CITY OF LOS ANGELES INTER-DEPARTMENTAL CORRESPONDENCE

Date:	August 2, 2017
То:	The Honorable City Council c/o City Clerk, Room 395, City Hall Attention: Honorable Mike Bonin, Chair, Transportation Committee
From:	Seleta J. Reynolds, General Manager, Department of Transportation Ted Ross, General Manager, Information Technology Agency Lud Vur Nazario Sauceda, Director, Bureau of Street Services
Subject:	PARKING REFORM: USING TECHNOLOGY TO REDUCE STREET SWEEPING TICKETS (COUNCIL FILE 15-1449)

SUMMARY

This report provides an update on the efforts to develop digital street sweeping routes, communication system between street sweepers and parking enforcement handhelds, a notification system to inform residents of when they can park on a street after it has been swept, and resource needs to develop such a system.

RECOMMENDATIONS

That the City Council:

- 1. INSTRUCT the Los Angeles Department of Transportation (LADOT), Bureau of Street Services (BSS), and Information Technology Agency (ITA) to work with City Administrative Officer (CAO) and Chief Legislative Analyst (CLA) to identify the necessary funding to initiate the pilot program.
- 2. INSTRUCT the General Manager of LADOT to execute a change order to the contract with Conduent (formerly Xerox) for the additional scope of work to implement the handheld integration with street sweeping data.
- 3. INSTRUCT LADOT, ITA, and BSS to report back to the Transportation Committee in 120 days with an update on the progress of a pilot program.

BACKGROUND

In June 2014, Mayor Garcetti engaged a group of stakeholders to discuss opportunities to improve the parking experience throughout Los Angeles. This group, called the Los Angeles Parking Reform Working Group, was subsequently formed with residents, business owners and representatives of different organizations. Over the course of seven months, the Los Angeles Parking Reform Working Group reviewed and analyzed a wide variety of potential parking reforms. The Los Angeles Parking Reform Working Reform Working Group released their comprehensive report and recommendations for consideration in 2015. One of the recommendations was to reduce the overall number of citations issued for street cleaning violations by better using technology to improve the operational efficiency of and coordination between city departments and residents.

In December 2015, City Council approved a motion to direct departments to incorporate GPS tracking on all street sweeping vehicles; improve communication between sweeping vehicles, traffic control officers and the public; examine the feasibility of creating a digital street cleaning notification system for subscribers; map and catalog all street cleaning routes and reevaluate the schedules to ensure that street sweeping activities do not conflict with hours of peak parking demand and school pickup/drop-offs.

In June and August 2016, Transportation Committee heard updates on the multidepartment effort to meet the goals of the council motion. At its meeting in August, the Committee directed the departments to report back with resource needs required to create the pilot program that tests the capabilities of the notification system and coordination of the street sweepers with parking enforcement handhelds.

DISCUSSION

Global Positioning System (GPS) Hardware on Street Sweepers

In order to create digitized street sweeping routes, the General Services Department (GSD) and their vendor, Orpak USA Inc. (Orpak), completed installation of the GPS hardware and sensors on all 100 motor sweepers that service posted routes. The calibration and testing of the GPS devices and sensors, which is needed to ensure the accuracy of the data, is 95% complete. There is sufficient information available from the hardware to be used for a pilot program.

In addition, Orpak will provide a web service that validates the status of street sweeping routes (i.e. swept, cancelled, etc.) and the location of sweepers to identify blocks that the sweeper swept, and provide relevant information which will be utilized by ITA's Notification System and LADOT's citation processing contractor, Conduent (formerly Xerox).

Orpak drafted the attached Preliminary Feature Specification document to begin the process of developing the web service. Assuming that the City wishes to move forward with a six month pilot program, Orpak estimates that it will take up to six months of development and testing. The total estimated cost for the feature is \$108,468 consisting of the following:

- Programming, testing and deployment = \$108,000
- Ongoing operational expenses = \$468*
 - * Data consumption and storage cost increase from \$16.95 to \$29.95/per month/per vehicle.

BSS needs four new positions in order to: (i) ensure that every weekday morning, each sweeper rolling out to service posted routes is accurately transmitting GPS data; (ii) advance the digital route mapping project; and (iii) utilize the GPS data to continuously improve the efficiency and effectiveness of the motor sweeping program.

Digital Route Maps

BSS completed digital turn-by-turn maps for 11 of approximately 900 street sweeping routes. It is expected to take an approximately six months at an estimated direct cost of \$40,000 to complete this effort.

Notification System

Based upon the result of an initial feasibility study, ITA determined it is feasible to implement a notification system to inform residents of when the street has been swept and could be available for parking. The street sweeping status will be provided by Orpak Street Sweepers' GPS via a web service. It should be noted that the street will not necessarily be shown as available for parking immediately after being swept. There may be a delay in releasing the street for multiple reasons including, but not limited to, allowing time for parking enforcement to cite the illegally parked vehicles that prevented the street sweeper from sweeping the curb and/or roadway. Communication of when it is legal to park will be critical to ensure motorists do not mistakenly assume that once the sweeper passes it is immediately safe to park on the street.

If the City Council approves funding, ITA recommends using the MyLA311 Constituent Relationship Management (CRM) system as a solution for the resident registration and notification. The resident would register in either the MyLA311 portal or mobile app with the information stored in MyLA CRM system. The registered resident would be allowed to subscribe to one or more addresses to receive notification of when BSS has swept the street via a map interface. The user can select how they want to be notified (email or push notification via the mobile app). Depending on the volume, additional costs may be needed for an external mass email system like MailChimp or Constant Contact. The system would also display a map of street sweeping information on MyLA311 mobile app and lacity.org.

The total estimated cost is \$219,840, with an estimated timeline of three to four months. The cost* consists of the following:

- Implementation = \$180,000
- MyLA311 user license (2 users) = \$3,040
- Ongoing annual support and maintenance = \$36,800

* Assumptions: (1) Street swept information will be provided and managed by Orpak's GPS system; and (2) BSS will provide and maintain digital route maps of street sweeping schedules.

Parking Enforcement Handhelds

Using GPS technology installed on the City's street sweepers, Orpak will provide a web service that validates the status of street sweeping routes (i.e. swept or cancelled), the location of sweepers to identify blocks that the sweeper swept, and provide relevant information to LADOT's citation processing contractor, Conduent, in order to prevent LADOT's Parking Enforcement Officers from issuing street sweeper citations on blocks that are either cancelled or swept. This will require the current handheld devices to determine whether or not to issue a citation based on their current location before starting the citation issuing process.

Conduent drafted the attached Street Sweeping Pilot Requirements Document and change order to the existing contract to begin the process of developing the handheld feature. Assuming that the City wishes to move forward with a six month pilot program, Conduent estimates that it will take up to four months of development and testing. The total estimated cost for the feature is \$67,250 consisting of the following:

- Programming, testing and deployment = \$35,000
- Ongoing operational expenses = \$32,250*

* Wireless plan increase to 1GB Plan is \$4,500/per month (\$7.5 increase in wireless cost x 600 devices x 6 months) plus additional PocketPEO[®] software maintenance cost of \$875/per month.

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Program Implementation

The notification system and handheld feature will be implemented in two stages: creating a six month pilot program, and a phased citywide rollout. There are 24 street sweeping districts with approximately 900 posted routes in the City. The pilot program will initially take place in two of these districts, one in the Woodland Hills community of San Fernando Valley, and the other in West Los Angeles. These locations were selected in different parts of the City to test the communications and data transmission activities across different geographic regions.

The pilot program is expected to take approximately 8 to 10 months to implement and complete following adoption of this report's recommendations and securing the necessary funding. Table 1 shows the details of the timeframe.

Phase	Task	Duration
Planning	 Perform project planning and initiation activities 	8 weeks
Requirements Gathering	 Gather requirements for all necessary applications and components 	ITA: 3-4 weeks Orpak: 4 weeks Conduent: 3-4 weeks
Development & Unit Testing	 Ongoing creation of digital street sweeping route maps Design, develop and unit test application components *includes testing & deployment of pilot 	ITA: 6-8 weeks Orpak: 16-24 weeks* Conduent: 12-16 weeks*
User Acceptance Testing and Deployment of Pilot Program	 Perform integration test with all application components Perform user acceptance testing Add map to Lacity.org Launch the pilot project 	ITA: 4 weeks
System Stabilization	 Monitor system performance and make necessary correction/adjustment Address system defects 	8 weeks

Table 1:	Pilot	Program	Timeframe
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The total estimated cost for delivering the pilot program is \$573,316. The one-time costs are shown in Table 2. The six month operation and maintenance costs are shown in Table 3.

Table 2:	One-Time Costs for Pilot Program
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Provider	Deliverable	Amount
GSD/Orpak	 Application programming interface (API) to provide real-time section coverage data per street sweeper (to be used by the City system and Conduent's handheld devices for Parking Enforcement Officers). Application for BSS staff to manage daily routes cancellation. 	\$108,000
LADOT/Conduent	Enhancements to Parking Enforcement Officers' handheld devices to include the ability to determine whether or not to issue a citation.	\$35,000
ITA and 3Di Inc.	User subscription and notification features in MyLA311 portal and mobile app.	\$183,040
	TOTAL	\$326,040

Table 3: Six Month Operation and Maintenance Costs for Pilot Program

Provider	Item	Amount
GSD/Orpak	Continuous data processing of API providing real-time street sweeper coverage status and application for BSS staff to manage daily routes cancellation. (Additional \$13 per vehicle x 6 x 6 months)	\$468
LADOT/Conduent	Enhancements to Parking Enforcement Officers' handheld devices (1GB plan - \$4,500/month) plus additional PocketPEO maintenance cost (\$875/month)	\$32,250
ITA and 3Di Inc.	Subscription and notification features in MyLA311 portal and mobile app	\$36,800
BSS	Two GIS Specialists (7213) and two Systems Analysts (1596) – Direct salaries	\$177,758
	TOTAL	\$247,276

The pilot program will be successful if the following tests yield favorable results:

- 1. Residents can subscribe/unsubscribe to notification of when a street has been swept;
- 2. Residents can check if one can park on the street based on location;
- 3. Parking Enforcement handhelds can query the cloud-based server maintained by Orpak;
- 4. Few instances of wireless communication issues or if the Orpak service is not available, and prompt reporting of the issue back to the City;
- 5. Orpak service recognizes street name and block number entered in the handheld or transmit latitude/longitude information from handheld and returns a response.

- 6. The Orpak service accurately indicates if the block entered by the Traffic Officer has been swept or not via manual query; and
- 7. Conduent eTIMS® citation database note accurately reflects the response received from Orpak.

Assuming the pilot program is successful, the program will be rolled out citywide incrementally as digitized street sweeping routes become available. We will provide a timeline for citywide expansion after the successful conclusion of the pilot program. There are not expected to be any additional one-time costs to expand the program citywide. However, the annual operation and maintenance costs will increase to \$472,416. The breakdown of the annual operation and maintenance costs for citywide expansion are shown in Table 4.

Provider	ltem	Amount
GSD/Orpak	Continuous data processing of API providing real-time street sweeper coverage status and application for BSS staff to manage daily routes cancellation. (Additional \$13 per vehicle x 100 x 12 months)	\$15,600
LADOT/Conduent	Enhancements to Parking Enforcement Officers' handheld devices (1GB plan - \$54,000/year) plus additional PocketPEO annual cost (\$10,500)	\$64,500
ITA and 3Di Inc.	Subscription and notification features in MyLA311 portal and mobile app	\$36,800
BSS	Two GIS Specialists (7213) and two Systems Analysts (1596) – Direct salaries	\$355,516
	TOTAL	\$472,416

Table 4: Annual Operation and Maintenance Costs

FISCAL IMPACT STATEMENT

The total estimated cost for delivering the six month pilot program is \$573,316, which includes the costs from Tables 2 and 3. Table 2 costs represent one-time expenses and will not be a consideration when the notification program expands to include all posted sweeping routes citywide. Funding for the pilot has not yet been identified. The potential impact to the General Fund by the reduction in street sweeping citation revenue during the pilot program is estimated to be between \$82,000 to \$214,000. Conduent estimates the annual revenue impact by expanding the program citywide is between \$4.5 million and \$11.8 million. The citywide estimate will be refined following an analysis of the revenue impact upon completion of the pilot program.

Attachments

Appendix A -Requirements

Conduent Transportation Parking & Mobility Solutions





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Document Version: 1.1 (February 2017).

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1. Introduction

At the request of the Mayor and City Council, the Los Angeles Department of Transportation, Bureau of Street Services, Fleet Services, and Information Technology Administration are developing a system that will allow constituents to park on streets posted for no parking during street sweeping hours if the street sweeping is canceled or the street sweeper has swept the street. Using GPS technology installed on the City's street sweepers, the City's vendor Orpak will provide a web service that validates the status of street sweeping routes (i.e. swept, cancelled, etc.) and the location of sweepers to identify blocks that the sweeper has swept, and provide relevant information to Conduent in order to prevent LADOT's Traffic Officers from issuing street sweeper citations.

Conduent's Objective

To provide an additional feature to the current handheld devices that LADOT Traffic Enforcement Officers are using; adding the ability to determine whether or not to issue a citation based on their current location (block number and street name) before starting the citation issuing process.

Assumptions

A system hosted by Orpak will contain all streets on the sweeping routes, the days and times that street sweeping and parking restrictions are in place for each of the routes. Orpak's web service will have the ability to ingest, analyze, and correlate the street number and name and optionally the latitude/longitude and return a message that the Officer can use to issue or not issue a citation. The street table in the handhelds is generated from the Conduent PocketPEO® handheld software that is currently in use, the Latitude/Longitude information is generated from the Handhelds location (not correlated to the street number and name) The Officer will conduct an initial check to ensure the route is enforceable and will be able to issue citations for that route in "Street Sweeping" mode (i.e. Quick Ticket). If the Officer for any reason issues a citation in a different category (i.e. Red Zone), and returns to street sweeper violation the validation needs to be done again. The Officer will needs to conduct a validation each time a new street sweeper route is enforced and need to be familiar with the routes.

2. Requirements

Street Sweeping check via handheld

Traffic Officers can have a separate screen (prior to issuing a citation) to validate the type of citation they are about to issue (e.g. Street Sweeper). The Officer will be prompted to enter a street name and address (e.g. 1435 S MAIN ST) into their handheld device to validating if the route is enforceable. The handheld device will send the street number and name and optionally the latitude and longitude to the web services provided by Orpak to query if the route has been cancelled or swept. Upon receiving a response, the handheld will display a message indicating if the Officers should proceed to the citation issuing application and issue a citation or not issue a citation. If the message returned is to "Issue a Citation," the handheld device will enable the officer to issue a citation. The Officer will be able to utilize the same functionality to issue a "Quick Ticket". In the event where the Officer enforces areas away from the street sweeper route and/or issues a "non-sweeper" citation, a re-verification would need to be conducted once the Officer returns to street sweeping enforcement or beginning of a new street sweeping route.

Example:

- 1. Officer arrives at a Street Sweeping route and logs on to the handheld devices.
- 2. The Officer will select pre-verification :
 - a. The Officer is asked to enter a Street Number and Street Name.
 - Difficer enters an address (Street Number and Street Name) into the handheld device (i.e. 1435 S MAIN ST) from a pre-existing list of streets
 - c. The handheld sends a query to Orpak's web services using the address that Officer entered previously (i.e.1435 S MAIN ST) or
 - d. The handheld sends a query to Orpak's web services using the handhelds Latitude/Longitude information (not tied to address the Officer entered).
 - e. Orpak sends a response back to the handheld device, Conduent translates the messages based on business rules to be identified and relays the message to the Officer that states to "Issue a Citation" or "Don't Issue a Citation." This can be based on the fact that the street sweeper has gone by, certain restrictions, and/or the route has been cancelled. Don't Issue a Citation (if the sweeper route has been cancelled and/or the sweeper has gone by) no further action. Officer is prompted back to the first screen on the handheld device. The response from Orpak can be logged in PocketPEO® for reporting and analysis. Reporting requirement will need to be defined.
 - f. Issue a Citation Officer is prompted to the citation issuance screen and citation is issued as currently done.

Citations to note response received from Orpak

When a street sweeping citation is issued successfully, the handheld will save the comments received from Orpak, and save those notes as part of the Conduent eTIMS® citation history.

Example: The Conduent eTIMS® citation database comments for a street sweeping citation issued at 3:22PM on 12/21 will show: "Issue Citation" response received 3:22PM 12/21/2016."

3. Pilot and Testing Plan

Communications Testing

- 1. Test communications between handheld and Orpak's system by:
 - a. Ensure that handhelds can query the cloud-based server maintained by Orpak.
 - b. Determine if there are any instances of wireless communication issues or if the Orpak service is not available, and report back to LA City. Additional log will be provided to officers to track any instances where wireless communication on the handheld is not working and when Orpak doesn't return a response.
- 2. Test ability to recognize street name and block number entered in the handheld and return a response.
 - a. Check list of number and street names in Orpak server must match table in Conduent PocketPEO® handheld software. OR
- Test ability to transmit Latitude/Longitude information from handheld device and return a response.
- 4. Test accuracy of response to queries by:
 - a. Look-up function: Check manually that the response from the Orpak service accurately indicates if the block entered by the Traffic Officer has been swept or not.
- 5. Test that Conduent eTIMS® citation database note accurately reflects the response received from Orpak.

Latitude and Longitude GPS Accuracy

There are number of factors that contribute to the accuracy of GPS devices that are outside Conduent's control. The GPS radio signals encounter differing conditions while travelling through the atmosphere, causing signal delays, and therefore affecting accuracy. The geometry of the satellites being used will impact accuracy as well as the number of satellites that the handheld device is locked onto. In addition accuracy is also affected in an urban environment where GPS signal can bounce off of buildings or other objects. Based on the reasons mentioned we do not think using the GPS coordinates from the handheld devices is a feasible solution to determine the location of the Officer in order to issue a citation or not to issue a citation.

4. Project Team

Name	Role	Email
Armen Kazaryan	Conduent – Regional Director	Armen.Kazaryan@Conduent.com
Kevin Albanese	Conduent – Systems Development Manager	Kevin.Albanese@Conduent.com
Suheila Haider	Conduent – Program Manager	Suheila.Haider@Conduent.com
Alex Schaffer	Conduent – Associate Program Manager	Alexander.Schaffer@Conduent.com

This document is Conduent's understanding of the project requirements and what role Conduent will be responsible for. By signing below, both parties agree to the roles and responsibilities of Conduent.

Deliverable Title: Street Sweeping Citation Program

Signature Page - Requirements

Signature and Approval

Wayne Garcia Senior Management Analyst II City of Los Angeles, Department of Transportation Date

Armen Kazaryan Regional Director of Operations Conduent Transportation Date

CHANGE NOTICE NUMBER #4

TO THE DEFINITIVE AGREEMENT DATED SEPTEMBER 26, 2014 BY AND BETWEEN THE CITY OF LOS ANGELES AND CONDUENT STATE & LOCAL SOLUTIONS, INC.

Contract #C124676

This CHANGE NOTICE is issued this ______ day of August _____ 2017 ("Effective Date"), by and between the City of Los Angeles, a municipal corporation ("CITY"), and Conduent State & Local Solutions, Inc., ("CONDUENT", formerly XEROX), individually referred to as "party" and collectively as "parties," with reference to the following:

WHEREAS, CONDUENT has entered into an Agreement on September 26, 2014, with the CITY for the purpose of providing Parking Citation Processing and Collection Services ("Prime Contract") Contract #124676;

WHEREAS, Section 10.1 of the Prime Contract specifies that a Change Notice is appropriate for any change which does not significantly affect the scope of work, as set forth in the Statement of Work;

WHEREAS, CONDUENT and CITY have completed various discussions concerning the clarification and expansion of the scope of work of the Agreement;

NOW, THEREFORE, for and in consideration of the mutual promises and covenants made herein, and other good and valuable consideration, the receipt of which is hereby acknowledged, CITY and CONDUENT mutually agree to modify Agreement as follows:

- 1) Contract Section 1 Applicable Documents is hereby modified by replacing the order of precedence with the following chart
 - i. The Main Body of this Agreement
 - ii. Exhibit 1 Scope of Services
 - iii. Exhibit 2 This Contract (Rev. 3/09)
 - iv. Exhibit 3 Xerox' Proposal & BAFO
 - v. Exhibit 3.5 Appendix A Street Sweeping Pilot Requirements Document
 - vi. Exhibit 4 CITY's RFP and Addendums
- 2) EXHIBIT 1, SECTION 1.8.9 HANDHELD APPLICATION is hereby modified to add the following:

Street Sweeper handheld application - To provide an additional feature to the current handheld devices that LADOT Traffic Enforcement Officers are using; adding the ability to determine whether or not to issue a citation based on their current location (block number and street name) before starting the citation issuing process.

 SECTION 7.0: CITATION PROCESSING COST is hereby modified to add the following section and text after the VOIDED CITATION section and before the MOST FAVORED PRICING GUARANTEE section:

STREET SWEEPER PILOT

Compensation for Street Sweeper Pilot are as follows:

- Programming, testing and deployment = \$35,000 billed at acceptance for up to 200 hour of development (additional hours will be billed at \$175/per hour)
- Monthly Billing* = \$5,375
- * Wireless plan increase to 1GB Plan is \$4,500/per month (\$7.5 increase in wireless cost x 600 devices) plus additional PocketPEO® software monthly maintenance cost of \$875 per month.

All other terms and conditions of the Agreement for "Citation Processing and Operation of Parking Customer Service Center" between the City of Los Angeles and Conduent State & Local Solutions, Inc. (formerly Xerox State & Local Solutions, Inc.) dated September 26, 2014, Contract #124676 and all prior Change Notices remain in full force and effect.

IN WITNESS WHEREOF, CITY and CONDUENT have caused this Change Notice to be signed by their duly authorized officers or representatives on the Effective Date.

ACCEPTED AND AGREED:

Seleta Reynolds Date General Manager, Dept. of Transportation City of Los Angeles Kirk Strassman Date Vice President Local Government Solutions Xerox State & Local Solutions, Inc. **APPROVED AS TO FORM:** Mike Feuer, City Attorney ATTEST: Holly L. Wolcott, City Clerk

Michael Nagle Date Deputy City Attorney By

Date





FOREFLEET – CITY OF LA SWEEPER COVERAGE REPORTING

Feature specification - preliminary

Version 2



FUELING YOUR BUSINESS FOR SUCCESS

1 Overview

Streets in City of LA are marked with times when there will be street sweeping. During this timeframe residents cannot park on the streets. If the cars are left parked during a street sweeping schedule, DOT (Department of transportation) parking officers issue parking tickets (using Conduent parking management system and terminals).

In order to ease the parking situation in City of LA the city wants to provide notifications to its subscribers (residents) when the street is cleaned and available for parking. The notifications will be sent to DOT officers also so that they don't issue tickets if the street sweeping is completed. These notifications will be generated by the City's systems based on sweeping data received from ForeFleet.

Orpak's responsibility in this solution – ForeFleet system shall provide the GPS data necessary by pushing updated data when street sweeping is completed using Section ID (the city streets are broken down into sections, usually between crossings, defined in the city GIS).

The solution should be based on the DPLs installed on the sweepers, and the system should report over API to the city servers the completion of sweeping by section.

2 Feature description

2.1 City of LA GIS data

Section GIS data will be retrieved from the city centerline layer as shapefile or KML at:

http://geohub.lacity.org/datasets/d3cd48afaacd4913b923fd98c6591276_36

The section data will be imported into ForeFleet servers, to be used for the section sweeping reporting.

2.2 Section coverage monitoring

The system will monitor the sweeping coverage by section according to DPL location reporting and Broom status, based on the section GIS definitions.

As long as at least one of the brooms is down, the sweeper is considered to be sweeping.

Completion of a section is considered to be one pass of the section in either direction while in sweeping state all throughout the section.

Each instance of sweeping a section should be reported independently, i.e. if a sweeper sweeps a street on one direction and then back to the other direction, each will be considered one section covered.

2.3 Cancelled sections

The city might sometimes cancel planned sweeping route for a specific day. If a route is cancelled, all the associated section IDs have to be marked 'cancelled' for that day, so they can be reported as cancelled in queries by location as detailed below in 2.4.2.

Route cancellation will be reported at the beginning of the day if needed by the City. In order to do that, a new GUI tab will be added to the system, as well as a user permission to view this tab and manage the cancelled routes. The new tab will include a list of all existing sweeping routes with a checkbox next to each route. All cancelled routes will be checked and the user will submit the list. All sections associated with these routes will be marked 'cancelled' for the day.

The list of routes and associated sections will be stored in the system database. Each route will have a name and a list of associated Section IDs. This data will be provided by the City to Orpak in an agreed format (such as Excel spreadsheet) and will be loaded to the database. There will be no GUI to manage the route list, and if an update is required from time to time (assuming once every few months), an updated list will be provided to Orpak to be loaded into the database.

2.4 API reporting

2.4.1 City server API – Query by sweeper and time frame

The system API (SOAP web service) will provide the section coverage data per sweeper, to be used by the city's systems. It will report all sections completed per sweeper during a certain period of time.

The API request will specify the sweeper ID, start time and end time.

The data reported will be an XML which will include the following data per section covered:

- Section ID
- Device ID
- License plate
- Section start time first sample in section
- Section end time first sample outside the section (with or without broom)
- Direction

API specification will be provided by Orpak prior to implementation.

2.4.2 Parking officer terminal API – Query by location

Parking officers should be able to Query ForeFleet server over an API (SOAP web service) to get coverage status of a section for the current day (starting midnight local time).

There are around 600 terminals in the City which will need to get API access.

The Conduent terminal will send the Query with Address data. The address received will be geocoded by ForeFleet server using Google Maps online API. The address format provided in the query should be compatible with Google Maps API requirements to ensure successful geocoding (https://developers.google.com/maps/fag#geocoder_queryformat).

Based on the address received, the server should determine the SectionID and reply with the following data:

- Section ID
- Coverage status one of the following:
 - Swept In case at least one pass of section sweeping had been completed (in either direction) since the beginning of the day
 - Cancelled If the section was marked 'Cancelled' for the day
 - Not Swept If not swept nor cancelled

* If a section is both cancelled and swept for the day it will be reported as cancelled.

2.5 Assumptions

- Maximum sweeper speed while sweeping is 10MPH.
- There is no crossing inside a section, i.e. a sweeper will enter or exit the section through its edges
- If the sweeper is switched off (ignition off) while sweeping a section, it will not be considered completed.
- The terminal API response should cover any section completed up to 60 seconds before the time of query. This performance is under the assumption of up to 14,000 sections covered per day (Assuming 70 sweepers active x 3 routes on average per sweeper x 60 average sections per route).
- Total number of routes is around 900.
- Total number of sections for the entire city is around 70,000.