



New York City Department of Transportation

Request for Expressions of Interest

regarding

Parking Availability and Payment Technology System

in

New York City

September 24, 2010

1. PURPOSE OF THE RFEI

This Request for Expressions of Interest (“RFEI”) is issued to invite interested vendors to submit information to the New York City Department of Transportation (NYCDOT) about parking technologies that can provide more convenient payment options, information about parking space availability on a real-time basis, and provide the basis for dynamic pricing of parking. NYCDOT seeks effective technology and system approaches from interested firms that would accomplish these goals, taking into account the demanding New York City operating environment.

Depending on the responses to this RFEI, NYCDOT may invite one or more vendors to participate in a limited demonstration of the proposed technology or service at no cost to the City. Invitations to participate in a demonstration will depend upon vendor experience, qualifications, and potential to achieve the City’s goals and work within established parameters, as described in this RFEI. Participation in a demonstration does not represent a commitment to any future procurement. Firms invited to the limited demonstration will be required to sign no-cost agreement with NYCDOT.

2. BACKGROUND

NYCDOT’s Strategic Plan commits the agency to a series of initiatives for improved mobility and transportation choice, safer streets, greening and public space, and reduced impact on global climate. Toward these ends, the agency has introduced innovative parking management programs and supportive technologies to make it easier for motorists to find a parking space and to introduce a wider set of payment options. Combined with other curb management practices, parking management can improve motorist convenience, help reduce double-parking and blockage of bus stops and hydrants, reduce vehicle miles spent searching for an available space, and increase compliance with curbside regulations.

DOT has undertaken a number of initiatives toward these goals, including a series of parking pricing peak-rate pilots, installation of multi-space meters, testing of real-time space availability and cell phone payment at municipal lots, reduction of agency parking placards, and development of an agency car sharing pilot to reduce NYCDOT’s light-duty vehicle fleet.

This RFEI focuses on identification and potential field testing of systems and technologies related to payment options and monitoring of space availability. The following background information is pertinent to potential implementation of these technologies and should be taken into consideration in responding to this RFEI.

NYCDOT currently operates 45 municipal parking facilities in the five boroughs of New York City with a total of 11,400 parking spaces (5,300 in garages and 6,100 in parking fields). All municipal parking facilities are equipped with multi-space parking meters that accept credit card payment, quarters, dollar coins and the pre-paid NYC parking card. These meters are generally Pay-N-Retain; enforcement officers retrieve data directly from the meters as to which marked parking spaces have currently valid payment.

In addition, NYCDOT also manages approximately 80,000 on-street metered parking spaces. The majority of on-street spaces are equipped with single-space meters, all of which are electronic and most of which accept quarters only. Multi-space meters were introduced in 1996. All on-street multi-space meters accept quarters, the NYC Parking Card, and credit / debit cards. These spaces are not marked on the street. On-street multi-space meters are Pay-N-Display, requiring users to display a receipt on their vehicle's dashboard allowing enforcement officers to see the parking expiration time. (Please see Appendix A for make and model of the single-space and multi-space meters.)

Parking summonses are issued by NYPD Traffic Enforcement Agents (TEAs) and police officers. TEAs and police officers issue parking violations using handheld devices, a computerized unit in their vehicle, or by manually filling out a summons. Data from handheld devices are downloaded at a base station. Handhelds do not have wireless connections due to security concerns.

Additional information on parking facilities, parking rates, enforcement and adjudications is provided in Appendix B.

3. PROJECT OVERVIEW

3.1 Goals and Objectives

NYCDOT is interested in information about technologies and systems that can:

- Provide real-time information such as parking location, availability and price to the public
- Provide more convenient payment options to users through hand-held devices such as cell phones and personal digital assistants (PDAs)
- Provide information on parking demand and supply that would serve as the basis for dynamic pricing of parking spaces

3.2 Project Concept

NYCDOT is interested in investigating both specific technologies, and opportunities to create a coordinated parking management system, from an operations and technological perspective, for all user levels ranging from parking users to agency management users to enforcement agents.

In an effort to keep costs down, NYCDOT encourages respondents to incorporate the use of the New York City Wireless Network (NYCWiN) into responses to this RFEI. NYCWiN could be used to communicate data between the various systems and devices. Appendix C contains a description of NYCWiN.

- Specific desired technologies and system aspects may include any or all of the following elements:

- A vehicle sensor that will accurately detect the presence of a vehicle in a NYC on-street parking space.
- A management program that will:
 1. Collect on-street parking availability information
 2. Collect on-street parking payment information
 3. Collect or collaborate with a third-party to collect and process parking payments.
 4. Provide NYCDOT with on-street parking information such as vehicle location, time and date, parking duration, payment amount and payment type
 5. Provide NYCDOT with on-street parking availability, use and turnover in specified areas or zones
 6. Communicate with wireless devices (cell phone, PDA or other electronic communication device) to allow users to pay for on-street parking
 7. Communicate with wireless devices (cell phone, PDA or other electronic communication device) to allow users to check on-street parking availability in specified areas or zones
 8. Provide NYPD with data regarding incidence of unpaid and expired meter parking
 9. Enable information sharing and communicate with other existing NYCDOT parking programs and systems
 10. Communicate with NYPD and DOF systems to recognize and identify stolen plates.
- A web-based and other electronic based interface system that will:
 1. Allow users to pay for on-street parking
 2. Allow users to check on-street parking availability by specified areas or zones
- Must comply with (or propose revisions to) the specifications for an “In-Vehicle Parking System” as outlined in [Section 4-08](#) (12) of the *New York City Traffic Rules* (see Appendix D)
- A communication system that is:
 1. Reliable for a real-time data system
 2. Cost effective
 3. Secure
- A system that:
 1. Integrates with other parking technologies such as car-sharing, parking placards, variable rate parking, and payment and availability in municipal and private parking facilities
 2. Possesses the capability to advance independently regardless of other programs’ technical or political obstacles
 3. Is scalable such that the overall system can advance as future options become available or necessary

Although, as stated above, any response need not include every element detailed above, NYCDOT has assembled a flow chart to outline the basic functions of a parking management system which includes all such potential elements. The flow chart, found in Appendix E, is provided as NYCDOT’s current vision. NYCDOT is open to all suggestions to achieve the best

system possible and the most effective deployment approach, which is likely to involve a staged implementation over a period of time.

4. POINTS OF INTEREST TO NYCDOT

Respondents to the RFEI are requested to include information about specific technologies and systems that provide the functionality and accomplish the goals discussed above, and/or an overall approach to the design, implementation, management, operation and maintenance of system with many if not all of these elements. Respondents should identify the key issues involved in implementing specific technologies and an overall system and ideas for innovative operational and technological solutions.

Respondents may describe the roles that could be played by other government agencies as they may relate to the system. Responses to this RFEI should address the issues and questions detailed below.

4.1 Program Structure and Logistics

- 4.1.1 Describe the overall system, including functionality and technologies. Describe system functionally from beginning to end. Create a flow chart that details the system functions and shows the relationships between the various users of the system.
- 4.1.2 Describe ease-of-use of the proposed systems and associated equipment for all groups of users. (Motorists, NYCDOT, enforcement, adjudications).
- 4.1.3 Describe the technical support required for the system.
- 4.1.4 What type of maintenance will be required for the system?
- 4.1.5 How will the proposed system track, record and report equipment failure?
- 4.1.6 Describe the energy requirements and mechanical specifications for the system and how these requirements will be met.
- 4.1.7 How much bandwidth would the proposed system require?
- 4.1.8 Describe how the proposed system is ADA compliant.
- 4.1.9 How will users be able add time or payment remotely?
- 4.1.10 Describe how the system will be physically and technologically secure.

- 4.1.11 Detail the durability of the detection and payment equipment detailed in the response to this RFEI, in various weather conditions (hot, cold, rain, heavy snow, ice). Is the equipment resistant to salt? Provide a list of cities with cold weather and similar urban environments, in which the equipment has been installed and document the experience in each city.
- 4.1.12 Detail the durability of the detection and payment equipment that would be installed in the roadway or on sidewalks with specific reference to heavy traffic volumes, heavy trucks and utility cuts. Provide a list of cities with dense urban environments, in which such equipment has been implemented and detail the experience in each city.
- 4.1.13 Will the system have the capability to detect vehicle presence at a curbside on-street parking space on a block in which parking spaces are not individually marked (e.g., using multi-space meters)? If so, how, where, and to what accuracy level?
- 4.1.14 Detail how the system will accept cell phone payment in a multi-space environment where individual parking spaces are NOT marked? If so, how does the system recognize the vehicle for which payment has been made, and how is this information relayed to enforcement personnel?
- 4.1.15 Detail other places where the system has been implemented and the approximate cost (capital and annual operating) for the system. Describe specifics of the implementation including payment channels and payment media used, scale and scope of implementation, and benefits derived to the public and to regulatory and enforcement agencies.
- 4.1.16 Provide references of government contacts where you have installed systems similar to that detailed within your response to the RFEI.
- 4.1.17 Would a pilot or demonstration program be advisable and/or feasible? If so, describe how the program would be implemented along with the recommended scope, typical location(s) and anticipated duration of the program.

4.2 Integration with Other Systems

- 4.2.1 How will the proposed system be compatible with and interact with existing multi-space meters?
- 4.2.2 How will proposed system integrate NYCWiN?

- 4.2.3 How will the proposed system integrate with existing and future credit card systems and the NYC Parking Card?
- 4.2.4 How will the proposed system integrate with the pay by cell phone parking? (Please note that the NYCDOT may be undertaking a pay by cell phone parking program.)
- 4.2.5 Can the technology for the system to sense parking space availability develop independently from the payment system and vice versa?
- 4.2.6 How will the proposed system centralize data management for all aspects of the Department's parking programs, namely information from parking payment, parking occupancy, availability and duration?
- 4.2.7 Does the proposed system provide enforcement tools in line with NYPD operating practices?
- 4.2.8 Describe potential opportunities for NYCDOT to work with private off-street parking operators and/or other private entities to provide parking availability information. Include ideas on how to integrate on-street, NYCDOT municipal off-street and private off-street parking to create a seamless experience for motorists.
- 4.2.9 What documentation of payment will be provided to individuals who pay for parking via cell phone payment that can be used as evidence of parking payment?

4.3 Costs and Funding Methods

- 4.3.1 How much would it cost to implement the system by element?
- 4.3.2 What would be the initial capital costs?
- 4.3.3 What would be the projected annual operational and maintenance costs?
- 4.3.4 What cost if any is charged to users (the public) and how would they be charged?

4.3.5 What would be the NYCDOT personnel requirements to operate and maintain the system?

4.3.6 What are the possible funding sources for the system? Specifically address the obstacles and advantages to each source of funding.

4.4 Potential Legal Issues

4.4.1 Are there any legislative or legal issues that we should be aware of in regards to your technology and proposed system?

4.4.2 How does your proposed system document transactions and violations and support adjudication of violations?

5. SUBMISSION REQUIREMENTS

5.1 Content

All submittals (“Submittals”) must be in writing and in electronic format (CD or DVD) and delivered **by-hand or by a nationally recognized express mail carrier** to NYCDOT at the address designated in Section 5.2 below. Submittals should be organized into two parts as listed in Sections 5.1.1 and 5.1.2 below.

5.1.1 Respondent’s Information

- Provide contact information, including, the legal name of your firm or entity, business address, name of contact, telephone, email and Federal Tax Identification number (EIN).
- Provide a summary of your firm’s background and experience related to the development and deployment of parking availability and payment technology systems. Please do not submit standard marketing material.

5.1.2 Response to NYCDOT Points of Interest

- Provide responses to the issues and questions in Section 4.1 through 4.4.

5.2. Submission Details

Any inquiries concerning this RFEI should be directed by e-mail, under the subject line "Parking RFEI Q&A", to ParkingRFEI@dot.nyc.gov. Final Submissions are due October 29, 2010 at 4:00 pm EST.

A pre-submission meeting will be held at 2:00 PM on October 19th at NYCDOT, 55 Water Street – Bid Room A, New York, NY. The deadline for submission of written requests for clarification is October 19th, 2010 at 4:00 p.m. EST. NYCDOT will circulate questions and answers, including those asked at the pre-submission meeting, to respondents who provide e-mail addresses no later than October 26th, 2010. DOT will post answers to all submitted questions on this webpage.

For those wishing to submit hard copy, please submit five copies of your submission, printed on both sides (double-sided) on paper with no less than 20% post-consumer material content by October 29th, 2010 at 4:00 p.m. EST to:

New York City Department of Transportation

Contract Management Unit

55 Water Street

New York, NY 10041

Attn: Willa Ng – Parking RFEI

6. ADDITIONAL INFORMATION

- 6.1 This RFEI is not intended as a formal offering for the award of a contract or for participation in any future solicitation.
- 6.2 NYCDOT does not intend to grant or issue any agreements on the basis of this RFEI.
- 6.3 NYCDOT, the City and their officials, officers, agents and employees make no representation or warranty and assume no responsibility for the accuracy of the information set forth in this RFEI.
- 6.4 No information contained in submissions shall be deemed confidential and such information may be shared with other governmental entities. Therefore, please do not submit any information that may be deemed proprietary in nature.
- 6.5 Neither NYCDOT nor the City shall be liable for any costs incurred by any respondent in the preparation, submittal, presentation or revision of its submission. Neither NYCDOT nor the City shall be obligated to pay and shall not pay any costs in connection with the preparation of such submissions.
- 6.6 All submissions shall become the property of NYCDOT and the City and shall not be returned.

6.7 NYCDOT at its sole discretion reserves, without limitation, the right to:

6.7.1 Withdraw the RFEI at any time;

6.7.2 To discuss various approaches with one or more respondents (including parties not responding to the RFEI);

6.7.3 Use the ideas and/or submissions in any manner deemed to be in the best interests of NYCDOT and the City, including but not limited to soliciting competitive submissions relating to such ideas or proposals and/or undertake the prescribed work in a manner other than that which is set forth herein; and

6.7.4 Change any terms of the RFEI.

Appendix A

NYC Parking Meters – Models

1. Single Space Meters

- Mackay X-Series

2. Multi Space Meters

a. Current Generation

- i. Parkeon DG

b. Next Generation Meters

- i. NYCDOT is currently in the process of selecting a vendor for the next generation of muni-meters. Accordingly, technology should be compatible with, but not necessarily limited to, the following Multi Space Meters:
 1. Metric Parking Aura
 2. Digital Payment Technologies LUKE
 3. Mackay Guardian
 4. Cale MP104
 5. Global Parking Solutions Metro
 6. Parkeon Strada

Appendix B. Background on Parking Regulation and Operations in New York City

Three New York City agencies, NYCDOT, the [New York City Police Department](#) (NYPD), and the New York City Department of Finance (DOF), play key roles in the regulation, pricing, and enforcement and adjudication of parking violations. Parking options in NYC include municipal parking facilities; on-street free, metered and variable rate parking; commercial parking; and private off-street parking. With the exception of private off-street parking and on certain privately owned streets, all regulations related to the various parking options fall under the jurisdiction of NYCDOT. There are a small number of privately-owned streets where on-street parking is regulated by the owner(s) of such streets. Parking enforcement is the responsibility of NYPD. DOF adjudicates parking violations and collects parking-violation payments.

1.1 NYC Paid Parking Options

Municipal parking facilities are available in all five boroughs. There are currently 5 municipal parking facilities in the Bronx; 11 in Brooklyn; 3 in Manhattan; 21 in Queens; and 5 in Staten Island. (Figure 1 shows the locations of all such municipal parking facilities.) Several of these facilities (two in the Bronx; one in Brooklyn; one in Manhattan; and three in Queens; and one in Staten Island) are garages which are operated by private management companies through three-year contracts. Garages that have attendants collect payments via a cashier at a toll booth. Permits are available for long-term parking at many of these facilities through the garage managers. The garages vary with respect to parking rates, hours of operation, parking time limits, and permit cost.

**Figure 1: New York City Department of Transportation
Municipal Parking Facilities**



Municipal parking fields and lots are managed by NYCDOT's Parking Operations Division. Users of the facilities make payments at a multi-space meter. All fields and lots have been upgraded to accept credit card payment, and also accept quarters, dollar coins and pre-paid NYC Parking Cards. Accepted credit cards for all NYCDOT-regulated parking include Visa, MasterCard, American Express and Discover and there are no additional fees or minimums. Permits are available for long-term parking at municipal lots on a first-come, first-serve basis after an application has been submitted to NYCDOT. The fields and lots vary with respect to parking rates, hours of operation, parking time limits, and permit cost.

On-street parking in NYC varies and includes free parking, metered parking, and variable rate parking. NYCDOT along with the Department of Sanitation and NYPD implement parking regulations which allow for street cleaning and improved traffic flow.

With respect to on-street metered parking, NYC has single-spaced and multi-space meters. There are 51,288 single-spaced meters, all of which are electronic and most accept quarters only. A small number of select single-space meters accept NYC Parking Cards. Multi-space meters were introduced in NYC in 1996 and expanded curb capacity by eliminating rigidly defined parking spaces. All multi-space meters accept quarters and dollar coins as well as NYC Parking Cards. Most multi-space meters (except those that are only used for commercial parking) also accept credit cards. Multi-space meters are either Pay-N-Display or Pay-N-Retain. Both types issue a receipt indicating the time purchased to park at the location. Pay-N-Display meters require the user to display the receipt on the vehicle's dashboard allowing enforcement officers to see the parking expiration time. At Pay-N-Retain meters, officers retrieve data directly from the meters, so a user retains the receipt as proof of payment as well as a reminder of when to return.

There are no parking meters in effect on Sundays. Recent City Council legislation related to metered parking involves parking rules at broken or missing meters. Specifically, this legislation notes that at both broken and missing meters, parking is allowed for the maximum time on the posted sign. (An hour for a 1-hour meter, 2 hours for a 2-hour meter, etc.)

PARK Smart is a new variable rate parking program being implemented as a series of pilots beginning in October 2008. PARK Smart aims to make parking easier while reducing congestion and improving safety by increasing the number of available metered parking spaces. The meter rate is higher when demand for parking is greatest and decreases when demand is lower. After a six-month PARK Smart pilot (from October 6, 2008 to April 6, 2008) in Greenwich Village, Manhattan Community Board 2 passed a resolution to make PARK Smart permanent. Currently, meter rates for the Greenwich Village PARK Smart area are \$3.75 per hour from noon to four p.m. and \$2.50 per hour at all other times that meters are in effect. A second pilot was launched in Park Slope, Brooklyn on May 4, 2009, with peak rates (noon- 4:00 PM) of \$1.50 per hour and regular rates of \$0.75 per hour. A third pilot was launched in the Upper East Side in June 2010 with a peak rate of \$3.75/hr from noon to four p.m. and \$2.50/hr at all other times. All other parking regulations remain the same.

Since 2000, certain areas in Manhattan have been designated as paid commercial parking zones. In these zones, commercial vehicles are required to pay for parking in "No Standing Loading & Unloading" zones on east and westbound streets as well as the avenues from 14th Street to 59th Street and from 2nd Avenue to 9th Avenue and on Canal Street on both sides between Bowery and West Broadway. These rules are in effect Monday through Friday from 7 a.m. to 6 p.m. unless otherwise posted. Payment within these zones is made at multi-space meters located along these streets, and users must display the receipt on their dashboard. The maximum time for such metered parking on a single block is a total of three hours, unless otherwise indicated by a posted sign. Rates for commercial vehicles are \$2.50 for one hour, \$5 for two hours, and \$9 for three hours of parking for loading and unloading. These multi-space meters accept coins and NYC Parking Cards. NYCDOT is examining locations outside of Manhattan to expand the commercial paid parking program.

There are numerous privately operated off-street parking garages and lots in NYC. These facilities are licensed by the Department of Consumer Affairs. While private off-street parking is not under the jurisdiction of NYCDOT, NYCDOT is interested in investigating opportunities to provide information about availability and pricing to parking users for all parking options.

1.2 Parking Enforcement

Parking summonses are issued by NYPD Traffic Enforcement Agents (TEAs) and police officers. TEAs use handheld devices to issue summons. These devices can scan barcodes as well as print tickets on-location. Most of the existing handhelds are five years old. Currently there is no additional memory space available on the handhelds to add new programs. NYPD is in the process of replacing these handhelds with a newer model. The newer model will be more rugged and less prone to environmental factors such as weather.

The current handhelds use store-and-forward technology. Data is stored in the handhelds by the TEAs and then docked into cradles at the base station to upload and download data from and to servers. The devices are not wireless and NYPD does not have any plans to make the devices wireless due to security concerns. TEAs manually input the location of the violation through the application dropdown menus. Currently the system has no capability to identify and track stolen vehicles. **Due to the stringent security requirements and data integrity issues**, the current system is on a **closed network**. Therefore, the devices cannot be integrated with another system.

Police officers issue tickets from a computerized unit in their vehicle or, if they are on foot patrol, manually fill out a summons. NYPD is reluctant to have officers that are not TEAs carry another device. Currently non-TEA officers can verify parking status and payment from pay and display receipts received from multi-space meters.

1.3 Parking Adjudication

The New York City Department of Finance, Adjudication Division provides a fair and efficient forum for motorists to challenge their parking or red light tickets. Administrative Law Judges (ALJ) enable drivers

to contest parking tickets over the Internet, by mail, and in person in all five boroughs. In addition, the ALJ's hear appeals of parking ticket determinations. The Division also includes a special unit for Commercial Adjudications, which conducts hearings and appeals on tickets issued to commercial vehicles. The Red Light Camera Unit handles hearings and appeals for tickets issued at selected, photographed traffic light locations throughout the City.

Appendix C

New York City Wireless Network

On September 12, 2006 Mayor Michael R. Bloomberg announced the selection of the Northrop Grumman Corporation to create the New York City Wireless Network (NYCWiN). This five-year, \$500 million contract award to build and maintain NYCWiN will use standards-based mobile broadband wireless technology, known as the Universal Mobile Telecommunications System (UMTS), provided by IPWireless. This technology delivers broadband mobility, high capacity, reliability, and scalability - all suited to meet the real-time, fail-safe requirements of the program. More information about this technology is available at <http://www.ipwireless.com/technology/>

The most aggressive commitment by any municipality to provide a next-generation public safety network, NYCWiN is a secure and reliable wireless network designed to streamline and enhance public safety and public service operations. The network provides wireless coverage throughout the City both on and off street, supporting high-speed mobility as well as fixed-location usage. NYCWiN is currently used by 19 New York City Departments, including the Department of Transportation for remote traffic light management, sensor management and vehicle location. (<http://www.ipwireless.com/news/pressreleases/press060909>)

NYCWiN is a broadband wireless data network designed to support the City's public safety and public service agencies. It enables a wealth of mobile and fixed applications, including real-time video, rapid database lookup and the exchange of rich graphical information. NYCWiN is the most aggressive commitment by any municipality to provide a next-generation public safety system. NYCWiN provides critical, real-time information to the City's first responders where and when they need it. The benefits of this next-generation network are most evident in its wide range of planned applications, which include the use of: (1) mobile applications (2) fixed-location applications and (3) automatic vehicle location technology:

(1) NYCWiN mobile applications support and enhance communication between public safety responders in the field and their command and supervisory centers. These applications provide high-speed data access to an agency's intranet systems and the Internet, as well as commonly used City, State and Federal databases. NYCWiN supports the transmission of on-scene video to first responders both en route and at the scene of an emergency. The NYCWiN mobile applications will enhance public safety responses by improving command and control and situational awareness capabilities. These applications will also enable the mobile workforce by allowing these users to work at any time, from anywhere within the City. Mobile applications can become an extension of the agency user's desktop systems. NYCWiN can enable handheld devices to connect wirelessly in real-time to central agency systems, and provide high-speed data transmissions for field users.

(2) NYCWiN also hosts fixed-location applications, which provide for wireless connectivity in areas where traditional networked devices may not be feasible. The planned fixed-location applications are wireless call boxes for the public to summon emergency dispatch services when needed and wireless traffic control to directly control traffic signals for the Department of Transportation's Vehicular Traffic Control System. Applications currently under consideration for future development include:

- SCADA (Supervisory Control and Data Acquisition) Systems - NYCWiN can significantly expand the City's existing SCADA systems, including bio-hazard and monitoring systems for water supplies, water pump and storage tank activities, and controls of other plant operations within the City.
- Automated Meter Reading - A wireless AMR system can provide water customers with better consumption information, and detect leaks for both the customer and the City. Automated meter reading will help to efficiently generate customer bills and reduce meter reading errors.
- Intelligent Transportation Systems - Using traffic and volume sensors along key roadways, the City can automatically monitor patterns, adjust traffic signals accordingly and plan for future traffic management needs. On-road digital message boards can be automatically updated from a central location to inform the public of traffic activity and potential delays.

(3) Automatic Vehicle Location (AVL) applications facilitate tracking of the City's first responder vehicles and other non-emergency vehicles from a central location. These enterprise systems also enable operators of emergency vehicles to establish their own precise locations and determine best routes to respond to requests for assistance. Likewise, backend systems at control centers will allow operators to locate and track vehicles in real-time or export vehicle tracking logs for future route planning and optimization.

Appendix D

New York City Traffic Rules

http://www.nyc.gov/html/dot/html/motorist/traffic_rules.shtml

Appendix E: Potential Payment and Availability Functions and Flow Chart (actual system may vary)



