conducted twice per year (two eight-week periods) at the inspection site at Morton Street and American Legion Highway. During these weeks, two officers process 60 taxicabs per day. When a vehicle is due for inspection, an officer will send a medallion owner notification by USPS mail. Officers also conduct random on-street vehicle checks, although these are usually focused on physical vehicle inspections. "Sting" investigation operations are conducted for both Wheelchair Accessible Vehicles (WAVs) and violations in taxi garages.

The Hackney Unit manages all taxi related complaints. According to staff, approximately 10 to 15 customer complaints are received each day (although the complaint data provided by the Hackney Unit indicates there is an average of six to seven complaints per weekday for 2012). The majority of customer complaints are related to overcharges, driver conduct, reckless driving, refusal of service, and credit card issues. According to staff, customer complaints increased exponentially after credit card acceptance was mandated for all Boston cabs. The data shows that credit card complaints account for about 12% of the total complaints received.

Additionally, the Hackney Unit is responsible for mediating disputes within the taxi industry: between drivers and medallion owners, managers and medallion owners, and drivers and managers. The Unit is also responsible for administering hackney driver hearings.

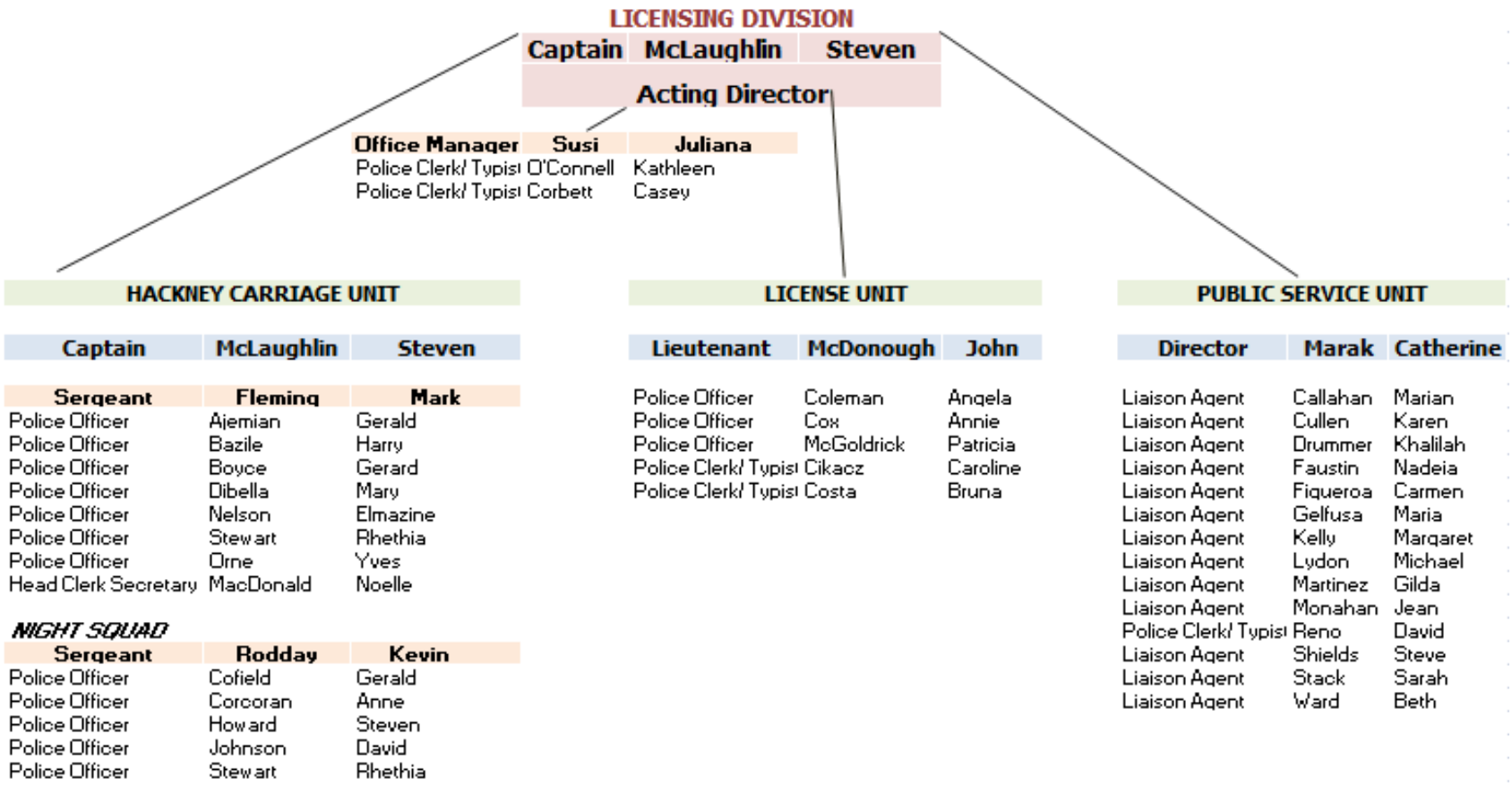
Driver complaints also frequently involve out-of-town taxis, gypsy cabs, and livery/black cars picking up customers illegally. The Unit is responsible for investigating these complaints and issuing citations for violations ($500 fine).

Hackney Unit officers also administer taxi driver training. Drivers are required to attend training one time after their application is accepted and again if they left the industry for five years or more. Driver training includes the following instruction: appropriate conduct and appearance, violence in the workplace, accepting and processing credit cards, Hackney Unit rules and regulations, vehicle standards, inspections, waybills and receipts, refusals, taxi stands, found property, rates, multiple loading, airport procedures, violations, complaints, and hearings, and other information necessary for driving in the city. WAV driver training is conducted separately. Driver training is typically offered two times per month.

Hackney Unit officers are also responsible for data entry, research, and investigation of items in the Lost and Found, which can include thousands of items left in taxis.

An organizational chart of the Licensing Division is provided in Figure 2-1.

Figure 2-1 Boston Police Department Licensing Division Organization Chart



Hackney Unit employees and job descriptions are set out by the City and are listed below. Note that job descriptions for the Director of the Licensing Division and the Office Manager do not exist.

- **Hackney Carriage Sergeant** – Responsible for oversight of the day-to-day operation of the Hackney Carriage Unit including developing and implementing patrol strategies for the purpose of regulating taxi and sightseeing bus industries. The Sergeant is responsible for monitoring citizen complaints and responding to public concerns. He or she administers the Hackney Carriage Rules and regulations and supervises the violation hearing process as outlined by those rules. He or she also supervises the training of drivers and acts as a liaison to other governmental, regulatory agencies, the Boston hospitality industry, and advocates for the elderly and disabled community. The Sergeant develops new rules, procedures, strategies and standards for improvement of the taxi/sightseeing industry. There are two patrols to which a Sergeant/Lieutenant may be assigned: the day tour and the night tour.
- **Hackney Carriage Police Officer** – Responsible for the regulation of taxi and sightseeing bus industries, including investigating consumer complaints and conducting vehicle inspections. Officers are required to have at least seven years of experience as a Patrol Officer before being considered for this position. Officers may be assigned to either the day or night tour.
- **Administrative Assistant/Clerical** – Responsible for typing reports, letters, memorandum, and other correspondence, answering telephone inquiries, providing information to the public, maintaining files and records, data entry, and other related duties.
- **Senior Research Analyst** (Not shown in Figure 2-1) – Responsible for supervising civilians and record keeping in the License Division, prepares the annual budget including purchasing, overtime, contracts and inventory control, and maintains payroll and data processing systems. He or she also acts as the liaison to the Captain, Lieutenant, License Director, Public Service Unit and the IT group and provides technical support and training to civilian staff. He or she prepares reports from Media Relations and Legal Advisors offices, coordinates the Hackney training classes and WAV training classes, and manages the funds taken in for the Hackney Training account and the Boston Taxi Industry Elderly Program account. He or she prepares daily Hackney medallion transfers and prepares data analysis, reports, and memorandum.

2.3 SUMMARY OF TAXI REGULATIONS

Introduction

Taxi regulations in Boston are covered primarily by the BPD Rule 403, “Hackney Carriage Rules and Flat Rate Handbook,” effective as of August 2008. This summary of taxi regulations was

derived from our review of this rule and through interviews with several stakeholders. Rule 403 is organized as follows:

Section 1:	Overview
Section2:	Applications (Medallions, Driver's Licenses)
Section 3:	Vehicles
Section 4:	Medallion Owners
Section 5:	Drivers
Section 6:	Leasing and Shifting
Section 7:	Radio Associations
Section 8:	Violations and Complaints
Section 9:	Miscellaneous Provisions (e.g., inspection program, elderly voucher program, and emergency conditions)
Section 10:	Rates
Appendices:	Authority, WAV taxi specifications, leasing and shifting rates, meter rates

Our summary of these regulations is meant to give the reader a primer on key provisions and is not meant to be comprehensive in nature. With that caveat, we have grouped taxi regulations into the following topics:

- Radio associations
- Medallions
- Drivers
- Fees and Fines
- Meter Rates and Fares
- Vehicles (age, equipment, meters)

A summary of regulations that pertain to each of these groupings is presented below.

Regulations Focusing on Radio Associations

Radio associations are defined by the functions that, at a minimum, they must provide:

- 24-hour dispatch service –customers should be able to call for a ride 24/7.
- Two-way radio and dispatch services –requests for taxi service can be transmitted to taxi drivers.
- WAV availability
- Taxi Coupon (65+ resident discount program) re-imbursement services –drivers affiliated with the radio associations may turn in these vouchers for reimbursement; the radio associations in turn submit these vouchers to the City of Boston for reimbursement.
- Call/dispatch record-keeping and reporting -- to include total numbers of calls, time and location of each request, the medallion number of the cab dispatched, with special reporting for WAV requests

- Lost and found functions

Rule 403 also refers to "Dispatch Services" but this is generally viewed as synonymous with radio associations.

Note that radio associations are not required to submit reports on dispatch data, but are required to maintain records for one year and furnish records upon request.

Note also that this information only includes dispatch-related information and not trip-level information on all trips served by cabs affiliated with the association. While the credit card processing companies (CMT and Verifone) do provide the Hackney Carriage Unit with on-line access to this trip data (for example, to access information in following up on an incident or complaint), there is no regular reporting on trip-level data required of the radio associations. Thus, while the Hackney Carriage Unit does have access to the data, it does not have the data in-hand, and there is no regular analysis of this data, except for periodic "high-level" analyses commissioned by the Hackney Carriage Unit and performed by a private individual retained by the BPD.

The radio associations must have a functional email address for BPD correspondence.

Each radio association must file its colors, markings, designs, decal or logos with the Inspector of Carriages, and any changes to this scheme must be approved.

Radio associations may charge up to 8% for voucher processing.

Radio associations must be approved by the Inspector of Carriages to operate in the City of Boston; however, the process for that approval (and becoming a new radio association in general) is unclear. The regulations do provide provisions that pertain to the removal of a radio association, noting that there is a documented appeal process should a removal occur.

Upon receiving a request from a customer requiring a WAV, the radio association dispatcher must either: (1) fulfill the request with a WAV affiliated with the radio association; or if that is not possible, (2) call another radio association to "forward" the request. It is unclear whether this second task is done, enforced, or effective.

The radio associations can determine the dues for medallion owners, which must be paid by check or credit card, and an immediate receipt is to be provided.

Per an amendment in December 2009, a radio association shall maintain a membership of at least 40 licensed Hackney Carriages.

Regulations Focusing on Medallion Owners

Medallion owners must be deemed suitable for ownership by the Police Commissioner; part of the application/transfer process involves disclosing ownership interests.

The medallion owners must have properly equipped and functioning vehicles. These can be vehicles that the medallion owner also owns (and either operated him/herself or shifts out to drivers), or vehicles that are owned by individuals to whom the medallion owner leases the medallion. Any such vehicles must have a properly sealed taximeter.

Medallion owners must have a Boston address, and maintain books, accounts, records and minutes for a period of five years. Medallion owners are "strongly encouraged" to keep waybills for the last calendar year, noting that this data is now maintained electronically by the credit card vendors as long as the meter is activated.

Medallions must be renewed annually by submitting required documentation to the Inspector of Carriages.

Medallions that are not used for three months must be surrendered to the Hackney Carriage Unit.

There is a specific process and steps outlined that must be followed to transfer medallions. The Inspector of Carriages keeps a Medallion File of all related paperwork for each medallion owner.

All medallion owners (or their lessee) must belong to an approved radio association and must equip the interior of vehicles with a two-way communication system that is linked to that radio association. The medallion owner is also responsible for ensuring that the taxicab has the paint scheme designated by the radio association. (Based on a 1998 agreement, there are 32 medallion owners who were exempted from having to join a radio association.)

If an affiliation with a radio association ceases, medallion owners have 30 days to re-affiliate with another approved radio association.

There appears to be no provisions that detail medallion owner obligations to the radio association.

Rule 403 specifies that medallion owners may charge a driver a maximum 6% fee on credit card transactions or the amount charged by the credit card processor if it is less. In fact, it is the credit card processing vendors that charge that fee and that deposit reimbursement less the fee in the driver's bank account. The medallion owner doesn't enter into this transaction. Rule 403 also prohibits the charging a credit card fee on extra charges and tips.

As mentioned above, medallion owners may lease their medallion to a taxicab owner or shift out his medallioned taxicab to one or more drivers. The agreements that document these arrangements must be consummated with agreement forms provided the Hackney Carriage Unit. In the case of third-party management of medallions on behalf of the medallion owner, there are no such forms or provisions in Rule 403.

Regulations Focusing on Taxi Drivers

Drivers must be 21 years of age, have a valid Massachusetts driver's license (and have had a Driver's license in the U.S. for at least two years), and complete an application for a Hackney Driver's License. The application packet is 63 pages long. Drivers must also have an original Birth Certificate, Alien Card, Asylum Document, U.S. Passport, or Naturalization Papers and pass an English language proficiency exam.

Drivers are unable to get a license if they have a driving infraction record; more specifically, if they've had a Hackney License revoked or suspended in any jurisdiction, been a Habitual Traffic

Offender as defined by state law, have outstanding or unresolved driving infractions, had their license suspended for five or more surchargeable incidents, had more than four traffic violations/accidents, had operating under the influence of drugs or alcohol convictions, and had felony, drug, sex offender, or criminal convictions/court cases.

Once they meet all these requirements, drivers must participate in driver training and pass a test before they are issued a license. As a side note, the long-time taxi driver trainer is no longer with the Hackney Carriage Units, and since then, no driver applicants have been trained.

Annual renewal of the driver permit — based on whichever date occurs first (the one year anniversary of date of issuance, driver's birthday, ICE Employment Authorization Card expires, or any other date deemed appropriate by the Inspector of Carriages) is required. Once a license has been expired for more than seven business days, the driver must apply for a license as if he/she was a new applicant. If an individual is denied a license, there is an appeals process.

All application materials and other documents are retained in a driver file.

Drivers fall into three categories: (1) those who also own a medallion and operate their own taxi (owner/operator); (2) those who lease a medallion but provide their own taxi (medallion lessee); and (3) shift drivers, who own neither a medallion nor their own taxi.

All drivers must display their Hackney Carriage license in the taxi they drive, and surrender their license upon certain circumstances identified in Rule 403.

There are in Rule 403 specific requirements for fares and fees that may be charged (see below), receipts, on-call procedures, treatment of passengers, appearance, cell phone use, refusal to transport passengers, taxi stand and WAV trip protocols, routing, and prohibitions on lock disabling, smoking, discrimination, and refusal of credit card use.

Regulations Focusing on Fees and Fines

Figure 2-2 displays the fees levied by the Hackney Carriage Unit relating to taxi companies, medallion owners, drivers, and others. Figure 2-3 details the fines levied by the Hackney Carriage Unit.

Figure 2-2 Taxi Related Fees

Item	Fee
Driver Fees (maximums)	
Medallion-only Leasing	$500 / week
Shift Rates	$77 / 12-hour shift $139 / 24-hour shift $700 / weekly[1] shift $800 / two-driver weekly shift
Shift Premium for one-year lease agreements	$10 / week
Collision Damage Waiver (optional)	$5 / 12-hour shift $9 / 24-hour shift $45 / weekly shift
Violation Assessment	$0.30 / 12-hour shift
New Vehicle Premium	$18 / 12-hour shift $22 / 24-hour shift $170 / weekly[2] shift $8,840 / yearly shift
Deposit (optional per Medallion Owner)	$500 (one-time)
Sales tax	6.25%
Application fee	$75 (one time)
License - first-time	$32
License - renewal	$32 / year
Hackney school/training	$75 (one time)
WAV Training	$40 (one time)
Medallion Owner Fees (maximums)	
Radio association fees	Varied (weekly)
Medallion renewal	$100 / year
Taxi Coupon (65+) Program	$150 / year
Meter Seal fee	$40 / year
Transfer of medallion	$250

Source: Rule 403, Hackney Driver's License Application Packet

[1] When a driver works seven consecutive twenty-four hour shifts or fourteen consecutive twelve hour shifts, he is charged the weekly rental rate.

[2] When a driver works seven consecutive twenty-four hour shifts or fourteen consecutive twelve hour shifts, he is charged the weekly rental rate.

Figure 2-3 Taxi Related Fines

Item	Fine
Medallion Owner/Manager/Lessee Fines	
Shift Driver Time Lost (over one hour) maintenance, repair, cleaning, or administration of vehicle	$8 / hour
Shift Driver Time Lost (over one hour) for misconduct	$28 / hour
Weekly Driver Time Lost (over four hours) maintenance, repair, cleaning, or administration of vehicle	$8 / hour
Weekly Driver Time Lost (over four hours) for misconduct	$28 / hour
Driver Fines	
Late return of vehicle	$8 / hour
Other	
Violation of Vehicle for Hire Ordinance	Up to $500 / occurrence

Source: Rule 403

Regulations Focusing on Taxi Vehicles

The taxi ordinance does not specify what make and model of vehicle may be used for taxi operation. Some of the more important requirements/limitations are as follows:

- New Vehicle Requirement - Only new vehicles (including WAVs) may enter service.
- Maximum Vehicle Age -- Taxis cannot be more than six years old. This is not well defined however, and needs clarification, as there is some confusion as to whether the specific expiration date is based on the new vehicle purchase date or January 1 of the model year. This rule went into effect on December 10, 2009 when this new car rule replaced earlier clean taxi standards. The exception: taxis owned by a single-medallion owner may remain in service for seven years, if the vehicle passes inspection.
- Boston address -- All vehicles are required to be registered to an address in the City of Boston, which could be a post office box, and have a current inspection sticker.
- Paint scheme and logo -- Vehicles are required to be painted with a white exterior with approved radio association markings and color scheme, plus display a medallion license "tin" on the rear of the vehicle.
- Required equipment -- Required safety equipment includes a protective partition, rear vinyl seats and floor mats, air conditioning, locks, a metal roof, a roof light, and amber trouble lights. Required equipment includes a sealed, approved taximeter that is capable of recording specific information as outlined by Hackney, a radio and related radio association equipment, electronic credit card processing capabilities that are functioning at all times, and an EZPass transponder.

- Posted information and advertisements-- The driver is also required to display certain information in the vehicle, including a fare rate card, lease/shift rate stickers, and authorized decals, signage, lettering, and numbering. Advertising must be approved by the Inspector of Carriages.
- Vehicle condition and inspections -- Vehicles also must be in clean condition and damage-free. Vehicles are inspected periodically (usually two times per year) and scheduled by the Inspector of Carriages. The inspection site is located at Morton Street and American Legion Highway in Mattapan section of Boston, near Roslindale.
- Separate WAV requirements – Specifications for WAVs are outlined in Rule 403 Appendix II and include standards similar to ADA minimum requirements for vans used in transportation services. As detailed later in this report, only one of the 98 WAVs inspected by the City's Disability Commissioner is in full compliance with the City's specifications.[3]

Regulations Focusing on Meter Rates and Fares

Fares are based on mileage and regulated by the taxi ordinance, except for flat rates that apply from Boston to cities and towns beyond 20 miles from Boston. Rates include:

- Drop rate (first 1/7 mile): $2.60
- Mileage rate (per 1/7 mile): $0.40
- Tolls additional
- Flat rate (destinations beyond 20 miles from Boston): $3.20 per mile as specified in a Flat Rate Handbook
- Idling/waiting time rate: $28.00 per hour
- $2.75 fee for trips from Boston proper to Logan Airport and North Shore Communities, excluding trips to East Boston

The $2.75 fee for trips from Boston proper to Logan Airport and North Shore Communities is roughly equivalent to half of the tunnel toll that a driver returning empty would need to pay.

Transportation Managers at Logan Airport, BCEC, and South Station may declare "emergency conditions", which indicates that multiple customers (taking different trips) may be loaded into the same taxi; fare is the metered rate minus $2.00 at each destination; no airport fees are charged; and turnpike/tunnel tolls may be added to the fare.

[3] "Taxi Service for People with Disabilities, Kristen McCosh, City of Boston Disabilities Commissioner, June 24, 2013.

3. THE BOSTON TAXI INDUSTRY AND TRANSPORTATION NETWORK COMPANIES

3.1 INTRODUCTION

Customer Perspective

From the customer perspective, customers may request a taxi in Boston in the following manners:

- Hailing – generally not restricted; one can hail a cab from anywhere.
- Taxi Stands – customers can go to one of numerous established taxi stands located throughout the City; customers have also been known to go to a hotel pick-up area, as many hotels have taxi queues.
- Telephone – There are seven licensed radio associations which customers may call 24/7 to request an immediate or advance taxi trip. Some associations (and TNCs) allow for customers to text message to confirm or track drivers.
- Computer – Customers may also request a trip via the web; two of the seven radio associations have a website from which customers can request a trip; another two radio associations have their own smart phone apps.
- Smartphone App – Customers may download to their smart phones applications (apps) which allow them to request a taxi trip directly from the radio association or directly from a driver who has partnered with a Transportation Network Company (TNC) such as Hailo, Taxi Magic, iTaxi, or Uber, noting that Uber also can be used to access livery vehicles.

The fare meter, regulated by the City of Boston Hackney Carriage Unit, is set as follows:

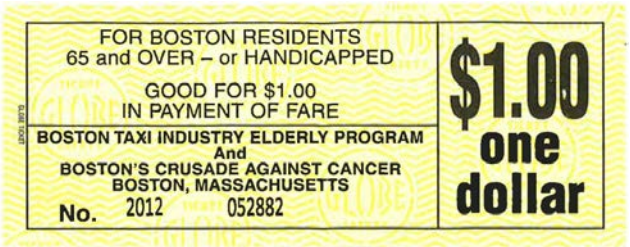
- Base fare = $2.60 for the first 1/7 mile

- Mileage fare = $.40 for each additional 1/7 mile ($5.00 per mile)
- Additional fees and tolls that are added to a customer's fare:
  - $2.25 airport fee for each trip that emanates from the airport, although we cannot find this in Rule 403.[1]
  - Highway/tunnel tolls (e.g., the taxi toll for both tunnels is $5.25)
  - $2.75 toll for all trips from Boston proper to Logan Airport and North Shore Communities; no tolls are added to the fare for trips from Boston proper to other destinations in East Boston, noting there is some confusion about what constitutes a trip to the airport vs. a trip to East Boston.
  - $6.00 charge per trip for requesting a large taxicab, although we were unable to locate this in Rule 403.
  - Idling/waiting time is charged at a rate of $28.00 per hour.
- If the destination of the trip is located more than 20 miles from City Hall, the driver may charge a flat rate; flat rates are published in the Flat Rate Handbook and are based on a rate of a per mile rate of $3.20

The fare amount plus any extras including a customer-specified tip appears on the Passenger Information Monitor (PIM) located in the passenger compartment. The customer can pay for the taxi trip in the following ways:

- **Cash**
- **Credit or debit card** – All Boston taxis are equipped with credit card readers and payment screens in the passenger compartment of the taxi; with this equipment, customers can pay for taxis note: credit card companies charge a processing fee of between 5% and 6% of the fare amount to the drivers; this amount is automatically deducted from payments to the driver (for credit card trips).
- **City of Boston taxi coupons** – Taxi coupons (in $1 per coupon denominations) are sold at 50 cents per coupon – or half price -- to Boston residents who are disabled and/or elderly (65 years and over) and to cancer patients. An example of one of these coupons is shown in Figure 3-1. Coupons are used to pay for fares, and used by some to pay for tips (some coupon users pay for tips in cash). Drivers turn in the coupon to their radio association (or medallion owner) and are paid at face value. The radio association

Figure 3-1 Boston Taxi Industry Elderly Program Coupon



[1] In an interview with Hackney Unit staff, the charging of this fee to customers is beyond Hackney's control.

then turns the coupon into the Hackney Carriage Unit. The radio association receives a check equaling the amount of the coupon turned in months later.[2]

- **Company vouchers** – Some radio associations supply private companies with (blank) vouchers (as an alternative to third party billing). The companies then provide these vouchers to their employees who need to make a taxi trip. Often the details of the trip, less the fare and tip, are completed by the company's administrative staff prior to their issuance to the employee. At the completion of the trip, the voucher is completed with fare, tip, and employee signature. Similar to the above, these completed vouchers are turned into the dispatch association. Drivers are paid for these vouchers less an 8% administrative fee (as allowed by the taxi code), and the radio associations submit the completed vouchers to the companies for payment. From interviews, several radio associations have indicated that the incidence of voucher use is declining, being replaced by credit card use.

Customers are able to register complaints through the Hackney Unit by phone or on the web. Hackney accepts complaint phone calls Monday - Friday between 8:30 a.m. - 4 p.m. On the web, complaints are filed using an online form. Although the Hackney website states that an investigator will contact the individual with the complaint within 10 business days, anecdotal evidence suggests that a follow up can take about a month.

The Taxi Industry

On the supply side, the taxi industry in Boston is composed of the following parts:

- **Boston Police Department's Hackney Carriage Unit** – The BPD Hackney Carriage Unit is charged with oversight of the taxi industry and enforcement of the taxi regulations. Major responsibilities include processing of all applications for medallions and driver's licenses and regulating the operation of the Hackney Carriage industry within the City. Of note, the Hack Division does not provide oversight of livery vehicles; however, Hackney Carriage Unit officers are empowered to fine livery vehicles licensed by the state, out-of-town taxi cabs, and "gypsy" cabs if they are acting as Boston taxis. (The Hackney Carriage Unit is discussed in more detail in Chapter 2.)
- **Medallion owners and types of drivers** – These consist of individuals or companies who collectively own 1825 taxi medallions, which authorize the individual or company to provide taxis service. The medallions themselves are numbered, have an annual expiration date and are affixed on the rear of each taxicab. Some of the medallion owners also operate their taxi vehicle. Some other owners lease their medallions to others (e.g., licensed taxicab drivers who provide their own vehicle). Other owners do not drive and either lease their medallioned taxicab to "shift drivers" or to a manager who leases the

[2] The 50% subsidy is partially paid for by medallion owners who provide $100 per medallion per year. At 1,825 medallions, this equates to $182,500. No more than 4,000 10-ticket books of scrip are sold per month. The subsidy per ticket book is $5.00. If all 4,000 books are sold each month, the subsidy required is $240,000. Thus, the $100 contributions pay for 76% of the subsidy.

medallioned taxicab to shift drivers on behalf of the medallion owner for a fee. According to the Hackney Carriage Unit, there are approximately 6800 drivers who have either been granted a new taxicab driver's license or have renewed their taxicab driver license within this past year.

- **Radio Associations** – There are seven "radio associations" licensed by the City of Boston. By city regulation, all medallion owners must affiliate themselves (and their medallioned taxicab) with one radio association. Medallion owners may switch affiliations at any time. Various dispatch systems are used. All are computerized, which means that dispatches are automatically sent to the logged-on taxi in the best location and who is available. In some cases the dispatch system is provided by the credit card vendor (see below). Other radio associations use other computerized dispatch systems such as DDS and Mobile Knowledge. Some of the radio association have developed their own "app" that allows customers to request a trip via their computer or smart phone. In the case of a smart phone with GIS technology, the location of the user is automatically transmitted. Requests are automatically sent to the association's dispatch system.
- **Support Services** – Some of the companies that own radio associations and/or large numbers of medallions provide various additional support services including vehicle maintenance and towing, fueling, and insurance. Depending on the association or company, these services may be included in an association's weekly fee or is available on a fee for service basis. In the case of maintenance, it is not unusual for maintenance providers to offer and provide maintenance services to taxicabs not affiliated with the association or company.
- **Credit card processing / PIM vendors** – There are two credit card processing vendors, Creative Mobile Technologies (CMTA) and Verifone, which between them provide in-vehicle computerized dispatch and credit card processing services to all but a few medallion owners and drivers. The in vehicle equipment consisting of an on-bard computer, a GPS transmitter, a credit card reader and a passenger information monitor (PIM) which doubles as a payment processing screen, all of which are linked to the meter. This equipment is required by the City and together with the meter provides a wealth of data on service provided and fare information for all taxi trips, regardless of whether they are paid for with a credit card or not. The City then has access to this data for planning and regulatory purposes. It would appear that most medallion owners have chosen CMT or Verifone based on the radio association with which they are affiliated.
- **Transportation Network Companies (TNCs) -** – There are companies such as Taxi Magic, Hailo, Lyft, and Uber that have created computer-based and smartphone "apps" which allow customers to request a taxi trips, and that will automatically forward the request to the smart phone of a taxi driver who is partnering with the TNC. These requests bypass the radio association with which the driver is associated and go directly to the driver.
- **Massport**– Massport provides a "taxi pool" at Logan Airport, which together with a central dispatcher and starters at each of the terminal's taxi stands, controls the

dispatching of taxis to the taxi stands to serve passengers in the taxi queues. Only taxis licensed by the City of Boston may enter the taxi pool and be present at taxi pick-up locations at the airport. In the case of three of the four terminals, drop-offs and pick-ups are on two different levels.

- **City of Boston Transportation Department** – The BTD is responsible for installing taxi stands within the City of Boston beyond the airport.

With that is an introduction, these "parts" are described in more detail below. These sections are followed by several observations stemming from the collection and analysis of various service, fare, and cost data.

3.2 MEDALLION OWNERS

As shown in Figure 3-2, 1825 taxi medallions have been issued by the City of Boston Hackney Carriage Unit. As of June 2013, there are 728 owners, according to the information provided by the Hackney Carriage Unit.

- One medallion owner, Edward Tutunjian under the company name EJT, owns 384 taxi medallions according to data provided by the Hackney Unit. This represents 21% of the total number of taxi medallions in Boston.
- The medallion owner with the next largest number of medallions is 41.
- Just over half of the medallions are owned by individuals who own 1-4 taxi medallions. Reflecting 677 individuals, this is the most common ownership "profile."

Figure 3-2 Medallion Ownership (June 2013)

Owners	Owners	Medallions	Percentage
384 Medallions	1	384	21%
20-41 Medallions	6	163	9%
10-20 Medallions	11	142	8%
5-9 Medallions	33	209	11%
1- 4 Medallions	677	927	51%
Total	728	1825	

Source: BPD Hackney Carriage Unit

Figure 3-3 What is Done With Each Medallion? (June 2013)

What Medallion Owners Do With Their Medallions	Total	Percentage
Lease medallioned taxicabs to shift drivers	883	48%
Operate medallioned taxicab	453	25%
Lease medallion(s) to driver with taxi vehicle	356	20%
Give medallion(s) to another to manage	88	5%
Owner operator exempt	31	2%
Unknown	12	1%
Other	1	<1%
(blank)	1	<1%
Grand Total	1825	100%

Source: BPD Hackney Carriage Unit

As shown in Figure 3-3, medallion owners utilize their medallions in a variety of ways:

- They acquire (or lease) and equip a vehicle to be a taxi, affix the medallion to the taxicab, and operate the taxi themselves; these are referred to as "owner-operators" and reflect about 25% of the medallions.
- Instead of operating the medallioned taxicab themselves, the owners lease the taxicab to shift drivers, typically either on a weekly basis, where the lessee driver is in possession of

the taxicab 24/7, or on a shift basis. The most common shifts that fill a day are two 12-hour shifts or three 8-hour shifts. Figure 3-3 shows that leasing medallioned taxicabs to shift drivers is the most common of all these arrangements. Note that 382 of the 883 medallioned taxicabs that are leased to shift drivers belong to EJT. It was reported that approximately 50% of these medallioned taxis are leased on a weekly basis, while the other half are leased to shift drivers on a 12-hour shift basis. Lease amounts, capped by from Rule 403, are identified in Chapter 2.

- Some medallion owners lease only the medallion to drivers who provide their own vehicle. This reflects about 20% of the medallions. Based on the medallion lease form provided by the City of Boston, drivers with vehicles can lease a medallion on a one-year basis, a two year basis, or for the life of the vehicle.
- Approximately 5% of the medallion owners hire an individual to manage their medallions for them, with the manager getting a cut of the revenue for their services.

3.3 VEHICLE TYPES

A list of the 1825 taxicabs by type is presented both in Figure 3-4a and Figure 3-4b. As shown, the number of "green" taxis total to 1287, all but 4 of which are hybrid vehicles. These hybrid vehicles represent 70% of the fleet Of the 1283 hybrid taxis, the most common model is the Toyota Camry (1036) followed by the Ford Escape (104).

Figure 3-4a Vehicle Type by No. of Medallions (June 2013)

Vehicle Type	Total	Percentage
Sedan – Hybrid	1152	63%
Van - non WAV	218	12%
Sedan	158	9%
SUV – Hybrid	126	7%
Van –WAV	100	5%
Station Wagon	35	2%
SUV	25	1%
Van - Hybrid	5	<1%
CNG	4	<1%
Unknown	2	<1%
Grand Total	1825	100%

Source: BPD Hackney Carriage Unit

Figure 3-4b Vehicle Type by No. of Medallions (June 2013)

	WAV	Non-WAV	Hybrid	Non-Hybrid	CNG	Total	Percent
Sedan			1152	158	4	1314	72%
SUV			126	25		151	8%
Station Wagon				35		35	2%
Van	100	218	5			323	18%
Unknown				2		2	0%
Total	100	218	1283	220	4	1825	100%
Percent	*5%*	*11.9%*	*70%*	*12%*	*0.2%*	*100%*	

Source: BPD Hackney Carriage Unit

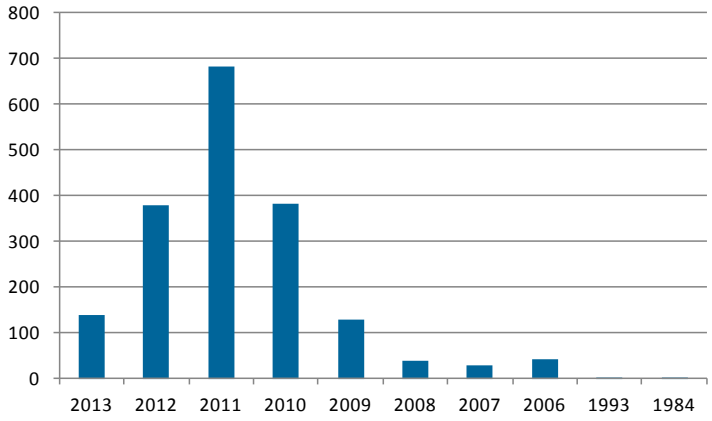
The model years of Boston's 1825 medallioned taxicab vehicles are presented in Figure 3-5a and 3-5b. The first two columns are sorted by fleet size; the second two columns by model year.

Figure 3-5a Taxicabs by Model Year (as of June 2013)

Model Year	Total	Model Year	Total
2011	682	2013	139
2010	382	2012	380
2012	380	2011	682
2013	139	2010	382
2009	129	2009	129
2006	43	2008	40
2008	40	2007	28
2007	28	2006	43
1984	1	1993	1
1993	1	1984	1
Total	1825	Total	1825

Source: BPD Hackney Carriage Unit

Figure 3-5b Taxicabs by Model Year (as of June 2013)



Source: BPD Hackney Carriage Unit

As presented in Figures 3-4a and 3-4b, there are 100 WAV vehicles. WAV is an acronym for "Wheelchair Accessible Vehicle." In 1993, the City of Boston adopted a 5% "guideline" for accessible taxis and accordingly issued 100 WAV medallions to meet that guideline. [3] This 5% guideline would appear to be an interpretation, as we have not found any specific wording in the ADA that suggests a 5% requirement. Nevertheless, this interpretation led to the issuance of 100 WAV medallions and that is a very positive thing for the City and its disabled residents and visitors who wish to use a WAV taxicab.

In conjunction with this issuance of WAV medallions, the Hackney Unit in cooperation with the City's Disability Commission developed minimum specification for these vehicles. These minimum specifications, which may be found in Appendix II of Rule 403, are roughly equivalent to the ADA's accessible van specifications. With the cooperation of the Hackney Unit, the City's Disability Commissioner recently inspected 98 out of the 100 WAV taxicabs, the results appearing in her June 24 report. A couple of key findings from the report include:

- There appears be to no regular and on-going effort made by the Hackney Unit to ensure that WAV taxicabs are compliant with the City's WAV specifications prior to entering taxi service for the first time

[3] As quoted from the City's Disability Commissioner's June 24 report on "Taxi Service for people with Disabilities: "The ADA does not expressly require municipalities to provide accessible taxi vehicles. However, if a municipality does provide or regulate taxi service, then 5% of the vehicles it owns, operates or regulates must comply with the Americans with Disabilities Accessibility Guidelines (ADAAG) specifications."

- Based on measurements taken (entrance height, seating height, seating depth, ramp slope and seat belt) only one WAV taxicab was found to be to be fully compliant, especially with respect to the 56" entrance and seating clearance. Ten percent were found to be "close to compliance" and another 10 percent was deemed "completely unable." The remaining 80% fell in between. In short, the Disability Commissioner concluded that the majority of WAV taxicabs are "not large enough to accommodate most types of wheelchairs" and are not in compliance with the City's required specifications.
- WAV driver training was found to be "not comprehensive" and contained "inaccurate information."

The report also mentions that the process of requesting a WAV taxi through a radio association has been "extremely difficult." From interviews with radio association, we were unable to confirm whether dispatching protocol for WAV requests is being followed.

3.4 RADIO ASSOCIATIONS

Background and Medallions by Radio Dispatch Association

By regulation, all taxi medallion owners must affiliate with a radio association. There is no regulation that limits the number of radio associations. Nor are there clear policies for removing radio association licenses or granting licenses to new radio associations. In most cases, the radio association is owned by an individual who does not also own one or more taxi medallions. The exception is Edward Tutunjian who also owns the Boston Cab Radio Association.

Radio associations charge medallion owners a weekly "dues" fee for their services, which ranges from $20 to $88.50. These services include the dispatching of "request" trips (that are received by the radio association by telephone or the internet), including "corporate account" calls from companies that have third-party billing arrangements or to which radio association coupons have been distributed, and towing.

Medallion owners affiliating with some radio associations are also required to sign a contract with the radio association and the credit card vendor that specifies a long-term financial commitment. Specifically, if a medallion owner wishes to sell a medallion for example, the seller must "deliver" the buyer to the same radio association. If this does not happen, the seller may owe as much as $1500 per year to the credit card vendor for the remaining years of the contract.

As shown in Figure 3-6, there are seven radio association, although two (Top Cab and City Cab) are owned by the same individual and are operated as one dispatch association), and another (Tunnel Taxi) has very few taxicabs. The largest radio associations are Metro Cab (527 or 29% of the fleet), Boston Cab (473 or 26%), Top Cab/City Cab (426 or 23%) and ITOA (303 or 17%). The other radio association is 617-TAXI CAB with 57 taxicabs (3%).

Other noteworthy observations from Figure 3-6 are that the largest number of owner-operators are affiliated with City Cab/Top Cab (189) followed by Metro Cab (120), the largest number of medallion owners who lease their medallions are affiliated with Metro Cab (156) followed by City Cab/Top Cab (134), and that the largest number of medallioned taxis that are shifted are affiliated with Boston Cab (401) followed by Metro Cab (202) and ITOA (187).

Figure 3-6 Taxicabs by Radio Association

Medallions by Association and by Use									
Radio Association	Shifted	Owner operated	Leased	Managed	Owner Operated exempt	Unknown	Other	Total	Percent
Metro Cab	202	120	156	40		9		527	29%
Boston Cab	401	38	32	2				473	26%
ITOA	187	72	19	25				303	17%
City Cab	30	110	83					223	12%
Top Cab	51	79	51	21		1		203	11%
617-TAXI CAB	11	31	15					57	3%
Exempt					31	1		32	2%
Tunnel Taxi	1	3						4	<1%
Probate							1	1	<1%
State						1		1	<1%
Unknown							1	1	<1%
Total	883	453	356	88	31	12	2	1825	100%

The distribution of WAV taxicabs among radio associations is presented in Figure 3-7. As shown, 40 (31+9) WAV taxicabs are affiliated with City Cab / Top Cab. The next largest WAV fleet (at 26) is affiliated with Metro Cab.

Figure 3-7 WAV Taxicabs by Radio Association

Association	WAV	Percent
City Cab	31	31%
Metro Cab	26	26%
ITOA Cab	15	15%
Boston Cab	13	13%
Top Cab	9	9%
617-TAXI Cab	5	5%
Probate	1	1%
Total	100	100%

Each of the radio associations is described below.

Metro Cab Radio Association

Background: After driving a taxi for a couple of years, Felix Shneur started Metro Cab in 1999 in Allston. The MetroCab facility includes a dispatch call center, a garage for CMT and Verifone credit card installations and maintenance (including after-hours service), and an administrative office for dues payments.

Structure: Of the 527 medallions owners that associate with MetroCab, most are single medallion owners, and most of the medallions are shifted and leased. MetroCab collects $75 per week for dispatch fees from medallion owners. There are three driver shifts: 7 a.m. - 3 p.m., 3 p.m. - 11 p.m., and 11 p.m. - 7 a.m.

Dispatch: MetroCab reports that it dispatches about 5,000 trips per day with 70% originating from neighborhoods and 30% from downtown. MetroCab uses the DDS dispatch system, which tracks the location of taxicabs in real time and allows the driver to view requested trips, accept a trip, and contact the customer directly.

Ridership: On average, MetroCab drivers take 27 (dispatched and street hail) trips per shift. MetroCab staff report that drivers frequently respond to the radio and therefore not many MetroCabs go to taxi stands.

Payment: Drivers use CMT for credit card payments and are required to accept corporate account payments (MetroCab has over 2,000 corporate accounts).

Extras: MetroCab has a smart phone app where customers can request a trip electronically, and the request goes through the dispatch call center in Allston. As of June 2013, the app has over 10,000 downloads.

Boston Cab Radio Association

Background: Ed Tutunjian owns the Boston Cab Radio Association, noting that Brett Barenholdz is the CEO and runs the day-to-day operation of the dispatch association. Located in the Fenway neighborhood, the Boston Cab Radio Dispatch Association has a dispatch call center, a daytime technician to work on credit card payments issues, and an administrative office for dues payments. It is also located next to the Boston Cab garage.

Structure: At Boston Cab, 384 of 473 medallions (or 81%) are owned by Tutunjian, and most of the rest are single-owners. Boston Cab has two weekly dispatch fees: $88.50 per standard cab and $48.50 per WAV. There are two twelve-hour shifts: 4:00 or 5:00 a.m. to 4:00 or 5:00 p.m. (drivers are split in half between the two times).

Dispatch: Boston Cab receives about 1,500 calls on an average day (about 1,200 on a slow day and 1,800 on a busy day). Each cab is equipped with a Mobile Knowledge dispatch system. Management guesses that approximately half of its affiliate taxis take advantage of dispatch.

Ridership: In a typical shift, a driver will have between 17-22 trips, a portion of which originate from the radio.

Payment: Drivers may use CMT or Verifone for credit card payments, although the majority of drivers use CMT. Drivers are required to accept corporate account payments; drivers are assessed an 8% fee on corporate account fares.

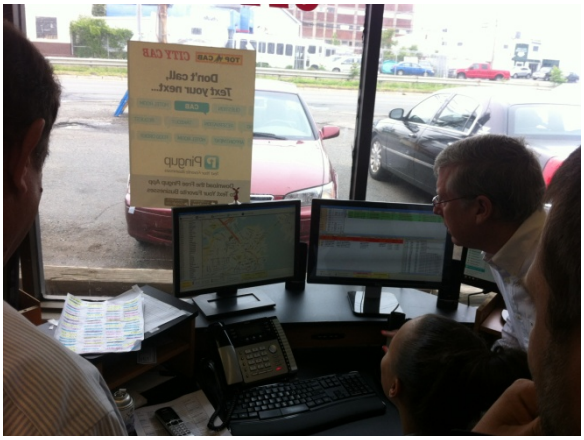
Extras: Boston Cab has a smartphone app where customers can request a trip electronically, and the request goes through the dispatch call center in the Fenway.

ITOA Cab Radio Association

ITOA is run by an eleven member board, elected by association members. ITOA is located in the South End neighborhood. ITOA management declined to participate in the study.

Top Cab/City Cab Radio Association

Background: Top Cab and City Cab are two radio associations that function as one under John Ford. Along with several other partners, John started Top Cab in 2004 and bought City Cab shortly thereafter (it was located next door on Route 1A in Revere). Top Cab started in 2001 as a repair shop, and the facility is still an active auto repair and maintenance facility with 14 lifts, plus towing functions, electronics maintenance and repair, dispatching, and administrative offices.



A close look at Top Cab/City Cab's dispatch system in Revere.
Source: Nelson\Nygaard

Structure: Of the 475 - 525 cabs associated with Top Cab/City Cab (the number varies week to week), most cabs are leased or owner operated. Dispatch fees are $36 per week with a rooftop sign with advertisements, or $39 without ads.

Dispatch: The association receives requests by telephone and Pingup, and uses Verifone's dispatch system for automated dispatch. Management states that 10% of the trips served by its affiliate taxis come from dispatch.

Ridership: Management claims that taxis serve about 40 trips per day.

Payment: Drivers use Verifone to accept payments (5% fee to drivers), as well as corporate charge accounts (8% fee to drivers).

Extras: Association members receive free towing up to $50 and deals in the on-site garage for brake jobs, etc.

617-TAXI CAB Radio Association

Background: 617 Taxi opened in 2011 (after one year of City process to open as an association) and is owned by Gary Lavitman's wife. Gary started as a driver and runs the association with a general manager. He started the association because he saw a need for a small association for one-shift owner operators. The facility includes a dispatch call center and administrative offices, including driver training on CMT and Verifone systems. The association is located on Route 1A in East Boston.

617 Radio Association has a small training center with CMT, Verifone, and Mobile Knowledge technology.
Source: Nelson\Nygaard

Structure: Although the association was started to attract one-shift owner operators, over time, there has been an increase in shift drivers. 617 Taxi charges weekly dispatch fees of $20 (if pre-paid) and $25-$30 not pre-paid.

Dispatch: The association receives 100 - 200 calls per day and reports that about 90% of the calls result in a completed trip. Drivers get about 20% of their daily trips from dispatch. Management reports that they use two dispatch systems: CMT's dispatch system, which works with CMT in-vehicle, and Mobile Knowledge, which works with Verifone's in-vehicle equipment.

Payment: Drivers use CMT and Verifone for credit card payments.

Extras: The association advertises in Back Bay, which results in many calls going to or from the neighborhood.

Tunnel Taxi Radio Association

Tunnel Taxi is located in East Boston and serves the East Boston neighborhood. Tunnel Taxi did not return the many phone calls about this study and therefore, the team does not have other information about them.

3.5 TAXI DRIVERS

Taxi drivers are licensed by the Hackney Unit, which is responsible for reviewing and processing new and renewal taxicab driver applications. Hackney Unit staff reported that they processed between 6200 and 6300 applications for new licenses or renewals in 2012. This is not to say that all 6200-drivers are actively driving taxis. Indeed, in three weekdays sampled, there were between 2700 and 2950 drivers providing taxi service.

Drivers fall into the following categories:

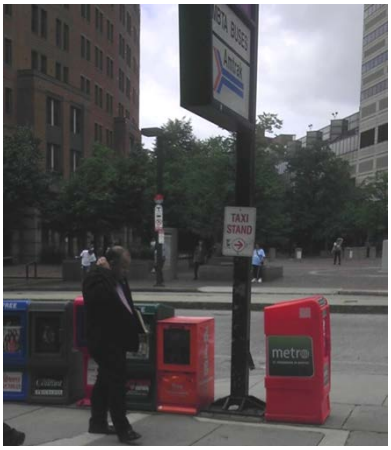
- **Owner operators** – These are drivers who own their medallion, own/lease the vehicle, and operate the taxicab – Based on information from the Hackney Unit, there are 453 medallion owners who operate their own cab.

- **Leased medallion drivers** – These are drivers who lease a medallion (from an owner or manager), and provide and operate their own vehicle. Number of drivers unknown, although the number of leased medallions totals 356, and the number of medallions managed by a third party totals 88.
- **Shift drivers** – These are drivers who neither own or lease a medallion nor own a vehicle; most shift drivers "rent" a medallioned taxicab over a weekly or 12-hour shift, paying the owner in cash for the rental. For weekly shifts, the drivers typically pay the shift rental fee upfront. For 12-hour shift drivers, the drivers typically pay for their shift rental fee after the shift is completed. Number of shift drivers is unknown, although the reported number of medallions shifted is 883. If half of these are shifted weekly and half are shifted on 12-hour shifts, as was reported to us by the largest medallion owner, then the number of shifted driver would total 1325. This excludes numerous part-time drivers who might pick up a Sunday shift, for example, or might fill in for a regular driver when he or she is not driving.

As part of the initial application process, drivers must attend taxicab driver training, as provided by the Hackney Unit. Drivers are required to attend training after their application is initially accepted and again if they left the industry for five years or more. Driver training, offered two times per month, is described in Chapter 2. WAV driver training is conducted separately.

3.6 TAXI STANDS

Taxi Stands are designated locations for licensed Hackney Carriages to wait for passengers. Often located in prominent locations with high levels of passenger activity, taxi stands establish a place for taxis to queue and represent an easily identifiable place for passengers to locate a taxi. Taxi stands can be either Private Stands (located on private property, such as a hotel) or Public Stands (located on street)



A sign outside of the entrance/exit to Back Bay station alerts customers to turn right to find the taxi stand.
Source: Nelson\Nygaard

Private Stands, under Rule 403, may be established on private property by individual firms or corporations, and these owners "may make reasonable rules for the management of said stands...but these ... shall be free and accessible to all Hackney Carriages licensed by the Police Commissioner.[4]" In practice, no specific approval of City agencies is required for the establishment of a Private Stand, and it does not appear that any list, map or comprehensive record of Private Stands is maintained by the City of Boston.

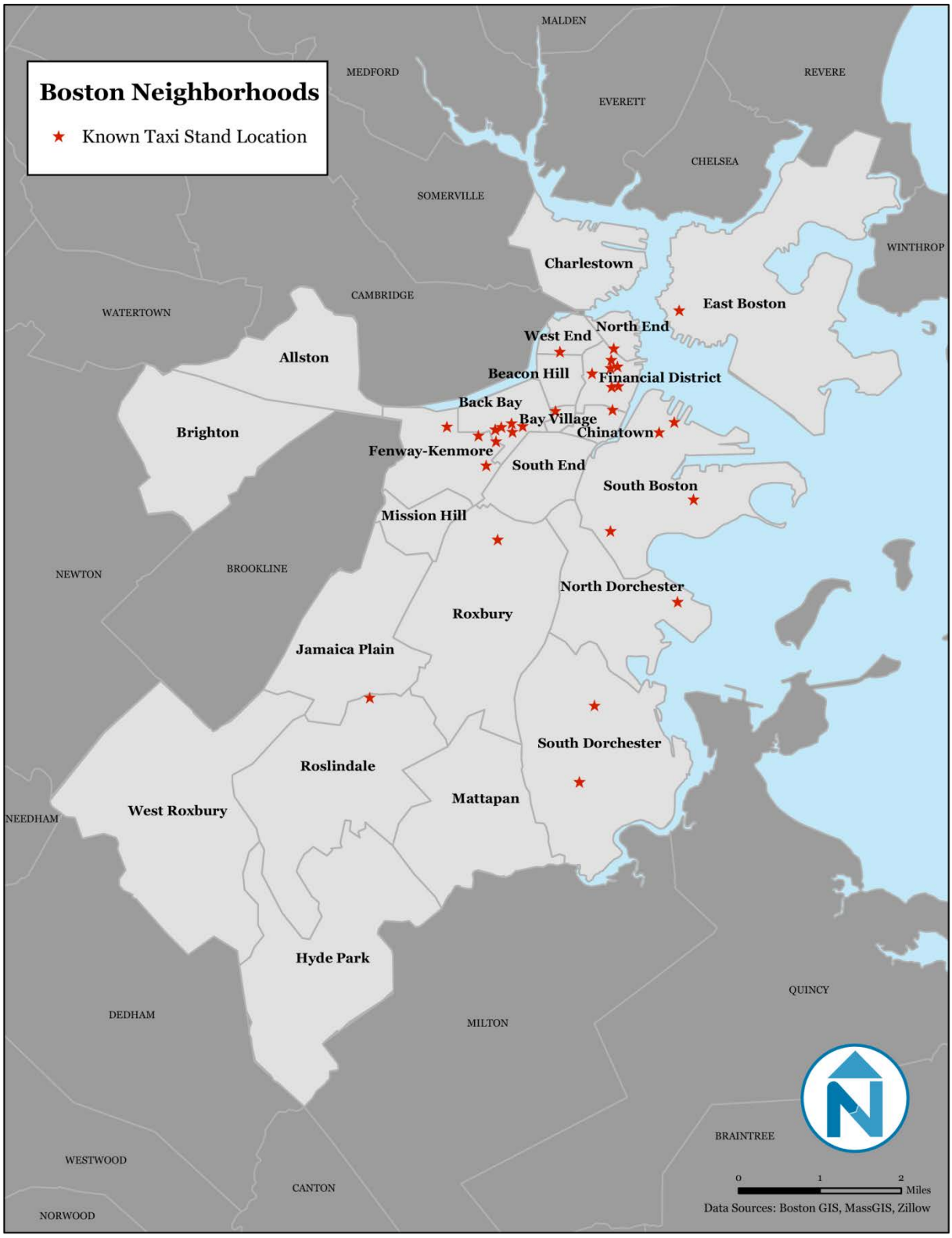
[4] Boston Police Department, Rule 403, August 29, 2008, pg. 31

Public Stands are curbside spaces that are specifically designated for use by licensed Hackney Carriages (Boston taxis). Per Rule 403, these can be designated by the Police Commissioner, and are subsequently installed by the Boston Transportation Department. The ability to operate a Hackney Carriage in a Public Stand is one of the specific and important benefits of being a licensed Hackney vehicle. Rule 403 further outlines the rules Hackney Carriage operators must observe when using a public stand, including maintaining a single line, not crowding or violating the queue, and the inability to pick up passengers via street hail in the vicinity of the stand if the stand is occupied.

An official record of the location of public taxi stands does not exist.

While most seem to be located in Boston proper (inside Massachusetts Avenue), additional stands have been installed in neighborhood business districts and near MBTA stations. Figure 3-8 shows the locations we have been able to compile through the course of this study based on information provided by BTD, BPD, Boston.com's "Convenience Center," stakeholders, and field observations. While incomplete, this figure should be a starting point for a more detailed City - led effort to inventory and document public stands in Boston.

Figure 3-8 Known Taxi Stand Locations



3.7 MASSPORT / LOGAN AIRPORT

As with most large airports in the United States, Massport's Logan Airport has established a staging area, called the taxi pool, where taxis can go prior to being called upon by an airport dispatcher to serve a trip at a particular terminal. There are four terminals at Logan Airport A, B, C and E.

The taxi pool can hold 400 taxicabs. Only City of Boston taxicabs are permitted. Massport Pool amenities include a prayer area, a cafeteria, machines to load transponders, a lottery kiosk, and restrooms.

Each taxicab entering the pool must be equipped with an EZ Pass / Fast Lane transponder issued by MassDOT. As the taxi enters the pool, the transponder issued to a specific individual is charged $2.25[5], a charge which is later passed along to the rider as an additional fee if the taxi indeed serves a rider after exiting the pool. As the taxi enters the pool, the driver also receives a numerical paper ticket through an automatic machine. Drivers line up their taxicabs in order based on their assigned number.

There is an electronic "dispatch" board, which then will display the ticket number and the specific terminal to which that taxi is dispatched.

Additional fees that area charged to taxi customers going to and from Logan Airport are repeated here:

- From Boston to Logan: Passenger pays $2.75 via tunnels, and $2.25 via the Tobin Bridge
- From Logan to Boston: Passenger pays $5.25 via the tunnels, and $4.25 via the Tobin Bridge

Some cabs go through Chelsea to avoid the toll.

According to Massport staff, taxicabs can wait up to 2 hours, although there are other times when there are zero cabs in the pool; they also stated the average wait time is 25-35 minutes. The longest waiting periods in the pool are weekdays 10 a.m. to 1 p.m. and Saturday and Sunday morning. Busy times for flights are early morning and after 3 p.m. Massport staff report that the highest demand times are on Friday evenings and when it is raining. (See also relevant data analysis Chapter 4). Many times the cab driver will wait once he reaches the terminal after getting through the taxi pool. Cab drivers tend to complain about this, but Massport likes there to be a queue ready at the terminals for customers.

When there are no taxis available, the "Starter" (a Massport employee at each terminal that communicates with the dispatcher regarding the number of customers waiting for a taxi) will "double load" taxis with people going in the same general direction. A different rate applies to double loading – first person out pays the fare showing on the meter less $2.00; the second person out pays the fare showing on the meter less $2.00, and so on.

[5] Drivers who enter the pool and do not pick up a trip at a terminal (for whatever reasons) do not get reimbursed the $2.25 Massport charge.

Massport uses Twitter to post levels of "fullness" in the pool for drivers and radio associations. Generally, Red alert = 20 or lower cabs, Yellow = over 100 cabs in the pool, Green = plenty of cabs in the pool. (BCEC has similar alert system via Twitter.) Most of the cabs that drop off at the airport go to the pool.

According to Massport staff, there are about 800 taxi drivers who regularly work the airport.

Massport also has established a "short trip ticket" system that waives the $2.25 for taxi drivers who return to the pool within 15 minutes. For instance, if a customer at the airport requests to go to the Hyatt Hotel in East Boston (a short ride), the driver can return to the pool for free.

Hybrid taxis get one extra trip through the taxi pool for free within an 8 hour period, plus they get to line up in a special line to go out first.

WAV taxis are expected to line up just like the other cabs, but they are allowed to bypass the other cabs if there is a special request for a wheelchair vehicle. (While there are lines that are supposed to be kept open to allow these vehicles out, these lanes are not kept open during peak times).

Massport staff (as well as state troopers) can write tickets for illegal pickups, etc.

Massport has monthly open meeting for taxi drivers, and reports that 20-25 drivers typically attend.

Livery vehicles have their own pool at Logan Airport; and Massport fees for livery vehicles are similarly handled electronically – through an EZPass/Fast Lane transponder. Out of town taxis are treated the same as livery vehicles. Uber trips – those with a prior reservation – are treated as livery and have to go to the livery pool.

Massport staff reported that Massport that they have about 7000 taxis come through the pool (see corroborating data in Section 4) and work with 1100 different livery companies. Massport also monitors shuttle vans, buses to rental cars, buses to MBTA, Logan Express, tourist buses, charter buses, etc. They do not monitor rental cars. Shuttle companies (scheduled buses) pay a fee to Massport and have a schedule. There are about 28-29 million passengers going through Logan every day.

3.8 OTHER INSTITUTIONAL CUSTOMERS

Many municipal and institutional customers were interviewed, including the Commission for Elder Affairs, Commission for Persons with Disabilities, Office of Neighborhood Services, MBTA Accessibility Office, Greater Boston Convention and Visitors Bureau, Boston Convention and Exhibition Center, MASCO, and Boston Onein3.

Several themes emerged from these discussions:

- Car-free lifestyles and dependence on taxis and taxi-like services are important to many of these stakeholders. Reliable and available taxi service is key.

- Access to taxis during peak hours (weekday evening peaks; late nights on Thursdays, Fridays, and Saturdays; and during inclement weather) is extremely difficult; stakeholders report that often people do not even try to hail or call for a taxi because of a lack of response. When several large events in town (events at Fenway/TD Garden, BCEC/Hynes conventions) coincide, the demand for taxis outstrips the supply.
- Residents and visitors use gypsy cabs and TNCs (see below) due to lack of taxi availability, particularly during peak hours and in the outer neighborhoods. Use of gypsy cabs by seniors is common. It has been reported that seniors wish to use Taxi Coupons for payment.
- Anecdotal complaints about drivers overcharging customers, drivers claiming credit card machines are broken, taxis not arriving in response to called-in requests, drivers not accepting vouchers/taxi coupons, and poor customer service. There is general confusion/lack of knowledge about customers understanding how to find lost articles and get responses to filed complaints.
- Refusals of trip from Boston to East Boston (because drivers have to pay a toll on the return trip) or illegal charging of the $2.75 charge for trips to the airport, if not the full $5.25 toll.
- WAV service is inadequate (many do not bother because service is poor or because wheelchair accessibility is limited). The general perception is that drivers do not like WAV trips because of the unpaid, long loading and unloading time.
- General confusion on the rate structure, including tolls and extra charges. Customers do not understand the rates and are charged inconsistently; they want better and more readily accessible information on fares and charges.

3.9 TRANSPORTATION NETWORK COMPANIES

Introduction

A relatively new type of company, which many in the industry now refer to as "**transportation network companies**," have located in Boston and while unregulated at this time do intersect with taxis.

The common characteristic of TNCs is that they are accessed by smart phone "apps" or by computer with internet access, and they can be used to request a taxi, and in some cases, other forms of private for hire transportation not regulated by the Hackney Unit. Requests placed through TNCs are then forwarded directly to drivers (on their smartphones) who partner with the particular TNC. The decision as to which driver is offered the trip is typically based on their current location, which is derived by their smartphone's GPS coordinates. And, while some of the radio associations in Boston have their own app and internet access, the primary differences are that:

- Requests for taxi service that come to the radio association through apps or the internet are then entered into the radio association's dispatch system, much like a called-in request, and are then dispatched as any other trip request through the radio association's automated dispatch system, which in most cases now, is based on a drivers' location and availability. Taxi drivers affiliated with a radio association pay a weekly fee that covers dispatching regardless of the number of dispatch calls accepted (if any). Requests that come to TNCs go directly to the driver and are not filtered through a call center or radio association.
- Requests for taxi service that come through a TNC are automatically offered to drivers based on proximity to the pick-up location. Customers set up an account with the TNC (i.e., provide a credit card) for payment. In addition to the stated fare (and a tip), some TNCs charge the customer for a "booking fee." Some TNCs also take a cut of the fare.
- TNC customers receive a confirmation whether or not their trip request will be picked up through a driver name and number, vehicle license plate, or other confirmation. The customer can track (via GPS) the location of their assigned driver to track response time in real-time. With some TNCs, the common practice is for the driver to contact the customer prior to pick-up.
- These are cash-less services. Payment is made through the customer accounts. Itemized receipts are emailed instead of having to ask for a paper copy.

For taxi drivers, this presents another source of business. However, when a customer instead opts to use a TNC to request service from a livery operator or one of the newer app-triggered rideshare services (such as Lyft) instead, it presents competition.

Two popular TNCs in Boston are Hailo and Uber. These TNCs are discussed below.

Hailo

Background

Hailo was founded by three taxi drivers and three entrepreneurs in the UK. One of the co-founders is from Boston. Hailo expanded from London to Dublin then Toronto. Boston was the first city in US. Hailo is now in twelve cities around the globe including London, New York, Dublin, Cork, Galway, Limerick, Toronto, Chicago, Boston, Madrid, Barcelona and Washington D.C. - and coming next to Japan.

Hailo started speaking with regulators in Boston in March/April 2012. In June 2012, it started recruiting drivers. The "pitch" to taxi drivers was to help fill their downtime that drivers have between trips. Hailo representatives noted that taxi drivers typically spend between 25 to 50% of their time with an empty backseat. Hailo representatives also noted that their experience has been that the average taxi driver can make 30% more income by partnering with Hailo[6]. One of the hallmarks of Hailo is that there are no contracts and no minimum number of required trips.

[6] https://www.hailocab.com/boston/blog/2013/01/17/Real-Life-Taxi-Cab-Confessions-A-Day-in-the-Life-of-a-Bostons-Cabbies

Hailo representatives indicated that they have a pro-active working relationship with regulatory bodies, and try to be as transparent as possible. Hailo representatives initially met with Mark Cohen, who gave Hailo an informal "go-ahead" indicating to Hailo that it was outside the current regulatory framework. With that go-ahead, Hailo started recruiting drivers in July 2012 and rolled out the "app" to drivers in August 2012. Hailo launched to passengers in October 2012.

Aside from drivers using their own smart phone, Hailo provides driver-partners with accessories such as (cradles, chargers, etc), largely as a safety measure.

Current Status in Boston

As of September 2013, Hailo had partnered with 1700 Boston-licensed taxi drivers. Hailo representatives reported that about 1,000 taxi drivers are available at any given time to take a trip and about 60% of the 1700 registered drivers have used Hailo at least once.

The registration process with Hailo in Boston involves the driver showing proof of a City of Boston Hackney Unit license, and a Massachusetts driver's license. Hailo takes a photo of driver (for customer benefit). Hailo also tracks driver participation, e.g., trips taken, customer ratings, cancels (after accepting a customer's trip) and warnings. After three warnings, Hailo will ban the driver from the network for a temporary period. If the offense is bigger, then the driver might be banned permanently and reported to Hackney.

Hailo representatives reported that driver-partners provide about 9,000 trips per month. Their goal is to provide drivers with at least two Hailo jobs per shift. The Hailo representatives also reported that about 80% of the requested trips are accepted and 70% are completed, noting that rush hour demand and congestion and neighborhood-based issues are the prime reasons for trips not being accepted/completed.

A major difference between the radio association dispatch and Hailo dispatch regarding immediate requests is that Hailo will tell a customer that there is no availability if there are no taxi-partners who are 5 minutes away from the pick-up location. As a result, Hailo has immediate response times between 2 and 5 minutes. Radii are set based on neighborhood and time of day (peak time vs. off-peak). Another major difference is that Hailo only charges drivers a credit card processing fee on jobs that they do. Hailo is a pay-as-you-go system – there is no weekly fee - and Hailo does not make money on the credit processing fee charged (the only fee charged to drivers).

As mentioned above, fares, tips, and a booking fee are paid by the customer at the end of the trip via the credit card provided to Hailo. Hailo then deposits the fare and tip amounts into the checking or savings account specified by the driver , charging a 5% fee for the credit card transaction (taken on just the fare and not on tolls or tip) that is directly passed to the credit card processing vendor.

For both customers and drivers, the app download is free. As of September 2013, booking fees are $0.99 for most of the day but increase to $1.99 during the weekday morning peak (7-10

a.m.) and afternoon peak period (4-8 p.m.) and Friday and Saturday night (10 p.m.-3 a.m.). Booking fees go to Hailo.

Hailo maintains data on data on all trips requested, and has shared data with authorities as needed (e.g., police incidents).

Hailo is also working with the City's Disability Commissioner, exploring how Hailo could serve as a centralized dispatch alternative for requesting WAV vehicles, and how the City's elderly program coupon could be automated.

Uber

Uber currently operates in 18 countries and 35 cities, including Boston. They have a family of services, including uberX (rideshare/personal driver and vehicle), uberTAXI, UberBLACK (black car/livery service), UberSUV (black SUV/livery service). They began serving Boston in October 2011.

Uber's fare structure for each type of service in Boston (as of September 2013) is below in Figure 3-9. Uber's cut is 20% of UberBLACK fares and 10% plus $1 for uberTAXI. We are not aware of Uber's cut for uberX and UberSUV.

Figure 3-9 Uber Fare Structure in Boston

	uberX	UberBLACK	UberSUV	uberTAXI
Base Fare	$5	$7	$14	Standard taxi meter rates plus $1 booking fee and default 20% gratuity.
Below 11mph	$0.60/minute	$0.85/minute	$1.00/minute	
Above 11mph	$2.60/mile	$4.00/mile	$4.75/mile	
Min Fare	$10	$15	$25	
Cancellation Fee	$10	$10	$10	

Uber declined to talk with the consultants regarding this study, so the team does not have information about the number of rides by geography or time, responsiveness and availability, or any other data to analyze.

However, gleanings from recent articles indicate that between October 2011 and January 2013, Uber's gross fares from rides total to about $9 million. This is about $600,000 per month on average, which compares to the Boston taxi industry's estimated $21 million per month on average

4. TAXI RIDERSHIP AND PERFORMANCE

4.1 INTRODUCTION

This chapter describes the number of trips provided by Boston taxicabs; how busy taxis are serving passengers and whether they have capacity to serve additional demand; and the availability taxicabs in neighborhoods, at Logan Airport, at taxi stands, and at the Boston Convention and Exhibition Center.

4.2 TAXI RIDERSHIP AND UTILIZATION

Boston taxicabs provided 14.6 million trips in 2012, about 40,000 trips per day. This estimate was calculated by the Hackney Division using data from the credit card terminals in all Boston taxicabs. Our independent analysis of credit card data, as well as data from meter readings, confirm these estimates. The average taxi carried about 22 trips per day, generating about $478 in revenue, including fares and tips. On a typical day, each cab is driven by about 1.6 drivers, which means that an average driver takes in about $300 in revenue, before considering expenses. Chapter 5 provides an analysis of driver income.

Taxi ridership and the number of taxis in operation were examined in more detail in order to determine whether the current taxi fleet is able to serve existing demand, and whether it can accommodate additional demand. For this purpose, credit card terminal data for three sample days in 2013 was examined on an hour-by-hour and driver-by-driver basis. (The terminals record information about every trip whether paid by credit card or not.) The three days were chosen to represent days with light, average, and heavy demand for taxi rides.

Figure 4-1 shows summary data for all three days. January 9 was a day with light ridership, April 11 (the Thursday before the Boston Marathon) was day with heavy ridership, and July 13 (a Saturday) was a day with average ridership. Trips per Hour Driven and Percent of Time

Occupied (by passengers) are measures of "utilization" and "occupancy" respectively. Above 1.5 trips per hour driven (i.e. 1.5 trips per hour per taxi) is considered a good level of productivity, at which there might begin to be a need for additional taxis to serve demand. Note the daily figures average very busy times with very light times, including the middle of the night. Taxi occupancy also takes into account the duration of trips, which averages about 11 minutes. Considering that the end of one trip will not usually coincide with the start of the next one (except possibly at extremely busy times and locations), occupancy much above 33%, averaged over an entire 24-hour day, indicates that the fleet is stretched to cover demand.

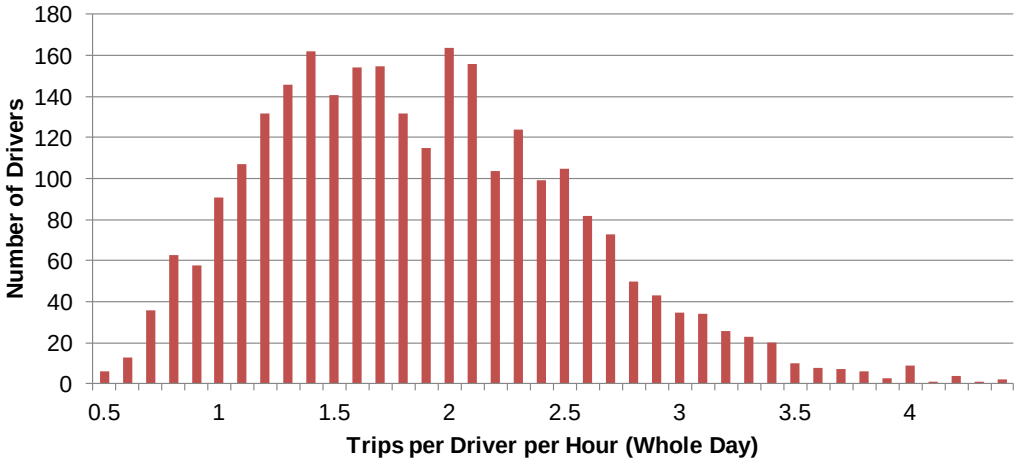
Figure 4-1 Taxi Utilization on Three Days

Date	Drivers	Cabs	Hours Driven	Hours Occupied	Trips	Trips per Hour Driven	Pct. of Time Occupied	Hours per Driver
January 9	2,746	1,768	21,053	5,254	29,453	1.4	25%	7.7
April 11	2,927	1,778	25,584	9,452	47,006	1.8	37%	8.7
July 13	2,702	1,732	22,032	7,386	41,432	1.9	34%	8.2

The daily totals show that utilization was very high on the busy day and the average day, as was occupancy. The number of drivers who chose to work varied little among the three days, but drivers drove more hours on days with higher demand. It is likely that demand was actually limited by the supply of taxis on April 11 and on July 13, so that more taxis would have resulted in more trips being carried. In these calculations, periods of four consecutive hours or more when a driver had no activity at all were counted as breaks. On this basis, many drivers took mid-day breaks, so that their actual hours worked averaged about eight hours per day, even though they were signed in on their terminals for ten or more hours.

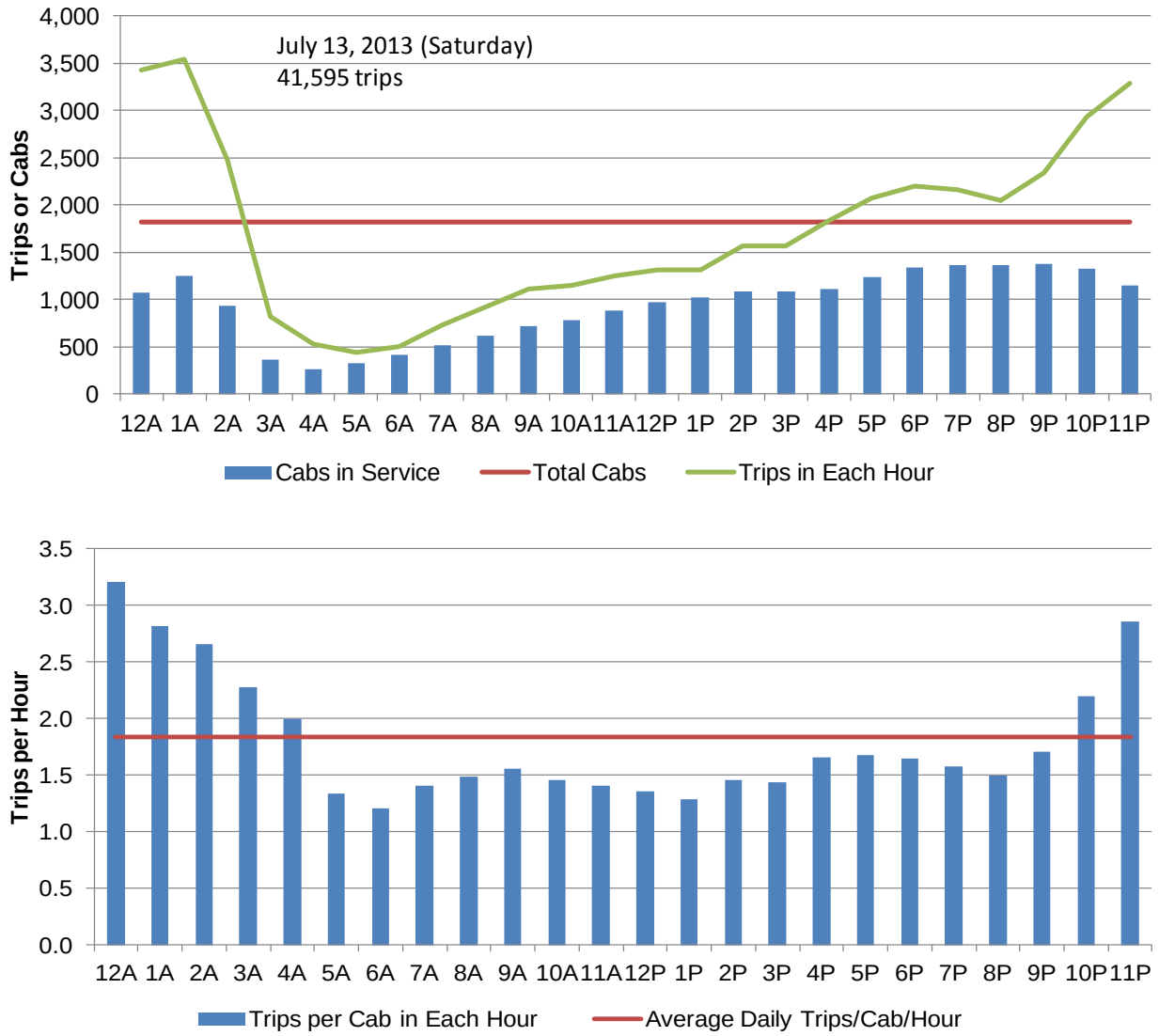
The fleetwide results hide wide variation among drivers, some of whom carry many more trips per hour than average, and some of who carry far less, as shown in Figure 4-2. Each bar in Figure 4-2 shows the number of drivers who carried a certain level of trips per hour on July 13, averaged over the whole day. The majority of drivers carried between 1.1 and 2.5 trips per hour, but 10% carried less than 1.1 trips per hour and 16% carried more than 2.5 trips per hour.

Figure 4-2 Range of Utilization among Drivers



To see more realistically how taxi supply is able to serve demand, it is necessary to see what happens on an hour-by-hour basis. Figure 4-3 shows hourly results for July 13, a Saturday with average demand overall.

Figure 4-3 Hourly Utilization (July 13, 2013)



The top part of the figure shows that there was very heavy demand in the early morning (i.e. late Friday night) and also during the late afternoon and evening. The number of taxis on the road also increased somewhat at these times, but not nearly as much as demand. At no time were there more 75% of all medallioned taxis in service. The ratio of trips to taxis in service in any given hour is the utilization (trips per hour) for an average taxi driver, which is shown in the bottom part of the figure. At the times of heavy demand, utilization exceeded 2.0 and even 2.5 trips per taxi per hour, indicating the fleet was severely stretched to meet demand. This corresponds to other sources of information which show that customers find it extremely difficult to get service at these times. The fact that, even at the busiest times, at most 75% of medallioned taxis were in service suggests that some form of incentive to work peak times might encourage more drivers to work at these times.

It might be expected that demand would outstrip the supply of taxis at the few busiest hours of a week. However, Figure 4-3 also shows that utilization is near or higher than 1.5 trips per taxi per hour throughout the day. Only at a few times can it be said that there is clearly an excess of cabs on the road.

A similar hour-by-hour analysis was done for the other two dates in Figure 4-1:

- On January 9, the day with light taxi ridership, taxis carried more than 1.5 trips per hour during 15 out of 24 hours, including late night, early morning, and much of the evening. For much of the midday, when there many taxis on the road, there was a dip in demand, resulting in utilization of just 1.0 to 1.3 trips per hour per taxi.
- On the very busy day of April 11, there were only five hours with less than 1.5 trips per hour per taxi, the 5:00 a.m. and 6:00 a.m. hours and the 11:00 a.m. through 1:00 p.m. hours. Starting at 8:00 a.m., taxis carried more than 2,000 trips per hour, rising continuously for the rest of the day, averaging about 3,000 trips per hour from 6:00 p.m. to midnight, served by about 1,500 active taxis carrying an average of 2.1 trips per hour. The number of taxis on the road dropped by 30% after 11:00 p.m. even though the number of trips carried fell by only 10%.

Detailed charts for all three days are provided in Appendix.

4.3 TAXI AVAILABILITY

Another key indicator of whether there are enough cabs is whether customers can find a taxi when they need one. If customers have difficulty getting a ride, then there may be too few cabs, at least in certain locations at certain times. Closely related to this is how long it takes cab drivers to find a passenger in busy areas. If drivers must wait long times for a customer, then there might be too many cabs, at least in certain locations at certain times.

Specific topics that have been investigated include:

- Availability of taxis in neighborhoods, as measured by response to telephone dispatch requests
- Availability of taxis at Logan Airport, based on statistics from Massport about the taxi waiting lot and curbside dispatching at the terminals
- Waiting times for customers and for drivers at cab stands, based on observations at cab stands
- Experience with taxicabs at the Boston Convention and Exhibition Center

Availability in Neighborhoods

One way of quantifying taxi availability/responsiveness is to analyze the data from computerized dispatch systems used by the larger radio associations. All taxicabs are equipped with in-vehicle systems. Once turned on, the system transmits the GPS location of the taxi, and its availability for a dispatched trip; if a driver's meter is on, he or she is not available. These automated dispatch systems take account of location and availability in offering a requested trip to a particular taxi driver.

Figure 4-4 Dispatch Requests Served by Neighborhood

Neighborhood	Requests per Day	Percent Served
Allston	29	78%
Back Bay	133	83%
Bay Village	10	77%
Beacon Hill	37	83%
Brighton	69	82%
Charlestown	83	88%
Chinatown	8	78%
East Boston	6	81%
Fenway-Kenmore	306	76%
Financial District	102	84%
Hyde Park	18	70%
Jamaica Plain	63	82%
Mattapan	14	52%
Mission Hill	8	64%
North Dorchester	42	63%
North End	61	82%
Roslindale	13	73%
Roxbury	92	67%
South Boston	151	81%
South Dorchester	33	59%
South End	122	81%
West End	52	78%
West Roxbury	5	78%
Total	1,457	78%

After a trip is offered through the dispatch system, a taxi driver can accept the trip, decline the trip, or not respond, assuming that they have turned the dispatch equipment on to begin with (which some drivers reportedly do not do). As independent contractors, taxi drivers are not obligated to accept a trip offer. A driver may opt not to take a dispatch call for a number of reasons: (1) the taxi may be near the head of a queue at taxi stand, hotel queue, or the taxi pool at Logan, and the driver does not want to give up his or her place in line; (2) the driver may reason that the customer will likely not be at the pick-up location when they arrive as the location may be ripe with trawling taxicabs; (3) the nearest driver may be some distance from the pick-up point and be unwilling to take time to travel to what may finally prove to be a no-show; or 4) the driver may consider the pick-up point to be in a dangerous or otherwise undesirable area.

Despite these limitations, the dispatch systems enable the radio associations to respond to requests. In outlying neighborhoods, where taxicabs are less likely to congregate, calling a radio association is the most common way to get a taxi ride.

All the larger dispatch associations use computerized systems for tracking service requests, drivers' response to these requests, and actual pick-up times. Sample data from these systems was requested from all the associations with more than 50 taxis, except for one that the team was unable to contact. After lengthy discussion, only three radio associations provided data, and only one of the datasets turned out to be usable. The others had issues with missing data and data with no consistent interpretation, for example a field that sometimes shows when an order was taken and sometimes shows when a dispatcher made some change to the order. The usable dispatch data included information about 40,800 service requests during four weeks spread over a four-month period. On a typical day, about 70% of the reporting dispatch association's cabs took dispatch calls, and these cabs took about 4.2 calls per day.

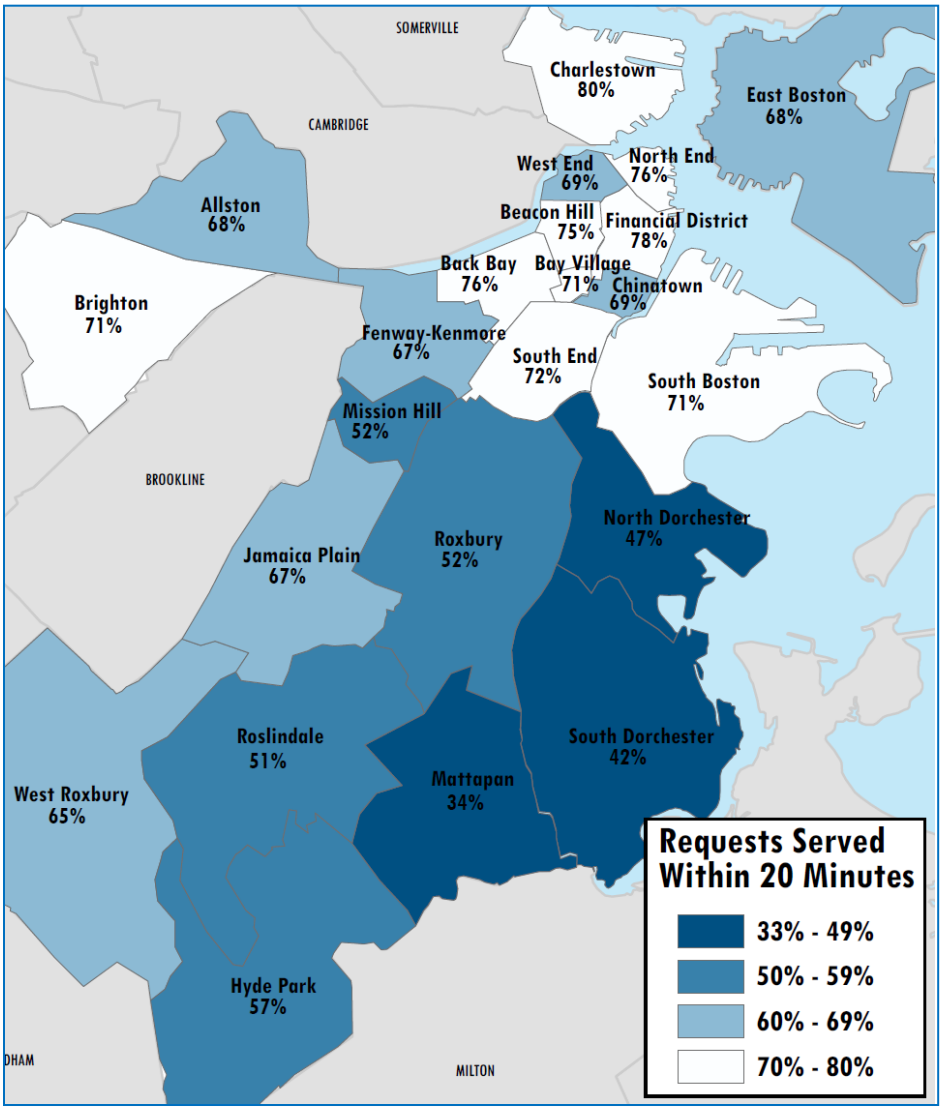
It needs to be stressed that this analysis is based on data from one large association. It is possible that results for taxis affiliated with other associations could be quite different—either better or worse.

In the period of time analyzed, 1,457 service requests per day were received. Of these, 1,141 or 78% resulted in a taxi being assigned to take the trip. In other words, 22% of the time, no taxi responded to trip requests offered through the dispatch system. Looking at data for each neighborhood, the percentage of requests served ranged from a high of 88% in Charlestown to a low of 52% in Mattapan. Figure 4-4 shows the number of requests per day received from each neighborhood and the percentage of those requests that were accepted by a taxicab. The volume of dispatch requests declined away from the central area, and the percentage of requests that went unfilled was much higher in certain neighborhoods, notably Roxbury, Dorchester, and Mattapan, which have high minority populations.

Another measure of taxi availability in a neighborhood is the percentage of trip requests served within 20 minutes. This measure of "responsiveness" combines whether or not a taxi takes the call with how quickly a taxi gets to the location requested. Good responsiveness would be in the region of 90%. As shown in Figure 4-5, in the central areas of Boston, a call for service resulted in a taxi within 20 minutes just 70% to 80% of the time. In more outlying areas, responsiveness was even worse. The poorest responsiveness was in Dorchester and Mattapan, where a call for service resulted in a taxi within 20 minutes less than half the time. Responsiveness in Roxbury, Roslindale, and Hyde Park was a little better, but still under 60%.

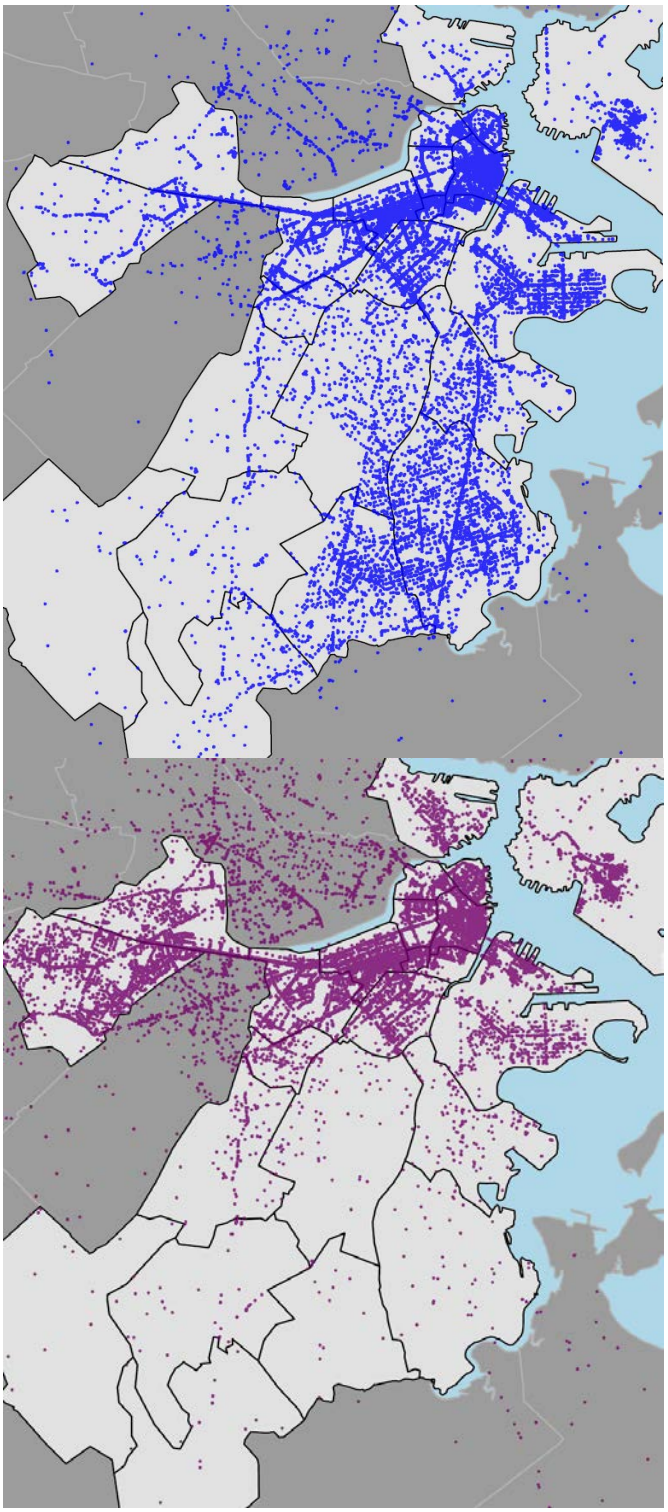
Figure 4-5 Dispatch Responsiveness in Boston Neighborhoods

(Four weeks of data from one dispatch association)



As noted, responsiveness by other radio associations could be better or worse. In particular, it is possible that responsiveness in neighborhoods might be better with radio associations that focus more on serving those neighborhoods. An analysis of trip pick-up locations (from credit card terminals) showed that some radio associations have many more pick-ups in outlying neighborhoods than others. Figure 4-6 shows that the patterns of pick-up locations for two of the largest radio associations (neither of which provided usable dispatch data) are very different from each other. Both have pick-ups heavily concentrated in the central area and at the airport, but the radio association on the top also serves many trips in Roxbury and Dorchester, while the radio association on the bottom serves many trips in Allston and Brighton.

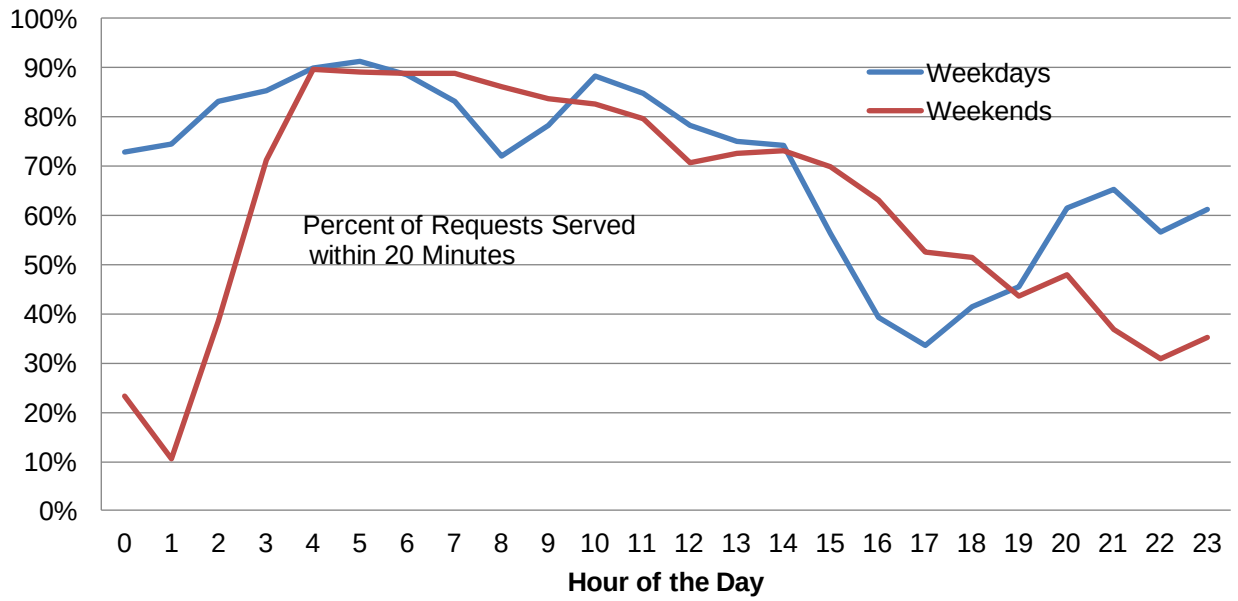
Figure 4-6 Pick-up Location for Two Dispatch Associations



Source: Analysis of seven months of credit card terminal data for ten cabs from each association.

Responsiveness also varies by time of day, as shown in Figure 4-7. Averaged over the whole city, responsiveness is between 70% and 90% from about 4 a.m. to 2 p.m. After 2 p.m., responsiveness declines continuously into the evening hours. On weekdays, responsiveness recovers somewhat after 8 p.m., while on weekends it continues to decline until about 2 a.m. Responsiveness in the neighborhoods is overall significantly worse, as shown above, but follows a similar daily pattern, in which the best performance occurs from early morning until mid-afternoon, and declines after that. As a result, in large areas of Boston, the chances of getting a taxi within 20 minutes are less than 50% between 6 p.m. and 3 a.m.

Figure 4-7 Responsiveness by Time of Day



Source: Dispatch data from one large association

Availability at Logan Airport

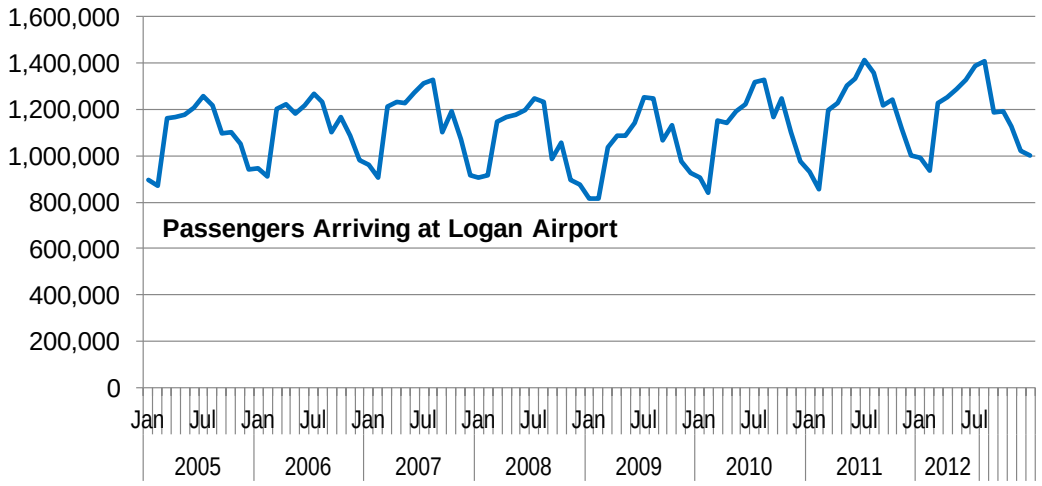
Logan Airport is the largest single point of demand for taxi service. Good availability of taxi service at the airport is important for travelers, including tourists, business people, students, and Boston residents returning home. Having a reasonable balance of supply and demand is important to passengers arriving at the airport so that they can be assured of getting a ride; to Massport so that waiting taxis do not create ground transportation problems; and to drivers so that they can serve the airport without excessive waits that make serving the airport unrewarding.

Data about taxi operations at Logan Airport was provided by Massport, which operates a holding area (the “taxi pool”) for taxicabs and manages curbside dispatching, putting passengers into cabs. When it appears that the supply of taxis may not be able to serve the number of

arriving passengers, airport taxi operations staff begin "multiple loading" of taxis, putting multiple passengers, not travelling together, into one taxi.

As shown in Figure 4-8, the number of passengers arriving at Logan airport has been growing since its recession bottom in 2009. Growth in passenger arrivals appears to have leveled off in the past year.

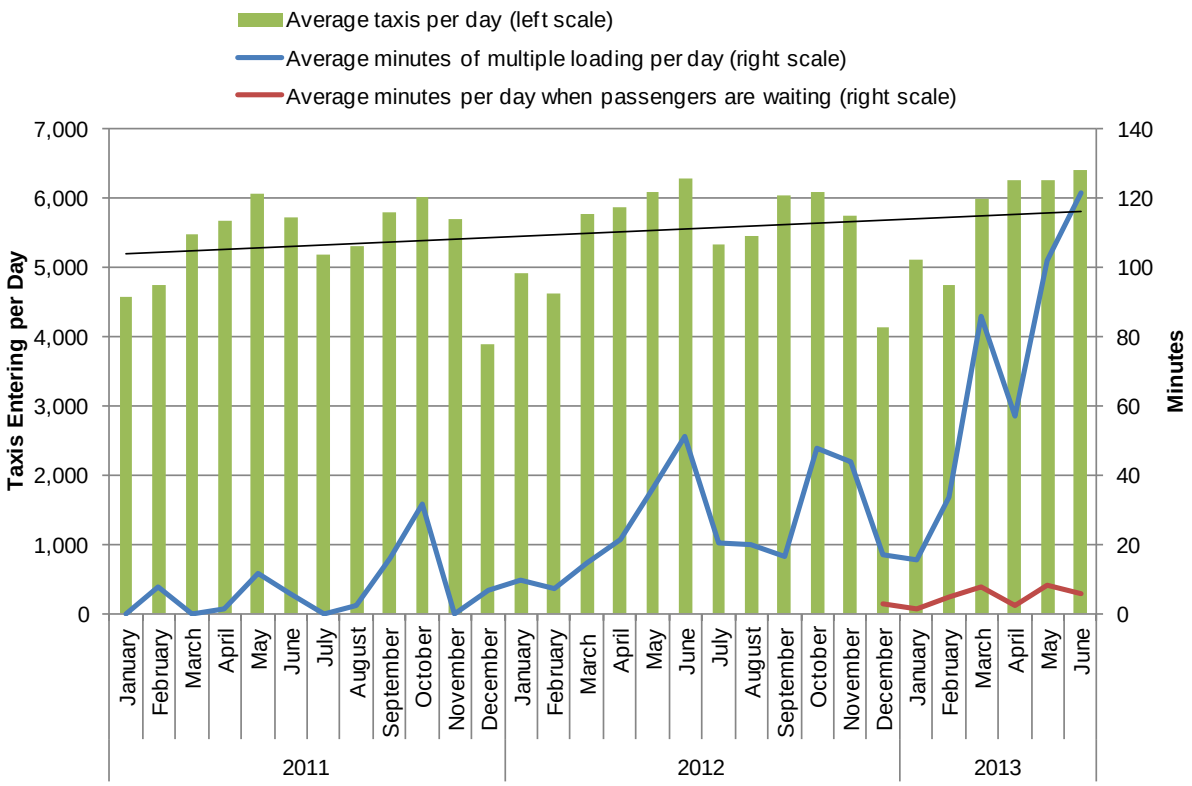
Figure 4-8 Trend of Passenger Arrivals at Logan Airport



Source: Bureau of Transportation Statistics T-100 Market data.

Meanwhile, operations data supplied by Massport, shown in Figure 4-9, shows that the number of taxis entering the taxi pool has been growing at around 4% per year, comparing each month to the same month in the previous year. Not only has the number of taxis serving the airport increased, airport staff have been increasing their use of multiple loading, especially in 2013, reaching an average in June of two hours per day when multiple loading was in effect.

Figure 4-9 Logan Airport Taxi Trends



Source: Massport

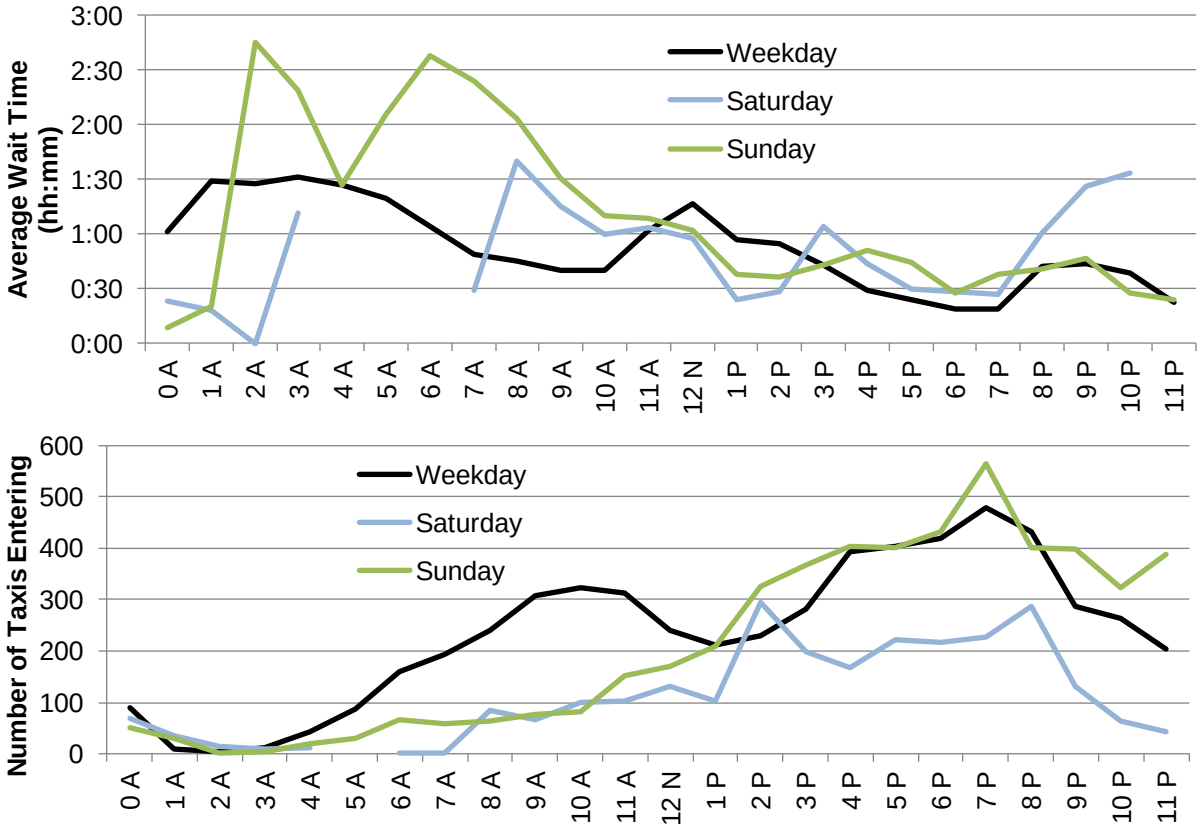
In December 2012, Massport began observing and reporting passenger wait time during periods of the day when there were no cabs. From December 2102 through June 2013, the average wait time observed was was 5 minutes. The worst case was on Thursday, March 7, when passengers had to wait an average of 31 minutes; on this day there was a three hour period when multiple loading was in effect.

According to airport officials, there can be 100 people waiting for a cab at each terminal at busy times – the worst times are Friday nights and when it's raining. These are times when there is high demand for taxis in many parts of Boston. It is possible that there is a continuous supply of taxis arriving but passengers queues still build up, a phenomenon that can occur in busy times even the supply is exactly balanced with demand. The passenger queue length depends not just on the overall supply of taxicabs but on how well airport taxi staff can coordinate the release of taxis from the pool with surges of passenger arrivals, the physical accommodations for passenger loading, and the speed with which passengers can be put into cabs. Airport staff also note that changes in airline scheduling, so that more flights arrive at the same time of day, can produce surges of taxi demand that result in lines and require use of multiple loading.

Another way to look at the balance of supply and demand at the airport is to consider the number of taxis waiting in the pool at various times and the time that drivers spend waiting in

the pool. Massport supplied data for this analysis for December 2012 and January 2013. The results for the first week of December are shown in Figure 4-10. December had 15% fewer passenger arrivals than an average month in 2012, while the number of taxis that entered the taxi pool was just 5% lower than average. The average taxi wait time in the pool for the week was 41 minutes. Wait times are generally highest in the morning, especially on Sundays, lower in the late morning weekdays, and lowest in the afternoon and early evening every day. Taxi drivers appear to have timed their arrivals to coincide with the periods of short wait time—late weekday mornings and late afternoons every day, when wait time was typically between 30 and 45 minutes. During the entire week, wait time was usually between 30 and 90 minutes.

Figure 4-10 Taxi Wait Time and Entrances - Airport Waiting Pool



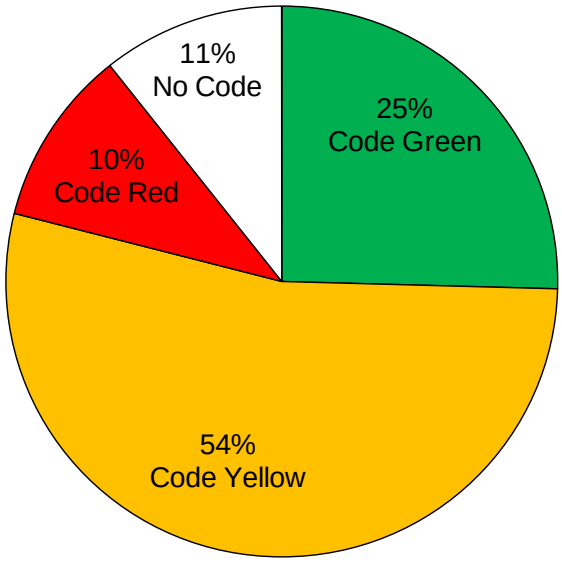
Source: Massport

Airport taxi management maintains a Twitter feed (@LoganTaxi) that, about once an hour, notifies drivers of the number of taxis in the pool and the approximate wait time, along with a color code based mainly on the current wait time (Green = short wait time, need more cabs; Yellow = about in balance; Red = long wait time, stay away). Analysis of 590 tweets during 31 days in July and August 2013 (about 20 per day) found 24% of the total advising of Code Green, 54% Code Yellow, and 10% Code Red (Figure 4-11). The remaining 11% of tweets contained no

color code, but instead provided information such as the schedule of flights expected during late hours.

The number of taxis actually in the pool is another indicator of the balance of supply and demand. The lot holds up to 400 taxis. If the lot is generally full, that would suggest that supply usually exceeds demand; if the lot is often nearly or completely empty then demand exceeds supply. Figure 4-12 shows the average and minimum number of taxis in the pool for each hour of the day for the same week of December 2012 as in Figure 4-10 before. The pool was rarely empty, except for early Saturday morning. Most commonly there were 100 to 200 cabs in the pool, peaking at midday on weekdays, and late afternoon and early evenings on weekends. A large number of cabs in the pool does not necessarily mean long wait times. In fact the periods when there were the most cabs were the periods of shortest wait times, as shown earlier in Figure 4-10.

Figure 4-11 Taxi Pool Tweets



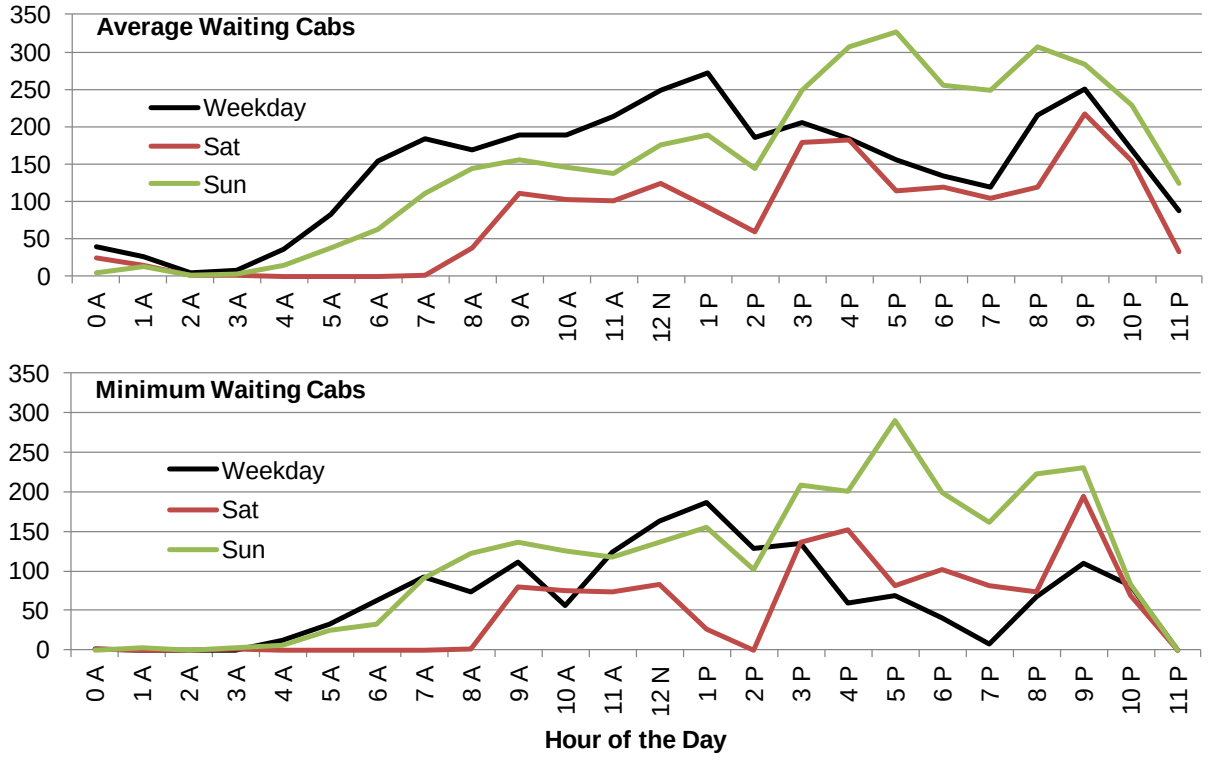
Source: Analysis of 590 tweets from @LoganTaxi in 31 days from July 15 to August 14, 2013. :

The July-August tweets from @LoganTaxi provide further evidence of the supply of taxis from a time of more typical airport activity than early December. There were 531 tweets that stated the number of taxis in the pool. As shown in

Figure 4-13, about two percent of the tweets noted fewer than 20 cabs in the pool, and the pool was rarely more than half full. Most commonly there were between 100 and 200 cabs in the pool, the same as during the first week of December.

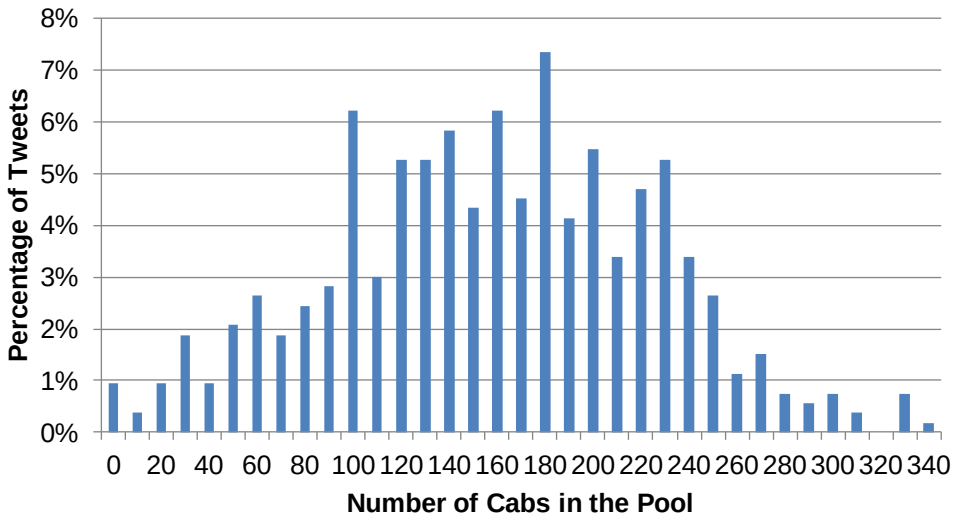
Overall, with active management of the taxi pool and passenger loading, it appears that airport management is able to maintain an adequate supply of taxis to meet demand at most times. Whether through experience, by paying attention to tweets from airport taxi managers, or by communication with each other and radio associations, drivers are able to time their arrivals at the airport to coincide with times of maximum demand, so that wait times in the taxi pool are rarely excessive. The periods when airport staff report long passenger lines are times when there is high demand for taxis away from the airport. In general the supply of taxis and demand for taxis at Logan Airport are roughly in balance, except at the busiest times.

Figure 4-12 Count of Waiting Cabs – Airport Taxi Pool



Source: Massport

Figure 4-13 Count of Waiting Cabs – Logan Airport Tweets



Analysis of 590 tweets from @LoganTaxi in 31 days from July 15 to August 14, 2013.

If passenger activity at the airport were to increase significantly, or if more travelers decided to use taxicabs, then the current supply would no longer be adequate. However, it is possible that taxi drivers would respond by going to the airport more often, avoiding problems at the airport but to the detriment of customers in other parts of Boston.

Availability at Taxi Stands

In busy locations, formal and informal taxi stands are a major focus of taxi activity. If passengers can generally find a taxi at a stand and drivers do not wait excessively long for a passenger, then that would indicate that supply and demand are balanced, at least for this segment of market.

To test the balance of supply and demand at taxi stands, employees of the consulting team and the Mayor's Office observed eight locations for a total of 21 hours and 50 minutes during the third week of July. The locations, the times each was observed, and the number of observations at each are shown Figure 4-14 below. Each observation consists a vehicle arriving or departing or a passenger (or group of passengers) arriving when they had to wait for a taxi. There were a total of 468 observations of vehicles waiting for or picking up passengers. Of these, 435 were legal Boston cabs, while seven were illegal cabs, 24 were livery vehicles, and two were pedicabs.

Figure 4-14 Taxi Stand Observations

Location	Time Period	Day	Hours	Observations
Back Bay Station	4:45-6:00 p.m.	Monday	1:15	50
Boylston St outside Hynes Convention & Prudential Ctr	12:01-2:30 a.m.	Sunday*	2:30	72
Back Bay - Park Plaza on St. James Ave	11:00 A.M.-2:30 p.m.	Monday	3:30	86
Dorchester - Ashmont Station	3:15-6:10 p.m.	Wednesday	2:55	33
Downtown - Pearl St	11:00 a.m.-1:35 p.m.	Monday	2:35	58
South Station on Atlantic Ave	3:00-7:00 p.m.	Monday	4:00	25
South Station on Atlantic Ave	2:30-3:10 p.m.	Tuesday	0:40	26
South Station on Atlantic Ave	2:45-4:35 p.m.	Wednesday	1:50	97
North End - Hanover St	5:00-6:00 p.m.	Monday	1:00	26
South Boston - East Broadway between L St and K St	12:00-1:35 p.m.	Wednesday	1:35	15
		Total:	21:50	488

*Saturday night.

Illegal taxis were observed waiting close to but not directly in taxi stands. Livery vehicles sometimes waited and picked up in the taxi stand area, but mostly they waited near the stand, either directly in front, behind, or across the street, and verbally solicited passengers. The illegal taxi activity was concentrated at the Ashmont Station in Dorchester where four of the seven observations occurred. Most of the livery activity (15 of 24 observations) occurred at South

Station on Atlantic Ave between 2:45 and 4:35 p.m., but there were also six observations on Boylston Street in Back Bay late on Saturday night. These observation periods also experienced most of the pedestrian queuing while taxi cabs were unavailable. However, liveries were often turned down by pedestrians, particularly by those who appeared to be experienced users of the system. Most livery rides were given to those who looked to be tourists or, in the case of Back Bay late at night, those who had been waiting over five minutes for a taxicab and lost patience. Even with long pedestrian wait periods, liveries would often get three or four rejections before they could get a fare. Of the 18 livery vehicles that were observed to leave, all but one left with passengers. In two cases, livery vehicles left in response to the arrival of police.

Of the 435 taxi observations, 294 included both arrival and departure times which allowed calculation of taxi wait times – the rest were either already waiting when the observation arrived or were still waiting when the observer left. On average, a taxi waited seven minutes before leaving the taxi stand, 73% of the time with a passenger and 27% of the time without a passenger (Figure 4-15). Leaving without a passenger does not necessarily mean that the driver has "given up." Instead they may have taken a dispatch call or learned of an opportunity elsewhere. In many cases, it appeared that drivers used a taxi stand as a convenient location to take a break where they might also happen to find a passenger. The wait times for taxis leaving with and without a passenger were not significantly different. In the case of Boylston Street late Saturday night (early Sunday morning), zero wait time corresponds with the fact that all observations were of passengers waiting for cabs, never vice versa.

Figure 4-15 Taxi Wait Times in Taxi Stands

Location and Time Period	Average Wait Time (mins.)	Left with no Passenger	Valid Observations
Back Bay Station 4:45 - 6:00 p.m.	5	0%	26
Boylston St outside Hynes Convention & Prudential Ctr 12:01 - 2:30 a.m.	0	8%	48
Park Plaza on St. James Ave 11:00 a.m. - 2:30 p.m.	19	0%	31
Dorchester - Ashmont Station 3:15 - 6:10 p.m.	9	30%	26
Downtown - Pearl St 11:00 a.m. - 1:35 p.m.	10	36%	44
South Station on Atlantic Ave 2:30 - 3:10 p.m.	15	21%	15
South Station on Atlantic Ave 2:45 - 4:35 p.m.	5	0%	66
South Station on Atlantic Ave 3:00 - 7:00 p.m.	3	2%	5
North End - Hanover St 5:00 - 6:00 p.m.	5	0%	22
South Boston - East Broadway between L St and K St 12:00 - 1:35 p.m.	4	31%	11
All Locations and Times	7	27%	294

For two taxi stands, the observer recorded additional remarks:

- South Station – The taxi stand location at the main South Station train entrance has space for 14 cabs. The taxi stand was consistently near capacity, but never over. There is an additional cab stand one block south that serves the bus terminal. Livery vehicles consistently parked four to five car lengths in front of the cab stands, making livery drivers the first ride choice for most customers. Many of the same drivers, taxi and livery, would return to South Station after completing a trip.

  South Station's taxi stand averaged 19.1 cabs an hour. When Amtrak trains would arrive, there would often be a rush of taxi demand, leading to waves of five or more taxis getting fares all within a couple of minutes. Drivers often used the wait periods as informal break periods and were observed socializing among each other, making personal phone calls, or having quick snacks.

  In informal conversations, drivers' biggest complaint was the livery vehicles in front of the stands attempting to steal customers. There was occasional transit police enforcement, usually in the form drive-bys. When on the ground enforcement occurred, illegal cabs were ticketed and liveries were instructed to move.
- Boylston Street at Hynes Convention Center – Boylston Street in Back Bay, the lone late night weekend observation period, was the only observation period that experienced no taxi queuing. The pedestrian demand often left two or three groups of pedestrians jockeying for one single taxi. This lead to taxi drivers being able to choose which trip was most favorable to do. Drivers tended to take the trips that would keep them close to similarly busy areas of the city. Due to high demand, drivers often would slowly cruise Boylston Street, turning down passengers, in order to find an ideal trip.

Only late at night on Boylston Street and, to a lesser extent, at South Station, did passengers experience significant wait times. Boylston Street was the only location where a passenger was observed to wait for more than five minutes. In 335 valid passenger observations, only 18 passengers (or groups) left without finding a taxi and 25 left in a livery vehicle, an illegal cab, or a pedicab. All of the cases of passengers leaving without a ride occurred at Boylston street (13 cases) or Back Bay Station (5 cases). Averaging all cases where passengers found a ride, wait time was zero in five cases, and more than a minute only on Boylston Street late at night (Figure 4-16).

Figure 4-16 Average Passenger Wait Time at Taxi Stands

Location and Time Period	Average Wait Time (m:ss)
Back Bay Station 4:45 - 6:00 p.m.	0:31
Boylston St outside Hynes Convention & Prudential Ctr 12:01 - 2:30 a.m.	4:12
Park Plaza on St. James Ave 11:00 a.m. - 2:30 p.m.	0:00
Dorchester - Ashmont Station 3:15 - 6:10 p.m.	0:12
Downtown - Pearl St 11:00 a.m. - 1:35 p.m.	0:00
South Station on Atlantic Ave 2:30 - 3:10 p.m.	0:16
South Station on Atlantic Ave 2:45 - 4:35 p.m.	0:12
South Station on Atlantic Ave 3:00 - 7:00 p.m.	0:00
North End - Hanover St 5:00 - 6:00 p.m.	0:00
South Boston - East Broadway between L St and K St 12:00 - 1:35 p.m.	0:00
Average of All Observations	0:53

Availability at the Boston Convention and Exhibition Center (BCEC)

The Massachusetts Convention Center Authority (MCCA) owns and oversees the operations of the Boston Convention & Exhibition Center (BCEC) and the John B. Hynes Veterans Memorial Convention Center, as well as other facilities. Both the BCEC and the Hynes are internationally renowned centers, and in 2012, hosted 245 events with more than 650,000 attendees. BCEC and the Hynes help to generate hundreds of millions of dollars for the City each year, and the MCCA staff understand that transportation is a critical component to the success of the conventions in Boston. Often, visitors arriving into Logan Airport for a convention have their first taste of Boston in a taxi.

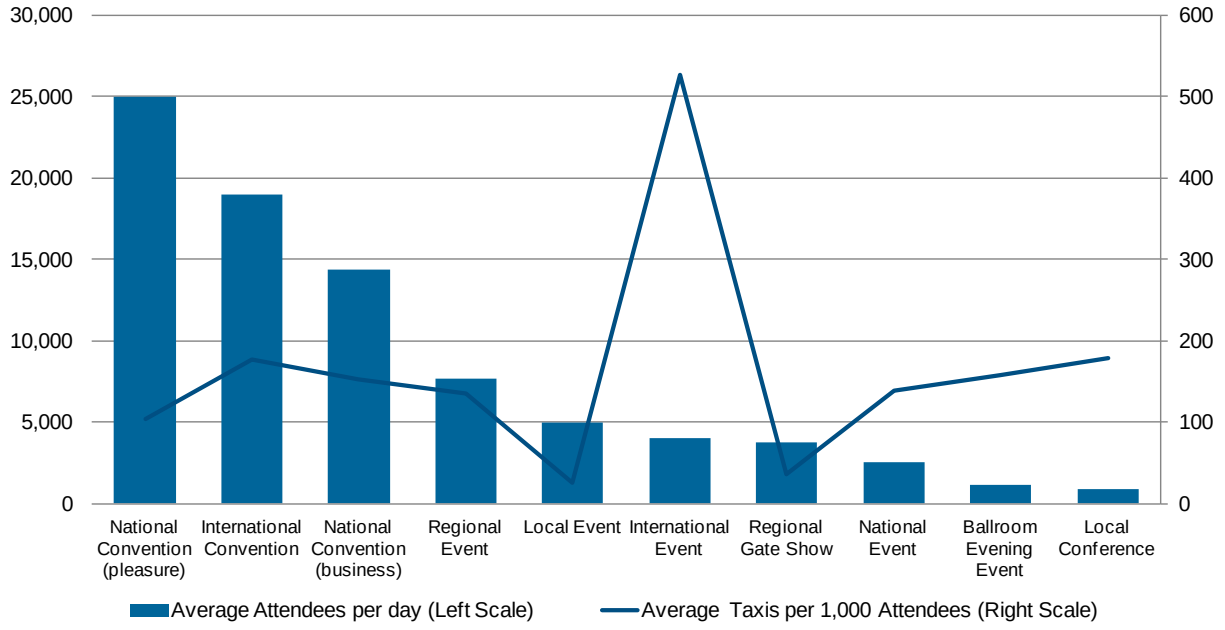
This section focuses on taxi availability at BCEC, located at 415 Summer Street in Boston's Seaport District. Taxi issues are more prevalent at BCEC than the Hynes due to fewer hotels that are located adjacent to BCEC and the less familiar street network and proximity of restaurants and entertainment than in Back Bay where the Hynes is located. Data about taxi availability at BCEC was provided by MCCA, whose transportation agents manage a curbside taxi stand with capacity for 50 taxis on Summer Street. BCEC has a staff of five transportation supervisors and 50 transportation agents. Supervisors and agents work on shifts based on break times of events. Typically, BCEC staff the Summer Street entrance with one supervisor and two to four agents that are available at curbside to expedite passenger loading and unloading.

When a show breaks for the day, typically between 4 p.m. and 6 p.m., there is a high demand for taxis, regardless of whether or not a show provides shuttles or other dedicated transportation to/from the BCEC. According to MCCA staff, there can be hundreds of show attendees waiting

for taxis. To help mitigate a long wait, the MCCA will notify drivers of a large convention through various means: contacting radio associations; leaving a message on the BCEC hotline for taxi drivers; posting flyers at radio associations; tweeting messages on Twitter; posting announcements at the Massport pool and on message signs at South Station; and occasionally using lottery scratch tickets and monthly rewards drawing as incentives. At show breaks, MCCA staff report that attendees can wait as long as 15 minutes, although the average wait time is much less (MCCA does not have average wait time data available). Agents have "double loaded" at peak times when it appears that the supply of taxis is unable to serve the demand, but they report that attendees prefer solo rides.

Figure 4-17 shows attendance and taxi usage for a sample of 2012 events at BCEC. Taxi availability varies by type of event, with an international convention (like the International Boston Seafood Show) having the most taxis available. In a small-sample, post-conference survey for the Seafood Show, 57% of attendees reported that they were “extremely or very satisfied” with taxi service; 30% were “somewhat satisfied”; and the remainder were “somewhat dissatisfied or dissatisfied.”

Figure 4-17 BCEC Event Attendance and Number of Taxis per 1,000 Attendees



Source: BCEC CY2012 Data

4.4 SUMMARY

The analysis shows that:

- On days of heavy demand, and at night on an average weekend, taxis are very highly utilized. On average, there is a good level of utilization from the point of view of drivers and medallion owners.
- Even on days of light demand, there is a good level of taxi utilization overall, meaning that, on average, taxis are kept busy carrying passengers.
- Many drivers carry very high levels of trips per hour, while others find far fewer trips.
- Based on limited dispatch data from one large dispatch association, responsiveness to telephone dispatch requests is not good, even in central locations, and is poor in outlying neighborhoods.
- Some dispatch associations serve more trips from certain neighborhoods, and may have better responsiveness in those areas.
- Dispatch associations do not provide reports or data to the City to measure responsiveness, and only one was willing and able to provide usable data for this study, though all the larger associations have the computerized data needed.
- Responsiveness is best during the middle of the day, and much poorer in the late afternoon, evening, and early morning.
- There is an adequate number of taxis serving Logan Airport at most times, but long passenger queues can build up at busy times, requiring Massport staff to double load taxis.
- Passengers rarely have to wait to find a cab at a cab stand. The only exception is late at night, when passengers have great difficulty finding a cab at all.
- Taxi drivers wait an average of seven minutes at cab stands before getting a fare or leaving for other opportunities.
- At the Boston Convention and Exhibition Center, attendees can wait as long as 15 minutes for a cab at busy times, though average wait time is much less. A small sample survey of attendee satisfaction with taxi service found 43% were only somewhat satisfied or else were dissatisfied.

5. DRIVER INCOME

5.1 INTRODUCTION

Driver incomes have been calculated and analyzed to determine whether Boston taxi drivers are able to make a reasonable living. This figure is also as an indicator of the overall balance of taxi supply and demand. The analysis includes an estimate of the amount of revenue that drivers collect in fares and the expenses that they incur, which can include medallion and vehicle lease costs, radio association fees, vehicle purchase and maintenance, fuel, insurance, and credit card fees. The income analysis provides a basis for testing the effects of several scenarios representing changes in policies in response to issues raised in this study.

Data used for this analysis includes:

- Medallion and vehicle lease rates set by the City
- Radio association fees and insurance (as reported by the radio associations and in a survey of drivers)
- Fees charged by the City for driver permit renewals, etc.
- Hours driven, paid mileage, and fare revenue (data from credit card terminals)
- The mix of vehicles actually driven and the mix of medallion and vehicle lease types (from City records)
- Typical vehicle purchase costs for vehicles in the Boston taxi fleet (Kelley Blue Book) and vehicle "set-up" costs (as reported by the radio associations)
- Vehicle fuel usage (based on EPA fuel economy ratings for vehicles in the Boston taxi fleet)
- Typical vehicle maintenance costs (based on data from comparable cities)
- Average fuel price in the Boston area

Note that all Boston taxis are required to have credit card terminals, and these terminals record information about every trip, whether paid by credit card or not, including: the start and end

time of each trip; trip distance; amount paid for fare, extras, tolls, and tips (if paid by credit card). Seven months of credit card terminal data (from January through July 2013) were analyzed from the two major vendors that cover all but a handful of cabs.

5.2 DRIVER INCOME AND COST MODELING

The driver income and cost model provide estimates for current ("baseline") driver revenue, costs, and net income under current conditions in Boston, i.e. what a Boston taxi driver currently earns, net of expenses. The model can also be applied to scenarios of future conditions, including growth in the market, changes in the patterns of demand (and supply), and changes to City policies. Two scenarios were tested and are described later in this chapter.

The model calculates the baseline income using the following inputs:

- Driving patterns, including number of hours driven, number of trips made, and trip distances. Driving patterns affect costs, such as the cost of gasoline, and also impact the number of trips taken. As no single driver will drive the same number of hours, the model was run for three typical working hours patterns:
  - Part-time
  - Full-time, and
  - Extended hours.

  Actual average hours worked were calculated using the data from the credit card terminals for January through July 2013.
- Revenue from fares, extras, tolls, and tips, using the credit card terminal data.
- Ownership / Lease / Shift patterns. Boston taxi drivers access taxis in a number of ways. Some are owner-operators with a medallion, some are vehicle owners who lease a medallion (and provide their own vehicles), and some are "shift drivers" who lease a vehicle with a medallion from a medallion owner or manager. A variety of shift and lease arrangements are possible within this structure (12-hour, 24-hour, or weekly), which have also been analyzed.
- Vehicle costs. These vary depending on make and model of vehicle driven. In some cases vehicle costs are included in lease or shift fees. In other cases, an owner-operator pays for the vehicle, its outfitting for service (vinyl seats, partition, paint scheme, etc.), and for its maintenance. A range of industry typical vehicle costs are derived from the survey and external reports, including vehicle purchase cost from Kelley Blue Book and vehicle fuel efficiencies from the U.S. Environmental Protection Agency.

The combination of costs and revenues for each combination of driving patterns and lease/ownership arrangements gives us a baseline income for an average driver in each category, as shown in Figure 5-1 below. Since individual drivers vary considerably in actual hours worked, actual vehicles driven, and actual fare revenue, net income for individual drivers will vary from the average values shown.

Figure 5-1 Baseline Driver Income

Working Hours	Ownership Category	Hours per Day	Trips per Day	Estimated Annual Pre-tax Income after Costs
Part Time	Shift Driver	5	12	$35,883
Full Time	Owner-Driver with Medallion (1)	10	17	$53,971
Full Time	Shift Driver,12-hour Lease (2)	10	17	$59,193
Full Time	Shift Driver, Weekly Lease for Two (3)	10	17	$65,675
Full Time	Owner-Driver Leases Medallion (4)	10	17	$51,910
Extended Time	Shift Driver, 24-hour lease (5)	15	21	$62,451
Extended Time	Shift Driver, Weekly Lease (6)	15	21	$67,701

Notes:
(1) Owner driver finances medallion from commercial credit over 25 years, at mid-point valuation including compound interest calculated annually.
(2) Shift driver pays maximum rate allowed for 12-hours plus new vehicle premium.
(3) Shift driver pays maximum rate allowed for weekly lease, shared equally with a second driver, plus new vehicle premium.
(4) Owner driver pays maximum allowed weekly medallion lease.
(5) Shift driver pays maximum rate allowed for 24-hours plus new vehicle premium.
(6) Shift driver pays maximum weekly rate allowed plus new vehicle premium.

5.3 MARKET GROWTH

Growth in demand for taxi services has been estimated as an input to the scenario analysis. Growth in demand may result from economic growth, where individuals are more likely to travel to/from activities, and may also follow from population growth. We have used a mix of demand indicators to identify potential growth in the market:

- Population growth: Metropolitan Area Planning Council (MAPC) MetroFuture predictions
- Home ownership: U.S. Census Bureau, American Community Survey, 5-Year Estimates
- Per Capita Income: Boston City-Data
- Airline Passengers: Federal Aviation Administration, planning and capacity predictions

From a review of the growth indicators, it is likely that demand for taxis will grow by 6.6% in the period to 2017, and by 12.9% in the period to 2022. This represents about 1.3% per year growth in the use of taxis. This estimate does not account for any changes that may result from growth in the use of alternatives to traditional taxi service, and it does not account for possible policy changes. These are considered in the development of scenarios.

Figure 5-2 tabulates current estimated income levels and predicted levels in 2017 and 2022 with all other factors remaining equal.

Figure 5-2 Current and Predicted Income by Driver Group

Driver Working Hours	Ownership Category	Estimated Annual Pre-tax Income after Costs		
		2013	2017	2022
Part Time	Shift Driver	$35,883	$38,252	$40,512
Full Time	Owner driver with Medallion	$53,971	$57,533	$60,933
Full Time	Shift Driver, 12-hour lease	$59,193	$63,623	67,383
Full Time	Shift Driver Weekly, Lease for 2	$65,675	$70,009	$74,147
Full Time	Owner driver Leases Medallion	$51,910	$55,337	$58,607
Extended Time	Shift Driver, 24-hour lease	$62,451	$66,573	$70,507
Extended Time	Shift Driver, Weekly Lease	$67,701	$72,169	$76,435

5.4 SCENARIO TESTING

The model has also been used to test the effect on driver costs and incomes of two scenarios, each representing possible changes in operating conditions or licensing requirements to respond to issues raised in this study. The two scenarios are:

1) Vehicle Inspection and Age Rules: An enhanced inspection regime is implemented, along with the possibility of longer vehicle service life.
2) Incentives: A surcharge for nighttime service.

Scenario 1: Vehicle Inspection and Age Rules

The first scenario concentrates on issues affecting investment in vehicles, their inspection and replacement. The scenario tests the application of an enhanced inspection system and extension of allowed vehicle age for vehicles that pass a more rigorous inspection than now used. The scenario test is based on a 25% increase in maintenance costs to meet higher standards and one or two years of additional vehicle life that may follow, resulting in spreading out vehicle purchase cost over a longer period. The added maintenance cost is a direct cost to owner-operators and a cost passed on to lease drivers. The benefit of spreading out vehicle costs with a longer service life accrues to vehicle owners, but it assumed not to be passed on to non-owner drivers.

The enhanced test by itself would decrease net income by a very small amount for both owner drivers and shift drivers (see Figure 5-3). Allowing an added year of service life would restore much of the loss to owner-operators, but not to shift drivers. The effect of added vehicle life on

annual cost is reduced by finance charges. Adding a second year of extended service life would add a little more to net owner-operator income but not at all to shift driver income—in fact older vehicles would have somewhat higher maintenance costs, which owners would probably pass on to drivers.

Figure 5-3 Effects of Scenario 1 (Enhanced Testing and Longer Service Lifetimes)

Driver working hours	Ownership category	Annual Pre-tax Income after Costs		
		Baseline	Enhanced Test Plus 1 Additional Year	Enhanced Test Plus 2 Additional Years
Part Time	Shift Driver	$35,883	$35,186	$35,177
Full Time	Owner driver with Medallion	$53,971	$53,920	$54,353
Full Time	Shift Driver,12-hour lease	$59,193	$58,986	$58,977
Full Time	Shift Driver, Weekly Lease for 2	$65,675	$65,116	$65,109
Full-time	Owner-driver leases medallion	$51,910	$51,859	$52,292
Extended Time	Shift driver, 24-hour lease	$62,451	$61,338	$61,324
Extended Time	Shift driver, weekly lease	$67,701	$66,689	$66,676

Scenario 2: Incentive for Nighttime Service

The second scenario tests the likely impacts of an incentive for drivers to serve nighttime trips. Incentives can be used to encourage more service at specific locations or at particular times of day. Incentives may include additional fare charges, such as a nighttime surcharge, short trip queues used at some airports to encourage the acceptance of trips to nearby locations and/or use of environmentally friendly vehicles, or lower rates for various City fees, which have been used to encourage purchase of wheelchair-accessible vehicles. The additional net income that incentives provide can sometimes encourage additional service at locations or times that are poorly served or service to a particular clientele.

Scenario 2 consists of a surcharge of $2 per trip that would apply to weekend nighttime trips, from 10 p.m. Friday night to 6 a.m. Saturday morning, and from 10 p.m. Saturday night to 6 a.m. Sunday morning. A weekend nighttime surcharge results in an increase in driver income of approximately $3,000 when averaged across all drivers (Figure 5-4). The actual impact on a particular driver would also depend on the driver's choice of hours. Drivers who still chose not to work nighttime shifts would see zero gain, while those that do choose to work nighttime in preference to day time would see a much larger increase in income. Figure 5-5 illustrates this effect for the case of a 12-hour shift driver.

Figure 5-4 Effects of Scenario 2 (Nighttime Surcharge)

Driver working hours	Ownership category	Annual Pre-tax Income after Costs	
		Baseline	$2 Weekend Nighttime Surcharge
Part Time	Shift Driver	$35,883	$37,293
Full Time	Owner driver with Medallion	$53,971	$55,870
Full Time	Shift Driver,12-hour lease	$59,193	$61,583
Full Time	Shift Driver, Weekly Lease for 2	$65,675	$67,574
Full-time	Owner-driver leases medallion	$51,910	$53,810
Extended Time	Shift driver, 24-hour lease	$62,451	$64,839
Extended Time	Shift driver, weekly lease	$67,701	$70,089

Figure 5-5 Driver Incomes Depending on Work Hours

Preferred Work Hours	Annual Pre-tax Income after Costs
Daytime Only, 12-hour Shift Driver	$59,193
Mixed Daytime / Nighttime, 12-hour Shift Driver	$61,583
Nighttime, 12-hour Shift Driver	$63,482

In general, a weekend nighttime surcharge should have a positive impact on driver income. The financial impact depends on the amount of time drivers choose to work during those hours. If the incentive works as expected, passengers should benefit in the form of better availability of service, albeit at the cost of an extra payment. The estimate does not take account of any change in passenger demand, which could increase in response to better availability (or fall in response to a higher price). Considering that there currently appears to be considerable unmet demand at night on weekends[1], passenger demand would most likely increase, so that the actual effect on driver income would be even higher than estimated.

The information presented in Chapter 4 showed that, even at the peak of weekend demand, at most, 75% of taxis are in service. This suggests that there is room for a surcharge to attract more drivers to work at night. Even if current drivers prefer not to work at night, there appears to be room for additional drivers to work night shifts, whether as a 12-hour shift driver or by subleasing from an owner-operator or weekly-lease driver.

[1] https://www.hailocab.com/boston/blog/2013/03/22/MBTA-Riders-Wants-Late-Night-Service-Hailo-is-the-App-for-Gap

6. PROMINENT ISSUES

6.1 INTRODUCTION

Prominent issues as identified by City officials, stakeholder organizations, taxi companies and taxi drivers (through the driver survey and focus groups) are identified below.

6.2 CUSTOMER-ORIENTED ISSUES

The following issues are specific to customers – both individual customers and organizational customers such as Massport, the Greater Boston Convention and Visitors Bureau, the Boston Convention and Exhibition Center, MASCO, etc.

- **Poor performance in response to trip requests.** When a customer requests a trip via the telephone or an application through a radio association, only 78% of the requests are completed, and only 87 % of the served trips are picked up within 20 minutes of the call, based on data from one dispatching system representing 25% of the fleet.
- **There is unmet demand during peak hours.** Regardless of what neighborhood needs service, many report that it is difficult to get a cab either via street hail or through the dispatch during rush hour, late nights on weekends, and during inclement weather. A dispatcher will rarely say they can't pick-up somebody else, but may give a pick-up time that is unreasonably long (for an immediate request). This unmet demand for taxi service during such hours has partially been accommodated by transportation network companies (such as Uber) that have partnerships with livery vehicle drivers. Generally, this impact is on the ONEin3 population (more than one-third of Boston's population).
- **Confusion over the $2.25 Massport/Logan Airport Taxi pool charge.** The charging of the $2.25 Massport/Logan pool entry fee to taxi customers is not documented for customers. Hackney Unit staff has also stated that authorizing the charging of the $2.25 Massport taxipool fee to taxi customers is not in the purview.

- **Confusion over the $2.75 charge from Boston to the airport.** Rule 403 states that taxi drivers may charge passengers $2.75 for trips from Boston to the airport. The premise of this is to ensure that some of the $5.25 toll for the "empty" return trip to Boston is defrayed, although many taxi drivers who take a trip to the airport typically enter the airport taxi pool and get the toll paid for in full if they pick-up a trip at the terminal. Regardless, Rule 403 also states that passengers taking a trip from Boston to East Boston should not be charged the $2.75 fee. The confusion – which affects customers and taxi drivers alike – is what destinations are considered airport destinations and what destinations are considered East Boston destinations. For example, is the Hilton Hotel, located in the middle of the airport an airport destination or an East Boston destination? The Hyatt Hotel? The new consolidated rental car center?
- **Confusion over the $6.00 "large vehicle" charge.** Passengers that request a large vehicle are charged an additional $6.00. This happens from time to time at Logan Airport and at hotels (for trips to the airport) with passengers who have extra large luggage or a lot of luggage. It also is appropriate to groups of passengers who won't fit into a smaller (standard) taxi. However, the $6.00 charge is not documented in Rule 403, nor is a large taxi or the request type defined. For example, can a driver charge the $6.00 fee to a group of 4 passengers who hails a 5-passenger taxi?
- **Rates are either difficult to access or not displayed.** While base rates – but not all charges – are displayed on the Passenger Information Monitor (PIM) in the back set of all taxis, some customers have difficulty navigating the PIM to find the rates, and those that are able to find the rates may not realize they are displayed over multiple "pages." Also, how a customer accesses that information is different depending on the PIM used. (Different PIMs are used by different credit card vendors.) Thus, if there is a dispute at the end of the trip, it is not easy to support a point because the rate information is not easily accessible or not there. (More than a quarter of complaints are about overcharges.)
- **Insufficient, undersized, and unknown taxi stands.** With a few exceptions, taxi stands are not well marked and are not well advertised. For example, the Boston Transportation Department, while responsible for the taxi stand signs and size, does not maintain a list of taxi stands (nor does the Hackney Unit). On the other hand, help is provided by the boston.com "convenience center" that does list over 25 stops – by neighborhood – with addresses; however, one would have to look up the address to locate a nearby stop on a map (and the list is incomplete). While residents and visitors alike have applauded the new map kiosks that are now located throughout the heavily visited pasts of Boston, taxi stands are not on them. Stakeholders have suggested several of the taxi stands are undersized, with some having been reduced in size (to make way for parking spaces or MBTA buses), or are too far away from building entrances. Temporary taxis stands for events at Fenway Park were also suggested.
- **Lack of visitor assistance and public education/information.** Visitors to Boston will ask curb-side starters at the airport terminals how much the fare will be for a

particular trip. This is difficult to answer because (1) different routes can have less or greater mileage; not to mention different toll amounts (tunnels vs. bridge); (2) additional fees may or may not be added to the fare, as mentioned above; and (3) starters may not know where a particular destination is. The MCCA's website provides radio association phone numbers, but myBCEC and myHynes apps do not provide any information on getting a taxi or what the rates are (although they do include information and rates for water taxis). In addition, there is little information available to Boston residents and employees and no public education efforts. While rates are posted on the Hackney Unit's website and are available on the PIMs as discussed above, there is no information available about rules and regulations regarding out-of-town pick-ups, TNCs, driver behavior, etc. that is available for public consumption.

- **WAVs are not compliant with City of Boston standards and are not readily available.** The City's Disability Commissioner, in cooperation with the Hackney Unit, recently inspected 98 of the 100 WAV vehicles. It was found that only one vehicle met the City's WAV standards, and that the correct specifications (in Rule 403, Appendix II) are not being used to retrofit vans. Most importantly, the Hackney Unit was not inspecting WAVs prior to their entering into service to ensure that the WAVs met the required specifications. The City's Disability Commissioner also reported that persons requesting a WAV through radio associations have found it challenging and frustrating. And even if a WAV is successfully dispatched, it may be unusable, as it was found that many customers using wheelchairs will not "fit" into these vehicles. The MBTA is contemplating using more taxis for ADA trips and as the centerpiece to a taxi subsidy program that would provide another mobility option to customers of THE RIDE. However, the current usability of the WAV fleet potentially may limit these programs to non-accessible taxicabs.
- **Driver training.** Stakeholders expressed mixed reviews on the results of driver training and lack of standards, stating that many drivers (1) do not know where popular destinations are located, and (2) exhibit unsafe driving habits and slovenly appearance. Several stakeholders expressed specific concerns about driver training, suggesting that the entire training program and testing standards should be overhauled. Specific suggestions included:
  - Driver training classes should be offered regularly with required testing
  - There should be an incentive for follow-up training for already licensed drivers
  - Training should include shadowing a driver (in the front passenger seat)
  - WAV training is insufficient (according to the City Disability Commissioner) and should be included with standard driver training
  - Disability awareness training should be included in the basic training
  - TLPA standards and videos should be utilized in the trainings
  - Ambassador training should be provided

- **TNCs and livery vehicles are not regulated.** TNCs (such as Uber) and livery service operators (who are licensed by the Commonwealth) do not have a regulatory body providing oversight. Some TNCs already comply with Hackney regulations regarding background checks, etc.; others do not. This poses several issues, in addition to those voiced above by drivers, medallion owners and the radio associations):
  - **Customer safety:** Stakeholders are concerned that livery service drivers do not have to undergo a standard criminal and driving record background check and include former taxi drivers who are no longer allowed to drive a taxi because of violations.
  - **Pricing:** Hackney licensed taxis may only charge customers the fare rates outlined in Rule 403. Stakeholders noted that unregulated services may charge customers a higher fare and a surcharge depending on the time of day/week, and some charge the drivers a certain percentage of the trip.
  - **Access:** Stakeholders noted that many seniors, persons with disabilities, low income persons, and tourists do not own or have access to smartphones or the web, and therefore are unable to access these types of services.
- **Complaint management/response.** On the Hackney Unit website, it states that staff will respond to customer complaints within 10 business days. Some customers have reported that it often takes up to a month to be contacted. Also, the window of time to discuss a complaint – sometimes a specific two hour period on a specific day -- can be unreasonable.
- **Little outsourcing of Hackney functions.** Many stakeholders reported that some Hackney functions are ineffectively operated in-house by a uniformed officer and may be able to be handled more effectively by a civilian or contractor. Functions include license renewals, inspections, and training. Others suggest that having uniformed officers perform some of these functions is effective, as drivers respect and obey a uniformed officer. Specific functions mentioned for possible outsourcing included:
  - Licensing
  - Conflict resolution
  - Driver training
  - WAV and disability awareness
  - Ambassador training
  - Safety training
  - More comprehensive (including mechanical) inspections
  - Complaint management
  - Lost and found
- **No forum or process for stakeholder input.** Many stakeholder organizations voiced that they have been left out of the process of providing input to taxi issues and regulatory matters. There hasn't really been a reliable and objective forum or any process

to do this, and many suggested a desire to be on such a "task force" or "committee" if one is formed. Some stakeholder organizations stated that their interview held in the course of this study was the first time they had been asked to voice an opinion.

- **Not enough taxis serving Massport at peak times.** Massport staff reported that at peak times, there can be 100 or more customers waiting for a taxi at each terminal. They report that the worst time is Friday nights, and when it's raining. When there is a dearth of taxis, Massport has instructed its starters to multi-load taxis, and as needed, to use livery vehicles. Massport staff reports that multiple loading periods can sometime last for as long as 3 hours. This happened on March 7, 2013, for example, when the average wait time for a passenger was 31 minutes. Graduation weekends, given the large number of colleges in the Boston area, also see a peak in demand. Taxi pool data shows (see Chapter 4) that the supply of taxis and demand for taxis at Logan Airport are roughly in balance, except at the busiest times.
- **Institutional users have a persistent lack of taxi availability.** Users such as BCEC and MASCO (representing hospitals and institutions in the Longwood Medical Area) are not provided service at the level of their need, and they do not have a way to communicate effectively to the taxi industry. In some cases, individual arrangements and communication protocols have been established but not always achieve desired results. Moreover, these stakeholders have indicated that they are unlikely to turn to livery operators or TNCs because of lack of licensing and perceived safety reasons).

6.3 TAXI DRIVERS, MEDALLION OWNERS AND RADIO ASSOCIATION ISSUES

- **Lease agreements cause disputes between medallion owners and lessees.** Medallion lease agreements are only for one to two years; however, lessees often purchase a vehicle that they expect will last up to six years. When a medallion owner does not renew a lease agreement, the lessee is "stuck" with an outfitted taxi but no medallion. In some cases, the medallion owner has helped to finance the vehicle. When the same medallion owner does not continue the lease, it forces the driver to sell his vehicle. Often, the medallion owner is the only option, but the offer is to buy the vehicle for a fraction of its worth. The driver may have to do this to continue being able to drive a taxi. Once the medallion owner buys the vehicle, he shifts it back to the driver.
- **No receipts for cash payments.** Some shift drivers have indicated that they have been unfairly charged for various circumstances from previous shifts and do not have an itemized receipt to support their argument. Rule 403 Section 6 mandates that medallion owners, managers, or lessees shall provide immediate receipts to drivers for all payments and transactions; in addition, Rule 403 Section 7 reads that radio associations shall provide an immediate receipt to medallion owners, managers, and lessees for all payments and transactions. There is inconsistency on when receipts are issued and what information is included on the receipt. Some use them; some don't. A lack of a receipt

makes it impossible for a driver or other to have proof of payment for various payments, resulting in "he-said/she-said" issues. (The Hackney Unit has been working on a universal receipt form.)

- **Dispatcher tipping.** According to driver survey and interviews, tipping radio dispatchers (e.g. to get a long trip) or tipping window dispatchers (e.g. for non-regular drivers to move to the head of the waiting line to get a taxi) does happen in some instances. From the survey, 1.3% of the driver survey respondents mentioned this issue. While this low response suggests that tipping is not a dominant feature of driver-dispatcher-owner interactions, it should nonetheless be watched out for and addressed where it happens.
- **Illegal pick-ups are not enforced.** There are on-going illegal pick-ups in Boston by livery vehicles, out-of-town taxis, and "gypsy" taxis (sedans or vans painted to look like a taxi or livery vehicle, but they are unlicensed) who "act" as taxis. Issues include:
  - Differentiating between a livery operator who is responding to an advance request or TNC request and a livery operator illegally responding to a street hail within the City of Boston
  - Curbside pick-ups at or adjacent to taxi stands (vehicles often wait in between the taxi stand and building entrance/exit)
  - Paint schemes, logos, decals, and company names that mimic Boston radio association schemes to attract customers
  - Little to no enforcement at taxi stands, hotels, and on street to minimize illegal pick-ups
- **Not enough taxi stands.** Drivers are in favor of additional taxi stands and would like to some of the existing taxi stands expanded and better marked. Drivers also mentioned a desire to establish "temporary" taxi stands at Fenway park.
- **No designated public rest rooms.** Taxi drivers would like to see the City designate specific public restrooms which they would be allowed to use.
- **New car premium fee is confusing and ineffective.** Drivers feel that the additional fees assessed to shift drivers for new cars (defined as four model years old or less) are excessive and unnecessary since all vehicles are six years old or less, and as of June 2013, only about 13% are more than four years old.
- **Radio association dues are seen as inequitable; required affiliation seen as unnecessary.** Required affiliation with radio associations is required but mainly functions as an (important) avenue for electronic trip level data collection – through their contracts with credit card processing vendors. There are many drivers who accept dispatch trip offerings, but many do not or accept very few, but still have to pay the weekly association dues. Some of the associations do not actively advertise, do not assist with disputes, and with the exception of dispatch, do not provide any meaningful services to medallion owners or drivers. Some drivers are supportive of removing the requirement for radio association affiliation or keeping the requirement but changing to

a "per trip" dispatch fee. If the latter, some drivers have also suggested that the long-term financial commitments that come with affiliation should be removed (see below).

- **Excessive financial obligations.** When a medallion owner signs on with a radio association, a 10-year financial obligation to the associated credit card processing vendor would appear to become part of this affiliation contract, and there also appears to a fairly stiff penalty for a medallion owner disestablishing relations with the credit card vendor. In cases where a medallion owner sells his/her medallion and the buyer chooses not to associate with the same radio association, for example, the seller may owe the credit card vendor $1500 per year for the remaining years of the 10-year contract. We think this financial obligation applies to CMT and not to Verifone, but are not 100% certain. We also do not know whether the obligation would be applied to cases where the medallion buyer affiliates with another radio association who has a relationship with CMT. More investigation into this issue is warranted.
- **5% to 6% fee (and other fees) for credit card transactions.** Drivers would like to see the percentage for credit card transaction processing fees reduced. Some drivers report that there is some inconsistency over what specific elements of the transaction amount are considered in this calculation, i.e., is the tip included? Are tolls included? Are additional fees such as the large vehicle charge included? Drivers also mentioned that the limitations and fees associated with accessing credit card trip reimbursement payment from designated ATMs and banks can be onerous, and that they would like direct control over choosing the banks to which credit card reimbursements would be deposited.
- **8% fee for voucher processing.** Rule 403 permits radio associations to assess up to 8% to drivers who receive voucher payments from employees of organizations to which the association has distributed such vouchers. This seems excessive to drivers.
- **Paper-coupon program for seniors is cumbersome.** The senior coupon program, which subsidizes taxi rides for seniors, utilizes paper coupon, which (1) is cumbersome to administer and use; (2) causes additional administrative labor for the City and for the radio associations which often wait a few months to get reimbursed for coupons submitted to the City, and (3) is susceptible to fraud.
- **Logan Airport charges.** Drivers would like to see a mechanism put in place where they are credited for a $2.25 taxi pool fee and/or do not have to pay the $5.25 tunnel toll if they respectively return from the airport taxi pool or from the airport without a fare.
- **Advertising revenues do not go to the medallion owner or driver.** Taxi advertisements generally come in two ways: (1) the rooftop signage and (2) video advertising on the PIMs. Neither medallion owners nor drivers receive any benefits from these revenues; the rooftop signage revenue goes to the radio association, noting that some radio dispatch associations do offer discounted weekly dispatch fees to medallion owners that advertise via rooftop signage. It is unclear who receives the video advertising revenue.

- **Competition from unregulated TNCs that partner with livery operators.** Medallion owners, drivers and radio associations all mentioned that Uber and other TNCs that partner with livery vehicle and other private for hire operators are "stealing" business from taxis while not having to undergo or abide by the same regulations as the taxi industry.
- **Specific Perceived Shortcomings of the Hackney Unit**
  - **Inconsistency in enforcing Rule 403.** Some rules are consistently enforced (such as radio association membership) and others are not (such as receipts for payment and WAV standards). There are also rules that are not in Rule 403 that are enforced, including that a radio association must be located within the City of Boston and that associations must have a minimum of 40 members.
  - **Clarity of Rule 403.** Some rules are not clear or incomplete or missing, e.g. the model year for the new car premium and lack of guidance regarding organizations wishing to become a radio association (or criteria used to evaluate an application).
  - **Rule 403 is out of date.** The Hackney Unit releases Rule 403 amendments and additions notices regularly; however, Rule 403 itself has not been updated to include these notices. Therefore, one must look in multiple places to find the most up to date regulations.
  - **Lack of enforcement in protecting Boston taxis.** Medallion owners and drivers view the BPD as focused on taxi driver violations, and that that effort is not in balance with the lack of effort put toward protecting taxis from out-of-town taxis, bandit/gypsy taxis, and cruising livery vehicles acting as Boston taxis, i.e., responding to hails and picking up passengers in taxi stands in Boston. [Citations for illegal pick-ups have increased over the past few years: 305 were issued in 2011; 377 in 2012; and as of August 24, 2013, 513 were issued. However, field observations indicate that illegal pick-ups are much more rampant than the number of citations issued.]
  - **Decision-making has little to no input from radio associations, medallion owners, and drivers.** Medallion owners, drivers, and radio associations alike feel that many regulations are implemented without seeking input from the industry and are mandated to be implemented "overnight", or on short time frames, yet no systems are established. From their perspective, examples include Rule 403 itself, implementation of credit card payment technology, and the driver training program. They also have stated that there is no documented or followed procedure to get rules changed or updated.
  - **Inconsistency of Hackney leadership.** The effectiveness of the Hackney Unit is diminished due to a "revolving door" of leadership (8 Captains/Lieutenants and 8 Sergeants since 1997). It is also difficult to discern who is in charge of what issues (i.e. Civilian Leadership, the Captain, the Sergeants, the officers, and others). Without a clear point of contact, questions/issues have gone unanswered. There are

no identified individuals/departments that serve as a point of contact to address issues regarding associations, drivers, leases, the public, etc.

– **Is the Hackney Unit the right entity to regulate the taxi industry?** Some drivers are supportive of the keeping taxi regulation under the auspices of the Hackney Unit. The Steelworkers Union, which represents several taxi drivers (we heard varying numbers) has suggested that the Hackney Unit is not be the right entity for taxi oversight (because of the issues above), and would prefer a civilian commission.

6.4 HACKNEY UNIT'S ISSUES

- **Labor for Dispute Resolution.** An overabundance of Hackney Unit staff labor is spent resolving disputes between drivers and medallion owners, especially over lease agreements and payment due. The Hackney Unit has been brought into these discussions because the City provides the lease agreement forms, and because there paper receipts for cash payments have been lacking in detail. See above.
- **Confusion over Definition of Maximum Vehicle Age.** Rule 403 is not clear in identifying what a "model year" is. According to Mark Cohen, the maximum age of the vehicle (i.e., no more than 6 years old) is based on of January 1 of the model year, regardless of the date of the purchase. This seems reasonable. However, Rule 403 does need to be updated with this definition.
- **Customer fees that are not in Rule 403.** It is the drivers' understanding that they may pass along – and they do pass along -- the Massport/Logan Airport taxi pool fee of $2.25 to customers upon picking them up in from the of the terminals. This is not specified in Rule 403. Moreover, Hackney Unit staff has stated that it has no control over whether this $2.25 fee is charged to the passenger or not. There is also a $6.00 customer fee that is charged to a customer who requests a large taxi. This is not specified in Rule 403, nor is a large taxi defined. The type of request is also not defined. For example, can a driver charge the $6.00 fee to a group of 4 passengers who hails a 5-passenger taxi?
- **East Boston vs. Logan Airport.** Hackney Unit staff – and drivers and customers alike-- lack clarity on the circumstances under which the $2.75 fee may be charged on a trip from Boston to Logan Airport. Indeed, this lack of clarity has resulted in complaints. Rule 403 states that the $2.75 fee can be charged on trips to the airport, and that it cannot be charged for trips from Boston to East Boston. Clarity is needed however on what exactly is considered the airport and what is in "East Boston." For example, are the Hilton Airport, the Hyatt Hotel, and the new rental car facility considered "airport" or "East Boston" locations?
- **Reporting of Data.** Trip level data is accessible on line from the credit card processing vendors for complaint/dispute resolution or to follow-up with an official incident. And there is some very high-level reporting conducted by a data analysis contracted by the Hackney Unit. However, there is an abundance of reporting that could be available and

that could be used to perform many of the analyses from this study that is not being requested. The issue is a bit murky because there is no known direct contractual relationship between the City and the credit card processing companies.

7. RECOMMENDATIONS

Recommendations are offered for short-term implementation—within a one-year time-frame—and for long-term implementation. Long term recommendations require more time because of their complexity or are dependent on the results of the short-term recommendations.

7.1 SHORT-TERM RECOMMENDATIONS

Oversight Infrastructure

Keep Regulatory Oversight with BPD–for Now - Taxi regulatory oversight and enforcement should be kept within the Hackney Unit, at least until the short-term recommendations are implemented and certain issues addressed. Making any significant change to this structure while also implementing a significant number of policy changes is ill-advised. The current structure should remain in place during this period.

Place a BPD Officer in Charge of the Hackney Unit - A civilian head of the Hackney Unit combined with a BPD captain or lieutenant has been reported by BPD staff and the industry to have been somewhat dysfunctional in the past, with some BPD officers electing to follow direction from the civilian head and some not. The current structure, using all BPD officers and reporting to a captain in charge of the Hackney Unit, removes that wild card.

Add a Lieutenant to the Hackney Unit – The captain currently in charge of the Hackney Unit is performing two jobs: oversight of the taxi industry and other modes (horse-drawn carriages, pedi-cabs, tour buses, etc.) as well as day-to-day duties associated with licensing, administration and supervision of administrative personnel. Adding a lieutenant who would responsible exclusively for taxi regulatory enforcement is strongly recommended.

Maintain Leadership Continuity -- Steps should be taken to allow for continuity and longevity in the top leadership of the Hackney Unit, unhindered by automatic rotation policies or changes of political administration. Taxi regulatory oversight and enforcement is a very complex undertaking. The leadership of the Hackney Unit requires a nuanced understanding to be

effective, and that comes with time. Continuity and longevity breeds understanding, trusting relationships, and effectiveness.

Establish a Taxi Advisory Committee -- The taxi industry needs to be more involved in the process of revising and adding taxi regulations and related policies. While attempts have been made in the past, these attempts have not been effective. An independent Taxi Advisory Committee (TAC), comprised of individuals appointed by the Mayor, should be established as soon as possible, with administrative support as needed provided by the Hackney Unit staff. We recommend an inclusive 14-member committee with one representative each from the following groups:

- Large medallion owners
- Small medallion owners
- Shift drivers
- Radio associations
- United Steelworkers – Boston Taxi Drivers Association
- City of Boston Transportation Department
- City of Boston Commission for Elder Affairs
- City of Boston Commission for Persons with Disabilities
- City of Boston Office of Neighborhood Services
- Greater Boston Convention and Visitors Bureau/Massachusetts Convention Center Authority
- Massport
- MASCO
- MBTA Accessibility Office
- Boston Onein3

It is suggested that representatives from the taxi industry be chosen by their peers, but all representatives should be approved by the Mayor. The primary on-going function of the TAC, which would meet quarterly, will be to (1) seek suggestions from the Boston taxi industry and stakeholders for revisions to current regulations and policies and the addition of new regulations and policies, and (2) make recommendations to the BPD based on its findings.

In the short-term, the TAC could function to help prioritize many of the short-term strategies suggested in this report, including changes to Rule 403. In addition, any changes to Rule 403 should be publicized.

Outsourcing Functions

Transfer Dispute Resolution Functions to a City Ombudsman and Taxi Appeals Board -- It has been reported that a substantial amount of BPD labor is dedicated to disputes between medallion owners and medallion lessees and between medallion owners and shift drivers. The

BPD has been brought into these disputes by virtue of its establishing rules about these relationships. It is also suggested that BPD may not be the best organization to provide dispute resolution as it has been alleged that BPD almost always sides with medallion owners. To reduce the drain on BPD staff and to assure impartiality, it is recommended that a taxi ombudsman position be created and that that position not be housed in the BPD. The Hackney Unit should maintain its existing Appeals Board (per Rule 403), which could be available to resolve issues that cannot be successfully resolved by the ombudsman.

Transfer Lost and Found Item Management to Radio Associations –Management of lost and found items has proven to be very time-consuming for the Hackney Unit. While the Hackney Unit should continue to assist a customer in tracking down the affiliation of the specific taxi taken, the responsibility for managing lost and found items responsibility should be transferred to the radio associations.

Outsource Taxi Driver Training -- Stakeholders are calling for an overhaul of the taxi driver training program because of specific deficiencies. BPD might consider outsourcing driver training as follows:

- Teaching the mechanics of being a driver, using a BPD-approved curriculum, such as the TLPA driver training curriculum. Staff from the Hackney Unit would monitor these training classes. The classes should involve representatives from Massport, MCCA, and other major institutions. The training class might also benefit from a driver teaching part of the class, for which he/she would be paid.
- Ambassador training should be part of the curriculum and conducted the GBCVB or MCCA.
- Special WAV training, including passenger assistance and disability awareness training, should be performed by entities that have experience with Passenger Assistance Training, Disability Awareness Training, and the use of accessibility equipment. Trainers from THE RIDE contractors, with input from the City's Commission for Persons with Disabilities, may be a possibility.

Driver training requirements for initial, annual refresher, and incident-driven training should be added or clarified.

Outsource Vehicle Inspections -- The current BPD taxi inspection practice covers mostly cosmetic items, and in the case of the WAV vehicles, has proven to be ineffective with respect to compliance with City specifications. It is recommended that this function be outsourced to an independent maintenance contractor, who would also perform a mechanical inspection.

Better Monitoring of Complaints -- The BPD should produce a monthly complaint report (by type of complaint, resolution, and responsiveness) that is reviewed by Hackney leadership and the TAC to ensure a high standard of responsiveness, as well as a means to identify reoccurring issues.

In the end, Hackney Unit personnel should focus on licensing; enforcement of rules pertaining to taxi operation, drivers, medallions, and radio associations; and complaint intake and follow-up.

Clarification of Current Policies

Model Years/Vehicle Age – The policy governing vehicle age should be clarified. Currently, taxis must be taken off the road when they are more than six years old. Rule 403 should be clarified to state that the clock on a 2014 model year vehicle, no matter when it is purchased or put into taxi service, starts on January 1, 2014, and expires on December 31, 2019. (See also recommendations on new policies below.)

The $2.25 Taxi Pool Fee – This authorization for passing along to the customer of a trip originating at Logan Airport whatever Massport charges for the taxi pool fee should be added to Rule 403, the Hackney website, backseat monitors, and on a fare decal.

The $2.75 Charge and the Logan Airport/East Boston Distinction – Pertaining to the $2.75 fee that may be charged for trips from Boston proper to the airport, and may not be charged from trips from Boston proper to East Boston, there is some confusion about whether specific destinations are considered to be airport destinations vs. East Boston destinations. It is recommended that the airport trips be defined as trips with drop-offs at one of the four terminals only, as well as at the Hilton Hotel, which is in the middle of the airport and is walkable to terminals. Trips to all other destinations in East Boston, even including other hotels and the rental car center with shuttles to the airport, should not be charged the $2.75. This charge should be added to Rule 403, the Hackney website, backseat monitors, and on a fare decal.

The $6.00 Large Vehicle Charge – This should be added to Rule 403, the Hackney website, backseat monitors, and on a fare decal with the following qualification: a $6.00 charge may be charged under both of the following conditions, i.e. both must apply: (1) a large vehicle (that seats a minimum of 5 passengers in the rear compartment) is requested through a radio association or of a starter at Massport/Logan Airport or through a hotel doorman; and (2) the taxi that responds to the request and serves the trip is a large taxi (as defined above). A driver of large taxi that responds to a hail, regardless of the group size, may not assess the $6.00 charge.

New Visitor/Customer Information

Make Taxi Rates More Accessible to Customers – In the midst of a fare dispute, customers may not be able to retrieve fare information from the PIM quickly and easily, especially if they do not know how to access it. For example, on one system, a passenger would have to press the "on-demand" button first. The Hackney Unit should therefore take one or more of the following actions: (1) Direct radio associations to direct their credit card vendors to post the full set of taxi fare rates and charges on the PIM, and to highlight how they can be accessed – or move them to a more prominent place; and/or (2) posting of a full rate sheet in each taxi.

Information at Airport – Work with Massport to post signs or to provide slips of paper that include the average fares (including tolls and fees) of taking a trip to specific high-demand locations.

Create a Public Education Campaign – Boston residents and employees are unaware of many of extra charges (many are not listed on the City of Boston's website[1]), rules about out-of-town taxi hails, and issues with unregulated TNCs; the City should undertake a public education and awareness campaign of taxi rules, safety issues, driver etiquette/respect, and taxi fares.

New and Revised Policies

Reports and Data from Radio Associations –Radio associations should be required to provide monthly reports showing: the number of trips requested and served in each neighborhood and the number that were dispatched; fare revenue paid by cash, credit card, City voucher, and private voucher; for all dispatch requests, the number in each neighborhood that were requested and served and the number in each neighborhood that were responded to within 10, 20, and 30 minutes; and the number of WAV requests received and the disposition of each one. The radio associations should also be required to maintain the detailed source data for these reports, listing all trips with the data items for each trip used to calculate the reported values, in a form that the City can conveniently access at any time for purposes of auditing the reports and investigating complaints.

In addition, radio associations, as part of their agreement with credit card processing vendors, should be required to ensure that BPD has direct access to all data for following up on accidents and incidents and for resolving complaints.

Create a New License for Transportation Network Companies – The City should create a new class of licenses for Transportation Network Companies (TNCs)[2], defined as companies or organizations that provide transportation services using an online-enabled platform to connect customers with licensed taxi drivers, licensed livery vehicle drivers, or drivers using their personal, non-commercial vehicles. These companies serve a market and provide services that many passengers value. But, the public and drivers need some measure of protection to ensure minimal standards of safety, accountability, and fair dealing.

TNC licensees would be required to ensure that all drivers with whom the licensee partners pass a driving and criminal background check consistent with Hackney Unit standards, have received approved driver training, and have required vehicle and liability insurance. While some TNCs already do some of these things, a TNC license would ensure that all TNC licensees meet these requirements in a consistent fashion.) TNC licensees would also be required to provide the BPD with: (1) a fare structure that it follows for all trips that is displayed in a manner so that customers know in advance what rates they will charged; and (2) monthly reports with detail similar to the reports recommended for radio associations, with backup data available that lists each trip, including GPS pick-up and drop-off locations and times, fare information, and a breakdown of customer and driver fees paid to the TNC licensee. City legal staff will need to

[1] http://www.cityofboston.gov/police/hackney/taxi_rates.asp

[2] Note that the State of California implemented a similar classification for drivers that use personal, non-commercial vehicles: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K132/77132276.PDF

determine whether state enabling legislation would be required to implement this recommendation.

While one of the longer-term recommendations is to vest the City with oversight of livery operators, this interim step will indirectly address the issue of driver background checks and data collection. There is obviously a demand for this kind of service; it is recommended that the City of Boston embrace these kinds of services through regulatory oversight of the TNC Licensees, and then augment that with oversight of the livery industry.

Driver Receipts – All lease and shift drivers should be provided with a receipt for weekly or daily lease fees. The process should consist of: (1) printed waybills that indicate the amount owed and paid, along with the signature of the medallion owner or his/her representative and the driver; (2) a requirement that all cash/vouchers submitted for payment be counted in the presence of the driver and agreed upon before either party signs the waybill; and (3) an official BPD taxi receipt form to be used and attached to the waybill for other charges/payments, with similar processing. These documents, once signed, are to be given to the driver.

Driver Education/Awareness – The Hackney Unit and outside professionals should offer training and education for drivers on their rights as independent contractors. Drivers should be regularly educated on acceptable treatment practices.

Reduce the New Car Premium – Rule 403 in Appendix III, 2(d) indicates that a "Clean Taxi Premium" may be charged to the driver ($18 per 12 hour shift, $33 per 24 hour shift, $170 per weekly shift, and $8840 for an annual shift). In 2009, BPD converted the Clean Taxi Premium to a New Car Premium with "new car" being defined as a taxi which is four or less model years old. Depending on the shift, these premiums alone result in total 4-year payments of between $35,360 and $52,416 per vehicle, which seems excessive, given the purchase price of a 2013 Toyota Camry Hybrid for example ranged from $24,000-$27,000.

Upgrade WAVs –The Hackney Unit should take immediate steps to require that any WAV entering taxi service must first pass an initial inspection (plus have an annual inspection) to ensure that it is fully compliant with all City specifications for accessibility and to ensure that all accessibility equipment is working. As an incentive for WAV medallion owners to replace their non-compliant WAVs with new, compliant WAVs before the mandatory retirement age, the City should consider waiving certain fees as an incentive. Any incentive should be contingent on the WAV medallion holder demonstrating compliance with all rules for WAV service, including continuous availability for dispatch calls from wheelchair users (giving preference to these over other business), taking affirmative action to ensure service for wheelchair users, and non-discrimination in serving street hails by wheelchair users. Stringent penalties should be established for non-compliance with these rules, including possible revocation of the WAV medallion.

The model years of each of the WAVs are shown in Figure 7.-1. If this recommendation is put into place immediately, there would be a minimum of 7 new and compliant WAVs in 2014, another 11 new and compliant WAVs in 2015, and again in 2016, etc. A total turn-over of the 100 WAVs would take at least 6 years (unless incentives as described above provide a quicker turn-over).

Figure 7-1 Model Years of Current WAV Taxicabs

Model Year	Total
1993	1
2006	5
2007	1
2008	11
2009	11
2010	21
2011	20
2012	16
2013	14
Total	**100**

With the phase-in of truly compliant WAVs, and with taxi-related efforts currently being planned by the MBTA, the demand for WAVs should increase dramatically. Therefore, consideration should also be given to extending similar incentives to regular medallion holders who opt to purchase or lease a WAV to replace their non-accessible vehicle and who comply with all the rules for WAV medallions.

Progressive Fines or Impoundment for Illegal Poaching– While the BPD does enforce $500 violations for out-of-town taxis, bandit/gypsy cabs, and livery vehicles who offer to or provide service in response to hails or at taxi stands (305 and 377 citations in 2011 and 2012, plus 513 citations through August 24, 2013), drivers, medallion owners, and radio associations still believe that there is not enough enforcement. It is suggested that periodic, random "sting" efforts be considered in high demand areas and times. The City should also consider progressive violations, such as $500 for the first offense, $750 for the second offense, $1,000 for the third offense, and perhaps vehicle impoundment for the fourth offense. The Hackney Unit should also educate/train BPD, Massport, and MBTA transit officers on enforcement of illegal pick-ups.

Automate the Senior Taxi Coupon Program and Eliminate Driver Fees for Voucher Processing – The senior coupon program utilizes a paper coupon which is cumbersome to administer and use and is susceptible to fraud. This program should be automated by replacing taxi coupons with debit or swipe cards. In exchange for the reduction in administrative work, the radio associations should not be permitted to assess a fee for processing these payments.

Eliminate Processing Fees for Radio Association Vouchers– Currently, radio associations are permitted to charge drivers up to 8% for each radio association voucher used as fare. This is inherently unfair to the driver. If corporate customers are getting some special treatment in return for calling a particular radio association and vouchers are used as payment, the company should pay for the voucher processing, and not the driver. Such a levy to the driver is a disincentive to accept these calls. However, radio associations are free to raise their association fees to reflect the marketing that they do to create work for drivers.

Consider Setting a Cap on Credit Card Processing Fees – The City should take steps to reduce the maximum percentage that credit card vendors can charge. This could be done by following one of two strategies: (1) set a reduced maximum (e.g., 3%), or (2) put out an RFQ for pre-

qualifying credit card companies, with specific requirements (such as a reduced percentage), allowing drivers to pick the bank they want to use, and with requirement for responders to identify ALL fees and financial obligations that pertain to associating with them. That way, the Hackney Unit can pre-qualify certain vendors, and medallion owners can choose who they want to associate from among those pre-qualified vendors, making informed decisions because they know what the ground rules are. The pre-qualification list should be updated regularly as new technologies and companies emerge.

Advertising Revenues from Rooftop Signs and PIMs - More data and information is needed in order to investigate and make a recommendation on this issue.

Create a Map or List of Public Rest Rooms for Drivers. Drivers should be provided a list of public rest rooms in Boston proper and in neighborhoods.

Consider Incentives for Drivers to Take Dispatch Calls – The City requires all medallion owners to belong to a radio association, resulting in drivers paying weekly fees ranging from $20 to $90 per week depending on the association. However, some drivers elect not to turn on the radio or ignore dispatched opportunities in favor of working the airport, hotels, and street hails. This may reflect drivers' judgment of the value of an association's dispatch services, drivers' dislike of serving certain areas or clientele, or bad experiences with passenger no-shows. The City should consider incentives for drivers to accept dispatch calls, for example in the form of a customer dispatch surcharge that goes directly to the driver. There is already evidence from app-based TNC services that many customers are willing to pay extra for being able to summon a cab.

Consider Peak Period Fare Surcharges –Surcharges for taxi service are worth considering to address a shortage of taxis during weekday afternoon peak times and weekend late night times. New York City, for example, has a peak time surcharge of $1.00 in effect from 4 p.m. to 8 p.m. weekdays and a night surcharge of $.50 in effect from 8 p.m to 6 a.m. One of the app-based services in Boston charges a higher booking fee for morning/afternoon peak-hours and late night service. Another one uses "surge pricing" that raises mileage charges on some holidays when demand is extraordinarily high. The shortage of taxis during the afternoon rush hour appears to stem largely from the switchover from the a.m. to the p.m. shift for shift drivers. A surcharge could result in more taxi drivers opting to serve the peak periods when more taxis are needed. A weekend late night surcharge could be linked to the hours when the MBTA is not in operation, which is from 12 midnight to 5:30 a.m, or an expanded period from 10:00 pm to 6:00 am. The analysis in Chapter 5 considers at a $2.00 surcharge from 10:00 p.m. to 6:00 am. on Friday and Saturday nights.

Explore Alternatives for a Flat Fare From Logan Airport –The City should explore alternatives for creating a flat fare from the airport to specific areas in downtown Boston. Two ways to go about this are to (1) to plot concentrations of destinations and establish a zone around the high-demand destinations, or (2) to create a zone – or two zones – to include hotels and work places in downtown Boston and perhaps Back Bay. Then, the average fares under each scenario can be established from historic data.

Taxi Stand Expansion, Improvements, and Advertising –Taxi stands provide customers locations at which taxis can be engaged, and serve taxi drivers by providing locations to which customers will gravitate. They can also provide a focus for security, with safety features such as lighting, visibility, and CCTV. Most taxi stands in other large cities have a minimum of three spaces. Taxi stands should be well-marked and encourage queuing. Existing taxi stands should be reviewed to ensure visibility of location and markings, and should be well-marked on city maps. We recommend that the City establish taxi stands of three spaces or greater, with street markings indicating clear start and end positions of the stand. It is also recommended that signs also include a notice of fines for illegal pick-ups, as well as the Hackney Unit's complaint line. The City should work with the new TAC to identify new locations for taxi stands.

Implement an Annual Process to Review Meter Rates and Medallion Supply – Utilize collected data and implement a model / and an annual process for determining (1) whether or not a meter rate increase is needed, (2) what adjustments to lease caps (if any) are justified; and (3) need for additional medallions.

Funnel Taxi Fines to a New Fund Dedicated to Testing New Incentives – Several needs for incentivizing drivers have been identified – to pick-up on more dispatched calls, to replace regular taxicabs with WAVs, etc. The City should establish a new policy where a portion of the fines are deposited in an Incentive Fund that is used to test the effectiveness of new incentives.

7.2 LONG TERM RECOMMENDATIONS

Changes to the Taxi Infrastructure and Oversight

Allow for Extended Vehicle Usage – Once the City has greater confidence in the quality of vehicle inspections, the allowed six-year vehicle life could be extended up to two one-year periods for vehicles meeting certain inspection standards. No WAV vehicle that does not meet accessibility standards should be granted an age extension.

Centralization of Radio Dispatch Functions – The current system of dispatching appears to be ineffective at providing reliable service to customers, especially in neighborhoods beyond central Boston. As more drivers rely on other means for business, including on-line services, and as more customers opt to place taxi requests by other means, response times are likely to become even worse, leading to further declines in volume and reliability for customers.

If this happens, the City may wish to consider centralizing dispatch services with one vendor that would have access to all vehicles. All medallion owners would be required to subscribe to this one dispatch service. Then a customer would potentially have access to all 1,825 taxicabs with one call instead of just a portion of the fleet. Similarly, persons with disabilities could access all WAV taxis and not a subset.

If centralized dispatching is implemented, the City would likely procure central dispatch services via an RFP process. The successful contractor would be responsible for providing reports and data for all trips and could also manage any subsidy programs and lost and found items. The

RFP would request each proposer to state what fee would be assessed for dispatching service. As suggested earlier, drivers might be incentivized to take dispatch calls by means of a surcharge for dispatched trips, which would also pay for the dispatching service.

One Paint Scheme –If there is a change to centralized dispatching, names and separate paint schemes related to radio dispatch associations would no longer be relevant. All that would be important is that the taxicabs be recognizable as licensed Boston taxis and differentiated from out-of-town taxis, bandit/gypsy cabs, or livery vehicles.

Explore the Creation of an Independent Taxi and Livery Department or Commission – Several of the short-term recommendations are designed to improve the BPD's oversight of – and relations with – the taxi industry. Continuity of leadership is key to the success of these efforts. If continuity of effective leadership proves elusive, the City should consider establishing an independent Taxi and Livery department or commission with its own permanent staff. An independent department or commission would provide regulatory oversight and enforcement. It is recommended that the City track BPD's effectiveness in implementing the set of recommendations over the next two years, and if there is noticeable improvement, there may not be a need for an independent oversight body. If the BPD struggles, the creation of an independent department or commission is recommended.

Establish Regulations for Oversight of Livery Operators – Many cities regulate livery services in order to protect the public with safety-related standards and to establish clear distinctions between taxi service and livery service. Currently, livery operators are licensed by the state, but the state does little more than issue livery plates through the Registry of Motor Vehicles. Possibly, the proposed recommendations for licensing Transportation Network Companies may be sufficient to address issues with livery operators. If not, it may be necessary for the City to seek a change to state laws so it can regulate livery operators operating in Boston.

Alternative Strategies Based on Ongoing Analysis – The short-term recommendation for a more comprehensive collection of data and subsequent analyses may point to the need to address certain issues that were mentioned by stakeholders but were difficult to quantify because of the lack of data. For example, some of the stakeholders mentioned that the outer neighborhoods were subject to poor response times. If data from all dispatch systems were collected and analyzed, a better picture of taxi responsiveness would emerge. If the percentage of trips over 20 minutes turns out to be significant in any given section of the city, clearly a strategy to deal with the issue is warranted. For example, incentive based strategies for radio associations or partnerships with TNCs could be tried as a demonstration project.