ACTION MINUTES OF
BOARD OF PUBLIC UTILITIES COMMISSIONERS
CITY OF TULARE

February 15, 2018

A regular meeting of the Board of Public Utilities Commissioners, City of Tulare, was held on Thursday, February 15, 2018 at 4:00 p.m. in the Tulare Public Library & Council Chambers.

BOARD MEMBERS PRESENT: James Pennington, Howard Stroman, Thomas Griesbach, Gregory Blevins, Chris Soria

STUDENTS ABSENT: Alicia Aroche, Maribel Lupercio, Esmeralda Arellano

STAFF PRESENT: Joe Carlini, Sarah Tobias, Trisha Whitfield, Tim Doyle, Nick Bartsch, Ben Siegel, Jim Funk, Melissa Hermann

I. CALL TO ORDER REGULAR SESSION

President Pennington called the regular session to order at 4:01 p.m.

II. PLEDGE OF ALLEGIANCE AND INVOCATION

President Pennington led the Pledge of Allegiance and a moment of silence for the victims of the Florida school shooting was led by Vice President Stroman.

III. CITIZEN COMMENTS

President Pennington advised that comments from the public are for items within the jurisdiction of the Board. Speakers will be allowed three minutes.

There were no citizen comments presented.

IV. COMMUNICATIONS

There were no items for this section on the agenda.

V. STUDENT REPORTS

There were no students in attendance to provide a report.

VI. CONSENT CALENDAR

It was moved by President Pennington, seconded by Board Member Griesbach and unanimously carried 5 to 0 that the items on the Consent Calendar be approved as presented with the exception of item(s) 2, 3, 4, 5, 7, & 11.

(1) Approve minutes of February 1, 2018 regular meeting(s).

(2) Accept the Financial Status Report. President Pennington pulled this item to inquire about the projected deficit in the Solid Waste Commercial and Roll-off funds. Public Works Director Trisha Whitfield provided a response thereto. With no further discussion, it was moved by President Pennington, seconded by Vice President Stroman and unanimously carried 5 to 0 to accept the item as presented.

(3) Accept the Public Works Monthly Water System Report. Board Member Griesbach pulled this item to inquire about CalWater's connection to the City's water system. Water and Wastewater Collection Utilities Manager Tim Doyle provided a response thereto. Following discussion, it was moved by Board Member Griesbach, seconded by Board Member Soria and unanimously carried 5 to 0 to accept the item as presented.

(4) Receive the Public Works performance reports for January 2018. President Pennington and Board Member Griesbach pulled this item. Board Member Griesbach inquired about the potential inundation of roll-off needs and possibility of contracting that service. Public Works Director Trisha Whitfield and City Manager Joe Carlini provided a response thereto. Vice President Stroman inquired on the status of the Prop 218 notice. Public Works Director Trisha Whitfield provided a response thereto. President Pennington inquired about the increase in water use in December 2017 as compared to December 2016. Public Works Director Trisha Whitfield and Water and Wastewater Collection Utilities Manager Tim Doyle provided a response thereto. President Pennington inquired about the natural gas fuel cell status. Public Works Director Trisha Whitfield and City Manager Joe Carlini provided a response thereto. Staff agreed to add a section to the dashboard regarding the fuel cells. President Pennington inquired about the biogas fuel cell status. Public Works Director Trisha Whitfield provided a response thereto. Following discussion, it was moved by President Pennington, seconded by Vice President Stroman and unanimously carried 5 to 0 to accept the item as presented.

(5) Accept the Water System Development Program update. President Pennington pulled this item to inquire on the status of the storage tank projects. Senior Project Manager Nick Bartsch provided a response thereto. Following discussion, it was moved by President Pennington, seconded by Board Member Griesbach and unanimously carried 5 to 0 to accept the item as presented.

(6) **Accept as complete the contract with Johnson Drilling Co. of Reedley, California for Project WT0025 – Construction of a test well at Bardsley & K Street; authorize the City Public Works Director to sign the Notice of Completion; and direct the City Clerk to file the Notice of Completion with the Tulare County Recorder's Office.**

(7) **Receive an update on the status of current and proposed Water System Improvements and provide feedback regarding projected growth, demand and future system improvements.** This item was pulled to receive a presentation by Eric Casares with Carollo Engineers. Following presentation, staff and the Board discussed next steps for the Water System Improvements. It was moved by President Pennington, seconded by Board Member Blevins and unanimously carried to accept the item as presented.

(8) **Approve a list of pre-qualified firms for on-call Supervisory Control and Data Acquisition (SCADA) services, and authorize the City Manager to enter into professional services contracts, not to exceed the total amount authorized under the City's purchasing policy and subject to minor conforming or clarifying changes agreeable to the City Attorney and City Manager, with Canon of Bakersfield, CA and Telstar Instruments of Concord, CA for on-call SCADA maintenance and integration services for a period of three years with two additional one year renewal options.**

(9) **Award and authorize the City Manager to sign a contract with Kleinfelder of Fresno, CA in an amount not to exceed $100,269.80 for materials testing services associated with EN0064 – 'E' St. Improvements project; and authorize the City Manager or designee to approve contract change orders in an amount not to exceed 10% ($10,027) of the contract award amount.**

(10) **Award and authorize the City Manager to sign a contract with Cannon of Bakersfield, CA in an amount not to exceed $83,265 for construction surveying services associated with EN0064 – 'E' St. Improvements project; and authorize the City Manager or designee to approve contract change orders in an amount not to exceed 10% ($8,327) of the contract change award amount.**

(11) **Award and authorize the City Manager to sign a contract with Emmett's Excavation, Inc. of Fresno, CA in an amount not to exceed $4,381,627.60 for street and utility improvements associated with EN0064 - 'E'. St. Improvements project; Approve the revised project budget (attached); and authorize the City Manager or designee to approve contract change orders in an amount not to exceed 10% ($438,163) of the contract award amount.** Staff requested the item be pulled. *[The Board pulled the item as requested].*

VII. GENERAL BUSINESS:

Comments related to General Business Items are limited to three minutes per speaker for a maximum of 30 minutes per item unless otherwise extended by the Board.

There were no items for this section.

VIII. ITEMS OF BOARD INTERESTS **(may include City Council and Planning Commission updates)** – GC 54954.2(3)

Items of Board interest were discussed among the Board and staff.

IX. ADJOURN REGULAR MEETING

President Pennington adjourned the regular meeting at 5:28 p.m.

_____
President of the Board of Public Utilities
Commissioners of the City of Tulare

ATTEST:

_____
Secretary of the Board of
Public Utilities Commissioners

AGENDA ITEM: Consent 2

CITY OF TULARE, CALIFORNIA
BOARD OF PUBLIC UTILITIES COMMISSIONERS
AGENDA ITEM TRANSMITTAL SHEET

Submitting Department: Finance

For Board Meeting of: March 1, 2018

Documents Attached: ☐**Ordinance** ☐**Resolution** ☐**Staff Report** ☒**Other** ☐**None**

AGENDA ITEM:
Receive the City's annual audited financial statements/Comprehensive Annual Financial Report (CAFR) for 2016-2017 fiscal year (Informational item only).

IS PUBLIC HEARING REQUIRED: ☐**Yes** ☒**No**

BACKGROUND/EXPLANATION:
Each year, the City's financial records are audited by an independent accounting firm. For the fiscal year ended June 30, 2017, the accounting firm of Brown Armstrong, Certified Public Accountants, conducted the audits, prepared the financial statements, and has given each report an unqualified ("clean") opinion. An unqualified opinion by Brown Armstrong concludes that the CAFR presents fairly, in all material respects, the respective financial position of the governmental activities, the business –type activities, each major fund, and the aggregate remaining funds information of the City: and the respective changes in financial positons.

The CAFR is prepared annually in accordance with generally accepted accounting principles (GAAP) and reporting standards established by the national Governmental Accounting Standards Board (GASB), as verified during the independent auditor's examination. The June 30, 2017 CAFR continues to comply with the GASB reporting standards. Management's Discussion and Analysis (MDA) gives a summary of the City's financial data for the year.

The financial statement information and audit opinion, as well as additional narrative and statistical information, is presented with the CAFR. Below is a listing of the different sections in the report:

- Transmittal Letter by the Finance Director
- Independent Auditor's Report
- Management's Discussion and Analysis
- Government-wide Financial Statements
- Fund Financial Statements
- Notes to the Basic Financial Statements
- Required Supplementary Information
- Other Supplementary Information
- Statistical Section

The City issues copies of its CAFR to financial institutions and credit rating agencies for use in evaluating the City's financial position, as well as to the City Council, City Management, and interested citizens. The City's CAFR is also on the City's web site.

The Government Finance Officers Association of the United States and Canada (GFOA) awards a Certificate of Achievement for Excellence in Financial Reporting and is only valid for a period of one year. The City has submitted annually and has received 19 awards for excellence in financial reporting. The current report has been submitted and is under consideration for this award. City staff believes the current report continues to exceed financial standards.

New Reporting Requirements:

The following Governmental Accounting Standards Board (GASB) Statement has been implemented in the current financial statements:

GASB Statement No. 82 – Pension Issues – an Amendment of GASB Statements No. 67, No. 68, and No. 73.

This statement addresses certain issues regarding (1) the presentation of payroll-related measures in required supplementary information, (2) the selection of assumptions and the treatment of deviations from the guidance in an Actuarial Standard of Practice for financial reporting purposes, an (3) the classification of payments made by employers to satisfy employee (plan member) contribution requirements. The City has implemented this statement for the June 30, 2017 fiscal year end an there were no effect to the financial statements

Financial Statements

The financial statements are separated into Governmental and Enterprise (Business) type funds. Governmental Funds and Enterprise Funds have different methods of accounting.

Governmental Funds – are prepared on the modified accrual basis of accounting, which means they measure only current financial resources and uses. This basis focuses on (1) how cash and other financial assets can be readily converted to available resources and (2) the balances left at year-end that are available for spending. Capital assets and other long-lived assets along with long-term liabilities are not presented in the Governmental Fund Financial Statements. Such information may be useful in determining what financial resources are available in the near future to finance the City's programs. The City uses governmental funds to account for the General Fund, Measure R, Financing Authority, as well as many other special revenue and capital project funds (2017 CAFR pages 24 & 26).

General Fund

It is important to remember that fund balance is not cash. Fund balance is when liabilities are subtracted from assets. A positive fund balance means there are more assets than liabilities; a negative fund balance means just the opposite.

The General Fund's fund balance (including sub funds) was $50.4 million at fiscal year-end which was allocated as follows:

$35 million to committed for advances to other funds, capital projects (Other General Fund CIP, Streets CIP, etc.) and specific purposes such as various reserves (Economic Incentive, etc) and the Successor Agency Note.

Enterprise (Business) Funds – are prepared on the accrual basis of accounting which reports revenue when earned and expenditures when was received or used. They also distinguish operating revenue and expenses from non-operating item. Operating revenue and expenses generally result from providing services and producing and delivering goods in connection with the funds principal ongoing operations. The City uses business-type funds to account for Water, Solid Waste, Sewer/Wastewater, Community & Economic Development Services, Transit and Aviation services (2017 CAFR pages 28-33).

STAFF RECOMMENDATION:
Receive the City's annual audited financial statements/Comprehensive Annual Financial Report (CAFR) for 2016-2017 fiscal year (Informational item only).

CITY ATTORNEY REVIEW/COMMENTS: ☐**Yes** ☐**No** ☒**N/A**

IS ADDITIONAL (NON-BUDGETED) FUNDING REQUIRED: ☐**Yes** ☐**No** ☒**N/A**

FUNDING SOURCE/ACCOUNT NUMBER:

Submitted by: Darlene Thompson **Title: Finance Director**

Date: February 22, 2018 **City Manager Approval: _____**

AGENDA ITEM: Consent 3

CITY OF TULARE, CALIFORNIA
BOARD OF PUBLIC UTILITIES COMMISSIONERS
AGENDA ITEM TRANSMITTAL SHEET

Submitting Department: Engineering - Project Management

For Board Meeting of: March 1, 2018

Documents Attached: ☐Ordinance ☐Resolution ☐Staff Report ☒Other ☐None

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AGENDA ITEM:
Award and authorize the City Manager to sign a contract with Steve Dovali Construction, Inc. of Fresno, CA in an amount not to exceed $4,507,048.83 for street and utility improvements associated with EN0064 - 'E'. St. Improvements project; approve the revised project budget (attached); and authorize the City Manager or designee to approve contract change orders in an amount not to exceed 10% ($450,705) of the contract award amount.

IS PUBLIC HEARING REQUIRED: **☐Yes ☒No**

BACKGROUND/EXPLANATION:
EN0064 is a street and utility improvement project on 'E' Street between Bardsley Avenue and Rainier Court. The project includes ADA compliance improvements to intersection curb returns and alley/sidewalk intersections that fall within the project limits. Additionally, it addresses necessary water, sewer and storm drain improvements within those limits. The need for the project was identified through the City's Pavement Management System and a review of the conditions of the City's utility infrastructure. The project is included in the City's approved transportation and utilities CIP program.

On February 8, 2018, ten (10) bids were opened for the subject contract. The Engineer's Estimate for this project was $4,320,000. The bids ranged in cost from $4,381,627.60 to $6,702,221.74. The bids were evaluated to determine if they were responsive to the requirements and instructions contained in the bid documents. On February 14, 2018, the low bidder, Emmett's Excavation, Inc., submitted a letter requesting to retract their bid in accordance with Section 5100-5110 of the California Public Contract Code due to a clerical error in their bid proposal. The request to retract their bid met the conditions, justification and process identified to do so; therefore, it was determined that Steve Dovali Construction, Inc. of Fresno, CA submitted the next lowest responsive bid in the amount of $4,507,048.83. Steve Dovali Construction, Inc. possesses a current and active Class "A" General Engineering Contractor's license issued by the State of California and has submitted a list of licensed and experienced subcontractors who will be performing portions of the work. Bid opening results are attached.

Due to the inclusion of funding from various transportation related funds on this project, this contract was also reviewed and approved by the City Council at its February 20, 2018 regular meeting.

STAFF RECOMMENDATION:
Award and authorize the City Manager to sign a contract with Steve Dovali Construction, Inc. of Fresno, CA in an amount not to exceed $4,507,048.83 for street and utility improvements associated with EN0064 - 'E'. St. Improvements project; approve the revised project budget (attached); and authorize the City Manager or designee to approve contract change orders in an amount not to exceed 10% ($450,705) of the contract award amount.

CITY ATTORNEY REVIEW/COMMENTS: ☐**Yes** ☐**No** ☒**N/A**

IS ADDITIONAL (NON-BUDGETED) FUNDING REQUIRED: ☒**Yes** ☐**No** ☐**N/A**

FUNDING SOURCE/ACCOUNT NUMBER:
EN0064-050-0601
022 – Gas Tax
077 - CDBG
010 – Water Bonds
615 – Sewer Wastewater CIP
647 – Surface Water Management CIP

Signed: Nick Bartsch **Title: Sr. Project Manager**

Date: February 15, 2018 **City Manager Approval: _____**

BID OPENING

CITY OF TULARE

PROJECT EN0064 - RFB No. 18-647 - E St. Improvements

Thursday, February 8, 2018, at 2:00 p.m.

Engineer's Estimate: $4,320,000

	NAME OF COMPANY	CITY	BID AMOUNT
~~1~~	~~Emmett's Excavation~~	~~Fresno, CA~~	~~$4,381,627.60~~
2	Steve Dovali Construction	Fresno, CA	$4,507,048.83
3	Agee Construction Corporation	Clovis, CA	$4,787,394.16
4	Dawson-Mauldin Construction	Huntington Beach, CA	$5,069,061.25
5	Teichert Construction	Roseville, CA	$5,515,100.00
6	Avison Construction	Madera, CA	$5,695,991.00
7	R. J. Berry Jr., Inc.	Selma, CA	$5,937,234.06
8	Don Berry Construction	Selma, CA	$6,353,621.67
9	Lee's Paving	Visalia, CA	$6,551,741.31
10	MAC General Engineering	Porterville, CA	$6,702,221.74

ATTESTED AND OPENED BY: *Roxanne Yoder*
CHIEF DEPUTY CITY CLERK

WITNESS: *Doug Wilson*

RECORDED: *Darlene Thompson*

WITNESS: *Nick Bartsch*

BIDS ARE SUBJECT TO REVIEW AND VERIFICATION. THE AWARD OF A CONTRACT, IF AWARDED, WILL BE TO THE LOWEST RESPONSIBLE RESPONSIVE BIDDER BASED ON THE BASE BID AMOUNT WHOSE BID COMPLIES WITH ALL THE REQUIREMENTS PRESCRIBED.

CURRENT (APPROVED)

TRANSPORTATION PROJECT (PMS)

PROJECT #EN0064 (enR2015-3)	ACCT # 643-4643-6841
'E' St. - Badsley to Pleasant	**610-4610-6841**
R-EN.16.17 PMS E Alpine to Tulare	**615-4615-6841**
(CIP)	**647-4647-6841**

PROJECT MANAGER: Nick Bartsch

PROJECT DESCRIPTION & PURPOSE: Pavement Management System project on E Street between Bardsley Avenue and Pleasant Avenue. Includes ADA Concrete work, Water, Sewer and Surface Water facilities.

KEY POINTS: Traffic safety; Relief from potential liability concerns; Compliance to the American Disabilities Act

PROJECT STATUS: ***Construction: Summer 2017*** ; Approved by TMT on 2/27/15

PROJECTED START DATE: 3/1/2016

PROJECTED END DATE: 6/30/2018

FUTURE M & O: None

CRITERIA (1-8): Criteria 7: Project addresses regulatory, safety, or environmental requirements that could threaten in whole or in part the City's ability to operate a core program or function at some future time if not replaced or repaired.

	Fiscal Year						
	2016/17	2017/18	2018/19	2019/20	2020/21	Total	Unfunded
Costs Description							
001 -Conceptual	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
002 - Preliminary Design	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
003 - Environmental	$6,000.00	$0.00	$0.00	$0.00	$0.00	$6,000	$0.00
004 - Final Design	$375,266.31	$0.00	$0.00	$0.00	$0.00	$375,266	$0.00
005 - Construct/Impliment	$0.00	$5,124,428.49	$0.00	$0.00	$0.00	$5,124,428	$0.00
006 - Close Out	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
Total Costs:	$381,266.31	$5,124,428.49	$0.00	$0.00	$0.00	**$5,505,695**	$0.00
Funding Sources							
022 - Gas Tax	$210,359.81	$2,437,351.34	$0.00	$0.00	$0.00	$2,647,711	$0.00
077 - CDBG	$0.00	$390,000.00	$0.00	$0.00	$0.00	$390,000	$0.00
021 - Measure 'R' Local	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
010 - Water Bonds CIP	$77,806.74	$1,045,765.32	$0.00	$0.00	$0.00	$1,123,572	$0.00
615 - Sewer/Wastewater CIP	$29,916.48	$402,093.87	$0.00	$0.00	$0.00	$432,010	$0.00
647 - Surface Water CIP	$63,183.28	$849,217.96	$0.00	$0.00	$0.00	$912,401	$0.00
Total Funding:	$381,266.31	$5,124,428.50	$0.00	$0.00	$0.00	**$5,505,695**	$0.00

Project Cost Worksheet

Expenses	Fiscal Year					Total
	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	
001 - Conceptual						
						$0.00
						$0.00
						$0.00
Sub Total:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
002 - Preliminary Design						
						$0.00
						$0.00
						$0.00
Sub Total:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
003 - Environmental						
Environmental (CEQA & NEPA)	$6,000.00					$6,000.00
						$0.00
						$0.00
						$0.00
Sub Total:	$6,000.00	$0.00	$0.00	$0.00	$0.00	$6,000.00
004 - Final Design						
PSE - Engineering Consultant	$345,394.40					$345,394.40
PSE - Streets Time						$0.00
PSE - Water Time						$0.00
PSE - Sewer Time						$0.00
PSE - PM Time	$19,914.61					$19,914.61
PSE - DSD Time	$9,957.30					$9,957.30
Sub Total:	$375,266.31	$0.00	$0.00	$0.00	$0.00	$375,266.31
005 - Construct/Impliment						
CON - Streets Time		$1,500.00				$1,500.00
Con - Water Time		$1,500.00				$1,500.00
Con - Sewer Time		$1,500.00				$1,500.00
Con - PM Time		$35,329.21				$35,329.21
Con - DSD Time		$9,957.30				$9,957.30
CON - Design Engineer - Construction Support		$39,829.21				$39,829.21
CON - Construction Management		$278,804.47				$278,804.47
CON - Testing, Surveying, Labor Compliance		$199,146.05				$199,146.05
CON -Construction Costs (Contractor)		$3,982,921.00				$3,982,921.00
Contingency		$563,941.25				$563,941.25
Misc.		$10,000.00				$10,000.00
Sub Total:	$0.00	$5,124,428.49	$0.00	$0.00	$0.00	$5,124,428.49
006 - Close Out						
						$0.00
						$0.00
						$0.00
Sub Total:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Costs:	$381,266.31	$5,124,428.49	$0.00	$0.00	$0.00	**$5,505,694.80**

Funding Sources	Fiscal Year					Total
	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	
022 - Gas Tax	$210,359.81	$2,437,351.34				$2,647,711.15
077 - CDBG		$390,000.00				$390,000.00
021 - Measure 'R' Local						$0.00
010 - Water Bonds CIP	$77,806.74	$1,045,765.32				$1,123,572.06
615 - Sewer/Wastewater CIP	$29,916.48	$402,093.87				$432,010.35
647 - Surface Water CIP	$63,183.28	$849,217.96				$912,401.24
Total Funding:	$381,266.31	$5,124,428.50	$0.00	$0.00	$0.00	**$5,505,694.80**

PROPOSED

TRANSPORTATION PROJECT (PMS)

PROJECT #EN0064 (enR2015-3)	ACCT # 643-4643-6841
'E' St. - Badsley to Pleasant	**610-4610-6841**
R-EN.16.17 PMS E Alpine to Tulare	**615-4615-6841**
(CIP)	**647-4647-6841**

PROJECT MANAGER: Nick Bartsch

PROJECT DESCRIPTION & PURPOSE: Pavement Management System project on E Street between Bardsley Avenue and Pleasant Avenue. Includes ADA Concrete work, Water, Sewer and Surface Water facilities.

KEY POINTS: Traffic safety; Relief from potential liability concerns; Compliance to the American Disabilities Act

PROJECT STATUS: ***Construction: Summer 2017*** ; Approved by TMT on 2/27/15

PROJECTED START DATE: 3/1/2016

PROJECTED END DATE: 12/31/2018

FUTURE M & O: None

CRITERIA (1-8): Criteria 7: Project addresses regulatory, safety, or environmental requirements that could threaten in whole or in part the City's ability to operate a core program or function at some future time if not replaced or repaired.

	Fiscal Year						
	2016/17	2017/18	2018/19	2019/20	2020/21	Total	Unfunded
Costs Description							
001 -Conceptual	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
002 - Preliminary Design	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
003 - Environmental	$6,000.00	$0.00	$0.00	$0.00	$0.00	$6,000	$0.00
004 - Final Design	$363,303.50	$0.00	$0.00	$0.00	$0.00	$363,304	$0.00
005 - Construct/Impliment	$0.00	$5,541,675.87	$0.00	$0.00	$0.00	$5,541,676	$0.00
006 - Close Out	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
Total Costs:	$369,303.50	$5,541,675.87	$0.00	$0.00	$0.00	**$5,910,979**	$0.00
Funding Sources							
022 - Gas Tax	$168,353.95	$2,200,496.33	$0.00	$0.00	$0.00	$2,368,850	$0.00
077 - CDBG	$0.00	$390,000.00	$0.00	$0.00	$0.00	$390,000	$0.00
021 - Measure 'R' Local	$0.00	$0.00	$0.00	$0.00	$0.00	$0	$0.00
010 - Water Bonds CIP	$102,383.69	$1,536,344.05	$0.00	$0.00	$0.00	$1,638,728	$0.00
615 - Sewer/Wastewater CIP	$37,751.38	$566,487.74	$0.00	$0.00	$0.00	$604,239	$0.00
647 - Surface Water CIP	$60,814.48	$838,347.75	$0.00	$0.00	$0.00	$899,162	$0.00
643 - Caltrans Reimbursement	$0.00	$10,000.00	$0.00	$0.00	$0.00	$10,000.00	$0.00
Total Funding:	$369,303.50	$5,531,675.87	$0.00	$0.00	$0.00	**$5,910,979**	$0.00

(Revised 2-20-18)

Project Cost Worksheet

Expenses	Fiscal Year					Total
	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	
001 - Conceptual						
						$0.00
						$0.00
						$0.00
Sub Total:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
002 - Preliminary Design						
						$0.00
						$0.00
						$0.00
Sub Total:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
003 - Environmental						
Environmental (CEQA & NEPA)	$6,000.00					$6,000.00
						$0.00
						$0.00
						$0.00
Sub Total:	$6,000.00	$0.00	$0.00	$0.00	$0.00	$6,000.00
004 - Final Design						
PSE - Engineering Consultant	$298,303.50					$298,303.50
PSE - Streets Time						$0.00
PSE - Water Time						$0.00
PSE - Sewer Time						$0.00
PSE - PM Time	$50,000.00					$50,000.00
PSE - DSD Time	$15,000.00					$15,000.00
Sub Total:	$363,303.50	$0.00	$0.00	$0.00	$0.00	$363,303.50
005 - Construct/Impliment						
CON - Streets Time		$1,500.00				$1,500.00
Con - Water Time		$1,500.00				$1,500.00
Con - Sewer Time		$1,500.00				$1,500.00
Con - PM Time		$40,570.49				$40,570.49
Con - DSD Time		$20,000.00				$20,000.00
CON - Design Engineer - Construction Support		$56,610.95				$56,610.95
CON - Construction Management / Inspection		$225,352.44				$225,352.44
CON - Materials Testing		$110,296.78				$110,296.78
CON - Construction Surveying		$91,591.50				$91,591.50
CON - Labor Compliance		$25,000.00				$25,000.00
CON -Construction Costs (Contractor)		**$4,507,048.83**				$4,507,048.83
Contingency		$450,704.88				$450,704.88
Misc.		$10,000.00				$10,000.00
Sub Total:	$0.00	$5,541,675.87	$0.00	$0.00	$0.00	$5,541,675.87
006 - Close Out						
						$0.00
						$0.00
						$0.00
Sub Total:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Costs:	$369,303.50	$5,541,675.87	$0.00	$0.00	$0.00	**$5,910,979.37**

Funding Sources	Fiscal Year					Total
	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	
022 - Gas Tax	$168,353.95	$2,200,496.33				$2,368,850.28
077 - CDBG		$390,000.00				$390,000.00
021 - Measure 'R' Local						$0.00
010 - Water Bonds CIP	$102,383.69	$1,536,344.05				$1,638,727.74
615 - Sewer/Wastewater CIP	$37,751.38	$566,487.74				$604,239.12
647 - Surface Water CIP	$60,814.48	$838,347.75				$899,162.23
643 - Caltrans Reimbursement		$10,000.00				$10,000.00
Total Funding:	$369,303.50	$5,541,675.87	$0.00	$0.00	$0.00	**$5,910,979.37**

Emmett's Excavation, Inc.
6207 E. Clinton Ave Fresno, CA 93727
Tel: (559) 347-9188 Fax: (559) 348-9272
California License # 579845

February 14, 2018

Nick Bartsch
City of Tulare
411 E. Kern
Tulare, CA 93274

Reference: E Street Improvements Bid

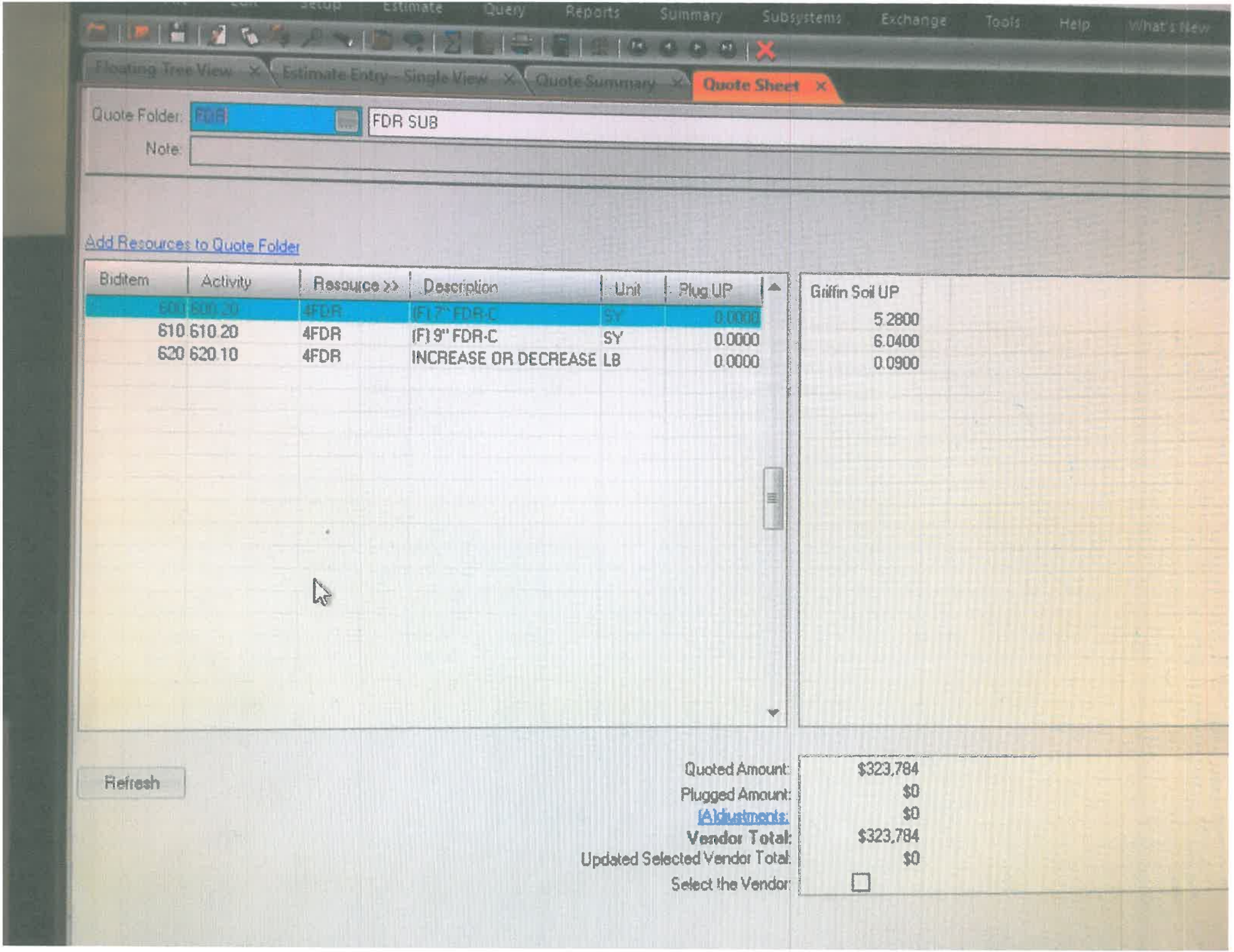
Subject: Relief of Bidder

Dear Mr. Bartsch,

Per Sections 5100-5110 Relief of Bidders of the California Public Contract Code we hereby request relief of our bid on the above referenced project due to a clerical error. Upon review of our submitted bid we discovered an error made in our estimating software, we failed to select the amounts entered for subcontractor Griffin Soil. Please see attached photos of our estimate. Under the "Quote Sheet" tab, the unit prices were entered for Griffin Soil but the "Select the Vendor" window wasn't checked. The "Quote Summary" sheet shows $0.00 for the FDR quote sheet. If Griffin Soil had been selected their name would have been highlighted green like Chrisp Company. To explain the electrical "Quote Sheet" being red on the "Quote Summary" sheet, AC Electric had been the selected subcontractor but at the last-minute Cable Links Electric bid was received and just entered on the "Estimate Entry" sheet that is why you see $186,135.00 (Cable Links bid) at the top of the "Quote Summary" sheet. The last two attached photos show the "Estimate Entry" sheet with the amounts on the two bid items for the FDR subcontract being zero. Griffin Soil's bid amounts to $323,784.00 without any overhead or profit. This amount was left out of our bid. Emmett's Excavation can't absorb this error, it would be detrimental to our company therefore in accordance with the above-mentioned Contract Code we hereby request a grant of relief of our bid without forfeiture of our bid bond.

Thank you, respectfully,
Emmett's Excavation, Inc.

David Walsh
General Manager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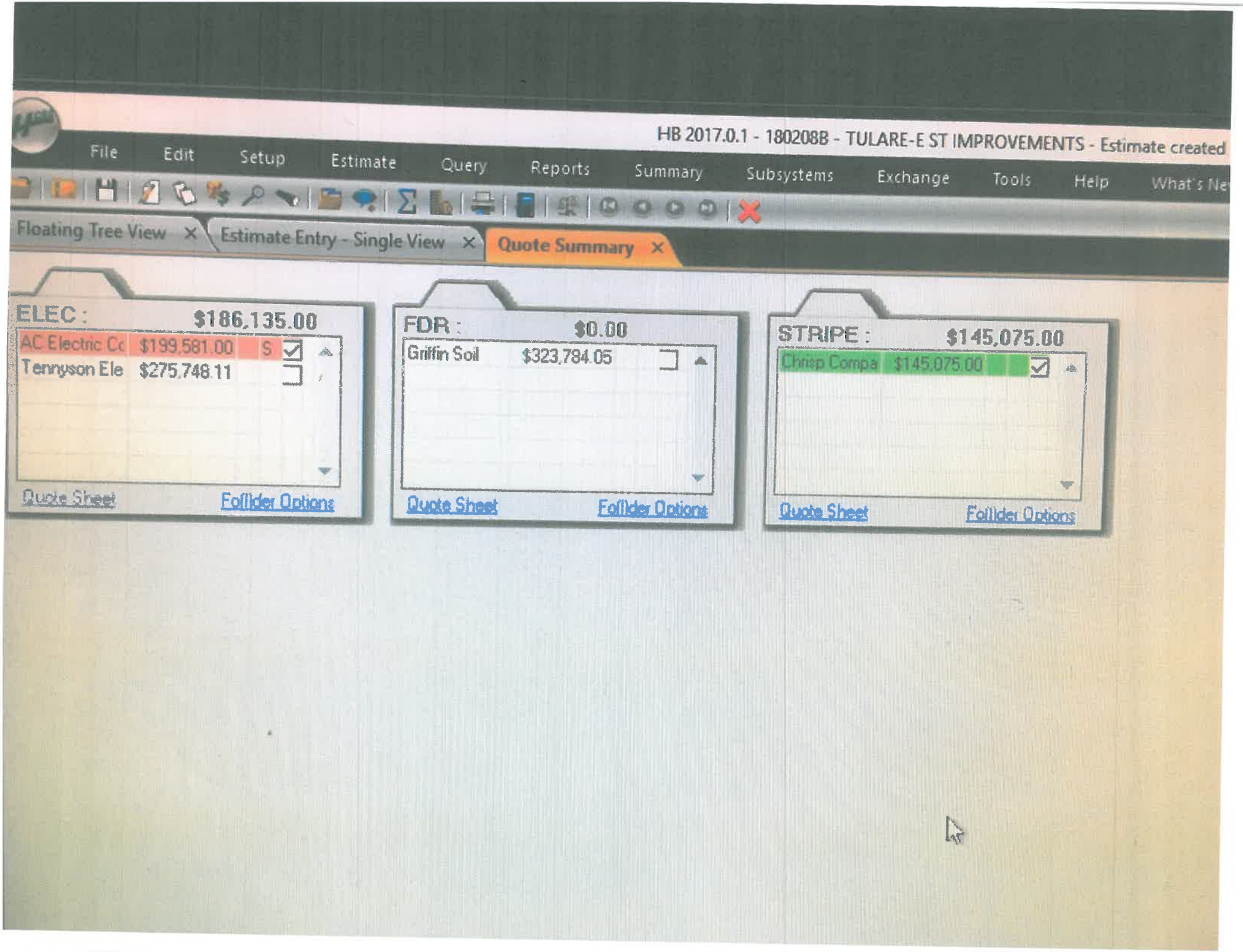
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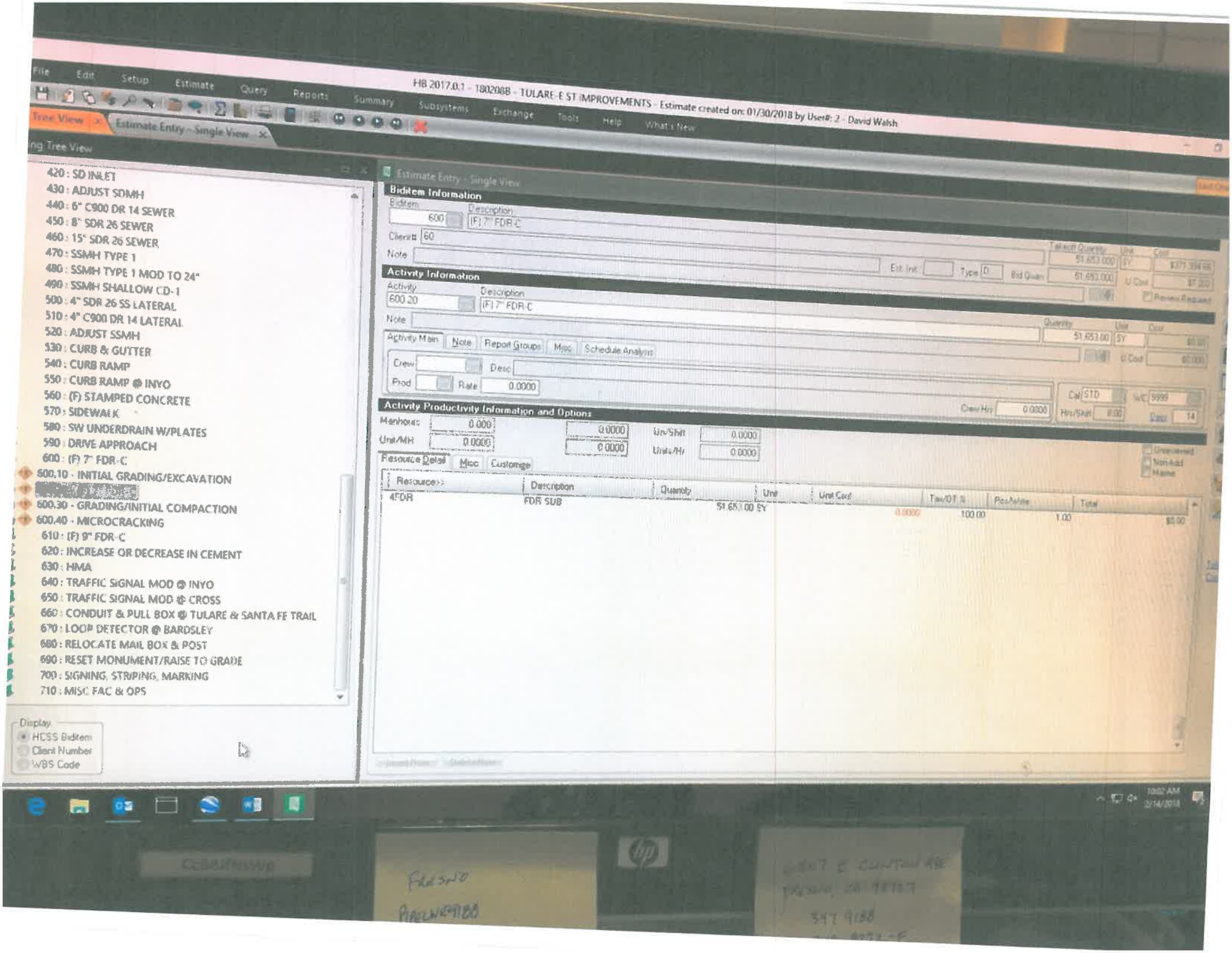
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Estimate Entry - Single View
420 : SD INLET
430 : ADJUST SDMH
440 : 6" C900 DR 14 SEWER
450 : 8" SDR 26 SEWER
460 : 15" SDR 26 SEWER
470 : SSMH TYPE 1
480 : SSMH TYPE 1 MOD TO 24"
490 : SSMH SHALLOW CD-1
500 : 4" SDR 26 SS LATERAL
510 : 4" C900 DR 14 LATERAL
520 : ADJUST SSMH
530 : CURB & GUTTER
540 : CURB RAMP
550 : CURB RAMP @ INYO
560 : (F) STAMPED CONCRETE
570 : SIDEWALK
580 : SW UNDERDRAIN W/PLATES
590 : DRIVE APPROACH
600 : (F) 7" FDR-C
600.10 - INITIAL GRADING/EXCAVATION
600.30 - GRADING/INITIAL COMPACTION
600.40 - MICROCRACKING
610 : (F) 9" FDR-C
620 : INCREASE OR DECREASE IN CEMENT
630 : HMA
640 : TRAFFIC SIGNAL MOD @ INYO
650 : TRAFFIC SIGNAL MOD @ CROSS
660 : CONDUIT & PULL BOX @ TULARE & SANTA FE TRAIL
670 : LOOP DETECTOR @ BARDSLEY
680 : RELOCATE MAIL BOX & POST
690 : RESET MONUMENT/RAISE TO GRADE
700 : SIGNING, STRIPING, MARKING
710 : MISC FAC & OPS
Display
HCSS Bidtem
Client Number
WBS Code
Estimate Entry - Single View
Bidtem Information
Bidtem
600
Description
(F) 7" FDR-C
Client#
60
Note
Activity Information
Activity
600.20
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Activity Main
Note
Report Groups
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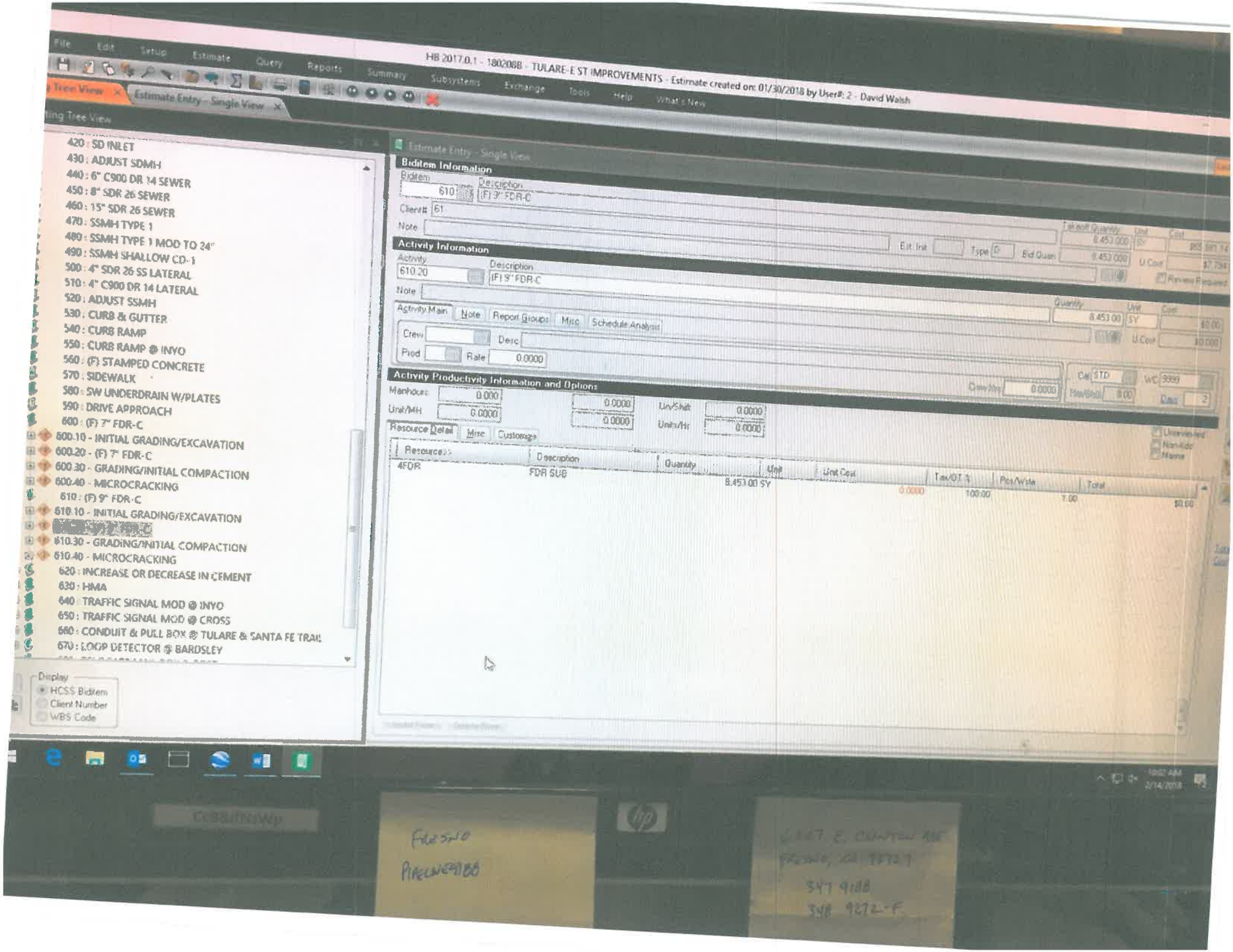
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450 : 8" SDR 26 SEWER
460 : 15" SDR 26 SEWER
470 : SSMH TYPE 1
480 : SSMH TYPE 1 MOD TO 24"
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660 : CONDUIT & PULL BOX @ TULARE & SANTA FE TRAIL
670 : LOOP DETECTOR @ BARDSLEY
Display
HCSS Bidtem
Client Number
WBS Code
Bidtem Information
Bidtem 610
Description (F) 9" FDR-C
Client# 61
Note
Activity Information
Activity 610.20
Description (F) 9" FDR-C
Note
Activity Main Note Report Groups Misc Schedule Analysis
Crew
Prod
Rate 0.0000
Desc
Activity Productivity Information and Options
Manhours 0.000
Unit/MH 0.0000
Resource Detail Misc Customize
Resource
Description
Quantity
Unit
Unit Cost
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FDR SUB
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PUBLIC CONTRACT CODE - PCC

DIVISION 2. GENERAL PROVISIONS [1100 - 22355] *(Division 2 enacted by Stats. 1981, Ch. 306.)*

PART 1. ADMINISTRATIVE PROVISIONS [1100 - 9203] *(Heading of Part 1 added by Stats. 1982, Ch. 1120, Sec. 2.)*

CHAPTER 5. Relief of Bidders [5100 - 5110] *(Chapter 5 added by Stats. 1982, Ch. 435, Sec. 2.)*

5100. (a) "Public entity" means the state, Regents of the University of California, a county, city and county, city, district, public authority, public agency, and any other political subdivision or public corporation in the state.

(b) "Bid" means any proposal submitted to a public entity in competitive bidding for the construction, alteration, repair, or improvement of any structure, building, road or other improvement of any kind.

(Added by Stats. 1982, Ch. 435, Sec. 2.)

5101. (a) A bidder shall not be relieved of the bid unless by consent of the awarding authority nor shall any change be made in the bid because of mistake, but the bidder may bring an action against the public entity in a court of competent jurisdiction in the county in which the bids were opened for the recovery of the amount forfeited, without interest or costs. If the plaintiff fails to recover judgment, the plaintiff shall pay all costs incurred by the public entity in the suit, including a reasonable attorney's fee to be fixed by the court.

(b) If an awarding authority for the state consents to relieve a bidder of a bid because of mistake, the authority shall prepare a report in writing to document the facts establishing the existence of each element required by Section 5103. The report shall be available for inspection as a public record. In the case of the University of California or a California State University, the report shall be filed with the regents and the trustees, respectively, and shall be available as a public record.

(Amended by Stats. 1994, Ch. 726, Sec. 21. Effective September 22, 1994.)

5102. The complaint shall be filed, and summons served on the director of the department or the chief of the division or other head of the public entity under which the work is to be performed or an appearance made, within 90 days after the opening of the bid; otherwise, the action shall be dismissed.

(Added by Stats. 1982, Ch. 435, Sec. 2.)

5103. The bidder shall establish to the satisfaction of the court that:

(a) A mistake was made.

(b) He or she gave the public entity written notice within five working days, excluding Saturdays, Sundays, and state holidays, after the opening of the bids of the mistake, specifying in the notice in detail how the mistake occurred.

(c) The mistake made the bid materially different than he or she intended it to be.

(d) The mistake was made in filling out the bid and not due to error in judgment or to carelessness in inspecting the site of the work, or in reading the plans or specifications.

(Amended by Stats. 2005, Ch. 270, Sec. 2. Effective January 1, 2006.)

5104. Other than the notice to the public entity, no claim is required to be filed before bringing the action.

(Added by Stats. 1982, Ch. 435, Sec. 2.)

5105. A bidder who claims a mistake or who forfeits his or her bid security shall be prohibited from participating in further bidding on the project on which the mistake was claimed or security forfeited.

(Added by Stats. 1982, Ch. 435, Sec. 2.)

5106. If the public entity deems it is for its best interest, it may, on refusal or failure of the successful bidder to execute the contract, award it to the second lowest bidder.

If the second lowest bidder fails or refuses to execute the contract, the public entity may likewise award it to the third lowest bidder.

On the failure or refusal of the second or third lowest bidder to whom a contract is so awarded to execute it, his or her bidder's security shall be likewise forfeited.

(Added by Stats. 1982, Ch. 435, Sec. 2.)

5107. In all actions brought under the provisions of this chapter, all courts wherein such actions are or may hereafter be pending, shall give such actions preference over all other civil actions therein, in the matter of setting the same for hearing or trial, and in hearing the same, to the end that all such actions shall be quickly heard and determined.

(Added by Stats. 1982, Ch. 435, Sec. 2.)

5110. (a) When a project for the construction, alteration, repair, or improvement of any structure, building, or road, or other improvement of any kind is competitively bid and any intended or actual award of the contract is challenged, the contract may be entered into pending final decision of the challenge, subject to the requirements of this section. If the contract is later determined to be invalid due to a defect or defects in the competitive bidding process caused solely by the public entity, the contractor who entered into the contract with the public entity shall be entitled to be paid the reasonable cost, specifically excluding profit, of the labor, equipment, materials, and services furnished by the contractor prior to the date of the determination that the contract is invalid if all of the following conditions are met:

(1) The contractor proceeded with construction, alteration, repair, or improvement based upon a good faith belief that the contract was valid.

(2) The public entity has reasonably determined that the work performed is satisfactory.

(3) Contractor fraud did not occur in the obtaining or performance of the contract.

(4) The contract does not otherwise violate statutory or constitutional limitations.

(b) In no event shall payment to the contractor pursuant to this section exceed either of the following:

(1) The contractor's costs as included in its bid plus the cost of any approved change orders.

(2) The amount of the contract less profit at the point in time the contract is determined to be invalid.

(c) Notwithstanding subdivision (a), this section shall not affect any protest and legal proceedings, whether contractual, administrative, or judicial, to challenge the award of the public works contract and enforce competitive bidding laws, nor affect any rights under Section 337.1 or 337.15 of the Code of Civil Procedure.

(Added by Stats. 2003, Ch. 678, Sec. 2. Effective January 1, 2004.)

AGENDA ITEM: Consent 4

CITY OF TULARE, CALIFORNIA
BOARD OF PUBLIC UTILITIES COMMISSIONERS
AGENDA ITEM TRANSMITTAL SHEET

Submitting Department: Public Works - Solid Waste

For Board Meeting of: March 1, 2018

Documents Attached: ☐Ordinance ☐Resolution ☐Staff Report ☒Other ☐None

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AGENDA ITEM:
Receive the completed Solid Waste Study document.

IS PUBLIC HEARING REQUIRED: **☐Yes ☒No**

BACKGROUND/EXPLANATION:
On August 17, 2017, R3 Consulting Group, the firm performing the Solid Waste Routing, Operational Review, and Vehicle Impact Fee study for the City, presented their findings to the Board of Public Utilities (BPU). At the September 7 and October 19, 2017 BPU meetings, the Board approved an increased Vehicle Impact Fee schedule, additional staffing, increased safety and technology resources, including GIS, to be included in the rate design portion of the rate study.

R3 has prepared a rate study and financial plan report which gives an overview of the rate study process, discusses the process to analyze revenues and cost allocations, incorporates capital needs, and discusses the development of initial rates and recommendations for current and future rates. The final draft of the Financial Plan and Rate Study report has been incorporated into the Operations Review and Vehicle Impact Fee Study and presented as a single, comprehensive document (Attachment A).

STAFF RECOMMENDATION:
Receive the completed Solid Waste Study document.

CITY ATTORNEY REVIEW/COMMENTS: **☐Yes ☐No ☒N/A**

IS ADDITIONAL (NON-BUDGETED) FUNDING REQUIRED: **☐Yes ☒No ☐N/A**

FUNDING SOURCE/ACCOUNT NUMBER:

Submitted by: Benjamin Siegel **Title: Management Analyst**

Date: February 21, 2018 **City Manager Approval: _____**

R3 CONSULTING GROUP, INC.
RESOURCES · RESPECT · RESPONSIBILITY

Sloan VAZQUEZ McAFEE
MUNICIPAL SOLID WASTE ADVISORS

FINAL REPORT

Solid Waste Study

SUBMITTED TO:

City of Tulare, CA

July 27, 2017

PDF SUBMITTAL

R3

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Acronyms

COS – Cost of Service

CRM – Customer Relations Management

CSR – Customer Service Representative

ESAL - Equivalent Single Axle Load

FTE - Full Time Equivalent

GIS – Geographic Information System

OBC – On-Board Computer

OSHA – Occupational Safety and Health Administration

PCI – Pavement Condition Index

PMS – Pavement Management System

RFID – Radio Frequency Identification Devices

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Acronyms

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Tables

Figures

Appendices

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Section 1
Findings and Recommendations

1.1 Background

R3 Consulting Group (R3), with Sloan Vazquez McAfee, was engaged by the City of Tulare (City) to conduct an Operational and Financial Review of the City's Solid Waste and Street Sweeping Division (Division). The project's objective was to conduct a review of the Division's operations, and finances, and identify and prioritize specific recommendations for improvement. We have completed that review and offer the following findings and recommendations.

1.2 Findings and Recommendations

1.2.1 Overall Assessment

The Division is doing a good job managing its day-to-day operations with available resources. Management, supervisors, and drivers appear qualified and dedicated, and overall the Division appears to be providing good quality service. With that said, for the Division to be able to operate more effectively, it needs:

1. Three (3) full time equivalent (FTE) additional Route Drivers to cover the current workload, and additional planned workload associated with increased commercial recycling and organic waste[1] collection services, and City growth;
2. Additional City and/or Public Works: (a) safety; (b) customer service; and (c) GIS[2] resources;
3. Improved technology (e.g., on-board computers and GIS routing capabilities), and the development of an electronic system for gathering the information it needs to improve its safety and productivity; and
4. Performance standards against which it measures and evaluates its performance in support of identifying and realizing opportunities for continuous improvement.

1.2.2 Solid Waste Route Study

1.2.2.1 Staffing Needs

Route Driver(s) - The Division does not currently have enough route drivers to cover all routes daily, and needs additional, drivers, the question is how many. Factors supporting the need for additional route drivers include:

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1 Organic waste includes yard waste, food waste, and food-soiled paper waste.

2 A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data.

1. Longer landfill haul distance with the closing of the Woodville Landfill;
2. Increasing number of residential and commercial accounts due to population growth estimated at ~3% annually;
3. Increase commercial recycling (AB 341 – Mandatory Commercial Recycling) and commercial organics (AB 1826 – Mandatory Commercial Organics Recycling) collection services; and
4. Increased roll-off service demand.

The Division last added a Route Driver position (commercial) in 2014 in response to the closing of the Woodville Landfill and longer drive times to the Visalia Landfill. Division management has proposed staffing five (5) additional positions as shown in Table 1-1 below. Based on our review, we support the staffing of the three (3) Route Driver positions requested by the Division. The Division's current Relief Driver staffing level (1 FTE Relief Driver for 10 FTE Routes), is reaching capacity, and additional Relief Driver staffing will be needed in the near term as the Division adds routes. The Division should continue to monitor the adequacy of Relief Driver staffing and determine when to add additional staff.

Table 1-1
Division Proposed Staffing Needs

Positions	Routes			
	Residential	Commercial	Roll-Off	Total
Route Drivers	1.0	1.0	1.0	3.0
Relief Drivers	1.0	1.0	0.0	2.0
Totals	**2.0**	**2.0**	**1.0**	**5.0**

The Division's street sweeping routes are also reaching capacity at the current operating speed of five (5) miles per hour. If the City allows street sweepers to operate at up to eight (8) miles per hour, which is within industry standards, there is significant capacity in the system to accommodate increased workload (e.g., new developments and/or more frequent sweeping). If the City maintains a standard operating speed of five (5) miles per hour, it should consider adding an additional route to accommodate the existing work load and near to mid-term development and growth.

City Safety Resources - In general, municipal solid waste collection operations, like the City's, have not realized the type of improvements in safety that may private sector operators have over the past 10+ years. The Division's Occupational Safety and Health Administration (OSHA) injury frequency and severity rates, which are not unlike other municipal operations we have reviewed, are two or more times the industry standard rates, and the Division's 2016 OSHA accident frequency and severity rates were the highest they have been in the past 5 years.[3]

[3] Refuse and recycling drivers have the 5th most dangerous job in the Country in terms of fatality rates, ahead of both police and fire, and Division employees may have the most dangerous job in

The City has one (1) Safety and Regulatory Compliance Analyst for all City operations. The City's Safety and Regulatory Compliance Analyst is making very positive steps toward improving the safety of the Division but has limited time available to devote specifically to the Division. Additional City safety staffing, and training resources are needed to develop and manage a safety program capable of bring the Division's safety record more in line with the industry standard.

City GIS Resources – Opportunities for increased productivity are largely realized by redistributing the existing workload, which involves some form of rerouting of all or portions of the collection system. The Division does not currently have the ability to reroute its collection system efficiently with GIS based routing software, which is the industry standard. The Division needs a GIS solid waste data base that it can use to evaluate and manage its productivity, and the support of a City or contract GIS Specialist who can help design and manage the gathering and analysis of relevant data for the Division, in collaboration with the Public Works Analyst.

Public Works Customer Service Representatives - Division Route Supervisors currently spend an estimated 20+% of their time serving the function of a customer service representative (CSR). This is not an appropriate function for the Route Supervisors to be performing. Additional customer service support staffing is necessary so that route supervisors can perform their supervisor responsibilities and have limited CSR responsibilities.[4] The Public Works Director and the City Manager have both expressed an interest in the concept of a call-center Public Works, and we fully support that concept.

Recommendations:

1. **Hire three (3) additional FTE Route Drivers, one each for residential, commercial and roll-off operations. Continue to monitor adequacy of Relief Driver staffing and determine when to add additional staff.**
2. **Determine whether to increase standard street sweeper operating speed or add an additional street sweeping route.**
3. **Evaluate the best means for providing additional safety staffing resources to the Division to support the City's Safety and Regulatory Compliance Analyst's efforts to improve the Division's safety record. This could involve additional Route Supervisor safety training and responsibilities and/or additional Risk Management safety staffing.**
4. **Develop "Model" Safety Program for the Division that includes: (a) the tracking and analysis of relevant data; and (b) targeted, relevant and ongoing safety training.**[5, 6]

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the City. The effectiveness of the City's overall safety program is very much reflected in the effectiveness of the Division's safety program – Source: Bureau of Labor Statistics.

[4] Route Supervisors have very important customer service responsibilities, but taking calls directly from residents and businesses is not one of them.

[5] The City and the Division should leverage the safety resources of the Solid Waste Association of America (SWANA).

[6] We suggest the City use the Division's "to be developed" safety program as a model for improving the proactive management of the safety of all City departments.

5. **Develop Division Specific GIS data base to provide for macro-routing of the City's residential and commercial collection systems.**
6. **Hire or contract for GIS staff with primary responsibility for: (a) managing the gathering, analysis and reporting of Division data, along with the Public Works Management Analyst; and (b) periodic rerouting of the Division's collection operations.**
7. **Develop Public Works centralized call center and remove routine CSR requirements from the Division's Route Supervisors.**

1.2.2.2 Collection System Productivity

While additional route staffing is required to handle the existing workload and additional anticipated near-term workload, as discussed above, we did not identify any concerns regarding the reasonableness of the productivity of the Division's residential, commercial and roll-off collection operations, and street sweeping operations (i.e., existing routes are providing efficient service). However, while current productivity appears to fall within a reasonable range, the Division, does not have the information it needs, including weekly participation (setout) rates by commodity, to "dial in" and proactively manage productivity.

The City's Eden System **can** provide certain important services the Division needs, including electronic work orders, and a container management system. The City's Eden System **cannot** provide many of the **tools** that an industry specific Customer Relations Management (CRM) system can provide, including serving as the hub for On-Board Computers in the Division's solid waste vehicles. The first thing the City, the Division, and the City's IT Department need to do is determine what customer relations management (CRM) system the Division is going to have (i.e., Eden and/or industry specific CRM), and put that system it in place. Much of everything else the Division needs to do (can do) to improve will flow from that system.

Recommendations:

8. **Conduct a "Needs Analysis" to determine:**
   - ***a.*** **if / how to utilize Eden for the Division's electronic work order and container management needs; and**
   - ***b.*** **If an industry specific CRM system makes sense for the Division, and if so determine the system that best meets the Division's Needs.**

1.2.2.3 Fleet Maintenance

The City's Fleet Maintenance Division (Fleet Services) is scheduled to replace much of the Division's residential side loader, commercial front loader, and street sweeping vehicles in FY 16/17 and 17/18. This will turn what is a relatively old fleet (average fleet age 8+ years), into a much newer fleet. This should improve Fleet Services Daily Vehicle Availability Percentage, reduce fleet maintenance costs, and enable Fleet Services to reduce its spare vehicle percentage, which is quite high.

The Division reported that there are days when Fleet Services cannot provide the required number of vehicles it needs to operate its scheduled routes, even with a very high vehicle spare ratio. While the purchase of a significant number of new vehicles, discussed above, should help increase vehicle availability, we question whether Fleet Services has enough mechanics to

meet the Division's daily vehicle requirements, while also maintaining a reasonable spare ratio. We suggest that the staffing of the equivalent of at least one (1) additional FTE mechanic may be necessary if Fleet Services is to be able to consistently provide the Division with the vehicles it needs each day to staff all routes (i.e., a 90%+ minimum daily vehicle availability rate).

Recommendations:

9. **Replace all Division vehicles as scheduled in FY 16/17 and 17/18.**
10. **Establish Minimum Daily Vehicle Availability Standard for Fleet Services that provides the Division with 100% of the vehicles its needs to operate its routes daily.**
11. **Increase Fleet Services Mechanic staffing levels, as appropriate, to meet the Division's Minimum Daily Vehicle Availability Standard.**

1.2.2.4 Data Tracking | Management by Metrics

"That which is not measured is not managed" and the Division has, with the help of the Public Works' Management Analyst, recently begun developing and implementing a performance data collection process. This process can help the Division identify opportunities for improvement and is a very positive first step, but the Division has limited access to information, and the data that is tracked takes considerable effort to collect and compile.

Recommendations:

12. **Implement a Management by Metrics Program – Establish performance standards, track performance relative to those standards, and identify and realize opportunities for improvement – Data tracking and reporting would be facilitated by a CRM System. Additional information on Management by Metrics is provided in Section 3.7 of this report.**

1.2.3 Solid Waste Vehicle Impact Fee

The Division's residential solid waste, recycling and yard waste vehicles (refuse vehicles) are estimated to cause 15.6%[7] of the overall axle loadings (wear-and-tear) that the City's residential streets experience, and are responsible for an associated percentage of the City's total residential street maintenance cost. In 2013, the City projected a $22.5 million annual need over the next five years ($4.5 million annually) to bring the level of its entire street system up to a Pavement Condition Index (PCI) of 70 (good condition), but only has $2.5 million annually for pavement rehabilitation projects, leaving a shortfall of $2.0 million annually. City Engineering staff estimates that 50% of that shortfall applies to residential streets ($1.0 million), therefore 15.6% of that shortfall can reasonably be associated with the Division's residential refuse vehicles, or $155,000 annually. The pavement maintenance cost impact of the City's commercial refuse vehicles is estimated to be $12,000 per year.

Table 1-2 below provides a summary of the projected impact of the City's refuse vehicles and streets sweepers on the City's annual residential and commercial street maintenance impacts.

[7] This estimate is based on an analysis similar to that used to evaluate refuse vehicle impacts in many other California jurisdictions, and is discussed in more detail in Section 4 of this report.

The Division is currently contributing $100,000 annually to offset the street maintenance costs associated with its refuse vehicles.

Table 1-2
Refuse Vehicle Impact Fees

Vehicle Type	Annual Street Maintence Cost Impact	
	$2.0 Million Shortfall	$4.5 Million Total Required Funding
Refuse Vehicles		
Residential Refuse Vehicles	$ 155,000	$ 348,750
Commercial Refuse Vehicles	$ 12,000	$ 27,000
Subtotal	**$ 167,000**	**$ 375,750**
Street Sweepers		
Residential Street Sweepers	$ 3,000	$ 6,750
Commercial Street Sweepers	<$1,000	$ 1,000
Subtotal	**$ 3,000**	**$ 7,750**
Total	**$ 170,000**	**$ 383,500**

Recommendations:

13. **Consider increasing the Division's annual contribution to account for the full amount of the projected street maintenance costs attributed to its refuse vehicles, as shown in Table 1-2.**

1.2.4 Technology Review

A major consideration identified by the City when evaluating the operations systems was their compatibility and potential for integration so that "everything works together" as efficiently and seamlessly as possible. The Division does not use a unified customer relationship manager (CRM) software system for managing the workflow related to services rendered to their solid waste customers. ***Without an industry-specific CRM, the alternatives for technology enhancements to improve workflow efficiencies are significantly limited and the Division's goal to have "everything work together" will be more challenging.***

1.2.4.1 Integrated Customer Relations Management (CRM) System

As noted above, the Division does not use a unified customer relationship manager (CRM) software system for managing the workflow related to services rendered to their solid waste customers. In fact, the Division does not perform its customer service functions through a

centralized customer service call center. To perform routine administrative functions and for work flow management, Division staff use emails to communicate and Excel worksheets for recording and tracking requirements.

Common practice for solid waste operations is for the customer service center to be equipped with an industry-specific CRM software system. The CRM system serves as a hub through which the staff in the various solid waste operations communicate and keep track of work flow. Several specialized CRMs have been developed to provide for the unique functions of a solid waste operation. These CRMs integrate customer service functions with collection operations, container management, billing, and route management.

The CRM system has become the "home base" upon which technological enhancements to the industry are connected. A significant limitation for the Division is the lack of a CRM system that can serve as a central hub to manage workflow communications. ***The best technological enhancements available to the solid waste industry have been designed to integrate with a CRM system including the use of On-Board*** **Computers (OBCs)**.[8]

Determining the compatibility and integration capacity of an operations system requires both the evaluation and understanding of the technology itself and, the organizational structure in which it will operate. The City is vested in EDEN, an ERP that serves the citywide financial business requirements.[9] Eden has the functional capabilities to manage the Division's container maintenance and work order system, and may effectively serve that capacity. However, Eden cannot provide many of the very important capabilities of a solid waste industry specific CRM system, including OBCs and real-time route management.[10] The City needs to determine if and how Eden will be used to support the Division's work order and container management needs, and if an industry specific CRM also makes sense for the Division. ***If a CRM is pursued, the City's IT department would need to provide leadership in the final selection of a CRM system, and its integration into the City's IT infrastructure***.

Recommendations:

Conduct a "Needs Analysis" – See Recommendation #6 above

1.2.4.2 RFID Tag Identification

RFID tag systems provide for tacking the time of service and other data. The City is purchasing containers with embedded RFID tags, and that process should continue. To take full advantage of RFID Tags, most systems have been developed around OBCs that have been integrated with a CRM system, which the Division does not currently have. The City is vested in EDEN, and ERP that serves the citywide IT requirements. As discussed above, to incorporate a CRM for the Division, the City's IT department would need to provide leadership in the final selection of a CRM system and its integration into the City's IT infrastructure.

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8 OBCs are specialized, truck-mounted mobile devices that facilitate communication from and to field operations.

9 Tyler's enterprise resource planning (ERP) financial solutions are designed to manage public sector core business functions — financials, human resources, payroll, citizen services, revenues, and utility billing.

10 The tracking of vehicle services in the field in real time, and the ability to establish average account service times based on actual performance.

As an alternative to a CRM or Eden based container management system, we suggest the Division consider the services of CD SRVS[11] through their aGenda software. It can be implemented as a stand-alone program with smartphones and/or tablets. Although the program can be used for any type of delivery and pickup, it has been customized to address the needs of the solid waste container management environment. Since it is based on a monthly subscription, it is easy to implement and does not require a large up-front investment. In addition to container management, the program can be used for scheduling bulky item pickups, temporary container, including roll-off boxes.

Recommendations:

14. **Consider the services of CD SRVS through their aGenda software for the Division's container management function and potentially for scheduling bulky item pickups, and temporary containers, including roll-off boxes. This review should be undertaken as part of the recommended "Needs Analysis" discussed above.**

1.2.4.3 Mobile Application Software

There is no consensus by City staff that a mobile app would significantly enhance the quality of information distributed or the service experience for its client base. **Therefore, it is important to first identify what problem the Mobile App will solve and how it will improve the current user experience.** The development of a mobile app will cost the City between $15,000 to $80,000, depending on the sophistication of the developer selected and the scope of work to be completed. If it is determined that there is a "need" for a mobile app, we suggest that the City consider subscribing to the services of Recycle Coach. Its mobile app feature may provide the Division with some features sought for in a mobile app with little or no costs depending on the subscription level.

Recommendations:

15. **Evaluate the specific "need" that a mobile application would fill. If it is determined that a mobile app is needed, as an alternative to developing its own mobile app, we recommend that the Division consider subscribing to the services of Recycle Coach.**

1.2.4.4 GIS Routing Capabilities

Paper and pencils can certainly provide serviceable routes, as the Division has done. However, to obtain increased efficiencies and enable more dynamic routing, the Division should look to develop a more advanced, computer-based route management system. Ideally, in conjunction with obtaining the ability to track side-loader lifts per route to establish monthly participation rates for residential solid waste, recycling and organic services.

Though not the only GIS mapping software, ArcGIS by ESRI is the industry leading GIS mapping software, and most GIS-integrated routing software operate within the ESRI GIS product environment. ArcGIS or other GIS mapping software, with the overlay of the Division's accounts and service days, will provide a substantial improvement in the Division's routing capabilities, enabling it to efficiently develop macro-routes. Developing vehicle travel paths

[11] Note: CD SVRS is the full name of the company.

(micro-routing) requires advanced GIS data capacity and micro routing software, like RouteSmart, which could be considered in the future, following establishment of macro-routing capabilities.

Recommendations:

Develop Division Specific GIS capacity – See Recommendation #4 above

1.2.5 Rate Study and Financial Plan

Note: *The City has received a copy of the Rate Study. The Rate Study and Financial Plan will follow based on the recommendations that come out of this document.*

1.2.6 Other Items

1.2.6.1 Municipal Code Review

R3 reviewed the City's Municipal Code and has provided our recommended modifications in **Appendix 1A**.

1.2.6.2 Wage Comparison

The Division requested that R3 conduct a survey to compare the Division's wages for its Solid Waste Operator position to similar level positions in other cities in the central valley.[12] A total of ten other jurisdictions that operate municipal solid waste collection systems were surveyed. Five (5) of those jurisdictions had minimum and maximum wage rates less than the City, while five had minimum and maximum rates greater than the City. On average, the City's minimum annual wage rate was 4.3% ($1,635) less than the average minimum wage rate of the other 10 jurisdictions, and 7.3% ($3,465) less than the average maximum rate. Additional information is provided in **Appendix 1B**.

1.2.6.3 Impact of Closing / Opening of the Woodville Landfill

The Division currently direct hauls residential and commercial refuse loads to the County's Avenue 328 Landfill north of Visalia. Prior to 2015, the City delivered solid waste to the Woodville Landfill. The Division estimated that it takes approximately 30 minutes per load longer to use the Visalia Landfill then it does to use the Woodville Landfill, and that solid waste routes have an average of 2 to 3 loads per day. This is equivalent to between 60 and 90 minutes of additional time per day to use the Visalia landfill vs. the Woodville landfill. In terms of the impact on routes, if the Division could deliver residential loads to the Woodville Landfill at some point in the future, it would gain capacity on the order of **0.6** residential routes, and **0.4** commercial routes ~ **1.0 FTE** route capacity savings.[13]

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[12] The wage comparison did not consider employee benefits, including retirement benefits.

[13] When the County closed the Woodville Landfill the City negotiated a 5-year contract with the County for a lower tip fee at the Avenue 328 Landfill, although no adjustments were made to the roll-off per pull charge, the true cost of which increased due to the increased haul distance to the landfill.

1.2.7 Recommendation Cost Projections

Table 1-3 below, provides projected capital (one-time), and ongoing annual costs associated with the 15 recommendations presented above, as applicable. As shown, the associated capital or one-time costs would require the equivalent of a one-year rate adjustment of approximately 7.5%. Assuming a 10% rate increase with the first-year costs going to fund the associated capital costs, maintaining that 10% rate increase going forward would largely, if not entirely fund the associate annual costs (i.e., the recommended system for the Division requires a dedicated 10% across the board rate increase).

Table 1-3
Recommendation Cost Projections

#	Recommendation	Capital - One-Time Cost	Recurring Annual Cost	Comments
1	**Hire 3 Route Drivers** [1]		$ 231,000	$77K each fully loaded cost
2	**Increase Street Sweeper Speed or Add an Additional Rotue** [1]		$ 77,000	Assumes one additional route driver
3	**Increase City Safety Resources**		$ 100,000	City or contract staff and training
4	**Develop Model Safety Program**	$ 30,000		Program development costs
5	**Develop Division Specific GIS Capacity**	$ 50,000		Databased development costs
6	**Increase City GIS Resources**		$ 75,000	City or contract staff
7	**Develop Centralized Public Works Call Center**		$ 120,000	2 CSR's at $60,000 each fully loaded cost
8	**Conduct Needs Analysis**	$ 25,000		City staff time and/or consultant costs
	Industry Specific CRM [2]	$ 90,000	$ 15,500	Software licenses and implementation support
	On-Board Tablets (OBM) [2]	$ 365,000	$ 68,000	Wide range - Recurring cost accounts for periodic replacement of tablets
	Client Servers	$ 7,000	$ 700	Depends on number or servers required
9	**Replace all Vehicles as Scheduled**			Costs covered through Vehicle Replacement Fund
10	**Establish Minimum Vehicle Availability Standard**			No direct cost
11	**Hire 1 Mechanic**		$ 83,000	$83K fully loaded cost
12	**Implement Management by Metrics Program**	$ 25,000		Placeholder cost to develop program - Consider specifics as part of Needs Analysis
13	**Consider Increasing Refuse Vehicle Impact Charge**		$ 70,000	The Division currently contributes $100,000 annually - Policy decision
14	**Evaluate CD SRVS aGenda software**	$ 10,000	$ 24,000	City staff time and/or consultant cost for evaluation; Annual subscription cost
15	**Evaluate Recycle Coach Subscription**		$ 5,000	Annual subscription cost
	Totals [3]	**$ 602,000**	**$ 869,200**	
	FY 16/17 Rate Revenues	**$8,065,760**		
	Required Across the Board Rate Increase	**7.46%**	**10.78%**	

Note: $80,000 = ~ 1% Rate Increase

(1) Does not account for the cost of any additional route vehicles, the cost of which has been assumed would be paid for from the existing Vehicle Replacement Fund, or surplus Operating Reserves.

(2) Costs represent "Cost-High" estimates as presented in Table 5-2

(3) Does not account for any offsetting cost savings

Recommendations:

16. **Consider what if any rate increase is appropriate at this time to fund the above recommendations.**

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Section 2
Introduction, Methodology and Background

2.1 Introduction

The Primary objectives of the Rate Study included the following:

- **Collection Operations Review** – Evaluating how the Division currently provides solid waste services, and making recommendations for improving the overall performance of the City's municipal solid waste management system;
- **Technology Review** – Assessing a range of technologies, including RFID tags; smartphone mobile applications; and upgraded field communications systems;
- **Rate Model and Financial Planning** – Developing an Excel-based Rate Model to be used to project the Division's costs over an extended planning period (e.g., 1-5 and 5-10 years) and accounting for, among other things, timely vehicle replacement and other future capital costs;
- **Jurisdictional Survey** – Comparing the City's solid waste rates to those of other cities in the greater San Joaquin Valley;
- **Solid Waste Vehicle Impact Fee** – Quantifying a fee that could be charged to the Division for that portion of the City's the street maintenance costs associated with repairs caused by the City's solid waste vehicles; and
- **Proposition 218 Hearing** – Supporting the City's compliance with Proposition 218 requirements.

2.2 Methodology

Our review included, but was not limited to the following:

- Interviews and discussions with City staff, including:
    - City Manager;
    - Public Works Director;
    - Solid Waste Manager;
    - Solid Waste Supervisors;
    - Solid Waste Operators;
    - Solid Waste Department Assistant;
    - Public Works Management Analyst;
    - Risk Management Director;

  - Finance Director;
  - IT Department Manager;
  - City Engineer; and
  - Fleet Manager.
- Review of the Division's:
  - Management and information systems;
  - Collection and dispatching operations;
  - Vehicle maintenance operations;
  - Vehicle routing methodologies;
  - Customer service and billing operations;
  - Data collection, and reporting systems; and
  - Internal communication methods.
- Field work and review of the Division's field operations, including time and motion analyses of:
  - Residential solid waste, recycling and yard waste routes;
  - Commercial solid waste and recycling routes; and
  - Street sweeper routes.
- Technology Assessment, including:
  - Observations and interaction with administrative service staff to understand the work flow process. The purpose of these meetings and interviews was to get a comprehensive understanding of the City's Division's operations and to assess the systems and practices being used to perform customer service, billing, container tracking and inventory management, and field communications.
  - Researching and meeting with vendors who offered industry-specific technology products to evaluate the functionalities and features of each product and to determine their suitability to the City's Division's needs.
- Financial analysis:
  - Review of the Division's rates and Rate Ordinance;
  - Review and analysis of the Division's FY 16/17 budgets, and recent historical results;
  - Review of current Operating Reserve levels;
  - Review of the Division's Fleet Replacement Fund, and fleet replacement schedule; and
  - Analysis of the cost of service for the Division's lines of business, and various special rate categories.
- Other areas of review:

- Cart maintenance and delivery, and condition of residential carts and commercial containers;
- Vehicle availability;
- Safety program and staff training; and
- Vehicle load weights, and historical tonnages by line of business.

2.3 Background

The City is a charter city that was incorporated in 1872. It is located in Tulare County on State Route 99, approximately 45 miles south of Fresno and 60 miles north of Bakersfield, the City's population is approximately 62,000. Its incorporated area covers approximately 26 square miles.

The Division is responsible for collecting residential, commercial, and roll-off refuse, green waste and recyclables generated within the boundaries of the City. The Division is also responsible for street seeping services. Additional services include fall leaf-pickup, E-Waste recycling, curbside battery recycling and "clean-up" events. The Division currently has approximately 15,000 residential side-loader accounts, 1,000 commercial front loader accounts, and 40 industrial/roll-off customers.

By City ordinance, the City is the exclusive hauler for all residential services, and for all the commercial bin (frontload) services. Private debris box haulers that are approved by the Board of Public Utilities are permitted to haul recyclables, construction and demolition refuse, metal and hazardous materials only.

The Division is recognized as a self-supporting enterprise fund, and operates under the direction of the Board of Public Utilities. Revenues are derived primarily from service charges and must be adequate to fund the Division's operating costs, debt service, and capital programs. Solid waste is hauled to Tulare County's Avenue 328 Landfill in Visalia, organics are hauled to Harvest Power's facility in Tulare and recyclables are hauled to Mid Valley Disposal's recycling facility in Visalia. All City collection trucks drive directly to the appropriate facility to dump their loads; there is no transfer station.

All operations share the shop area and equipment, including forklifts, welding equipment and other miscellaneous maintenance equipment and parts. Residential and commercial cart and container maintenance and deliveries are conducted five days a week during normal working hours for that operation.

2.3.1 Residential Collection Operations

The Division provides weekly collection of solid waste, recyclables and green waste/food waste (organics) using three 96-gallon carts.[1] Collection services are provided on a 4 day-per-week 10-hour day collection schedule. The City is separated into two (2) collection zones with residential organics and recyclables collected on Monday and Tuesday, and solid waste collected on Thursday and Friday.

[1] 64-gallon carts are also available at the same rate.

2.3.2 Commercial Collection Operations

The Division provides weekly commercial refuse, recyclables, green waste and food waste collection services. Service is provided with a various size of bins, including "split" bins that are divided with two lids for refuse and recyclables, which are serviced by two different trucks. Commercial food waste is collected in 96 gallon automated containers with a designated automated side loader truck. Commercial loads of refuse, recyclables, green waste and food waste are delivered to the same facilities as the residential routes.

There are currently 20 weekly commercial routes. Four (4) routes on each Monday, Tuesday, Thursday and Friday, and two (2) routes on each Wednesday and Saturday each with 100 – 150 pickups each day.

2.3.3 Roll-Off Operations

The Division currently operates 2+ roll-off routes daily. Those routes average between 6 and 7 boxes each day.

2.3.4 Street Sweeping

The City provides street sweeping services to residential areas two times a month. Collector streets are also swept twice a month, and arterials are swept once per month. The City's downtown streets are swept once a week

2.3.5 Other Services or Operations

- **Free Dump Day** – Three free dump day events are scheduled each year in October, April and July where residents bring their debris and recycled materials to the City Corporation Yard. Residents can dispose of trash, green waste, cardboard, concrete, tires, metal, mattresses and e-waste free of charge (for City residents only). Paper shredding services are also provided.
- **Christmas Tree Drop** - The program allows residents to drop off their used Christmas trees into 30-yard debris boxes at 5 specific locations for a three-week period beginning the day after Christmas. Some of the collected materials are hauled to the compost dumpsite site some are chipped at the corporation yard and reused on City Park Rails to Trails.
- **Leaf Vacuum Program –** Residents are allowed to rake their leaves into a windrow three (3) feet away from their curb or on top of the parkway grass area. Customers then call in to the office and request to be picked up. The Division then places them on a schedule to vacuum the leaves up with the leaf vacuum truck. The program runs from the Monday after Thanksgiving until the 2nd or 3rd week of January. The leaves are collected and disposed of at the green waste dump site or to a city park/field for weed control.
- **Free Green Waste Drop-Off –** The City provides free green waste disposal for commercial landscapers (doing business within the city limits of Tulare) and City of

Tulare residents only. A green waste roll-off bin is available at the City of Tulare Corporation Yard, 3981 S. K Street from 7:00 a.m. - 3:00 p.m. Monday through Friday.

- **Free E-Waste Drop-Off –** Residents are provided with free Electronic Waste (E-Waste) drop off at the City's corporation yard, from 8:00 a.m. – 4:00 p.m. Monday through Friday.

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Section 3
Solid Waste Route Study

3.1 Objectives

The objectives of this task were to:

1. Review the productivity of the following Division collection services and assess the reasonableness of the current number of daily routes:
    - Residential solid waste
    - Residential recycling
    - Residential yard waste
    - Commercial solid waste
    - Commercial recycling
    - Street Sweeping
2. Develop recommendations for data the Division should be tracking.

3.2 Overview

3.2.1 Productivity Assessment

3.2.1.1 Background

Optimizing collection productivity is not about making drivers work harder or faster; it is a combination of maximizing the percentage of the work day that is spent "on route" collecting accounts, and minimizing the average service time per account.

Maximizing On-Route Time – Maximizing the percentage of the work day that is spent "on-route" involves two main objectives:

- Minimizing "off-route time" (e.g., reducing paperwork, providing for more efficient fueling, quick turn-around time at the landfill and processing facilities, etc.); and
- Effective load management to maximizing the use (and productivity) of available vehicle capacity, and minimize the number of trips to the landfill or processing facility - without overloading vehicles.

Minimizing Average Service Time per Account – Minimizing the average service time per account can involve a number of factors including:

- Effective routing to minimize deadheading,[1] traffic, left-hand turns, etc.

[1] Traveling over a street segment that the route has already serviced.

- Vehicle specifications and maintenance; and
- Driver training.

The goal of effective routing is to establish appropriate productivity standards for each route (i.e., number of residential carts or commercial containers serviced per route per day) that accurately reflect the average time that it takes to service a typical residential or commercial account, and the amount of total available daily "on-route time."

3.2.1.2 Methodology

As part of our review of the Division's collection productivity, R3 staff conducted time and motion analysis of each of the Division's residential and commercial services (i.e., solid waste, recyclables, and organics). That analysis recorded the various time elements that comprise the collection operations to enable us to project, among other things, the average service time per account. Working with Division management we also quantified the average time associated with each "off-route" task (e.g., pre- and post-trip requirements, breaks, traveling to and from the corporation yard to the route and from the route to the landfill or processing facility, etc.). This allowed us to determine the total daily available "on-route" time for each collection operation. Taking that projected available daily on-route time, and dividing that by the average service time per account, results in the target productivity standard for each collection operation, which we compared to the Division's actual productivity to assess the reasonableness of current productivity.

3.2.2 Data Tracking

Effective performance measures help an organization understand, manage and improve performance – *That which is not measured is not managed*. Specifically, performance measures can help the Division determine:

- How well it is doing;
- If it is meeting its goals;
- If customers are satisfied; and
- Where improvement is needed.

Performance measures should be designed to measure both:

- ***Effectiveness*** – How well the Division is achieving its objectives, such as:
  - Productivity / coverage – the number of customers served;
  - Accomplishments – the overall outcome or achievement of a program or service; and
  - Quality – the proportion of services provided without error, the ratio of complaints to total services provided, and the proportion of services produced at a specified standard.
- ***Efficiency*** – How well the Division is using its resources, such as:
  - Per unit costs;
  - Cycle time;
  - Response time;
  - Backlog;

- Per unit full time equivalents;
- Staffing ratios; and
- Back up vehicle ratios.

When developing, reviewing and updating performance benchmarks, the Division should consider the following guidelines:

- Link performance to specific documented operating objectives;
- Start with a few measures and use as few as possible;
- Assign responsibility and accountability for tracking and reporting data to specific staff;
- Track and report current data (e.g., monthly, quarterly, annual) as well as historical trends and make that information available to all staff through postings, meetings and training activities; and
- Use the measures in a positive manner, and not as a means to find fault with employees.

3.3 Residential Collection Routes

3.3.1 Background

Number of Routes

As discussed in Section 2 - the Division provides weekly residential solid waste, recycling and yard waste collection services on a four day per week 10-hour per day schedule. Table 3-1 provides a listing of the Division's various residential routes. As shown, the Division operates a total of 20 weekly solid waste routes, 8 weekly recycling routes and 12 weekly green waste routes.

Table 3-1
Residential Collection Routes

Day of Week	Solid Waste	Recycling	Green Waste	Total
Monday		4	6	10
Tuesday		4	6	10
Thursday	10			10
Friday	10			10
Total	**20**	**8**	**12**	**40**
% of Total	**50%**	**20%**	**30%**	**100%**

Structure of Routes

For purposes of organizing collection operations, the City is divided into two distinct collection areas (schedules), with collection services provided in the "North Area" Monday (recyclables and green waste) and Thursday (solid waste) and in the South Area on Tuesday (recyclables and green waste) and Friday (solid waste) (**Appendix 3A**).

3.3.2 Findings

Safety

- Route drivers R3 observed in the field while on-site operated safely and effectively.

Productivity

- The productivity of fully automated residential side loaders, like the Division operates, is typically within the range of 120 to 150 carts per on-route hour (24 - 30 seconds per setout (stop) | 2.0 – 2.5 setouts (carts) per minute)).[2]
- The productivity of the Division's residential refuse, recycling and organic routes all fall within the lower end of that range (i.e., 2.0+/- accounts per minute).
- Part of the reason for the Division's lower end productivity is due to:
    - Side yard subscription services, which are very labor intensive and negatively impact productivity; and
    - The age of the fleet.

System Capacity

- The current residential collection system appears to be at capacity, and an additional route is needed to handle growth and peak seasonal green waste workloads.[3]
- To service the current residential workload the Division often needs to use maintenance staff and route supervisors to staff open routes due to the current lack of a sufficient number of residential route drivers.

Structure of Routes

- Residential collection system is currently designed 10 routes year-round, with all route drivers collecting solid waste two days per week, and either recyclables or yard waste the other two days of the week. As currently structured there is no way to adjust the number of routes (notably yard waste) for any significant seasonal changes in

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[2] A system that operates at an average of 24 seconds is 20% more productive that a system operating at 30 seconds per account. Every second savings in "average service time per setout" for a system operating at 30 seconds per account results in the potential for a 3.3% increase in productivity if the system is rerouted to realize that increase in productivity.

[3] This assessment is based on the results of the time and motion data conducted as part of this study, and input of Division management, including assessment of increased green waste participation rates as compared to those observed during our review.

participation, or add a route specifically for one of the three commodities if the work load for that commodity warrants a change in the number of associated routes.

- The Division may be able to realize increased productivity by restructuring its collection operations to a "traditional 3-cart service", with daily routes for each commodity based specifically on the workload associated with that commodity. This provides for establishing the required number of routes for each commodity, based on the workload of that commodity, and changing the number of routes based on seasonal variations in participation rates, if and as appropriate.

3.3.3 Recommendations

Number of Routes

- Add one (1) additional FTE Residential Route Driver and route to support the current workload, and ongoing account growth.
- Develop the following capacities to identify and realize opportunities for increased productivity:
    - On-board computer capacity for tracking of real time route data, and participation rates; and
    - GIS macro-routing capacity.

Structure of Routes

The City should consider pros and cons of switching the residential collection system to a "traditional 3-cart – single service day system", with all three (3) commodities collected on the same day.

3.4 Commercial Collection Routes

3.4.1 Background

The Division provides commercial solid waste services six days per week, and recycling services five days per week, with drivers operating on a five day per week, 8-hour schedule. Table 3-2 provides a listing of the Division's various commercial routes. As shown, the Division operates a total of 20 weekly front-loader routes, 15.5 weekly solid waste routes and 4.5 weekly recycling routes. The Division also operates a commercial organics side loader route 5 hours per day, 5 days per week.

Table 3-2
Commercial Collection Routes

Commercial Front Loader Routes							
Commodity	**Mon**	**Tues**	**Wed**[1]	**Thurs**	**Fri**	**Sat**	**Total**
Solid Waste	3	3	1.5	3	3	2	**15.5**
Recycle	1	1	0.5	1	1		**4.5**
Total	**4.0**	**4.0**	**2.0**	**4.0**	**4.0**	**2.0**	**20.0**

Commercial Side Loader Routes							
Commodity	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**	**Sat**	**Total**
Organics [2]	0.625	0.625	0.625	0.625	0.625		**3.125**

[1] Wednesday = 1 solid waste route, 2nd route is 1 load solid waste and one load recycle

[2] Route operates ~ 5 hours per day

3.4.2 Findings

- Route drivers R3 observed in the field while on-site operated safely and effectively.
- The productivity of the Division's commercial refuse, and recycling routes all fall within a reasonable range (i.e., number of stops per on-route hour), although the additional work load associated with increased AB 341 (mandatory commercial recycling), and AB 1826 (mandatory commercial organics collection), and account growth, warrants one (1) additional FTE route at this time.
- To service the current commercial workload the Division often needs to use maintenance staff and route supervisors to staff open routes due to the current lack of a sufficient number of commercial route drivers.

3.4.3 Recommendations

- Hire one additional FTE Commercial Route Driver.
- Develop the following capacities to identify and realize opportunities for increased productivity:
    - On-board computer capacity for tracking of real time route data; and
    - GIS macro-routing capacity.

3.5 Roll-Off Routes

3.5.1 Background

Prior to the closing of the Woodville Landfill the Division was operating 2 FTE roll-off routes, the same number it is running today. At that time, each roll-off route was hauling 9 - 10 boxes per day. The closing of the Woodville Landfill added about 30 minutes to each residential, commercial and roll-off load. Roll-off, however was much more impacted by the Woodville closing then either the residential or commercial collection systems because roll-off routes travel to the landfill 6 - 7 times each day, versus 2 or at most 3 times per day for residential and commercial routes. The additional time per load that the roll-off routes experienced with the closing of the Woodville Landfill alone, would justify an additional roll-off route (all other factors the same and not accounting for increasing workload). The Division is currently operating 2+ roll-off routes and there is enough demand to staff a 3rd full-time route.

3.5.2 Findings

- The number of required roll-off routes is highly dependent on the economy and construction activity, and will fluctuate accordingly.
- The Division's current roll-off routes are achieving reasonable productivity.
- The current workload and increased landfill haul time support a 3rd full-time roll-off route at this time.

3.5.3 Recommendations

- Hire one additional FTE Roll-Off Driver.
- Develop on-board computer capacity for tracking of real time route data.

3.6 Street Sweeping Routes

3.6.1 Background

The Division provides street sweeping services to residential and collector streets twice a month and commercial streets (arterials) once a month. The City's downtown streets are swept once per week. The City also operates a leaf vacuum program that runs two to three months out of the year.

The Division currently operates two (2) daily street sweeper routes Monday through Thursday and one route on Friday (see Table 3-3 below). Those routes operated four (4) weeks each month. It has a fleet of four (4) street sweeping vehicles comprised of three (3) regenerative air street sweepers and one (1) broom sweeper. It also maintains one leaf vacuum truck. Regenerative air sweepers are generally considered the best all-around multi-purpose sweeper, although they are not as effective as mechanical broom sweepers at handling heavy or packed down materials.

Street sweeper routes typically generate two (2) to three (3) loads of material, which are delivered to the corporation yard and consolidated into roll-off containers. Those containers are then hauled to the landfill when full.

Table 3-3
Street Sweeping Routes

Mon	Tues	Wed	Thurs	Fri
2	2	2	2	1

Mon-Thurs - 2 full routes; sometimes a third when equipment and third driver is available

Friday - sometimes one truck on City parking lots, alleyways

3.6.2 Street Sweeper Speeds

When evaluating street sweeper productivity there is a balance between the quality of the sweeping and the number of curb miles swept per day, which are both directly impacted by the speed of the street sweeper. Tymco, a leading manufacturer of street sweepers reported the following:[4]

> *Forward speed of a street cleaner while sweeping will significantly affect its ability to pick up particulate material. Everything else considered equal, the pickup effectiveness increases as the forward speed decreases (Sartor and Boyd 1972). The optimum average forward sweeping speed is approximately 5 miles per hour. This is good balance for the tradeoff between pickup performance effectiveness and the need to sweep a reasonable length of streets in a given day. A good program realizes that there will be a range of, say, 3 to 7 miles per hour while sweeping that will occur daily. This allows the operator to adjust speed in response to conditions that are encountered. A good sweeping program uses continuous-recording GPS devices on the sweepers that allow management to both monitor and document the actual forward sweeping speeds being used.*

A review of a number of street sweeping request for proposals and contracts found the following:

- **City of Encinitas, CA** – *"The sweeping equipment shall not travel in excess of **eight (8) miles per hour** when sweeping any street."*
- **City of San Jose, CA** – *"Contractor shall operate the sweepers at a speed of not more than **six (6) miles per hour** when the sweeper brooms are down, unless the Contractor can demonstrate that the sweeper can operate efficiently and safely at a higher speed."*
- **City of Newman, CA** – *"The street sweeping equipment shall not travel at a speed in excess of **eight (8) miles per hour** and use both side brushes when sweeping."*

[4] Street Sweeping 101, Dec. 31, 2010, Tymco.

- **County of Yuba, CA** – *"The sweeping equipment shall not travel in excess of **eight (8) miles per hour** when sweeping any street."*

- **County of San Luis Obispo, CA** – *"Street sweepers will operate at suggested manufacturers speeds in accordance with local conditions and desired results. At no time may the street sweeper speed exceed **6 miles per hour**."*

- **City of Wildomar, CA** – *"Franchisee shall operate the sweepers at a speed of not more than **nine (9) miles per hour** when sweeping or when the sweeper brooms are down, unless the Franchisee can demonstrate that the sweeper can operate efficiently and safely at a higher speed."*

3.6.3 Methodology

As part of our review of the City's street sweeping operations, R3 observed the City's street sweeping route in the field and conducted a review of the productivity of those routes. That analysis considered the total available time the street sweeper routes have available for on route street sweeping versus off-route activities (e.g., pre- and post-trip requirements, traveling to and from the route, taking on water, etc.), and the total daily work load (i.e., number of daily sweeping miles).

3.6.4 Findings

- Street sweeper drivers we observed in the field operated safely and effectively.
- Typical street sweeper speeds while sweeping range from 5 to 8 miles per hour. Therefore, a vehicle that sweeps at 8 miles per hour will be 60% more productive than a vehicle operating at 5 miles per hour (i.e., can sweep 60% more curb miles in the same amount of time). As such, the productivity of a street sweeper is highly dependent on the speed at which it operates.
- At five (5) miles per hour, the two (2) existing street sweeper routes are estimated to be at about 90% or more capacity.
- If the City allows street sweepers to operate at up to eight (8) miles per hour, there is significant capacity in the system to accommodate increased workload (e.g., new developments and/or more frequent sweeping). If the City maintains a standard operating speed of five (5) miles per hour, it should consider adding an additional route to accommodate the existing work load and near to mid-term development and growth.

Based on the total average available on-route time per day and the daily work load, R3 calculated the required number of routes based on assumed average on-route travel speeds of 5, 6, 7 and 8 miles per hour. The results of that analysis are provided in Table 3-4 below. As shown, the current number of routes (2) is appropriate for the given daily work load assuming a travel speed of 5 miles per hour. If those routes are operated at an average speed between 6 and 8 miles per hour there is significant capacity within the existing system to handle additional work load without needing to increase the number of routes.

Table 3-4
Street Sweeping Productivity Analysis

Travel Speed (mph)	Number of Required Routes	Percent of System Capacity	Additional System Capacity (miles per day) (1)
5	1.79	90%	6.1
6	1.49	75%	17.7
7	1.28	64%	29.3
8	1.12	56%	41.0

Current Number of Routes	2.0

(1) Does not consider additional loads or water stops

3.6.5 Recommendations

- Hire addition Sweeper driver or increase operating speed standards to meet system capacity.
- Continue to track and evaluate productivity (i.e., track real time travel speeds and on-route vehicle mileage data).

3.7 Data Tracking | Management by Metrics

3.7.1 Background

"That which is not measured is not managed". The Division has, with the help of the Public Works' Management Analyst, recently begun developing and implementing a performance data collection process. This process can help the Division identify opportunities for improvement, and is a very positive first step, but the Division has limited access to information, and the data that is tracked takes considerable effort to collect and compile.

3.7.2 Findings

While the Division understands the importance of information and specific data related to its collection system, and has begun a regular data collection process and developed a "dash

board" for Division management, it lacks the electronic "tools" to gather much of the information that is most valuable to it in an efficient and effective manner. Without a good system to track and report the data that the Division needs to effectively manage its operations, it will be limited in its ability to realize significant improvements in productivity.

3.7.3 Recommendations

- Develop a Policies and Procedures Manual for the overall Division and each specific line of business.
- Implement a Management by Metrics Program – Establish performance standards, track performance relative to those standards, and identify and realize opportunities for improvement – Data tracking and reporting would be facilitated by a CRM System.
- We suggest that the Division identify meaningful benchmarks for each of the following aspects of its operations. Initial R3 suggestions are provided, and should be reviewed and revised by the Division based on its assessment of current data tracking capabilities and associated benefits:

    a. Safety

        i. OSHA Injury Frequency and Severity Rates (TIRR and DART)[5]
        ii. Vehicle Accident Rate (VARR)[6]
        iii. Excess speeds
        iv. Overweight vehicles[7]
        v. Hard stops and starts

    b. Customer Service

        i. Average hold time;
        ii. Complaints by type and line of business

    c. Productivity

        i. Vehicle Weights (overweight and underweight)
        ii. Overtime (planned vs. unplanned)
        iii. On-route time
        iv. Idle times

    d. Diversion – Diversion rate, by commodity, by line of business

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5 Total Incident Recordable Rate (TIRR); Days Away, Restrictions, and Transfer (DART).

6 Vehicle Accident Recordable Rate (VARR).

7 The industry standard is to monitor vehicle weights on a daily basis and make appropriate adjustments (e.g., resetting break-off points) to control overweight vehicles. It should be a standard daily responsibility of the Route Supervisors to track and manage the load weights for all the drivers they manage.

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Section 4
Solid Waste Vehicle Impact Fee

4.1 Objective

To quantify the impact of the Division's residential, commercial, and roll-off vehicles (Refuse Vehicles) on the City's residential and commercial streets (i.e., axle loadings), and the associated street maintenance costs attributed to the Division's Refuse Vehicles.

4.2 Summary Findings

It is projected that the City needs approximately $22.5 million for pavement maintenance over the next five years ($4.5 million annually) to bring the City's street network up to a "good" condition.[1] Approximately $2.5 million in annual funding is currently available, leaving an annual funding shortfall of approximately $2.0 million. The portion of that annual shortfall allocated to the Division's Refuse Vehicles, and the total of the based on the projected impact of those vehicles, on the City's residential and commercial streets as a percentage of the total vehicle impacts experienced by those streets, is provided in Table 4-1 below:

Table 4-1
Projected Refuse Vehicle Annual Street Maintenance Cost Impacts

Vehicle Type	Annual Street Maintence Cost Impact	
	$2.0 Million Shortfall	$4.5 Million Total Required Funding
Refuse Vehicles		
Residential Refuse Vehicles	$ 155,000	$ 348,750
Commercial Refuse Vehicles	$ 12,000	$ 27,000
Subtotal	**$ 167,000**	**$ 375,750**
Street Sweepers		
Residential Street Sweepers	$ 3,000	$ 6,750
Commercial Street Sweepers	<$1,000	$ 1,000
Subtotal	**$ 3,000**	**$ 7,750**
Total	**$ 170,000**	**$ 383,500**

[1] City of Tulare, Administrative Policy No. 13-05, Legislative Guiding Principle and Priorities, Approved: August 20, 2013.

The impact of roll-off vehicles on the City's street maintenance costs is projected to be $0.33 per ton of materials (solid waste, recyclables, organics).

The above analysis assumes that the projected annual funding shortfall is evenly distributed to residential and commercial streets (i.e., a $1 million annually funding shortfall for both residential and commercial streets). Changes to that distribution of the funding shortfall among residential and commercial streets would materially impact the above findings.

Notes: The Division is currently contributing $100,000 annually to the General Fund for the impact of its Refuse Vehicles on the City's street maintenance costs.

It is assumed that at least a portion of the total $2.5 million current available annual funding is related to "non-discretionary" funds, some which all vehicles, including Refuse Vehicles have contributed (e.g., gas taxes), in which case considering those non-discretionary funds would be effectively double counting (charging) Refuse Vehicles for that portion of those funds that have contributed to. We therefore, suggest that the City not consider what if any portion of such "non-discretionary" fund should be considered in this analysis. Alternatively, it may be appropriate to consider any discretionary funds (e.g., General Fund revenues) included as part of the $2.5 million current available funding, as part of the analysis. A breakdown of the current available funding by discretionary and non-discretionary sources was not available at the time of our analysis.

4.3 Background

4.3.1 Street/Pavement Rehabilitation

The City's streets are its highest valued capital asset, with an investment of over $400 million. The City's Pavement Management System (PMS) has identified approximately $22.5 million in needed pavement maintenance over the next five years ($4.5 million annually). That level of funding would bring the entire street system up to a Pavement Condition Index (PCI) of 70 (good condition). The optimal PCI is 83 (good to very good condition). The current PCI is 63 (fair condition). The City only has funding for approximately $2.5 million annually for pavement rehabilitation projects and some of that funding will be used to supplement general funds in the Public Works Street Maintenance budget. Based on a projected annual funding need of $4.5 million, and $2.5 million in available annually funding, there is an annual funding shortfall of $2.0 million.

4.3.2 Status of Refuse Vehicle Impact Fees

Refuse vehicle impact fees, designed to support street repair activities, have been applied in California for more than 15 years. While they have been more common in Northern California, jurisdictions throughout the State have implemented them, including Alameda, Belmont, Beverly Hills, Hemet, Lafayette, La Verne, Livermore, Menlo Park, Mill Valley, Modesto, Napa, Petaluma, Pittsburg, Redlands, Rolling Hills Estates, Ross, San Rafael, Tiburon, Union City and Walnut Creek. Jurisdictions surveyed as part of the 2016 California Statewide Local Streets and Roads Needs Assessment prepared by NCE, reported the use of both Enterprise Funds (solid waste and water), and solid waste funds as local funding sources for their pavement expenditures.

4.3.3 Street Network

The City's street network consists of 211 miles of City streets, 44 signalized intersections, and 379 street lights. The Streets Division's Street Services section is responsible for repairing and maintaining the City's street network.

4.3.4 Collection System

The City provides weekly collection of residential solid waste, recyclables and organics (green waste and food waste) with fully-automated vehicles. Commercial services are provided by the City, with roll-off service provided by both the City and a number of permitted private recyclers and debris box haulers.

4.3.5 Streets and Roads Annual Report

California Streets and Highways Code section 2151 requires each city and county to file an annual report of expenditures for street or road purposes with the State Controller's Office on or before October 1 of each year. Streets and Highways Code section 2154 requires the California State Controller's Office to distribute a compilation of those reports annually. That information includes both city and county expenditures by type (e.g., new street construction, street reconstruction), and an accounting of monies made available for street purposes (e.g., gas tax apportionments, general fund money).

Information reported by the City to the State Controller's Office for the past 3 years (2013 – 2015) did not identify any reported expenses for pavement maintenance related activities (e.g., street reconstruction, patching, overlay and sealing). During that same time-period, more than $45 million in New Street Construction expenses were reported.

4.4 Overview

Road maintenance is based on deterioration. While roads will deteriorate if simply left unused, most deterioration is associated with use, and the damage caused by vehicles increases exponentially with size and weight. Therefore, costs associated with maintenance are greater for trips made by heavy vehicles. A single large truck can cause as much damage as thousands of automobiles, and the configuration of the truck can affect the amount of damage as well. If the load is spread over more axles, there is less weight on each wheel, and damage is reduced.[2]

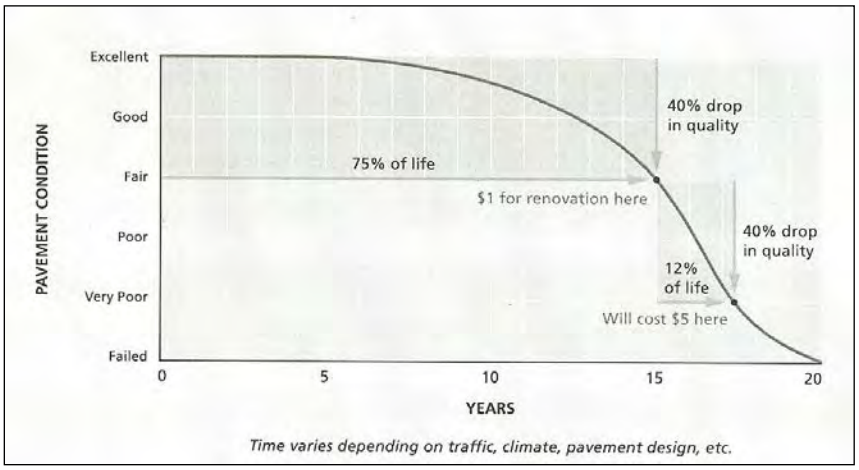
Refuse Vehicles are typically the heaviest vehicles regularly operating on residential streets and are a significant contributor to the wear and tear experienced by those streets. While Refuse Vehicles also contribute to the wear and tear on other street types (including arterials and collectors), those streets are designed to a higher standard and experience significantly more vehicle trips and large truck trips than residential streets. As such, the relative impact of a Refuse Vehicle on collector and arterial streets is significantly less than that on residential streets.

The PCI is a common unit of measure used to rate the condition of pavements. The PCI rates pavements on a scale of 0 to 100, with a higher value indicating better pavement condition. Rapid deterioration of pavement typically occurs after roadways drop to a PCI of 60 or lower, and studies have shown that every dollar spent performing preventative maintenance on a roadway with a PCI of 70 or higher saves $4 down the road - it would otherwise cost about $5

[2] A. Rufolo, *Cost-Based Road Taxation*, Cascade Policy Institute, November 1995.

to rehabilitate the same roadway once rapid deterioration occurs[3] (as shown in Figure 4-1). Assuring adequate funding for an effective pavement management system is therefore critical to achieving a cost-effective pavement management system.

Figure 4-1
Pavement Life Cycle Cost



Source: Metropolitan Transportation Commission

The goal of a pavement management program is to bring all roads up to "good" or "excellent" condition where they can be maintained most cost-effectively. The strategy often recommended is referred to as the "best first approach", which concentrates spending initially on routine and preventative maintenance on those roads that are currently in fair to good condition. This extends the useful life of those roads, preventing rapid deterioration. Spending money on routine maintenance now prevents additional spending in the future on more expensive repairs.

4.5 Approach

Our approach to projecting Refuse Vehicle street maintenance impacts is based on common principals of pavement design and vehicle loadings. The basic premise is that all vehicles, including Refuse Vehicles, exert an impact on streets that can be quantified. That impact or "vehicle loading" can be expressed as an Equivalent Single Axle Load (ESAL), which is a function of the vehicle's weight and the distribution of that weight over the vehicle's axles. By projecting the number and type of vehicles (i.e., cars, trucks, Refuse Vehicles) that travel on a street over its design life, and the average ESAL associated with each vehicle type, the total ESALs that street will experience can be calculated. The relative impact associated with a specific type of vehicle (e.g., Refuse Vehicle) can then be determined based on the percentage of total ESALs attributed to that vehicle type.

[3] J. Gerbracht, Bay Area Roads Close to "Tipping Point", Metropolitan Transportation Commission, Street Talk, March 2006.

4.6 Findings

Our proposed methodology for this task called for quantifying the portion of the City's annual street maintenance costs attributed to the Division's Refuse Vehicles (solid waste, recycling and yard waste vehicles). That was accomplished by calculate the weekly Refuse Vehicle ESAL experienced by a typical residential and commercial street both in total, and as a percentage of the total ESALs experienced by a typical residential and commercial street (i.e., the Refuse Vehicle Loading).

4.6.1 Residential Refuse Vehicle Impact

Our analysis found that the Division's residential Refuse Vehicles account for 15.6% of the total ESAL's experience by a typical residential street, as shown in Table 4-2 below. If we assume 50% of the $2.0 million annual street maintenance funding shortfall discussed in Section 4.3.1 is associated with residential street maintenance, then $155,000 of that annual cost can be attributed to Refuse Vehicles based on their relative total impact on residential streets. If that cost were distributed among all residential accounts, the associate monthly residential rate impact would be $0.85 per residential account.

A similar analysis of the impact of street sweepers on the City's residential streets projected an associated annual street maintenance cost of $3,000, which equates to a monthly residential rate impact of $0.02 per account.

Table 4-2
Residential Refuse Vehicle Projected Impacts

Vehicle Type	Average Axle Load (ESAL) / Vehicle	Passes / Week / Vehicle Type	Weekly ESAL Loadings	Percent of Total Vehicle Impacts	Annual Projected Funding Shortfall
Solid Waste Vehicles	1.035	2.0	2.071	5.7%	$ 57,000
Recycling Vehicles	0.784	2.0	1.569	4.3%	$ 43,000
Yard Waste Vehicles	0.995	2.0	1.990	5.5%	$ 55,000
Street Sweeper	0.051	2.0	0.101	0.3%	$ 3,000
Other Trucks	0.189	132.0	24.948	69.0%	$ 690,000
Automobiles	0.001	6,860.0	5.488	15.2%	$ 152,000
Total		**7,000**	**36.166**	**100.0%**	**$ 1,000,000**

Total Refuse Vehicle Impact =	**15.6%**	**$ 155,000**

Total Number of Residential Accounts =	**15,235**
Monthly Residential Rate Impact =	**$ 0.85**
Current Residential 90-gallon Monthly Rate =	$ 25.30
Associated Residential Rate Increase =	**3.35%**

Total Street Sweeper Impact =	**0.3%**	**$ 3,000**
Monthly Residential Rate Impact =		**$ 0.02**
Associated Residential Rate Increase =		**0.06%**

4.6.2 Commercial Refuse Vehicle Impact

Our analysis found that the Division's commercial Refuse Vehicles account for 1.2% of the total ESAL's experience by a typical commercial street, as shown in Table 4-3 below. This lower figure is due to the fact that commercial streets experience a significantly higher number of daily vehicle trips, with a higher percentage of those trips made by larger trucks. As such, the relative impact of commercial Refuse Vehicles on the City's commercial streets is much less than the impact of the Division's residential Refuse Vehicles on the City's residential streets.

If we assume 50% of the $2.0 million annual street maintenance funding shortfall discussed in Section 4.2 is associated with commercial street maintenance, then $12,000 of that annual cost can be attributed to commercial Refuse Vehicles based on their relative total impact on commercial streets. If that cost were distributed among all commercial accounts, commercial rates would need to be increased by 0.71%. The impact of street sweepers on commercial street maintenance costs in minimal (less than $1,000 annually).

Table 4-3
Commercial Refuse Vehicle Projected Impacts

Vehicle Type	Average ESAL / Vehicle	Passes / Week / Vehicle Type	Weekly ESAL Loadings	Percent of Total Vehicle Impacts	Annual Non-Discretionary Funding Shortfall
Solid Waste Vehicles	1.035	5.0	5	0.7%	$ 7,000
Recycling Vehicles	0.784	5.0	4	0.5%	$ 5,000
Yard Waste Vehicles	0.995	0.0	0	0.0%	$ -
Street Sweeper	0.051	2.0	0.1	0.0%	$ 136
Other Trucks	0.240	2,790	670	89.8%	$ 897,587
Automobiles	0.001	67,200	67	9.0%	$ 90,080
Total		**70,002**	**746**	**100.0%**	**$ 1,000,000**
			Total Refuse Vehicle Impact =	**1.2%**	**$ 12,000**
				Total Annual Commercial Rate Revenues =	**$ 1,702,000**
				Associated Commecial Rate Increase =	**0.71%**
Street Sweeper	0.051	2.000	0.1	0.000	**$ 136**
				Associated Commercial Rate Increase =	**0.01%**

4.6.3 Roll-Off Refuse Vehicle Impact

The impact of roll-off vehicles on the City's street maintenance costs is projected to be $0.33 per ton of refuse.

4.7 Assumptions

Residential Streets

- Vehicle trips per day = 1,000
- Percentage of truck trips per day = 2.0%

Commercial Streets

- Vehicle trips per day = 15,000
- Percentage of truck trips per day = 4%

4.8 Limitations

The impact of the Division's Refuse Vehicles on the City's street maintenance expenses is based on a number of underlying assumptions for which reasonable ranges exist (e.g., traffic counts, and traffic classifications). Changes to those assumptions may have a material impact on the resulting findings.

Section 5
Technology Review

5.1 Objective

The objective of this task was to evaluate the costs, efficiency and effectiveness of several operations systems enhancements and to provide recommendations whether the systems would be cost-effective and beneficial to the Division.

The Division identified the following operations systems for review and evaluations;

- An RFID Tag Identification System;
- Upgrade Field Communications;
- Mobile Application Software (Smartphone App); and
- GIS Mapping Software.

5.2 Summary Findings

Perhaps the most significant technological issue for the Division to address is whether to procure a solid waste industry specific customer relations management (CRM) system to serve as a central hub to manage workflow communications, and provide for integration of other technological enhancements, including On-Board Computers. The City currently uses Eden Utility Billing software. Eden includes a work order function, which is used by some other City departments, but is not currently used by the Division. Eden also includes a solid waste container inventory function that allows the user to enter container numbers into Eden and assign them to specific customers. According to City staff, this container inventory function within Eden was used by the Division for a short time, but a number of issues arose that led to the Division's discontinuing its use.

Eden certainly has the functional capabilities to meet the Division's work order and inventory tracking needs, although to make that happen will require a coordinated effort on the part of the Division, and the City's IT and Finance Departments. Eden does not, however, provide the means for integrating various solid waste industry technological enhancement into the Division's operations, including On-Board Computers. The lack of a solid waste specific CRM system is a significant limitation for the Division. Without an industry-specific CRM system, the alternatives for technological enhancements to improve workflow efficiencies are significantly limited, and the Division's goal to have "everything work together" will be more challenging.

To address this issue, we recommend that the Division undertake a "Needs Analysis" to determine what is required for Eden to serve as the Division's work order and container management system, and if a separate industry CRM system makes sense for the Division at this time, and if so what is required to integrate such a system into the Division's operations.

5.3 Background

The Division is a typical solid waste operation. Its primary purpose is to remove the City's solid waste and dispose of it safely and in a timely manner. The main organizational functions within such an operation include:

- **Collection Operations:** Responsible for equipment and personnel required to collect and dispose of solid waste and recycling materials;
- **Fleet Maintenance:** Responsible for the mechanical upkeep of the vehicles and equipment;
- **Container Management:** Responsible for maintaining, delivering and tracking containers;
- **Customer Service:** Responsible for handling inquiries and services request from customers; and
- **Billing:** Responsible for the timely production and distribution of invoices and billing statements, receipt and posting of payments.

For most solid waste operations, the customer service center is the communication nexus with its customers. Hence, the organization and management of the customer service center is vital to the delivery of efficient and consistent quality service.

Calls into the Customer Service Center fall into the following general categories:

- Establish new service;
- Request additional service;
- Amend existing service (such as cart or bin exchanges);
- File a service complaint;
- Billing; and
- General questions.

At its basic level, a solid waste operation directs the personnel and equipment to collect and dispose of solid waste and recycling materials. The other functions serve as support functions that can be organizationally directed by the solid waste collection operation, or can be provided by other departments and / or outsourced to vendors.

The general workflow for a solid waste operation is depicted, at a high level, from customer calls to billing, in Figure 5-1 (Typical Solid Waste Operation Work Flow Diagram).

In the City of Tulare, in addition to the collection operations, the Division is responsible for container management, and to a limited degree, customer service. Fleet maintenance is provided by the fleet maintenance department which is also responsible for all the City's vehicles. Billing is provided by the Finance Department through EDEN, a comprehensive enterprise resource planning software product for the public sector. Figure 5-2 (Division Solid Waste Operation Work Flow Diagram) depicts Division at a high level.

5.4 Evaluation of Operations Systems

A major consideration identified by the City when evaluating the operations systems was their compatibility and potential for integration so that "everything works together" as efficiently and seamlessly as possible. Determining the compatibility and integration capacity of an operations system requires both the evaluation and understanding of the technology itself and, the organizational structure in which it will operate.

Common practice for solid waste operations is for the customer service center to be equipped with an industry-specific customer relationship manager (CRM) software system. The CRM system serves as a hub or nexus through which the staff in the various solid waste operations communicate and keep track of work flow. Several specialized CRMs have been developed to provide for the unique functions of a solid waste operation. These CRMs integrate customer service functions with collection operations, container management, billing, and route management.

A well-designed CRM provides for functions such as processing service requests; keeping a history of service; complaint logging and follow-up; work order processing; on-call service dispatching; container assignment and tracking; accurate billing of permanent and temporary services; on-going interactive communication with field operations; report writing; and other functions.

Figure 5-1
Typical Solid Waste Operation Work Flow Diagram

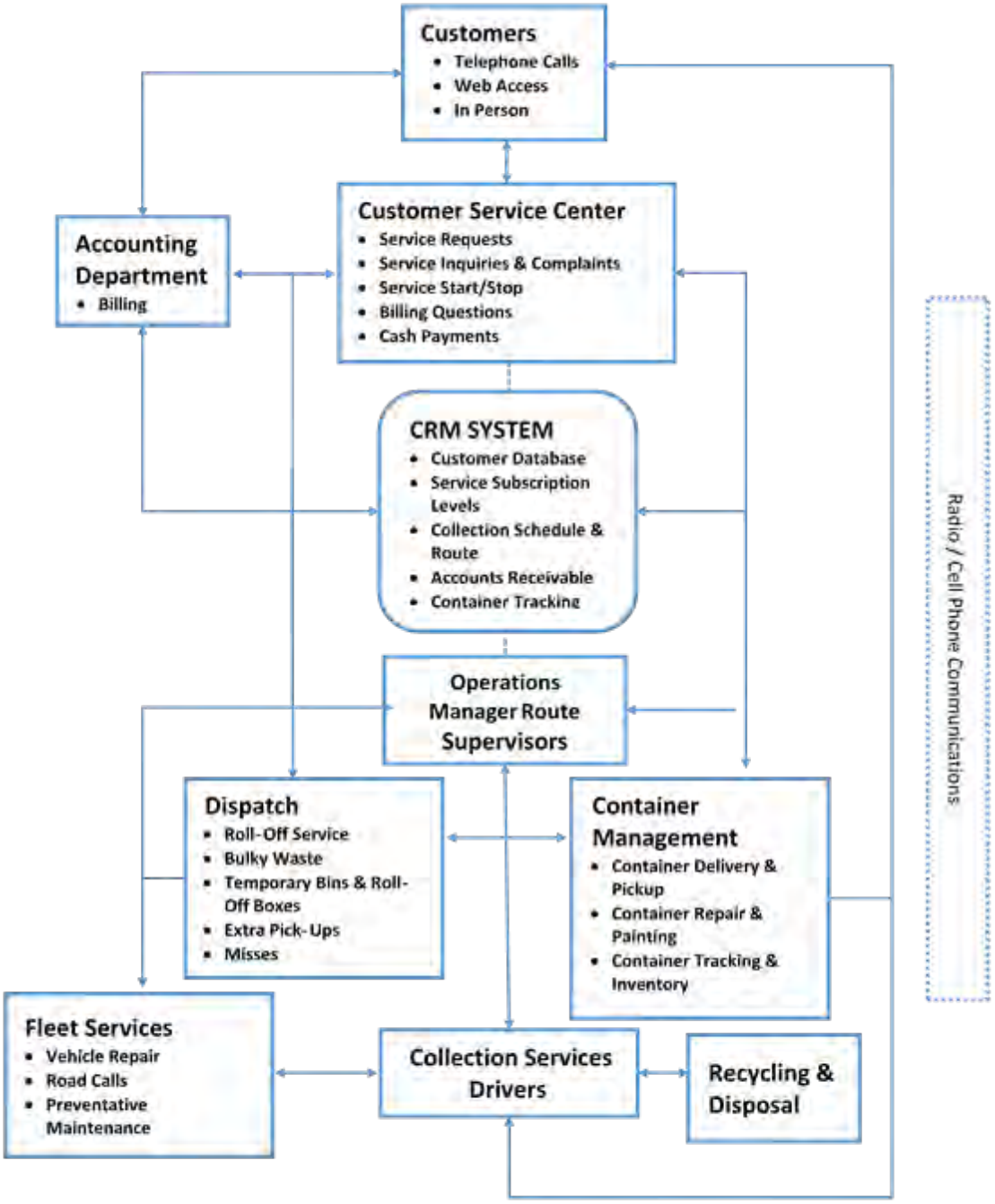
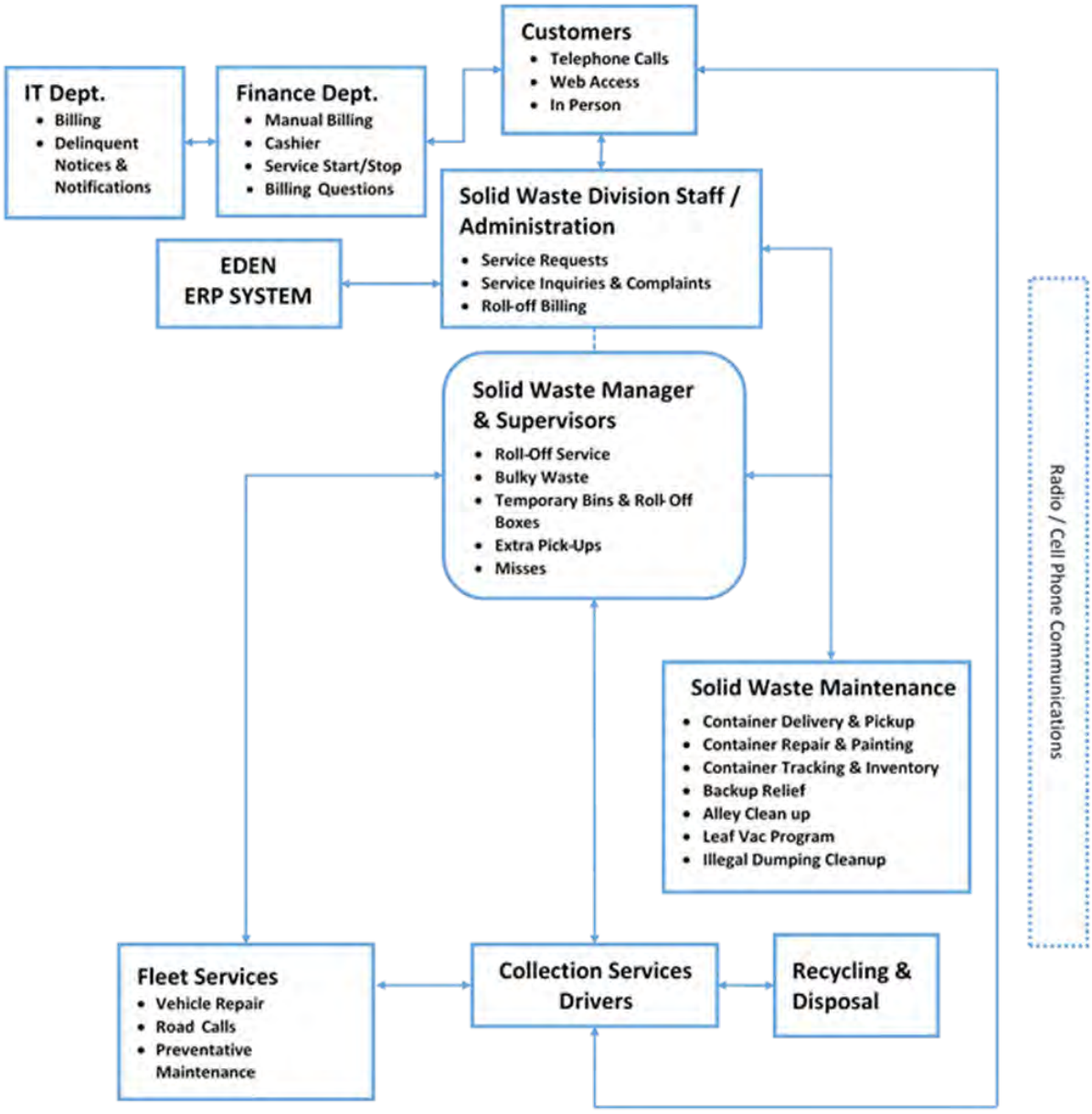


Figure 5-2
Division Solid Waste Operation Work Flow Diagram



For billing, the industry-specific software packages function as a front-end accounts receivable system, tracking items such as the subscribed level of services, rates and fees to be charged, one-time charges, late payment fees, current charges, past due amounts, payment history, payment terms, account balances, etc. These systems provide for creation of invoices and statements for either in-house, or out-sourced printing through a printing contractor. The general ledger can be updated by report generation or through a computerized interface.

The CRM system has become the "home base" upon which technological enhancements to the industry are connected. Most technological enhancements in the field have been developed to integrate and interact with specialized CRM systems.

It is important to note that City's Division does not use a unified CRM system for managing the workflow related to services rendered to their solid waste customers. In fact, the Division does not perform its customer service functions through a centralized customer service call center. To perform routine administrative functions and for work flow management, Division staff use emails to communicate and Excel worksheets for recording and tracking requirements.

A significant limitation for the Division is the lack of a CRM system that can serve as a central hub to manage workflow communications. The best technological enhancements available to the solid waste industry have been designed to integrate with a CRM system including the use of On-Board Computers (OBCs). OBCs are specialized, truck-mounted mobile devices that facilitate communication from and to field operations. Without an industry-specific CRM, the alternatives for technology enhancements to improve workflow efficiencies are significantly limited and the Division's goal to have "everything work together" will be more challenging.

The following sections will address the specific technology enhancements identified by the Division for potential benefits to the Division solid waste operation.

5.4.1 RFID Tag Identification

RFID tags are radio frequency identification devices embedded onto containers. In a solid waste operation, the application of RFID tags offers the potential to improve container management and tracking. Because containers represent a significant capital investment, it is important to manage and track this important asset in a reliable and effective manner.

5.4.1.1 Current Container Operations

The Division is staffed with personnel to operate the container management functions of the operations, including: container delivery and pick-up; and container repair, welding and painting.

Container inventory functions are performed by tracking containers in an Excel table by serial number for residential containers or by assigned number for commercial bins. The Excel table is updated with the current location of each container when: 1) new containers are purchased and received into inventory; 2) containers are delivered to a customer site; 3) containers are retrieved from a customer site and returned to City facilities for storage; and 4) containers are retired from service. The information is maintained and updated by field supervisors.

Although some residential carts are equipped with RFID tags, the tags are not used for tracking and inventory purposes at this time.

5.4.1.2 Potential Uses and Benefits of RFID Tags

With RFID tags, container tracking can be more accurate and reliable because each container can be associated with a specific location, either at a customer location or at the storage yard in inventory. The RFID tag can be read electronically with a scanning device. This offers various ways to automate and improve container management efficiency.

The main areas in which container management can benefit from RFID tags are

- Container Inventory & Tracking, and
- Service Verification.

5.4.1.3 Container Inventory & Tracking

Newly purchased containers can be received into inventory using a handheld scanner to quickly record the serial number into an electronic file. When delivering containers to a customer, staff can scan the RFID tag and assign the container to the customer location while at the same time, removing it from the City yard inventory list. Likewise, when removing containers from customer locations, the containers are scanned, identified and received into the City yard inventory. Containers that have been moved, misplaced, or stolen can be identified, retrieved and assigned to the proper location.

5.4.1.4 Service Verification

On the collection route, route trucks can be equipped with on-board computers (OBCs) that integrate various operational functions including software and scanners that can read and associate the container's serial number with the service location. This can be used to verify that the container has been serviced. The information can be transmitted to update the CRM system in real-time so that customer service personnel can avail themselves of the most current information.

5.4.1.5 Practical Considerations

If the reason for using RFID tags is container inventory and tracking, the first step is to ensure that all containers are equipped with an RFID tags. Residential carts can be purchased with embedded RFID tags at no significant additional cost. Hence, it is most efficient and cost-effective to convert to RFID tags concurrent with the acquisition of new containers. The Division has been purchasing RFID equipped residential carts since 2011, and approximately 25% of residential carts currently have RFID tags. None of the commercial bins have RFID tags. In addition, there are an unknown quantity of residential containers that would need to be identified and tagged to benefit from RFID tag technology. Any option that does not equip every container, or at least the majority of them, with an RFID tag would result in a less effective system.

Therefore, when considering RFID technology, an important consideration is the costs for installing RFID tags onto the containers. The process of installing RFID on existing carts is challenging and labor intensive because crews have to be deployed into the field to locate and install the RFID tags. To ensure maximum tagging, more than one cycle through a route will be required, since not all carts will be found in the first round. Even so, it is never certain that every cart can be located and tagged. The cost to tag existing carts with RFID's can range from $5.00 to $7.00 per cart, which includes $3.00 for the RFID unit.

The timing for replacing containers with RFID tags requires planning as well. The introduction of RFID tags may require the installation of equipment on the vehicles as well as the embedding of RFID tags on the containers. As previously stated, embedding RFID tags unto existing containers can be costly.

If the reason for using RFID tags is service verification, then an OBC will be required. In actual application, RFID tags have been found to be most reliable when used with residential carts. Even so, the consensus of vendors and users is that truck-mounted scanners can fail to read RFID tags up to as much as 80% of the time. There is virtually no application of RFID tags with commercial bins. For this reason, most on-board computer systems are equipped to detect the container lifting cycle as an alternative method for service verification. Other systems use both RFID and lifting motion.

5.4.2 Mobile Application Software

Mobile Application Software (Mobile App), is application software designed to run on mobile devices such as smartphones or tablet computers. With a Mobile App, users can connect to internet services, more commonly accessed on desktop or laptop computers. An important advantage of a Mobile App over more traditional access methods is the convenience of immediate access.

5.4.2.1 Current Communication Practices

To obtain information about solid waste services, customers may call the City. Also, information regarding solid waste collection is posted on the City's website and published through a newsletter that is distributed periodically.

5.4.2.2 Potential Uses and Benefits of Mobile Apps

The Division's purpose for the development of a Mobile App is to improve communications with the public regarding solid waste and recycling services, including such information as holiday schedules, scheduled collection days, etc.

Ideally, the Mobile App would be easy to use and enable customers to

- Look up pick up schedules and recycling information;
- Receive service alerts, route delay updates, weekly notifications; and
- Report problems.

Division staff looks to gather feedback from customer with the ability to receive photos and comments. If the Mobile App is to be developed, it should be branded with the City's name, artwork, logos, splash screen, etc. and must have the ability to be under the City's control and enhance the City's brand.

5.4.2.3 Mobile App Development Process

The development of Mobile App will undergo three basic phases;

1) Research Phase;
2) Design Phase; and
3) Build Phase.

Research Phase:

During the Research Phase the following tasks are completed.

- Identify Mobile App Requirements;
- Identify Tulare API Mobile App Requirements;
- Identify Tulare API Mobile App Requirements for Billing; and
- Design Mobile App Storyboard User Flow: Menu, Specific App Features, Content, Billing:
    - Accurate storyboards will need to be created for accurate build quotes.

Design Phase:

- UI Design (User Interface); and
- Graphic Design of Tulare-branded elements:
    - All Tulare Mobile App graphics will need to be designed before sending to coders for the build phase.

Build Phase:

- Code Tulare Mobile App;
- Connect backend API to Tulare;
- Connect backend API to Billing;
- Perform Tulare Mobile App User Testing;
- Export final build to all Mobile OS Platforms (Android, iPhone); and
- Submit to Google Play and iTunes Stores for approval.

5.4.2.4 Practical Considerations

Mobile Apps must be downloaded onto a mobile device. If the customers do not find added value or functional usability, the Mobile App will not be downloaded. **Therefore, it is important to first identify what problem the Mobile App will solve and how it will improve the current user experience. Often, Mobile Apps are refined, streamlined versions of the user's full web browsing experience or a slimmed down version of the City's website.**

5.4.3 GIS Mapping Software

5.4.3.1 Current Routing Methodology

The Division's current routing methodology is a manual, pencil-and-paper-based process where the Division Manager and Supervisors section out portions of the City on a large map by hand and assign specific routes to them. This is an ongoing, iterative process where adjustments are made as needed based on the apparent needs of the system. While Division staff's knowledge and expertise is sufficient to produce reasonably balanced and efficient routes, there is potential for route optimization using a computer-based route management system. Such a system could potentially provide the benefits of reduced fuel and labor costs, as well as reduced street and environmental impacts. Additionally, the Division's minimal route

data and lack of analytical routing tools limits their ability to quickly respond to changes in the system.

5.4.3.2 GIS Integrated Routing Solutions

GIS-integrated routing solutions are the state of the art in route management and optimization. These solutions consist of three components:

1. GIS mapping software;
2. GIS-integrated analytical routing software; and
3. GPS Vehicle Tracking for accurate and comprehensive route data.

GIS Mapping Software - The City currently has no GIS in place. The Public Works Director has advocated for the development of GIS capabilities for the City, and the City's IT Director as well as the City's Engineering Division are also in support of this. There seems to have been very little interest from other City Departments, however the Public Works Director has suggested that the Public Works Department could fund its implementation entirely themselves.

GIS is a crucial tool for most modern Municipal Public Works or Utilities Operations, and could serve a wide array of the City's current functions and needs. In addition to Public Works, other City departments that could likely benefit from a GIS system include, but are not limited to:

- Community Development Department (Development Services and Parks & Recreation);
- City Transit;
- City Fire Department; and
- City Police Department.

To utilize a GIS for the purpose of collection routing requires that a GIS database be developed and maintained with all data relevant to solid waste collection. This data may include (1) service area layout and characteristics, and (2) customer service subscription levels. Additionally, putting in place a GIS for one or more City departments would require that the City hire at least one GIS Specialist. This staff person(s) could be housed in the IT Department and serve multiple departments.

Though not the only GIS mapping software, ArcGIS by ESRI is the industry leading GIS mapping software, and most GIS-integrated routing software operate within the ESRI GIS product environment.

GIS-Integrated Routing Software – The immediate benefit of a GIS to the Division is the ability for them to analyze a GIS database of their service area to develop optimized routes. This can be accomplished using analytical routing software developed specifically for this purpose. This software is capable of accomplishing, to varying degrees:

1. High density residential routing;
2. Point-to-point commercial or special waste routing; and
3. Districting or area routing.

They can help to quickly produce routes which meet the Division's needs and constraints. Specifically, routes can be designed to:

- Balance route times, service days and districts;

- Account for vehicle capacities (by weight or volume);
- Manage the impact of resource constraints, seasonality or holiday schedules;
- Optimize travel paths;
- Meet customer time windows; and
- Allow for right side of street only pickups.

There are many companies or vendors in the market offering GIS-integrated solid waste collection routing solutions. Some that we are aware of include:

- CIVIX LLC (FleetRoute)
- EasyRoute
- Routesmart
- WM Logistics

GPS Fleet Tracking for Accurate Route Data – While a good GIS database is crucial for the routing software to function, there are also other detailed data and assumptions that the software will need to accurately model the Division's collection system, such as average durations for certain driver actions or customer container setout rates. In some cases, this data can be measured or estimated without GPS vehicle tracking. However, GPS vehicle tracking allows for complete, comprehensive, and accurate route data, while also serving other collection fleet management needs.

There are many companies or vendors in the market offering GPS-enabled solid waste collection fleet tracking tools. Some that we are aware of include:

- Air-Trak
- Alpine Technology
- ACMS 7.0 by ACMS – PC Scales;
- EnCore by Core Computing Solutions
- FleetMind
- GPS Insight
- PC Scale Technologies
- Routeware
- Soft-Pak

5.4.4 Integrated CRM System

As previously stated, the customer service center is the central point of communication. In a solid waste operation, customers may on occasion see the collection truck actually dumping their containers. More frequently, what customers see is their billing statements. What customers experience is their interaction with customer service staff. The internal activities performed to deliver service are practically invisible to the customer. Their relationship with the solid waste provider is their interaction with customer service, the receipt of their bill, and occasionally, interaction with drivers or field supervisors. Therefore, it is important to have a

well-designed and functional system that ensures that customer service information is current and accessible on-demand, in order to render quality customer service.

The majority of industry-specific software products originated over thirty years ago as billing systems integrated with basic customer service information. As a result, there are several robust CRM systems with an excellent track record. Most CRM system vendors have expanded their offering to include some of technology enhancements being considered by the Division. However, it is important to consider that for most of these vendors, their primary expertise is the CRM system, and their expertise and practical experience with on-board tablets/computers, RFID tags, and other such enhancements can be limited. In the recent years, solid waste operations soliciting a CRM system integrated with other technologies such as on-board tablets/computers, RFID tags, etc., would receive a proposal from an integrator who would join with several companies to offer their independent products as a "bundled solution". Because of the increased interest by solid waste operators for an integrated solution, most CRM software companies have developed arrangements or have acquired manufacturers of these technology enhancements to allow them to represent themselves as a one-stop-shop.

The OBC is essentially an extension of the CRM system. In effect, it is a remote computer mounted inside the collection vehicle and networked to communicate with the CRM system. The availability of OBC emerged with the advent and proliferation of portable computers. This technology application developed somewhat independently from the more established CRM system. Because it was costly and its effectiveness was limited by the reliability of communication technology, solid waste operations were slow to acquire OBC. Presently, due to customer expectations and because of the rapid enhancements in digital and wireless communication technology, there has been a rapid effort to integrate OBC with CRM systems such that they function interactively and seamlessly. In fact, up until very recently, most CRM vendors were teaming with OBC vendors to be able to offer a complete solution to the customer. Now some CRM vendors have partnered, acquired, or merged with OBC vendors so as to provide a complete solution. Other vendors have designed interfaces with generically available Android or Windows tablets or iOS iPads to serve as mobile devices.

The effectiveness of OBCs continues to depend on the reliability of the communication link with the server where the CRM system is housed. When communication is lost, the OBC cannot retrieve and display updated information for the driver to act upon. And information captured in the field cannot be transmitted to the CRM system for updating. When this occurs too frequently or for extended periods of time, drivers often choose to abandon using the OBC and begin to run their routes the old-fashioned way – by memory. Therefore, it is important to choose a system that has designed a workaround for this eventuality and that will continue to function reliably.

5.4.5 Technology Product Examples

5.4.5.1 RFID Tags

To implement RFID tag technology will require 1) all containers to be equipped with an embedded RFID tag, and 2) a system of hardware and software with which to scan the tags and record them into a database. The container tagging was addressed in Section 3.1.

The primary application for reading container tags is provided through OBC systems that integrate scanning, GPS, and customer database to identify the location of any container that is being serviced and to record that a specific customer has been provided service.

Because the Division does not currently have an industry-specific CRM, the available options for using RFID tags is limited. Considering that procuring a CRM system and associated OBCs will run into several hundred thousand dollars, procuring a CRM solely for container management and tracking would likely be economically impractical.

An alternative product is aGenda, a cloud-based software product with GPS tracking features. It was custom designed by Can Do Services (CD SRVS), specifically for their existing customer base and for the container management industry. aGenda functions as an iOS or Android phone or tablet application. The software is intuitive and easy for the operator to use. It is designed to track any task oriented process.

CDSRVS is a container management company that provides various container management services to solid waste operations. CDSRVS uses aGenda to track every driver route activity for all its customers including residential and commercial tickets, bulky item pickups, special events and route audits. In addition to aGenda, CDSRVS uses route optimization software to route every ticket.

On a daily basis, an Excel file can be uploaded to the (optional) route optimization feature with all transactions (tickets) for the day. The tickets are routed and sorted by driver so that each driver has a balanced work load. The completed routed files are then uploaded into aGenda.

All tickets are dispatched to the driver's device. The tickets are displayed on the driver's tasks list in real time through the Agenda web portal. The transaction details include the customer account number, address, service codes, service notes, driver notes, GPS coordinates, and any photos the driver took before or after the transaction was completed.

If the transaction was not completed for some reason, that information will be displayed on the task list and on the task report. Both CDSRVS management and City staff will have access to this information at any time through the aGenda web portal.

aGenda is offered on a subscription basis at a monthly of approximately $60 to $90 per driver. The devices are not included. More information about the aGenda product and services is provided in **Appendix 5A**.

Contact information for aGenda is provided below.

Name: CDSRVS, LLC
Jim Philipps, EVP Business Development
Cell Phone: 619.726.2140
Address: 840 W. Grove Ave., Orange, CA 92865
Information: philippsj@cdsrvs.com

5.4.5.2 Mobile App

The Mobile App will require the services of a Mobile App developer. Selecting a developer depends on the level of services sought which can range from a full-service firm that will guide the Division through all three development phases (research, design, and build); or, if the Division is capable of completing some of those phases, in-house, with the support and guidance of the City's IT staff.

A list of professional firms that provide mobile app development services are included below. The first three firms listed will range in cost from $20,000 to $80,000, depending on the specific services requested. The fourth firm is a boutique firm that will charge around $15,000 to $20,000.

An alternative to contracting a mobile app developer is to subscribe to the service of Recycle Coach by Municipal Media, Inc. According to Municipal Media, Recycle Coach is a technology solution that helps local governments manage resident inquiries more efficiently, and educates and encourages residents to be better recyclers. One of their products is a customizable mobile app that can be quickly set up. Pricing varies from free to up to about an $8,000 annual fee, depending on the features selected. Additional information about Recycle Coach is provided in Exhibit B. Contact information is provided below.

Name: SURGE
Main Phone: 866.764.3598
Website: www.surgeforward.com
Information: info@surgeforward.com
Address: 1215 K Street, Esquire Plaza, #1709, Sacramento, California 95814

Name: Plain Joe Studios
Main Phone: 951.735.4587
Website: www.plainjoestudios.com
Address: 7345 Piute Creek Dr. Corona, CA 92881

Name: BlendLA
Main Phone: 323.845.9655
Website: www.weareblend.la
Information: blend@weareblend.la
Address: 700 S Flower St. Suite 2990 Los Angeles, CA 90017

Name: JSparkStudio
Main Phone: 213.924.1804
Information: jaime@jsparkstudios.com

Name: Municipal Media Inc.
Jordan Richards Territory Sales Manager
Main Phone: 416.423.3203 ext. 117
Toll-Free Phone: 855.343.3363 ext. 117
Information: jrichards@recyclecoach.com

5.4.5.3 CRM Systems

There are several products that are designed specifically for the solid waste industry that offer the features and capabilities to meet the needs of the Division. For this study, the following five products were reviewed;

1. AMCS 7.0 by AMCS – PC Scale;
2. EnCore by Core Computing Solutions;
3. RAMS Pro 10 Alpine Technology;
4. Soft-Pak by Soft-Pak Software Solutions; and
5. FleetMind Solutions, Inc.

Except for FleetMind, the other vendors all offer a CRM/Billing system as their core product. FleetMind offers an on-board computer with comprehensive capabilities and the ability to interface with most CRM/Billing systems on the market. Until recently, most CRM/Billing

systems did not offer their own on-board computer solution. They partnered with vendors, such as FleetMind, who specialize specifically with the on-board computer technology. Except for EnCore, the CRM/Billing vendors prefer to use their own on-board technology. However, Tower and Soft-Pak specifically note their system's integration with FleetMind. EnCore provides the software and functionality to interface with Android-based devices such as a Samsung tablet, but they do not sell the devices. The main capabilities of these systems are summarized in Table 1 (CRM/Billing System Comparison) below.

Table 5-1
CRM/Billing System Comparison

Features	AMCS – PC Scale	EnCore	Rams Pro	Soft-Pak
Customer Service System	Yes	Yes	Yes	Yes
Billing	Yes	Yes	Yes	Yes
Customer Web Portal	Yes	Yes	Yes	Yes
On-Board Computer	Ruggedized portable tablet, or iPads; customer responsible for data plan.	Android tablets. Provides software and functionality; customer responsible for all hardware & data plan.	Ruggedized portable tablet through preferred vendor; customer responsible for data plan.	Android tablets. Provides software and functionality; customer responsible for all hardware & data plan.
Service Verification	RFID	Lifting Cycle Detection	Lifting Cycle Detection	RFID
Camera Integration	Yes	Uses tablet camera	Yes	Yes
Cloud Based "Hosted" Option	Yes	Yes	Yes	Yes
Client Server	Microsoft Windows; City to purchase and install server.	Microsoft Windows; City to purchase and install server.	Microsoft Windows; City to purchase and install server.	IBM iSeries; City to purchase and install; best for fleets >200 Vehicles.
FleetMind Integration	Yes	Yes	Able to create an interface but prefers to work with recommended vendor	Yes

Note: Product literature with complete description of feature and options are provided in **Appendix 5B** (AMCS – PC Scale), **Appendix 5C** for (EnCore), **Appendix 5D** for (RAMS Pro), **Appendix 5E** for (Soft-Pak) and **Appendix 5F** for (FleetMind).

Any one of these products would provide a complete solution to the Division's current CRM requirements. Where they differ most is in the technological enhancements, such as OBCs, RFID tags, etc. For this reason, the evaluation of one company specializing with on-board computers was also reviewed. This will afford the Division an opportunity to select one vendor for their CRM and a separate vendor for OBCs, should it be determined to be a better solution.

Should the Division opt to procure customer service system, it will incur both an initial capital expenditure for the acquisition of the hardware and software required by the system, and recurring operating costs related to the maintenance of the system and operation of the customer service and billing functions. The costs associated with the purchase, installation and operation of a system are summarized in Table 5-2

CRM System Costs Estimates. These costs estimates do not represent official quotes, but rather budgetary estimates. Based on this research, the Division can purchase a CRM system that is

designed specifically for a solid waste operation for a one-time cost of between $55,000 to $100,000 and recurring annual fees of between $8,000 and $23,000. These estimates are based on 15 users (e.g., CSRs, office and billing staff, supervisors). The price range is partially explainable on whether the system is hosted or installed on a client server. Most vendors added an additional charge for the hosting option, and one proposed a reduced price. If the Division prefers to install the program on its own server, the Division is responsible for purchase and installation of the server at a cost ranging between $5,000 and $7,000 per server.

One-time costs for on-board computers range from $35,500 to $365,000, and is based on equipping 30 vehicles with OBCs. The price range is primarily explainable on whether the vendor proposes the use of readily available tablets such as Samsung or i-Pads or a specialized ruggedized computer with monitor as the main unit.

Table 5-2
CRM System Costs Estimates

Item	COST - LOW		COST - HIGH	
	One Time Cost	Recurring Cost	One Time Cost	Recurring Cost
CRM / Billing System				
Software Site License	$ 22,500	$ -	$ 53,000	$ 3,500
Implementation and Support [1]	$ 30,000	$ 8,000	$ 37,000	$ 12,000
Subtotal	**$ 52,500**	**$ 8,000**	**$ 90,000**	**$ 15,500**
On-Board Tablets (OBCs)				
Tablets [2] [3]	$ 15,000	$ 5,000	$ 300,000	$ 60,000
Software & Data Service		$ 8,000		$ 8,000
Training	$ 4,000		$ 12,000	
Mounting & Case	$ 16,500		$ 53,000	
Subtotal	**$ 35,500**	**$ 13,000**	**$ 365,000**	**$ 68,000**
Client Servers [4]	$ 5,000	$ 500	$ 7,000	$ 700
Total	**$ 93,000**	**$ 21,500**	**$ 462,000**	**$ 84,200**

Note: Cost estimates are based on 15 users and 30 vehicles.

(1) Includes project management, software installation, office support, training, and data conversion

(2) The price variations are due to the choice of devise; Samsung tablets versus specialized, ruggedized computer with monitor.

(3) Recurring cost provides for funding tablet replacement: assumes 3 year life for tablets, 5 years for ruggedized computer

(4) This estimate is for one (1) server. Depending on the options and features selected, more than one server may be required. All vendors offer "hosted" or client server options. City is responsible for purchase of client service(s).

If the Division opts to use a vendor such as FleetMind for the on-board computer, it would cost approximately $450,000 for the OBCs alone. Although the price is comparatively higher than the other options presented, their system is credibly better designed for the solid waste environment than Samsung tablets or iPads. If the Division selects a vendor for the CRM software that offers Samsung tablets or iPads, the Division has the option to select a FleetMind OBC instead. Or the Division may choose a combination with the Samsung tablets and/or iPads assigned to roll-off trucks drivers, supervisors, and container delivery personnel.

5.5 Conclusions and Recommendations

The Division expressed an interest in understanding the potential benefits of introducing certain technology enhancements to the existing solid waste operation. After review of the Division current operational practices and use of existing systems and technologies, we have compiled the following conclusions and recommendations.

5.5.1 RFID Tags

The Division does not currently use an industry-specific CRM system to manage the Division operations. To take full advantage of RFID Tags, most systems have been developed around OBCs that have been integrated with a CRM system. The City is vested in EDEN, and ERP that serves the citywide IT requirements. To incorporate a CRM for the solid waste system, the City's IT department would need to provide leadership in the final selection of a CRM system and its integration into the City's IT infrastructure.

A more practical solution is for the Division to consider the services of CDSRVS through their aGenda software. It can be implemented as a stand-alone program with smartphones and/or tablets. Although the program can be used for any type of delivery and pickup, it has been customized to address the needs of the solid waste container management environment. Since it is based on a monthly subscription, it is easy to implement and does not require a large up-front investment. In addition to container management, the program can be used for scheduling bulky item pickups, temporary container, including roll-off boxes.

5.5.2 Mobile App Development

The development of a mobile app will cost the City between $15,000 to $80,000, depending on the sophistication of the developer selected and the scope of work to be completed. There is no consensus by City staff that a mobile app would significantly enhance the quality of information distributed or the service experience for its client base. As an alternative, it is recommended that the Division inquire as to the potential benefits of subscribing to the services of Recycle Coach (**Appendix 5G**). Its mobile app feature may provide the Division with some features sought for in a mobile app with little or no costs, depending on the subscription level.

5.5.3 GIS Mapping Software

Establish a Division residential and commercial account data base within an GISArc system that will enable the Division to effectively macro-route all or portions of its residential and commercial collection systems as necessary.

5.5.4 Integrated CRM System

Under take a "Needs Analysis" to determine if any how a CRM system would be integrated into the Division's operations and the specific role that system would play, with consideration for the work order and container management capabilities that the City's Eden utility billing software system.

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Section 6
Fleet Maintenance

6.1 Objective

To provide a general assessment of the Division's vehicle fleet, and supporting fleet maintenance services provided by the City's Fleet Maintenance Division (Fleet Services).

6.2 Summary Findings

The Division has an Aging Fleet (Average Age 8+ years) and a High Vehicle Spare Ratio

The Division's Fleet is aging. Franchised contract term lengths are often established for a 7 to 10-year term to coincide with the point at which the original vehicles will need to be replaced. Although a well maintaining and vehicle can last longer. Older vehicles are typically used as spare vehicles. A spare ratio (i.e., the percentage of spare vehicles to primary route vehicles) of 15% to 25% is reasonable. The Division's spare ratio is higher than 50% - 16 spare vehicles supporting 19 daily primary route vehicles (daily routes).

Many New Vehicles are Scheduled to be Purchased this Year and Next

Fleet Services is scheduled to replace 2 commercial FELs and 4 residential side loaders this year (fiscal year (FY) 16/17), and 2 commercial FELs and 4 residential side loaders in FY 17/18. Fleet Services is also scheduled to purchase two new vacuum street sweepers in FY 17/18. These equipment purchases will turn what is a relatively aged fleet (average age 8+ years), into a much newer fleet. This should improve Fleet Services Daily Vehicle Availability Percentage/Standard, reduce fleet maintenance costs in the short term, and enable Fleet Services to reduce its spare vehicle percentage.

Additional Mechanics May be Required to Meet Division's Fleet Maintenance Requirements

The Division has reported that it experiences days when Fleet Services cannot provide the required number of vehicles it needs to operate its scheduled routes, even with a high vehicle spare ratio. While the planned purchase of new vehicles, discussed above, should help increase vehicle availability, we question whether Fleet Services has a sufficient number of mechanics to meet the Division's daily vehicle requirements, while also maintaining a reasonable spare ratio. With the current number of spare vehicles, Fleet Services should be able to meet the Division's daily vehicle needs, while needing to achieve a vehicle availability percentage of no less than 75%, which is not a particularly high rate.

We suggest that the staffing of at least one (1) additional Division-dedicated FTE mechanic may be necessary if Fleet Services is to be able to:

1. Effectively maintain the Division's vehicles;

2. Maintain a 90%+ Division Vehicle Availability Percentage;[1] and
3. Maintain a reasonable spare ratio (i.e., no more than 25%).[2]

We suggest that the above three requirements are reasonable performance standards for a fully staffed and well-run fleet maintenance operation.

Vehicle Replacement Fund is Well Funded

Division's Vehicle Replacement Fund is well funded, and at the Division's current funding annual level ($853,000), may be more than adequate to fund the Division's scheduled vehicle replacements over the 10-year planning period.

6.3 Background

Maintenance of the Division's vehicles is handled by Fleet Services, which is part of General Services, and is located in the City's corporation yard. Fleet Services currently operates one eight (8) hour shift, five days per week (Monday - Friday), and has 6 full time mechanics when fully staffed. Preventative maintenance activities are normally scheduled on Wednesdays when the Division does not provide residential collection services.

The function of the Fleet Services is to provide maintenance service and replacement of all city owned equipment. Fleet Services performs preventative and repair maintenance on all equipment regardless of the department or division to which it is assigned, except for certain work which must be handled by specialty shops in the community. Each department or division pays for vehicle maintenance, repair and overhead costs for operating the shop facility. Cost accounting records are kept on each piece of equipment so that maintenance costs and conditions can be constantly evaluated. From these records and an annual inspection, determinations are made as to anticipated repairs for the coming year and at what point equipment should be replaced, which is a best practice. Replacement vehicles are funded by charging each department equipment replacement rates on every piece of equipment in a sufficient amount to amortize the equipment over its projected life, thereby providing for replacement.

As noted above, Fleet Services currently operates one shift. The Division believes a second or swing shift would increase vehicle availability, and help to further improve collection performance. Both single shift and swing shift maintenance schedules are used successful by solid waste operations. Many refuse fleet maintenance operations run a second or swing shift for the primary purpose of conducting preventative maintenance activities during non-collection hours. This provides the ability for the route driver to deliver his vehicle for preventative maintenance after his/her shift is completed, and for that vehicle to be available

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[1] The percentage of the vehicle fleet that is available for collection operations versus out of service for repair and maintenance or other reasons.

[2] Note: This percentage is for larger fleets, such as the Division's residential side loader fleet. The spare ration may be higher for lines of business with fewer routes. As an example, the Division operates 4 daily commercial routes. It would not necessarily be out of the question to maintain two (2) spare vehicles, similarly the Division operates two (2) street sweeping routes. In this case, it is certainly not unreasonable to maintain two (2) spare vehicles, particularly given the need to have both regenerative air and broom street sweepers available.

the following day. Where there is a single shift, drivers need to use a spare vehicle while their primary vehicle is undergoing preventative maintenance, or other repairs.

6.4 Findings

6.4.1 Vehicle Availability – Daily Vehicle Availability Standard

The Division has reported that there are days when it does not have sufficient vehicles available to staff all of its daily routes. Fleet Services is a vital component of an effective solid waste collection operation, and the provision of a sufficient number of safe and well-maintained vehicles to the Division on a daily basis should be one of its primary objectives, as the Division is its largest "client". Fleet Services needs to do what it needs to do to ensure the Division has all the number of trucks it needs every day, be that through changes to the number and/or scheduling of staffing, vehicle replacement, or other means.

We recommend that the Division and Fleet Services establish an appropriate vehicle availability standard (e.g., 90%+ daily vehicle availability) that provides the Division with a sufficient number of vehicles to staff its routes every day without fail. Fleet Services should have the flexibility to take what it considers to be the most appropriate actions to best satisfy that required vehicle availability (e.g., additional maintenance staffing, implementing a swing shift, etc.). As discussed under Maintenance Staffing Levels below, Fleet Services may need to hire additional mechanics to meet the Division's Daily Vehicle Availability Standard. That would be expected to result in an increase in the Division's Fleet Maintenance expense.

6.4.2 Fleet Age[3]

The Division has an aged fleet with an average age fleet age of more than eight (8) years. It is common to amortize refuse vehicles over 7 to 10 years, and while a well-maintained vehicle can last longer than 10-years, if an operation like the Division, runs it trucks for 10 years, at that point it will effectively need a completely new fleet (i.e., all new vehicles), which is the point the Division is reaching, and why so many vehicles are planned to be replaced. The Division is scheduled, however, to receive new primary route vehicles for a majority of its residential, commercial and street sweeping routes by the end of FY17/18. If those vehicles are replaced as planned, the Division will have about as new a fleet as may ever have, which should generate positive maintenance, and vehicle availability benefits.

6.4.3 Vehicle Spare Ratio

Table 6.1 below provides an analysis of the Division's spare ratio. For a well-maintained fleet, of reasonable age, spare ratios of 25% or less, are common. As shown, the Division's residential and commercial spare ratios are both significantly higher. Required spare ratios are impacted

[3] As a point of reference, one of the Industry's most successful private sector operator, which has a very good vehicle maintenance program, reported that they turn over their vehicles every 8 to 10 years

to by the fleet maintenance staffing levels and maintenance schedule. As noted above, a single shirt operation, like Fleet Services, will require a higher spare ratio that one that has a swing or second shift. Table 6-1 also provides a suggested target spare ratio for each line of business.

Table 6-1
Division Spare Vehicle Ratios

Line of Business	Number			Spare Ratio	Suggested Target	
	Daily Routes	Total Vehicles	Spare Vehicles		Spare Vehicles	Spare Ratio
Residential [1]	11	17	6	55%	3	27%
Commercial	4	8	4	100%	2	50%
Street Sweeping [2]	2	5	3	150%	2	100%
Roll-Off [3]	2	5	3	150%	2	100%
Totals	**19**	**35**	**16**	**84%**	**9**	**47%**

[1] Accounts for commercial organic sideloader route which operates 2 days per week

[2] Two types of street sweepers, each type needs backup

[3] Roll-off service volume

6.4.4 Vehicle Replacement Schedule and Funding

Appendix 6A provides projected annual transfers to the Fleet Replacement Fund and annual expenses for planned vehicle replacement, along with the associated year-end balance for the Fund. As shown, based on current annual funding levels and the current fleet replacement schedule, the fund is projected to have $2.8 million in reserves by fiscal year ending (FYE) 26/27.

The Division's current annual Vehicle Replacement Fund funding ($852,990) is more than sufficient to fund anticipated fleet replacement costs over the next ten years. In fact, the projected fund balance at the current annual funding level, is projected to be approximately $2.8 million by FYE 26/27, (Appendix 6A). At current funding levels, there are sufficient revenues to replace vehicles as currently scheduled, (which does not appear to be an unreasonable schedule), and potentially purchase additional vehicles, as appropriate, or provide for other capital purchases (e.g., on-board computers, CRM one-time expenses)?

We recommend that the Division and Fleet Services consider reviewing the current vehicle replacement schedule, spare ratio, and annual Fleet Replacement Fund funding levels, and make any appropriate changes to the timing of planned vehicle replacements and/or annual funding amounts.

6.4.5 Maintenance Staffing Levels

As noted above, Fleet Services reported that cost accounting records are kept on each piece of equipment so that maintenance costs and conditions can be constantly evaluated. From these records and an annual inspection, determinations are made as to anticipated repairs for the coming year and at what point equipment should be replaced. This is a sound approach to

assessing vehicle replacement, however, it raises a question as to why, with a very high spare ratio, are there days when Fleet Services cannot provide the Division with all the vehicle it needs to fully staff its daily routes.

As shown in Table 6.1 above, the Division has a total of 35 route vehicles. The industry standard is 7 route vehicles per mechanic. Therefore, based on this standard, the equivalent of 5 full time equivalent (FTE) mechanics are needed to maintain the Division's fleet. As noted above, Fleet Services reported that when fully staffed it has six (6) full-time mechanics. Given a projected need of 5 mechanics to handle the Division's vehicles alone, we question whether 6 FTE mechanics is a sufficient staffing level for Fleet Services to provide sufficient vehicle availability to the Division.

6.5 Recommended Fleet Performance Standards

In support of efforts to continuously improve performance, we suggest that Fleet Services consider establishing the following performance standards, if similar type standards are not currently in place, and regularly report performance relative to those standards:[4]

1. Completing every required preventative maintenance (PM) right and on time – within 20-hour window prior to scheduled PM (Standard = 98% compliance).
2. All identified repairs, excluding out-of-service repairs are completed within 15 working days.
3. All repairs meet or exceed published Original Equipment Manufacturer (OEM) specified guidelines.
4. Vehicle Condition Reports (VCRs) are completed correctly 100% of the time:[5]
    a. No missing signatures
    b. No unclear information
5. All Fleet Maintenance data is entered into the Maintenance database by the end of the next working day (The maintenance data Clerk is responsible for entering complete and accurate information on time).

We also recommend that the Division and Fleet Services establish an appropriate vehicle availability standard (e.g., 90%+ daily vehicle availability) that provides the Division with a sufficient number of vehicles to staff its routes consistently on a daily basis. Fleet Services should then take what it considers to be the most appropriate actions to best satisfy that required vehicle availability (e.g., additional maintenance staffing, implementing a swing shift, etc.).

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[4] These standards are used by one of the most successful private sector solid waste collection operations in the Country.

[5] The Division's Route Supervisors should be responsible for ensuring that drivers conduct effective pre- and post-trip inspections every day and accurately complete their VCRs

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Section 7
Safety Review

7.1 Objective

To assess the Division's safety record, both with respect to its internal historical performance and as compared to the industry.

7.2 Summary Findings

Solid waste collection is very dangerous job as measured by the number of fatalities per 100,000 full time employees. Waste Management, Inc. and Republic Services, the two largest private solid waste management companies in the country have dedicated considerable attention to safety, which has been reflected in significant improvements in their safety records over time. Our experience has been, however, that municipal solid waste operations tend to have relatively poor safety records, as compared to the industry. This is likely due to a combination of factors, including relatively limited safety resources, as compared to larger private haulers, and the success of the safety programs of the largest operators in the industry, which has resulted in improvements to the industry safety standard against which individual operator safety performance, including that of the Division, is measured.

The Division's safety record, as measured by OSHA frequency and severity rates, is not unlike that of other municipal operations that we have reviewed. However, as compared to the industry the Division's safety record, and that of those other municipal operations, does not compare favorably to the industry standard.

7.3 Background

"Safety First" is the foundation of effective solid waste management operations. It impacts customer service, employee morale, operational costs and other factors. Our experience has been that a company that has an effective focus on safety tends to pay attention to the other aspects of their operation.

Safety is the most important factor that contributes to an effective and efficient solid waste collection system. Many of the most successful public and private solid waste management operations have embraced the importance of safety as a critical component of customer service and productivity, and as a central component of controlling costs.

Solid waste and recyclable materials collectors have one of the most dangerous jobs in the country, consistently ranking in the top ten jobs with respect to the number of fatal injuries per 100,000 full-time employees. The most recent data from 2014, lists solid waste and recyclable materials collectors as the fifth most dangerous job in the country, experiencing

35.8 fatal injuries annually per 100,000 full-time workers.[1] The 2011 fatality rate of solid waste and recyclable material collectors was more than 10 times the national average, approximately three times that of coal miners, and almost twice that of police and sheriff's officers.

In addition to worker safety, the Division's collection vehicles are some of the largest and heaviest vehicles consistently operating on the City's residential and commercial streets. Those vehicles have the potential for significant negative impacts to public safety, and can be a major liability to the City if not operated safely.

The establishment of "Safety First" as a priority is central to effective solid waste operations. The maintenance of a safe work environment for employees, and the assurance of the safety of the City's residents and businesses with respect to solid waste management operations, should be a priority of any solid waste management operation. Safety is critical for an effective operation, both in terms of maintaining the health and well-being of employees and minimizing associated costs.

As with other aspects of operations, there must be clear standards for safety performance, as well as policies and procedures that support those standards, that are regularly communicated to staff at all levels and practiced through drills and lookback procedures. Safety performance benchmarks should be established and tracked to enable management to monitor, assess and improve performance through regular diagnostic review to support the identification and realization of opportunities to improve the safety of the Division's operations.

7.4 Case Studies | Industry Standards

Waste Management, Inc. is the largest waste service provider in the country, and Republic Services is the second largest. Both of those companies have corporate safety records that compare very favorably to the industry. They both have placed the safety of their operations, their employees, and the public at the top of their priorities, and that has been a major contributor to their success. Their staff training is high-quality, well designed, relevant and ongoing.

Appendix 7A provides an historical accounting of Waste Management's TRIR and DART Performance that reflects the results of their decision to commit to a "Safety First" workplace. We strongly recommend that the City and the Division make a similar "Safety First" commitment, and strive for similar type improvements in the Division's safety record going forward.

7.4.1 Waste Management, Inc.

Waste Management, Inc. (WMI) has been an industry leader in efforts to improve worker safety, and the safety of the public. WMI's "Mission to Zero" (M2Z) safety program is a comprehensive training program that provides classroom and on-the-jobsite instruction in safety fundamentals to supervisors, drivers and helpers. The program's aim is to reduce the number of on-the-job injuries to zero. The effectiveness of WMI's Mission to Zero program has been documented through WMI's historical reduction in its accident and injury rates (Appendix 7A).

[1] http://www.bankrate.com/finance/personal-finance/10-most-dangerous-jobs-us-1.aspx#ixzz 4XTY mrSfL

All drivers receive 80 hours of initial training, undergo regular evaluations and participate in regular and ongoing training. All drivers and helpers are provided with WMI's Operations and Safety Rules Book. They are to carry a copy with them at all times when on route. The book contains rules covering a range of topics including:

1 General safety work rules;

2 Emergency situations;

3 Incident procedures;

4 Rules specific to the operation of automated side loaders, front end loaders and roll-off vehicles; and

5 Safe practices, including defensive driving, backing, emergency braking and a wide range of other topics.

7.4.2 Republic Services

Republic Services has a comprehensive corporate safety program with its "Safe Actions for Excellence" (SAFE) booklet providing its Safety Policy and related standards and responsibilities. A key part of Republic's safety program is its Focus 6 training program that focuses on eliminating the six most common or significant types of industry-specific accidents:

1. Intersections;
2. Employees;
3. Backing;
4. Rollovers;
5. Pedestrians; and
6. Rear Collisions.

Republic's safety program includes an annual 100 Days of Summer Program to reinforce driver vigilance when schools are out for summer and interactions with children are likely to increase.

7.5 Findings

- **The Division Does Not Have a Good Five-Year Safety Record** – The Division has had a relatively poor safety record compared to the industry average (standard) over the past five years, as measured by:
    - The number of accidents the Division has per 100 employees (**OSHA Total Recordable Incident Rate or TRIR**); and
    - The number of days employees are not at work (lost days), have a job restriction, or are transferred / reassigned (**DART Rate** – **D**ays **A**way plus **R**estriction and **T**ransfer), which is also calculated at a rate per 100 employees.

  Table 7-1 provides a comparison of the Division's Incident Rate and DART Rate for the past five years as compared to the industry average (standard). As shown, the Division's:

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- OSHA Recordable Incident Rate, and DART Rate, were more than twice (2) as high as the industry average for 2012 through 2015, and in some cases more than four (4) times as high.[2]
- 2016 OSHA Recordable Incident Rate,[3] and DART Rate were the highest they have been in the past five years.

Table 7-1
Division Safety Rates Compared to the Industry

Year	Number of OSHA Reportable Injuries	Days Away from Work		Days of Job Transfer or Restriction		Total Recordable Incident Rate[(1)]		DART Rate [(2)]	
		Cases	Days	Case	Days	Division	Industry	Division	Industry
2012	6	2	20	3	57	19.9	7.0	16.6	4.8
2013	4	0	0	3	31	13.9	5.1	10.4	3.7
2014	8	2	128	4	1,112	26.3	4.8	19.7	4.8
2015	9	0	0	2	9	28.3	5.1	6.3	3.1
2016	12	5	159	7	326	38.4	TBD	38.4	TBD
Totals	**39**	**9**	**307**	**19**	**1,535**				
Annual Averages	**7.8**	**1.8**	**61.4**	**3.8**	**307**				

[(1)] The ***Total Recordable Incident Rate (TRIR)*** is the number of recordable incidents per 100 full-time employees

[(2)] The ***DART Rate*** is the number of recordable incidents per 100 full time employees that resulted in lost or restricted days or job transfer due to work related injuries or illnesses.

- **Solid Waste Collection is One of the Most Dangerous Jobs in the Country** – It has the fifth highest fatality rate; far higher than coal miners, firefighters or police officers.
- **The City's Solid Waste Division is the Most Dangerous Job in the City** – The Division's Safety Record is a direct reflection of the City's success providing the Division's workers with a safe workplace.
- **"Safety First" has become the Industry Standard** – The most successful solid waste management companies in the industry have fully embraced a "Safety First" work place.
- **The Division has Insufficient Safety Resources** – The resources the City and the Division have dedicated to managing and improving the safety of the Division are limited, and not consistent with industry standards. This is not a criticism of the Division. The City simply does not have sufficient safety staff, and supporting resources, dedicated to the safety of the Division.
- **You Cannot Manage What You Do Not Measure** – The City | Division does not currently ***measure and regularly report*** to management, and staff, the safety

[2] Data is not yet available for 2016.

[3] The number of employees per 100 full-time employees that have been involved in a recordable injury or illness.

performance of the Division in a meaningful way that supports the identification of the cause of worker injuries, and vehicle accidents, and the development of specific targeted training to address those causes.

- **Vehicle Accident Data Tracking is Insufficient** – Vehicle accident data provided to R3 as part of our review was very general and did not include any vehicle accident analysis that might provide insights to reduce the Division's vehicle accidents. As with worker injuries, vehicle accident data needs to be tracked and analyzed to provide a clear understanding of the number and types of vehicle accidents the Division is incurring. Relevant training and other appropriate steps need to then be put in place to address the root causes of those accidents. [4]

- **Current Division Safety Efforts**

  - The Division's route supervisors provide various training, including "Safety Monday"[5] and City-wide safety training – this should continue. The supervisors are dedicated but have limited safety training and resources, and little actionable information on the Division's safety record to focus training (i.e., they need a quarterly, enlightening breakdown of OSHA reportable injuries, and vehicle accident data [See: *You Cannot Manage What You Do Not Measure*, above]).

  - The City's Safety and Regulatory Compliance Analyst, who has been with the City for less than 2 years, has taken steps to improve the safety training of the Division. Those efforts must continue, but need to be expanded with additional City Safety Staffing dedicated to the Solid Waste Division. Solid waste collection is the most dangerous job in the City, and it does not have a particularly good recent safety record. Significantly improving the Division's safety record should be the number one priority of the City's Risk Management Department.

- **The Division Needs a Well-Designed Solid-Waste-Collection-Specific Training Program** – Safety issues related to the solid waste industry are very different from safety issues related to the streets department, water and waste water departments, parks and recreation, and other City departments. While there is common safety training that is required, and valuable to all City Departments, the dangers associated with solid waste collection are specific to solid waste collection operations. In addition to ongoing City-wide "general" safety training, the Division needs a well-designed, relevant solid waste collection specific safety program, and dedicated staff to manage and operate that program.

[4] According to industry and OSHA data, vehicle backing represents approximately 25% of all injuries and accidents in the solid waste collection industry.

[5] Safety Monday is a members-only, weekly, one-page safety newsletter distributed by the Solid Waste Association of North America (SWANA) in partnership with the National Waste & Recycling Association (NWRA).

7.6 Recommendations

- Evaluate the best means for providing additional safety staffing resources to the Division to support the City's Safety and Regulatory Compliance Analyst's efforts to improve the Division's safety record. This could involve additional route supervisor safety training and responsibilities and/or additional Risk Management safety staffing.
- Provide City's Safety and Regulatory Analyst with solid waste collection specific safety training – actively participate in SWANA safety training opportunities.[6]
- Starting with 2017 data, track OSHA reportable injuries specific to the solid waste Division on an annual basis and calculate and report annual OSHA Total Reportable Incident Rates (TRIR) and DART Rates for the Division.[7] You cannot manage what you do not measure!
- Starting with 2017 data, track all vehicle accidents in detail including date, time, weather, location, type of accident, cause of accident, party at fault, etc. Review prior existing vehicle accident data, categorize, and evaluate as to type and cause to determine the most common types of accidents (e.g., backing, intersections, etc.) and establish associated training.
- Begin tracking the following vehicle accident related benchmarks:
    - Vehicle Accident Recordable Rate (VARR) – The number of operational hours between vehicle accidents – the higher the VARR, the better.
    - Property Accident Recordable Rate (PARR) – The number of operational hours between property accidents – the higher the PARR, the better.
- Develop and implement a solid waste collection specific training program for the Division.

[6] SWANA's annual Safety Summit is a curated program track that focuses solely on all aspects of solid waste safety, including garbage truck safety, safe practices in landfills and transfer stations, and more. Speakers talk about their experiences with enforcing rules and regulations with everything, from OSHA to fires.

Appendix 1A

Suggested Municipal Code Revisions

R3

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Suggested Municipal Code Revisions

In a high-level review of the City of Tulare's municipal code, R3 suggests the following changes be made to *Chapter 7.16: Refuse Collection and Street Sweeping Services* for alignment with current legislation, and to better support diversion programs.

7.16.010 Definitions

Recommendation:

Having a definition for Organics is recommended when including text concerning AB 1826 and related collection services, and text to address AB 1594. Please see the Other Considerations section for additional suggestions regarding code definitions, and further discussion. This more inclusive term could replace "greenwaste" as used in the code.

> ***ORGANIC MATERIALS*** or ***ORGANICS***. Food scraps and trimmings from food preparation, including but not limited to: meat, fish and dairy waste, fruit and vegetable waste, and biodegradable food packaging items such as pizza boxes, paper towels, waxed cardboard, food contaminated paper products, plant debris, such as leaves, grass, weeds and wood materials from trees and shrubs.

Recommendation:

Having a definition for Recyclable Materials and/or Recycling is recommended when including text concerning AB 341 and related services. The term "garbage" in the suggested definitions below could be replaced with the term "refuse" to better match current code terminology. Please see the Other Considerations section for additional suggestions regarding code definitions, and further discussion.

> ***RECYCLABLE MATERIALS*** or ***RECYCLABLES***. Those materials separated from refuse by the generator which are capable of being recycled and which would otherwise be processed or disposed of as garbage.

Organics prohibited from use as alternative daily cover.

Recommendation:

Include the below text to demonstrate compliance with AB 1594. Suggest inserting new section language after *7.16.020 Unlawful acts,* or as part (C) of this same section.

> Pursuant to the provisions of Assembly Bill 1594 (AB 1594) a contractor or permittee, and any owners, occupants or persons in possession, charge or control of all dwellings, buildings, places and premises in the City who self-haul organics, may not direct their organic waste for use as alternative daily cover (ADC). If the Refuse Superintendent determines that a contractor or permittee, or any other applicable person has directed any organic waste for use as ADC, the Refuse Superintendent will notify the contractor, permittee, or person of the requirements of this provision. Repeated instances of directing organic materials for use as ADC may result in enforcement action.

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7.16.030 Refuse, recyclables, and organics collection and street sweeping services compulsory.

Recommendation:

By adding language that residential, commercial and MFD customers must also subscribe to recycling and organics collection services the municipal code addresses both AB 341 and AB 1826 in setting more stringent local requirements. This revision to the code also supports greater diversion by setting the expectation that all customers subscribe to diversion services. This following text change suggestion is a lighter touch to updating the code language, however additional or alternative language could be added to establish Mandatory Commercial & Multi-Family Recycling and Organic Recycling (see example, City of Los Altos Municipal Code). For example, the City could consider adding language regarding enforcement and exemptions.

> All dwellings, apartment houses and place of business in which refuse waste, recyclable materials, and organic materials accumulates within the city or upon streets or public highways which abut such property shall be required to utilize the collection, processing and disposal and street sweeping services of the city and to pay the charges set forth for the services by the Department of Public Utilities of the city.

7.16.040 Authorized collectors.

Recommendation:

To reflect potential addition of non-exclusive franchise for temporary debris boxes, it is recommended that the following text revisions to this section are made:

> It shall be unlawful within the city for any person other than duly authorized collectors and street sweeping operators, employed by the Department of Public Utilities, or private collectors and street sweeping operators licensed by the Department of Public Utilities or other regulating entity, to gather, collect, transport, burn or dispose of any refuse or to remove any refuse receptacle from any place where the same was placed by any occupant. Excepting that rubbish and rubble may be transported and lawfully disposed of by the customer who owns or controls the premises service upon which it has accumulated. The Refuse Superintendent may permit large construction or demolition debris hauls by equipment other than by roll-off container vehicles. In addition, collection of rubbish, rubble or other waste materials utilizing roll-off containers on a temporary basis must be performed by the authorized collector(s) licensed by the Department of Public Utilities or other regulating entity.

7.16.060 General provisions.

Recommendation:

Setting the expectation that customers source separate materials for diversion supports greater program participation and subscription. This is also supportive of AB 341 and AB 1826.

> (I) The customer shall be responsible for the contents of the refuse container conforming to acceptable federal, state and county Class 2 landfill or disposal

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site. Recyclable materials and organic materials shall be separated from other solid waste for collection and placed in appropriate containers.

7.16.090 Refuse, recyclable materials and organic materials collection.

Recommendation:

Referencing recyclable and organic materials here and elsewhere in the code is good practice regarding AB 341 and AB 1826, and it modernizes the code to include these material streams. Revised language for this section is suggested below.

> The city shall service refuse, recyclable materials, and organic materials collection containers once each week from all dwelling units in the city. The city shall collect daily (except Sundays) if required from all business and commercial establishments.

Other sections could also be similarly modified to include recycling and organics. For example, section 7.16.080 and sections 7.16.120 through 7.16.160.

Other Considerations

- The following suggestions regarding definitions are recommended to further streamline and modernize the code. Please note that substantially adding, deleting and otherwise changing definitions also requires a more in-depth and corresponding update to the code language.
    - The terms "loaded weight", "nonstandard containers", "refuse accumulation", and "standard containers" are not currently used in Chapter 7.16. Consider revising these definitions for better usage and flexibility, or remove.
    - "Refuse" and "Rubbish" are outdated terms; current industry terminology favors Garbage, Recyclable Materials/Recyclables, and Organic Materials/Compostable Materials (or Green Waste and Food Waste for specificity).
    - Alternatively, the definitions for "Refuse" and "Rubbish" could be updated. The code's current definitions of "Rubbish" "Refuse" and "Refuse Accumulation" include food waste and recyclable materials. This framing is contradictory to efforts to shift public perception around recycling and food waste diversion, and gain greater participation in diversion programs.
    - Other municipal codes use Solid Waste as an umbrella term for all three streams and effectively use it to proscribe subscription and participation in recycling and organics programs in addition to garbage service.
- The City should consider a more robust code update to improve alignment with AB 341 and AB 1826, with additional or alternative language to establish Mandatory Commercial & Multi-Family Recycling and Organic Recycling (see example, City of Los Altos Municipal Code).
- Self-haul of recyclable materials and organic materials is an acceptable form of compliance with AB 341 and AB 1826, and other communities address and allow for it in their codes—with the requirement that the generator is responsible for documenting compliance with the legislation, which can include filling out a form to

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that affect noting the types and amounts of these materials diverted and which facilities were used, in addition to the option for the City to restrict self-haul stated in the code.

- It is best practice when updating a municipal code to align solid waste services described with the current service offerings.
- Language addressing ownership of recyclable materials and scavenging could also be included in the code.
- Requirements for special event recycling and organics collection could be added in support of greater diversion.
- Currently, the City's municipal code contains multiple sections regarding solid waste. The City may want to consider streamlining the code by bringing all solid waste code sections together in a comprehensive solid waste chapter. This would ease administration and could simplify future solid waste code updates.

Recycling and Diversion of Construction and Demolition Debris

R3 reviewed *Chapter 7.18: Recycling and Diversion of Construction and Demolition Debris*, and found the City's C&D code to be comprehensive. Systems described follow best practices for achieving higher levels of C&D recycling. The following recommendations are suggestions only, as the current code demonstrates that the City is making a good faith effort to implement CALGreen, and goes beyond state requirements for C&D recycling. [1]

7.18.020 Definitions.

Recommendation:

To maintain alignment with CALGreen code, the following change to the definition of "Covered Project" could be considered:

> ***COVERED PROJECT.*** Projects subject to California Green Building Standards Code construction and demolition waste diversion requirements, or any project which consists of one or more of the following:

7.18.040 Diversion requirements.

Recommendation:

To better establish alignment and compliance with CALGreen, the following change could be made in *7.18.040 Diversion Requirements:*

(A) One hundred percent of inert solids and at least 50% by weight of the remaining

[1] When the City is ready to update its C&D code, there is a small typographical error that could also be corrected at that time (i.e. 7.18.070 Evidence of compliance with C&D Recycling and Reuse Plan).

construction and demolition debris resulting from the project shall be diverted to an approved facility or by salvage. The project's overall diversion rate must meet California Green Building Standards Code minimum requirements for construction and demolition waste diversion.

Sharps Waste Management

R3 also reviewed *Chapter 7.19: Sharps Waste Management*. The sharps code was recently adopted and no changes are recommended.

Appendix 1A

Suggested Municipal Code Revisions

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Appendix 1B

Wage Comparison

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Appendix 1B

City	County	Minimum	Maximum
Sanger	Fresno	$ 31,908	$ 38,784
Reedley	Fresno	$ 32,491	$ 39,493
Visalia	Tulare	$ 33,072	$ 41,577
Delano	Kern	$ 35,448	$ 43,116
Hanford	Kings	$ 36,132	$ 44,124
Tulare	**Tulare**	**$ 36,457**	**$ 44,314**
Wasco	Kern	$ 38,688	$ 49,392
Manteca	San Joaquin	$ 41,424	$ 61,176
Clovis	Fresno	$ 42,900	$ 52,152
Merced	Merced	$ 44,208	$ 53,736
Bakersfield	Kern	$ 44,643	$ 54,236
	Average without Tulare	$ 38,091	$ 47,779
	Tulare	$ 36,457	$ 44,314
	Tulare vs. Average	$ (1,635)	$ (3,465)
		-4.3%	**-7.3%**

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Appendix 3A

Current Routing Structure

R3

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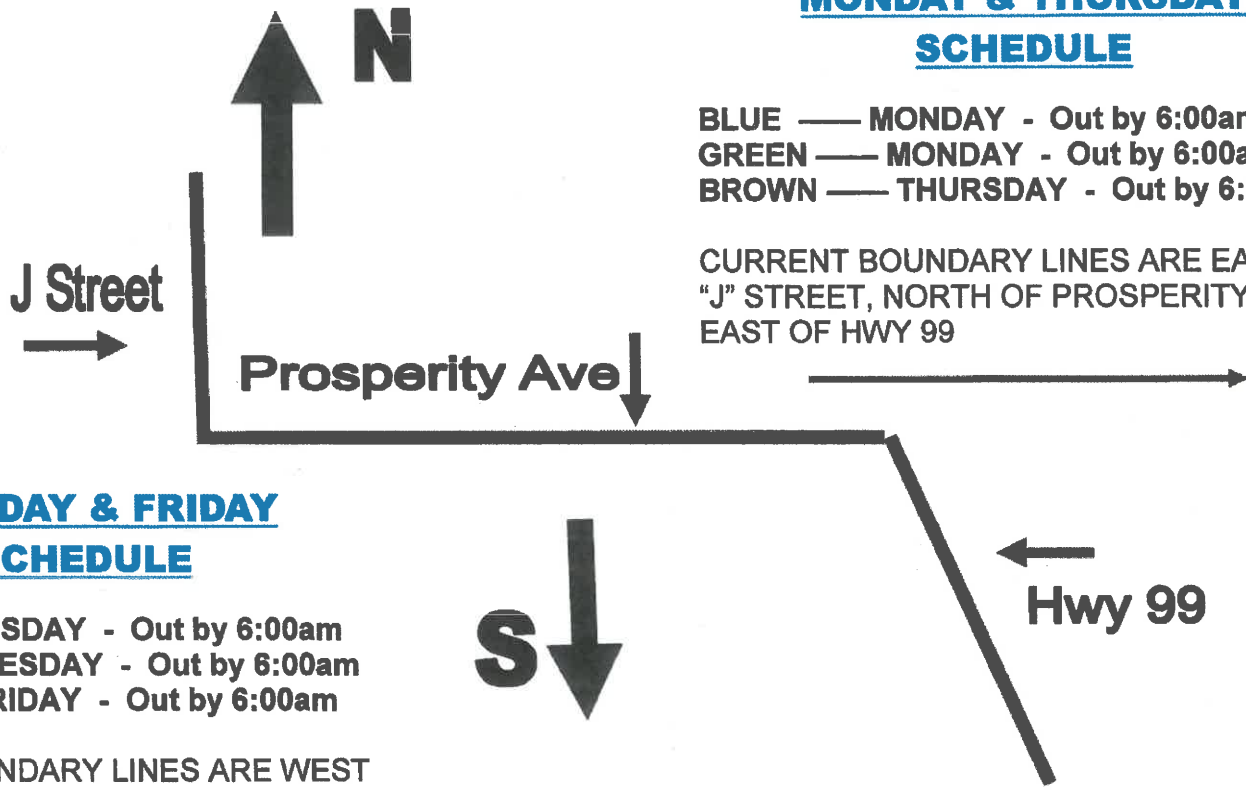
MONDAY & THURSDAY SCHEDULE

BLUE —— MONDAY - Out by 6:00am
GREEN —— MONDAY - Out by 6:00am
BROWN —— THURSDAY - Out by 6:00am

CURRENT BOUNDARY LINES ARE EAST OF "J" STREET, NORTH OF PROSPERITY AVE., EAST OF HWY 99



TUESDAY & FRIDAY SCHEDULE

BLUE —— TUESDAY - Out by 6:00am
GREEN —— TUESDAY - Out by 6:00am
BROWN —— FRIDAY - Out by 6:00am

CURRENT BOUNDARY LINES ARE WEST OF "J" STREET, SOUTH OF PROSPERITY AVE., WEST OF HWY 99

PLEASE CALL SOLID WASTE AT (559)684-4325 FOR MORE INFORMATION

Appendix 3A

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Appendix 5A

aGenda

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EXHIBIT A – CDSRVS aGenda

Technology Summary

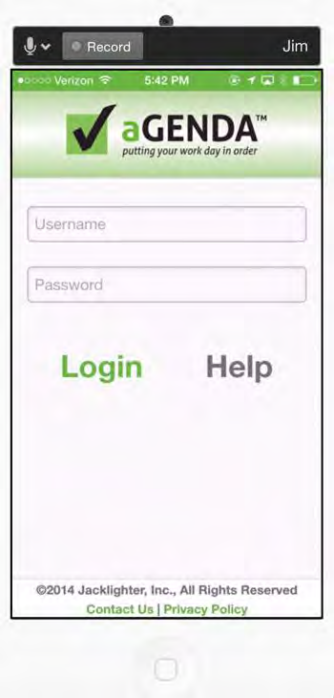
CDSRVS will track all transactions using its proprietary aGenda task management software. aGenda was custom designed by CDSRVS specifically for the container management industry and our existing contracts. The foundation for the aGenda software is a multimillion dollar GPS software product that is cloud based and has robust GPS tracking features. CDSRVS leveraged the technology that was already present in aGenda and enhanced the existing features based on twenty years of experience in the container management services industry. aGenda functions as an iOS or Android phone or tablet application. The software is intuitive and easy for the operator to use. It is designed to track any task oriented process. CDSRVS currently uses aGenda to track every driver route activity for all its customers including residential and commercial tickets, bulky item pickups, special events and route audits.

In addition to aGenda, CDSRVS uses route optimization software to route every ticket. Each day our manager will receive an Excel file of work orders from route management system with all the tickets for the day. These tickets are uploaded into our route optimization software so they can be routed in the most efficient way possible. The route optimization software also sorts the tickets by driver so that each driver has a balanced work load. The completed routed files are then uploaded into aGenda.

All transactions will be assigned to the appropriate driver and dispatched to the driver's device. As the driver completes each transaction the completed transaction will be displayed on the driver's task list. The transaction details will be available to view in real time through our aGenda web portal. The transaction details include the customer account number, address, service codes, service notes, driver notes, GPS coordinates, and any photos the driver took before or after the transaction was completed.

If the transaction was not completed for some reason, that information will be displayed on the task list and on the task report. Both CDSRVS management and City staff will have access to this information at any time through our aGenda web portal. We have provided a series of screen shots to highlight the functionality of our aGenda software.

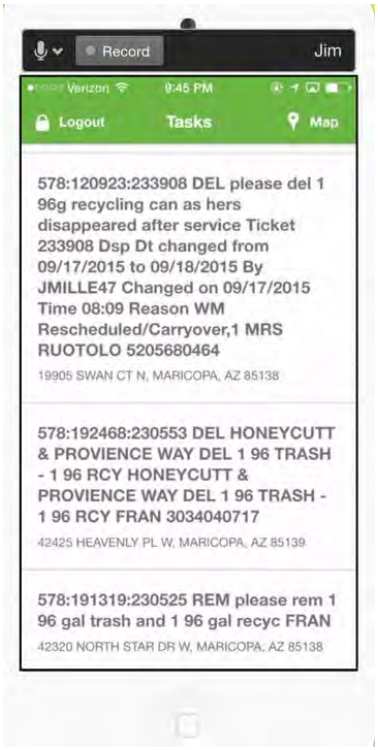
EXHIBIT A – CDSRVS aGenda



aGenda Driver Login Screen

Our aGenda software is a cloud based application that runs on a driver's phone or tablet. The login credentials are secure. City data is not stored on the device but is stored in a Sequel Server database on the cloud. If the driver's device breaks he can logon to another device and have access to the same data.

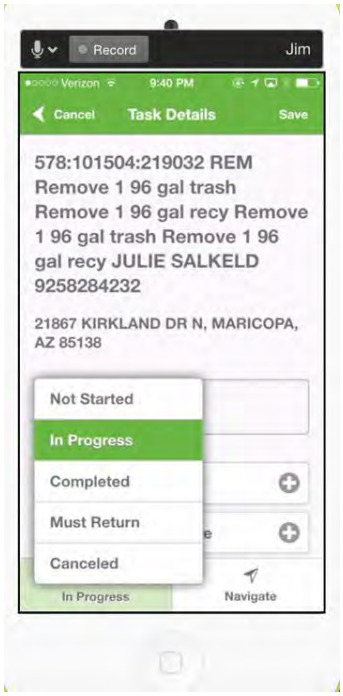
aGenda Driver Task Management Screen



The City ticket data that has been downloaded to the aGenda web portal is sent to the drivers' device. The tickets are presented to the driver in an optimized sequence. The driver selects the stop on his screen that he is ready to perform.

Can DO!

EXHIBIT A – CDSRVS aGenda



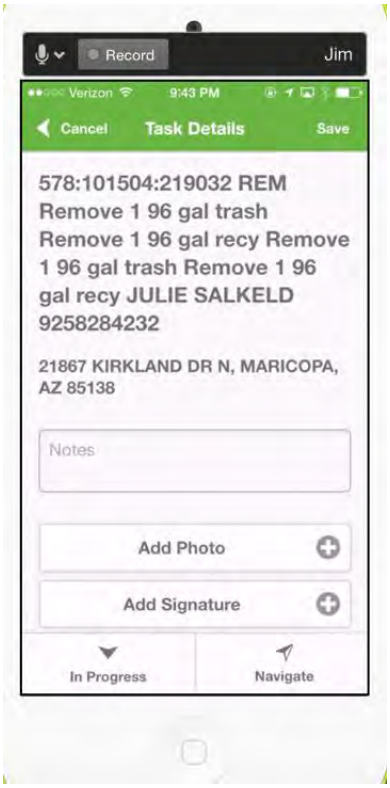
aGenda Task Detail Progress Screen

When the driver selects the task, he/she tracks the total stop time by selecting the progress button. When the driver completes the task, he selects the completed button and the total stop time will be saved to the task record. If the driver cannot complete the stop for some reason he presses the must return button. Dispatch can view the uncompleted stop and any notes regarding why the stop was not serviced.

aGenda Task

When the driver can Task Detail capture a the

the stop and available in real time.



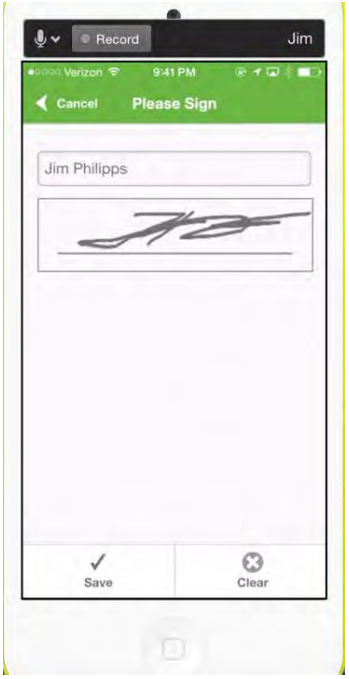
Detail Note Screen

driver is at the stop, the record route notes on the Screen or choose to picture or a signature. All information is saved to

EXHIBIT A – CDSRVS aGenda

aGenda Signature Capture Screen

The driver can capture the customers signature and record the customer's name. This feature works well for customers that request a signature or for special events and unique customer requests.



aGenda Task Photo Screen

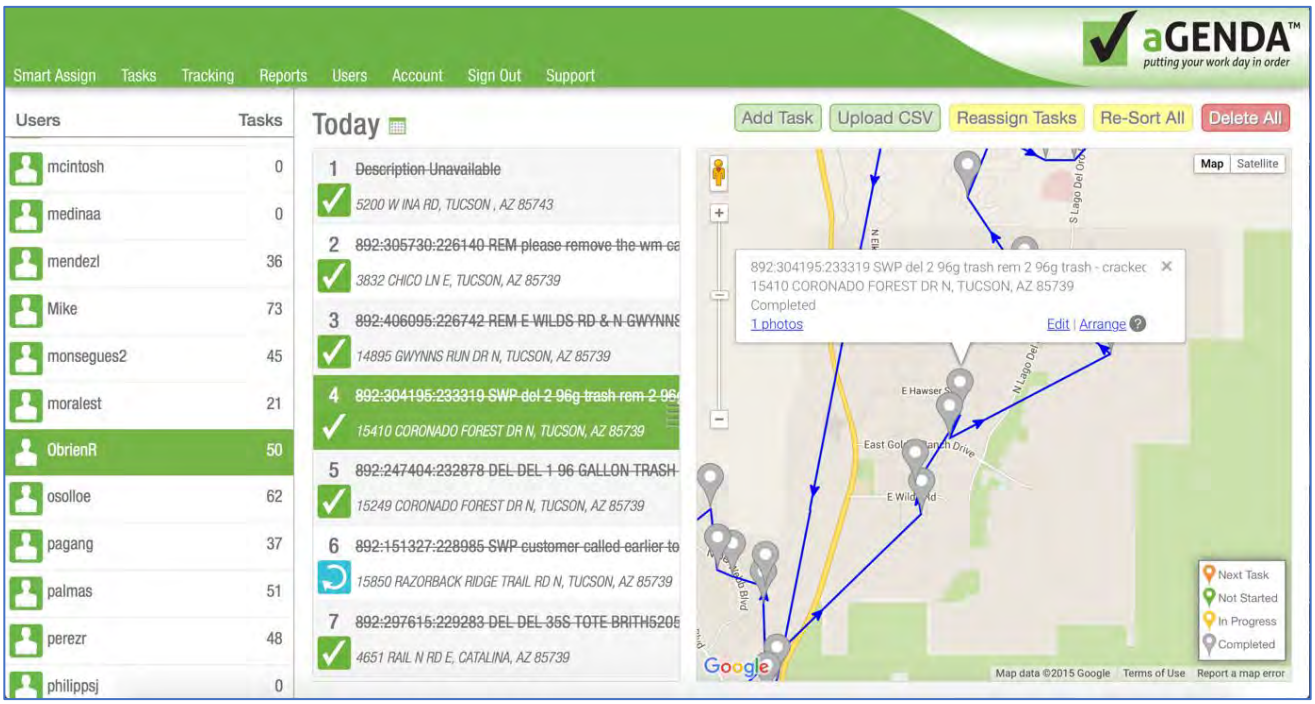
The driver can take multiple pictures of each stop including before and after pictures or stop progress pictures. All photos are available in real time. CDSRVS captures pictures for every ticket. These pictures have proved invaluable for providing customer service with real time photographic service verification.

aGenda Task Management Screen Shot 4

Can DO!

EXHIBIT A – CDSRVS aGenda

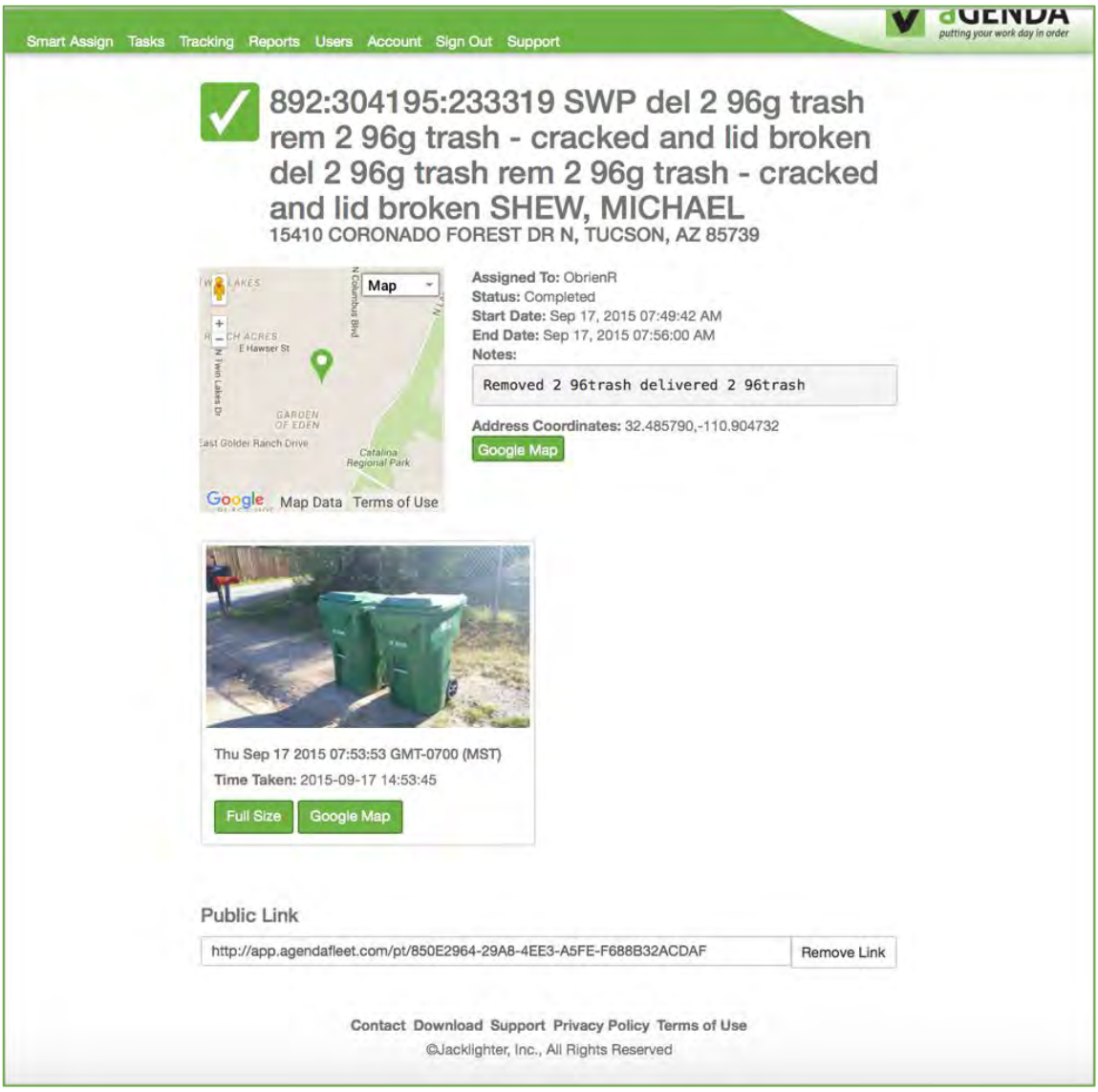
This screen shot illustrates a real time snap shot of all drivers, their work orders and the status of each work order. This is web based and can be accessed by CDSRVS and City staff. You can select a driver and view all their work orders at one glance. You can see what has been completed, pending, and the work order that he is currently on. If you select a specific work order you will see the service verification screen which is highlighted below.



aGenda Service Verification Screen Shot

EXHIBIT A – CDSRVS aGenda

This screen shot illustrates the powerful data and images we collect for each work order we perform. We capture GPS coordinates, time and length of service, service notes, signature, and multiple pictures. There is also a public web link at the bottom that can be sent to customers to provide access to this screen to help resolve service disputes.



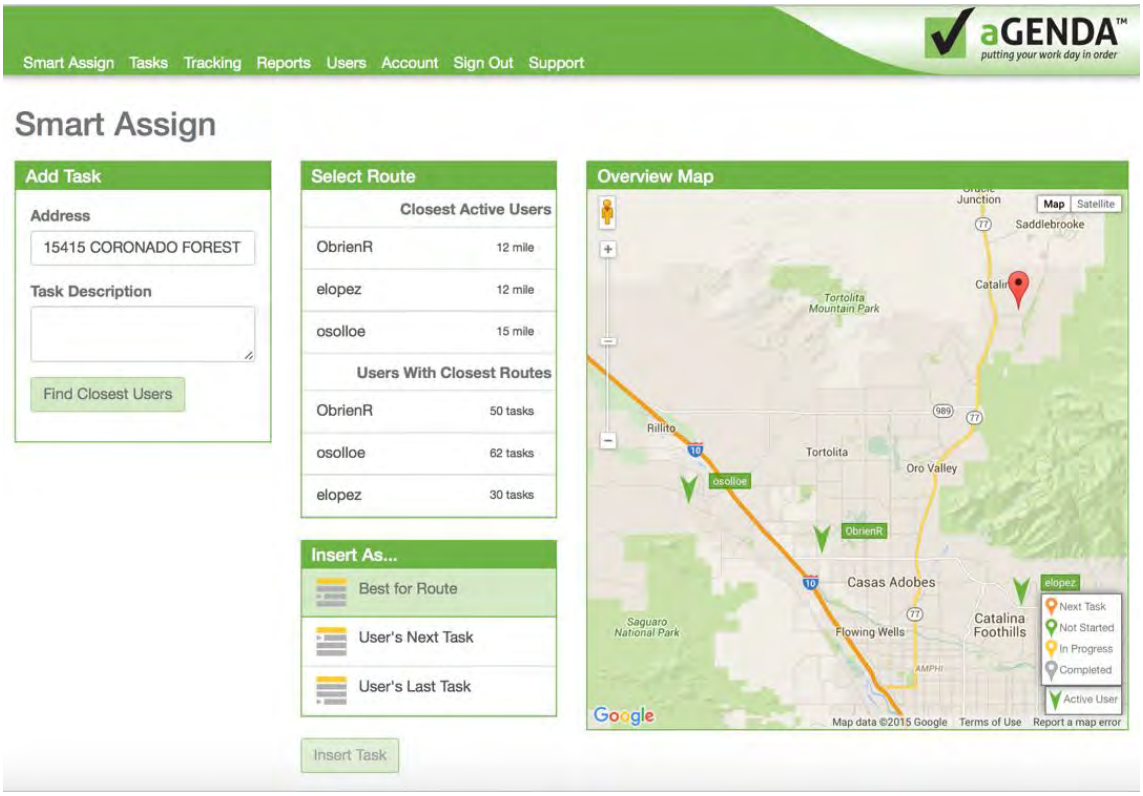
Can DO!

EXHIBIT A – CDSRVS aGenda

http://app.agendafleet.com/pt/850E2964-29A8-4EE3-A5FE-F688B32ACDAF

aGenda Smart Assign

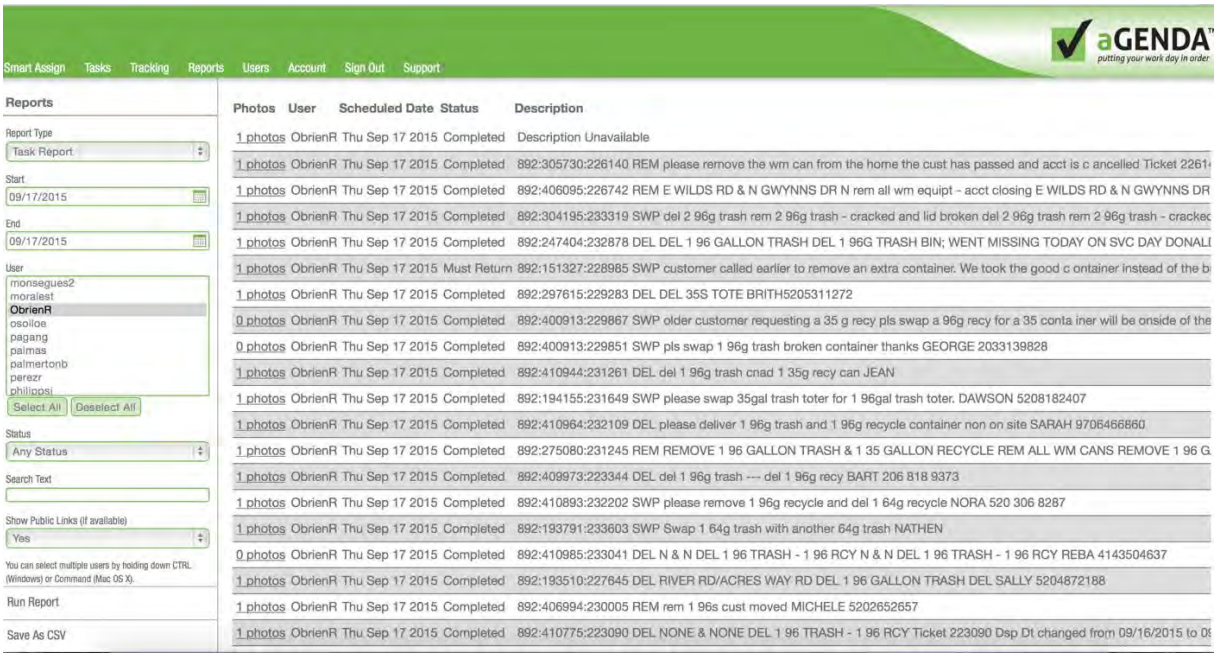
Smart assign is a new feature that was implemented by CDSRVS in September 2015. This feature was designed to assist in the assigning of "hot tickets" to drivers quickly and efficiently. The ticket address is entered into the "Add Task" menu. This feature locates the three closest active users and the three closest users with active routes. The software allows the user to select the driver that could service the account efficiently and effectively. The software also allows the user to place the ticket as the drivers next task or what is best for the route. This feature saves routing time and helps CDSRVS respond to City needs quickly and accurately.



aGenda Task Management Report

EXHIBIT A – CDSRVS aGenda

This screen shot shows a view of our task management report. This report can be configured to show one driver or multiple drivers activities for a specific date or date range. This report is available in real time or as historical data, and contains all the service verification data including public links.

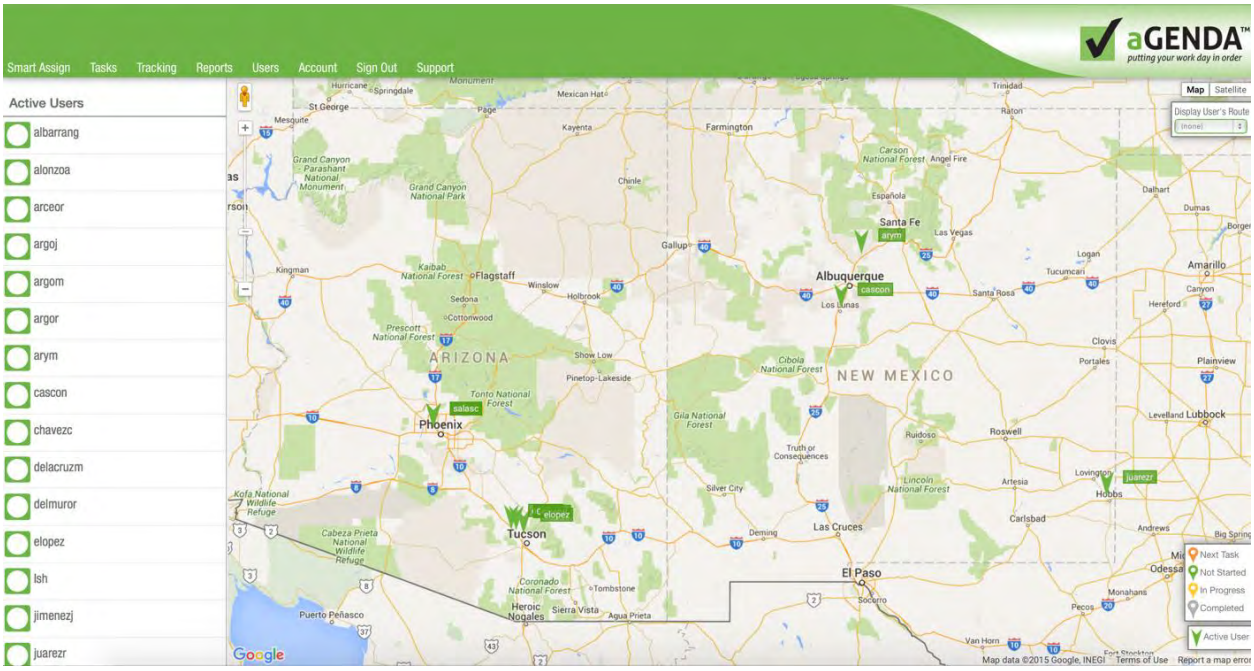


Can DO!

EXHIBIT A – CDSRVS aGenda

aGenda Driver GPS Location Map

The aGenda software program was written on a robust GPS engine platform. The software contains many of the standard features that a typical GPS system has. One of the most frequently used features, is the driver locate report. This report highlights where all of our drivers are located in real time.



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Appendix 5B

ACMS – PC Scales

R3

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PC Scale TECHNOLOGIES
A Division of AMCSGROUP

PC Scale Technologies™ Software for:

Hauling Management

scan to visit website

innovative software. simplified.SM

PC Scale, Inc.—A Division of AMCSGroup | PC Scale Technologies™ Software

119 South Fifth Street, PO Box 98, Oxford, PA 19363 | 800.962.9264 | sales@pcscale.com | www.pcscale.com

ABOUT TOWER 7.0™

PC Scale Technologies™ (PCST) offers the industry Tower 7.0™—a powerfully integrated route management and optional scale management software that will become an integral part of your business, allowing your operation to be more effective, productive and profitable.

Tower 7.0™ makes everyone's job easier—from dispatchers and customer service to sales reps and company administrators.

With Tower 7.0™, all of your waste management business functions are easy to perform and are always supported. PC Scale, Inc. enjoys an exceptional reputation because we offer an integrated, customizable business management software system designed to enhance productivity and increase profitability through integration and efficient use of today's latest technology.

We are the premier provider of Customer Service and Route Management software for the Waste, Recycling, Portable Toilets and Medical Waste industries.

OUR GOAL

PCST concentrates on providing waste and recycling companies with integrated, end-to-end, Microsoft-based business solutions. Our goal is to help you increase profitability by providing streamlined operational business processes, efficient billing and customer service, flexible reporting and route profit analysis. Our services include software installation and integration, customization, consulting, customer support and education.

INTUITIVE SOFTWARE FOR YOUR BUSINESS

Tower 7.0™ standard features allow users to manage customer accounts and services, map routes, manage inventory, generate invoices, create comprehensive reports, track scale data, track proposals and contracts and much more.

A user-friendly, comprehensive system setup module allows your System Administrator to specify and manage settings for most aspects of the program's behavior including default values, individual module settings and company security options.

PCST also provides custom programming and consulting to create the most efficient solution for customers requiring additional program functionality to meet the needs of their special business requirements.

EXPERIENCE THAT MATTERS

In addition to our technical qualifications, our key management staff has a combined total of over 80 years experience as waste industry professionals – we know this business. We understand that in order for technology to be effective, it must be simple, stable, and user friendly. Above all, technology must improve the quality of the lives of those affected by it. At PCST, we make it our business to understand your business. Whether you are an industry "Big Six", a municipality or a medium-sized company, we have the solutions that will help you meet and exceed your business goals.

PCST software is designed by waste industry professionals, built with the latest leading technology and backed by our ongoing commitment to each customer's success.

INSTALLATION, TRAINING AND SUPPORT

Executive sponsorship, implementation, effectiveness reviews, satisfaction surveys and rigorous management of customer satisfaction are key elements of our customer care process.

We take great pride in helping our customers succeed. Understanding our clients' business processes, unique needs and technical infrastructure allows us to be successful in implementing a software solution that will empower you to achieve your goals.

IMPLEMENTATION SERVICES

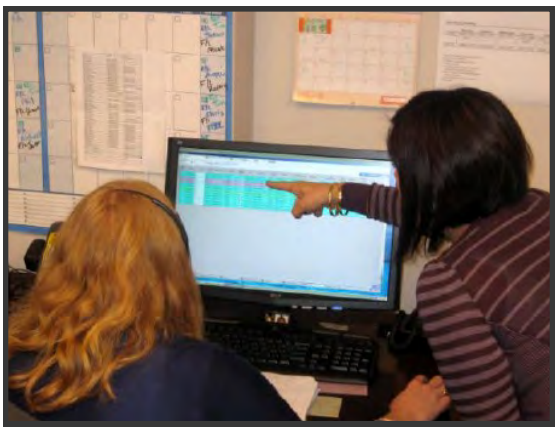
Our implementation personnel will professionally install and configure Tower 7.0™ to support your business and operational requirements. Our main goal is to meet your business objectives and accelerate return on investment with pre-packaged and custom solutions that are designed to make optimal use of "out of the box" software functionality.

Data Conversion Services — Our implementation personnel will convert and optimize your existing data from the current system to maximize the benefits of our software.

Customization Services — Skilled, experienced PCST programmers are full-time employees. We do not outsource any of our standard or custom programming services. This helps to ensure continuous product quality and seamless upgrades.

User Training — PCST is committed to providing you with the resources you need to ensure that your experience is successful. Each customer is provided with a custom training plan.

Training is provided online, onsite or a combination of both. In addition, free online training courses and standard customer support are available to all customers with premium or unlimited support plans.



SUPPORT SERVICES

PCST offers software support by telephone, remote access and onsite visits. We also offer other support services as necessary.

Telephone Support — 24/7, every day of the year. PC Scale, Inc. offers the best customer support in the industry. We offer dedicated telephone support services Monday-Friday from 7:00 AM to 8:00 PM (Eastern Time). We are also available on call 24 hours a day, 7 days a week, 365 days a year through our answering service.

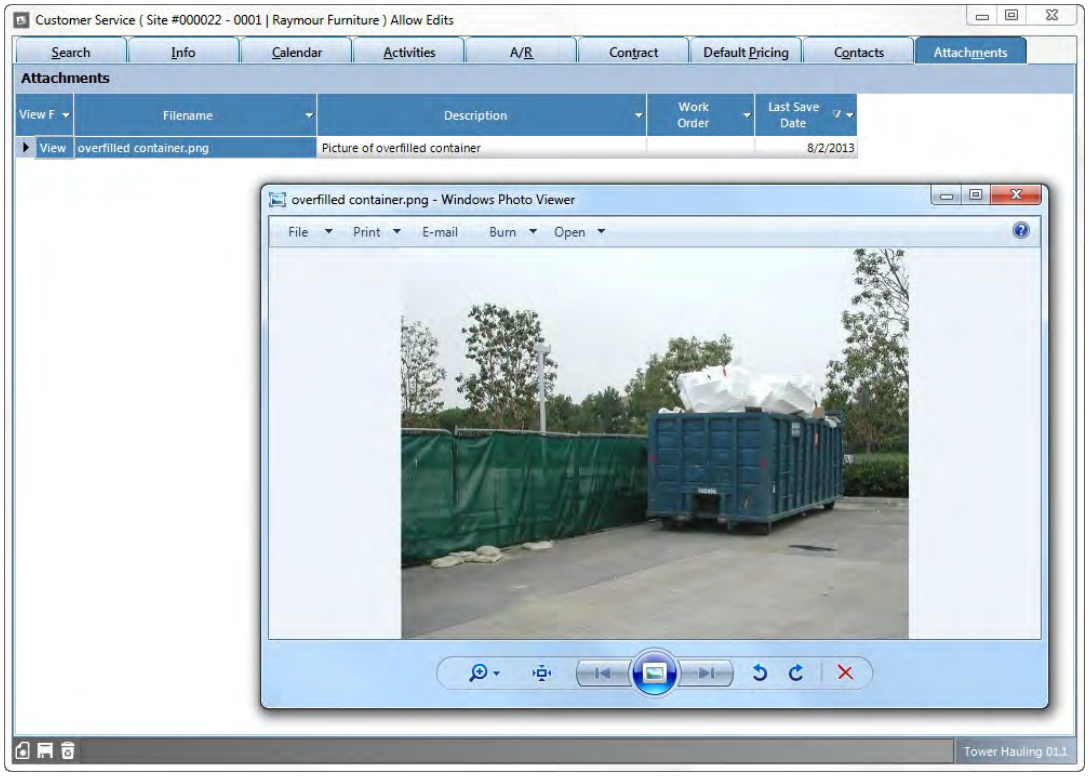
Remote Support — Remote support is set up during the installation and is offered for modifications, database checking for operator errors, repairing corruption caused by power surges and software upgrades.

Field Support — Field support is offered for site surveys, installations and emergency service.

EASY TO USE AND FEATURE-RICH

PCST integrates your waste management business functions. Our most popular, easy-to-use standard features allow you to:

- Validate customer, billing, site and service location addresses via connection to a Post Office database.
- Check for duplicate customer or address entries.
- Manage customers with multiple sites.
- Manage multiple company databases from a single user-interface.
- Restrict user access to select screens by role and/or company association.
- Track sales performance and calculate commissions to be paid.
- Generate and manage proposals and contracts.
- Use the Pricing Manager to analyze potential price changes before making them. Schedule prices to be changed automatically or change them manually for one or multiple customers at once.
- Generate customer and/or site level invoices automatically.
- Process payments and apply payments and credits to individual invoice items.
- Schedule automatic collection notifications and other activities.
- Automatically place customers on credit hold or require approval for orders placed by customers with a past due balance based on user-defined criteria.
- Process and consolidate manifests for medical waste.

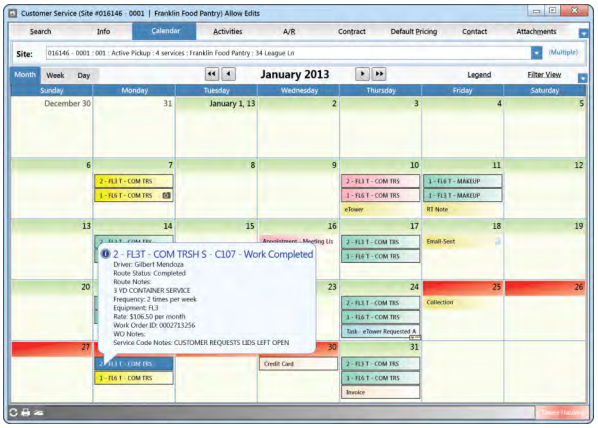


Store photos, spreadsheets and documents in an electronic customer file for organization and ease of access.

Information may be quickly and easily recalled when necessary to refresh your customer's memory or prove your case if a customer calls with concerns.

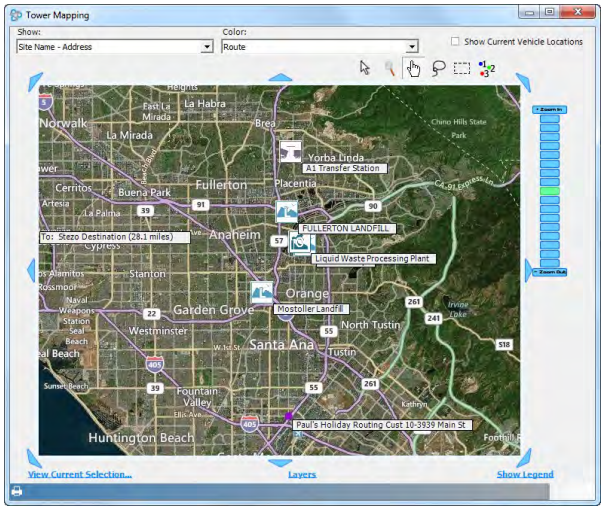
EASY TO USE AND FEATURE-RICH

- View appointments, tasks, scheduled services, A/R activity and other items on our easy-to-read, color-coded electronic calendar.
- Track driver and helper hours, vehicle engine hours and fuel consumption and other trip and productivity details.



Tower 7.0™ has easy-to-understand color-coded screens.

- Track truckload data with optional PC Scale Technologies™ WR 5.0™ software and complete dispatch work orders at the scales.
- Optimize your routes with automatic and dynamic routing.
- Manage yard and site inventory—know where your equipment is and know how many you have on-hand and ready to send out.
- Allow your customers to view account information and make payments online.
- Process one-time or automatic credit or debit card payments with fully encrypted card information.
- Use the Tower 7.0™ billing features for scale transactions.
- Integrate with on-board computer systems.
- Import and/or export billing, payment and collection data in multiple formats. PCST has been designed to offer seamless integration with multiple third party applications to help reduce data entry errors and to save your employees' valuable time.
- Map service locations by address or coordinates with our geocode and real-time mapping functionalities.



Microsoft® MapPoint is always up-to-date so you can be too.

- Generate more than 200 reports for everything from revenue billed or earned, to inventory reconciliation to route profitability. Schedule reports to run automatically or run them manually as needed.
- Rely on PC Scale, Inc. support— 24 x 7 x 365. Support staff is on the phone or online any time you need them.
- Schedule and dispatch services for Confidential Document Destruction (CDD) and/or shredded materials. Track and report the status of materials and generate Certificates of Destruction, providing an unbroken chain of custody for CDD audit trail requirements.

eTOWER™ MODULE

Give Your Customers Safe, Secure Internet Access to Specific Account Data.

eTower™ will free up your office staff's valuable time by giving your customers secure, anytime internet access to their own accounts to:

- Sign up for an eTower™ account using their customer account number.
- Make a one-time credit card payment quickly and easily.
- Change their automatic payment information, like a credit card number, that is set up in Tower 7.0™.
- See their current services as well as their service history on their activities calendar.
- View their latest invoices, their next pickup and more.
- Request additional services.
- Order items such as bags and tags.

With eTower™ you can :

- Collect credit card payments made online.
- Add a service to Tower 7.0™ using your customer's eTower™ request.
- Create a login note that will be displayed on the Tower 7.0™ calendar every time your customer logs into eTower™ .
- Receive an email confirming each credit card payment .
- Allow your system administrators to restrict data available to the customer. This is easy to do – simply select (or deselect) the appropriate checkboxes.
- Create exports based on information gathered from eTower™.
- Define a list of email templates from Tower 7.0™, which will be used when sending system-generated emails in eTower™.
- Send email notifications to your customers when an invoice is available to view on eTower™ or when sending a PDF of the invoice directly by email.

Our easy-to-use online portal lets your customers view their account summary and service history and to view and pay invoices.

eTower™ also allows them to request services and order items at the touch of a button, which means your employees save time.

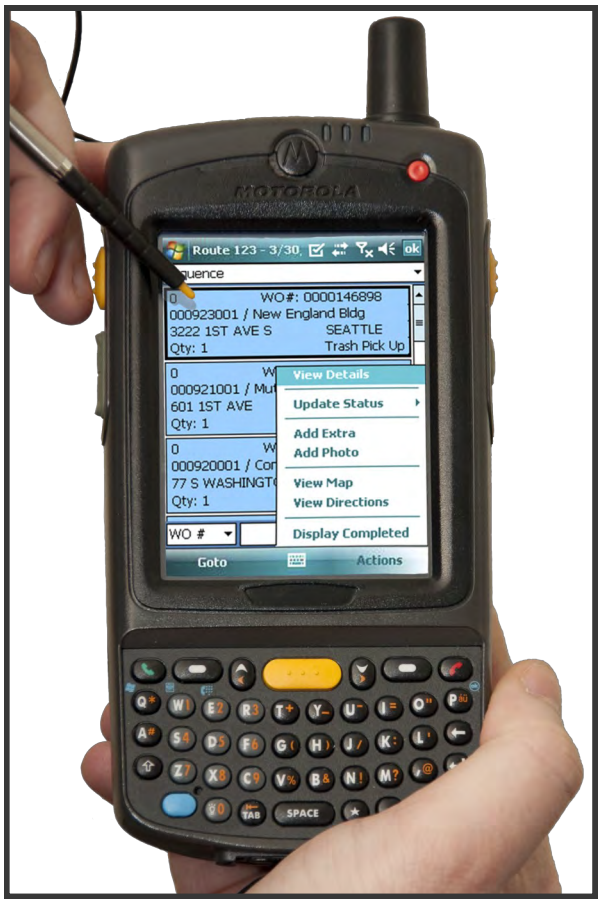
TOWER MOBILE™

Give your drivers real-time access to route data and turn-by-turn directions with the device's GPS.

PC Scale Technologies' Tower Mobile™ software for handheld devices allows your drivers to communicate in real time with operations and customer service staff, and subsequently your customers—giving the most up-to-date information available within the Tower 7.0™ product and/or the eTower™ web portal. Tower Mobile™ allows you to reduce the amount of paper printed in-house as we move toward a more economically- and eco-friendly world.

With Tower Mobile™ your drivers can:

- Get turn-by–turn directions using the handheld device's built-in GPS
- View a map of select service locations with a single click
- Receive one or more routes per handheld unit—reducing the need for paper route books and/or work orders
- View the total number of stops on any given route—including the assigned count versus the completed count
- Send and receive service-related text messages to/from the home office from the handheld unit
- Record vehicle/driver downtime information in the event of a vehicle malfunction, etc.
- Record disposal information—eliminating the need for data entry of disposal tickets, etc., at the home office
- Provide a real-time update of service statuses indicating when a route has been completed, skipped, etc.
- Take pictures and attach them to work orders or service records
- Capture and store customer signatures
- Easily add additional charges to a service and/or work order
- View detailed information about the location being serviced, including detailed or access notes, phone numbers, etc.



PC Scale Technologies' Tower Mobile™ software for handheld devices reduces the need for paper route books and in-office data entry with real-time updates on vehicle/driver downtime, disposal information and service statuses. Tower Mobile™ keeps your staff and customers "in the know."

HEALTHCARE WASTE MANAGEMENT

The PC Scale Technologies™ (PCST) Tower 7.0™ software accommodates for the unique needs of Healthcare Waste Management.

With flexible pricing schemes, Tower 7.0™ allows for customers to be billed:

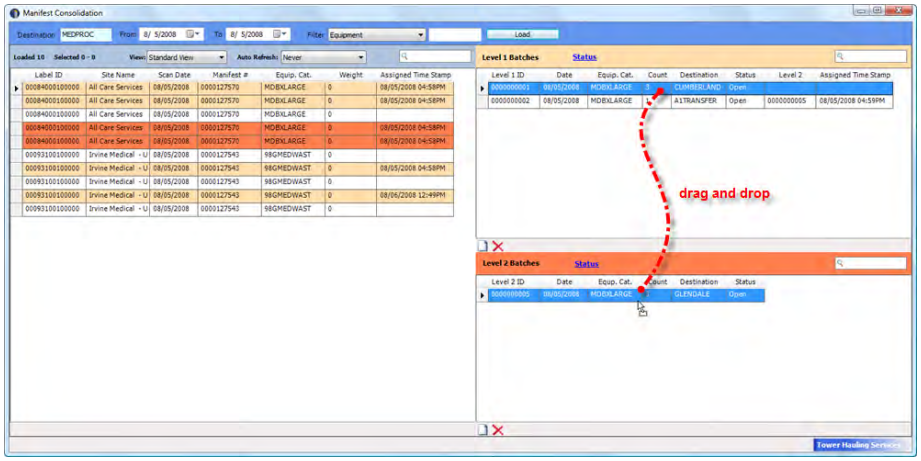
- By the pound for the total weight.
- By the container unless it's over a certain weight, in which case additional per-pound fees can be applied.
- By the total weight but at a minimum compliancy weight for each box. This means that Tower 7.0™ allows you to require that each box be charged for at least 'X' number of pounds.
- Manifest Consolidation:
  - Ability to consolidate manifests while repacking the waste at a transfer station.
  - Produce a control manifest with backup documentation containing the original generator, container counts and weights.
- Manifest level charges:
  - Fuel Charges – flat rate and percentage based.
  - Trip Fees.
- Per pound or per box with a total manifest minimum which must be met.
- Subscription fees.
- Different per-pound weight by waste type – we allow for standard healthcare waste to be billed at one rate while chemo waste is billed at a higher rate due to additional processing.
- Per stop, for the first set number of containers with an additional charge for each additional container.

Manifest Processing:

- Ability to process multiple manifests in one batch.
  - Containers are automatically assigned to proper manifest based on the container label.

Comprehensive reporting:

- Receiving reports.
- Customer weights.
- Plant productivity.



Easy to use features include the ability to drag-and-drop manifests between levels and a color code that allows users to quickly identify the level with which a manifest is associated.

TOWER 7.0™ OPTIONAL MODULES

PCST offers a multitude of options for managing your company's business-critical data. Our family of waste management software and technology solutions have been specifically designed by our industry experts for recycling & solid waste management, healthcare waste management, landfill billing, transfer station, liquid waste (grease & portable toilets) and municipal waste routing & billing.

Always using the latest Microsoft® technologies, we provide you with a powerful host of products to run your business in the most productive and profitable manner.

Optional modules currently available for use with our Tower 7.0™ application include:

Healthcare Waste / Manifest Processing

Flexible, easy-to-use application developed to accommodate the unique needs of healthcare and other manifested waste. This module is also available in TowerMobile!

TowerMobile

Provide real-time service data to your drivers, staff and customers with our mobile application and a rugged hand-hand PC running on the Windows Mobile platform.

eTower

A powerful e-Commerce extension of Tower 7.0. With eTower, your customers can conveniently access their accounts online, view billing history, make new service requests, change their paperless billing options, sign up for auto-pay or pay their bill on line, and much more!

Accounting Interface

Upload customer account transactions to your existing accounting software. Interfaces currently include Dynamics SL & GP, QuickBooks, MAS 90/500, ACCPAC, Great Plains, Maxwell Management, PeachTree, Solomon, PeopleSoft, Oracle, JD Edwards and BillTrust. Custom interfaces are also available.

Collections Interface

Automatically create collection export files for use by your third party collection agency. This module offers a seamless, simple and cost effective way to collect on your past due accounts.

Geocoding & Mapping

Reroute and/or resequence stops directly from aerial and street view maps. Because this module utilizes Microsoft® bing™ maps & MapPoint™ Web services, you are never required to purchase or download new maps!

Address Validation

Save time and money! This module uses U.S. Postal Service (USPS) certified technology to verify, correct and enhance any address in the U.S. and Canada with live data. The address validation web service corrects addresses, adds missing ZIP+4 and Postal Code data, and much more.

Billing Export

Effortlessly export and transmit Tower billing information to your third party billing or print vendor.

Credit Card Processing

Securely process, track and manage one-time and recurring account payments with our PCI compliant card not-present and card-present payment processing module.

Excel Exports

Export and manipulate data for your unique business needs! This module allows you to build custom report queries for export to a Microsoft® Excel format!

Route Optimization Integration

Give your dispatchers access to real-time route optimization using Microsoft® MapPoint™, RouteSmart, IIT, FleetRoute or Roadnet algorithms!

Onboard Computing Integration

Send real-time route data, text messages and more to your drivers while they're in route.

Tire Recycling

Record rough grade counts by work order while route trucks are being unloaded and transmit the collected data directly to the Tower 7.0 database.

SOFTWARE FOR SCALE MANAGEMENT

PC Scale Technologies™ has been a leader in scale point-of-sale, data management software since its inception in 1986. Over the years, we have expanded to also provide the best data management software for the waste, recycling, tire recycling, scrap metal and aggregate industries—basically any industry that uses a truck scale or tracks truckload data.

Installations include off-the-shelf software as well as custom applications, unattended truck scale systems and driver-assisted terminals, remote systems, bar code scanning, radio frequency, mobile solutions and more.

what our customers are saying...

"Using PC Scale's automated information exchange from our sites to our central office, coupled with their integration to our accounting package, saves Chartwell International between 60% and 70% on labor compared to manually entering tickets into Great Plains. Centralizing our data has helped reduce potential double entry errors and it provides us with the ability to get timely reports at our central office without having to rely on our remote facilities to compile and send the information. We appreciate PC Scale's readiness to provide a centralized database for our remote operations."

Paul Biberkraut
Chief Financial Officer
Chartwell International

what our customers are saying...

"PC Scale's software allowed us the ability to not only offer a robust, fully functional system, but also standardized all of our facilities with a single solution. This process, comprising of 60 facilities, has reduced our overall support costs and streamlined our processing and billing system integration. PC Scale's development and support teams have been a pleasure to work with. Thank you for providing us with an outstanding product."

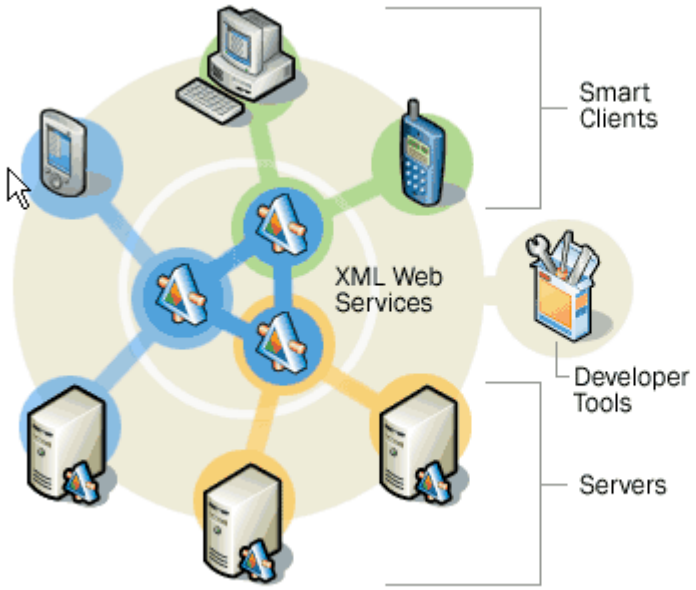
Eric Reibsane
Director, IT
Casella Waste Systems, Inc.

Our scale software is NTEP Certified to meet standards for legal trade. We also hold certificates from New York to California.

Optional, complete two-way integration with Tower 7.0™ is available, providing the industry with the most powerful combination of route and scale management available.

LEADING TECHNOLOGY

Developed utilizing Microsoft® .NET 4.0 and SQL server 2008, Tower 7.0™ uses the latest technology from Microsoft®. .NET is a set of Microsoft® software technologies for connecting information, people, systems and devices. It enables a high level of software integration through the use of XML web services—small, discrete, building-block applications that connect to each other as well as to other, larger applications over the internet.



XML Web services are small, reusable applications written in XML, a universal language for data exchange. They allow data to be communicated across the Internet (or internal intranet) between otherwise unconnected sources that are enabled to host or act on them, for example:

Client-to-client: "Smart" clients or devices can host and apply XML Web services that allow data to be shared anywhere, any time.

Client-to-server: XML Web services can share data from a server application to a desktop or mobile computing device via the Internet.

Server-to-server: XML Web services provide a common interface between existing applications within an environment of independent servers.

Service-to-service: XML Web services can work together in sequence to create a more complex data operation.

Just as PCST was the first to provide true Windows-based software to the waste industry, we are also the first solution provider to bring a .NET solution to the industry. The .NET architecture extends Tower 7.0™ beyond the Local Area Network. Our goal is to provide real-time access to all employees of the organization. Information is power and utilizing this technology will allow your employees to make better and more informed decisions in a timely manner.

SOFTWARE COMPATIBILITY

Tower 7.0™ is fully compatible with:

Client Operating Systems:

- Microsoft® Windows 7, Professional, Enterprise and Ultimate editions
- Microsoft® Windows Vista, Business and Enterprise editions
- Microsoft® Windows XP Professional SP3
- Microsoft® .NET Framework Version 4.0

Server Operating Systems :

- Microsoft® Windows Server 2008 R2 Standard x64 Edition
- Microsoft® Windows Server 2008 Standard x64 Edition
- Microsoft® Windows Server 2008 R2 Enterprise x64 Edition
- Microsoft® Windows Server 2003 Enterprise x64 Edition SP2
- Microsoft® Windows Server 2003 Standard x64 Edition SP2
- Internet Information Server (IIS) 6.0 or 7.0
- Microsoft® .NET Framework Version 4.0
- Note: Tower 7.0™ is not supported on Windows Small Business Server.

Client Operating Systems:

- Microsoft® SQL Server 2012 Standard Edition
- Microsoft® SQL Server 2012 Enterprise Edition
- Microsoft® SQL Server 2008 R2 Enterprise x64 Edition
- Microsoft® SQL Server 2008 Enterprise x64 Edition

what our customers are saying...

"My company is growing at a rate of one route every two months. I needed a partner in business, not a vendor. I have two words that describe PC Scale: "The Best!". "

Pat Sperduto, President
Waste Haulers, LLC

what our customers are saying...

"I just wanted to take a moment and comment on the responsiveness of Tower support personnel. With all the other software/hardware support issues I have to deal with, it is nice to know that when I need Tower it is handled quickly and professionally. I would like to thank the support team for all their help!

Ruben Garza
Ace Disposal, Inc.

"I wanted to take a few moments to thank everyone who worked on this project—from start to finish. I appreciate all your hard work in formulating and troubleshooting the spec. Your meticulous attention to detail did not go unnoticed. I also wanted to thank the development team...From the very beginning, it was clear that he was going to get the job done as quickly and effectively as possible. While a few minor issues surfaced during initial testing, he was right on top of them and had the problems resolved and fixes installed immediately

We have been using this new format for about two weeks now and we could not be happier. Payment processing time has been reduced dramatically!!

Please pass along my appreciation to everyone who was involved.."

Shawn Parks
Parks & Sons of Sun City, Inc.

Professionals on staff are there to see that your software meets your needs. We have:

- Microsoft Certified Systems Engineers (MCSC)
- Microsoft Certified Database Administrators (MCDBA)
- Microsoft Certified Application Developer (MCAD)
- Microsoft Certified Professionals + Internet (MCP+I)
- Microsoft Certified Professionals (MCP)
- Microsoft Certified Trainer (MCT)
- Citrix Certified Professionals

OUR MISSION

Focusing on customer's needs, we will provide the premier suite of business solutions and highest caliber of professional services to the environmental services sector. We will deliver these products and services 24 hours a day, 7 days a week, 365 days a year, leading our industry in quality and innovation, always setting the mark to which all competitors must measure themselves.

ALLIANCES

PC Scale Technologies™ values our key business relationships, and aligns with only select companies.

Acquirint Payment Processing

AIR-TRAK

A·R·M SOLUTIONS

Billtrust

Coast to Coast Financial Solutions
Redefining Accounts Receivable Management

CTP SOLUTIONS

FAIRBANKS SCALES

FleetMind

MyOnlineBill.com℠
VIEW. PRINT. PAY.

roadnet technologies™
How to deliver™

RouteSmart TECHNOLOGIES
The world's most intelligent routing system.

ROUTEWARE®

TRANSCORE.

Microsoft Partner
Independent Software Vendor (ISV)
Application Integration
Business Intelligence
Data Platform

CITRIX PARTNER
Silver Solution Advisor

SAP BusinessObjects
Authorized Application Provider

PARTNERSHIPS

For the seventh year straight, PC Scale, Inc. remains the only Microsoft® partner in our industry to have achieved the designation of a Microsoft® Silver Partner in the Independent Software Vendor, Application Integration, Business Intelligence and Data Platform categories. Microsoft's Competency designations define their partners' success as technology market leaders and the criteria for obtaining certifications is increasingly comprehensive.

Each of Microsoft's technology Competencies differentiates a partner's specific technology expertise and qualifications as a solution provider. PC Scale, Inc. is dedicated to leading our industry's software providers by investing in the training and testing necessary to deliver applications based on the leading-edge Microsoft® based solutions.

PC Scale, Inc. is also a Citrix Silver Solution Advisor. We help companies and municipalities connect multiple sites, facilities and plants to each other and/or a main office for reliable data access.

Microsoft Partner
Independent Software Vendor (ISV)
Application Integration
Business Intelligence
Data Platform

CITRIX PARTNER Silver Solution Advisor

SAP BusinessObjects Authorized Application Provider

SWANA SOLID WASTE ASSOCIATION

NTEP NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

AEM ASSOCIATION OF EQUIPMENT MANUFACTURERS

Additionally, we have developed alliance partnerships with industry leaders to help ensure your seamless operation using Tower 7.0™ with the following applications:

Powerful On-Board Computing Solutions

ROUTEWARE®

Tower 7.0™ integration with Routeware® gives our customers a superior GPS system combined with the best hauling software in the industry. From its inception, Routeware® has been solely focused on automating solid waste hauling operations. Their Rcore® product is an on-board computer, focused on route and customer transactions. It is simple for the driver to use and features the latest advancements in two-way cellular communications, GPS and application software. Tower 7.0™ integrates fully with Routeware's back-office components.

Integrated Waste-Vehicle Management Systems

FleetMind

Tower 7.0™ interfaces with FleetMind's waste management solution. FleetMind Solutions is a technology leader that has successfully designed, manufactured and marketed successive generations of wireless enabled on-board technology and enterprise fleet management systems for companies that make use of heavy trucks.

PARTNERSHIPS

FleetMind provides a great way to extend your existing business systems to drivers and vehicles to achieve superior productivity and performance. FleetMind's solution for waste management enables drivers to easily log the precise activities that account for the full day, as they happen, with the easy-to-use Fleetlink Driver Display Terminal. Roll-offs, lifts, disposal tickets - every possible time stamp and location calculation is recorded to help you manage route costs and profitability.

Affordable Fleet Management Solutions

Air-Trak delivers complete Automatic Vehicle Location (AVL) and Mobile Resource Management (MRM) solutions for organizations looking to increase their revenue, lower their operating costs, and improve customer service. Air-Trak has worked with PC Scale Technologies™ to build an affordable and easy-to-use solution that is easy for the driver to use. Air-Trak is a pioneer in GPS-based vehicle tracking solutions and has been serving the DOD, federal, state, and local governments, and commercial enterprises since 1999.

Route Planning software for Delivery Success

For over 28 years, Roadnet Technologies has provided innovative fleet management solutions for distribution and service companies with private fleets and mobile resources. Through a suite of applications and integration with Tower 7.0™, Roadnet Technologies offers optimized route planning and scheduling, real-time wireless dispatch and GPS, strategic territory planning, vehicle telematics, web-based reporting and more.

BRIEF COMPANY HISTORY

PC Scale, Inc. began in 1986 as a division of Scale Systems, Inc. Our first software package was designed for the waste industry and was installed at a transfer station in the suburbs of Philadelphia, Pennsylvania.

PC Scale started as a regional supplier of software interfaced to truck scales and as word of our excellence and support grew, our product line expanded to accommodate many industries that require tracking of truckload data. Before long we found the need to divide into two separate companies - software and scales – in order to provide greater flexibility and diversity for our customers. PC Scale, Inc. incorporated in December 1997.

In November 2006, PC Scale, Inc. acquired TransComp, Inc., the Orange County, CA software firm best known as the publisher of Tower software, a leading provider of route management software with hundreds of customers throughout the United States and Canada.

The union of PC Scale and TransComp created the suite of PC Scale Technologies' customer-centered software solutions. As the premier provider of management software and services for the waste, recycling, aggregate and transportation industries, in June 2008, PC Scale Technologies™ purchased Norwesco Computing, Inc. of Seattle, WA, best known for their RICSoft software solutions, HaulBoss and ScaleBoss.

Included in our customer base are 6 of the top 10 waste companies in the United States and 11 of the top 20. PC Scale, Inc. has offices nationwide and employs approximately 50 people, most of whom are on the development and support teams.

what our customers are saying…

"I would like to take a moment to give some credit and thanks to your Project Manager. From the onset of our company migrating/converting to Tower. He has been a great asset in answering our questions and solving challenges we faced in converting to Tower.

We recently had to come up with some reports for our City and County contracts that were complicated and extremely detailed, as far as the information they requested goes. [Your Project Manager] provided the detail we needed to satisfy and, quite frankly, overwhelm these government agencies with the most accurate data they have ever received from any of the refuse haulers in the metro area. We could not have retrieved this information with a standard report and [your Project Manager] stepped up to the task and took care of us, delivering the results quickly and as we had requested. Your employee and your product, T6 has helped us achieve a much higher standard of reporting that has us in a positive spotlight with our City and County agencies we work for.

[Your Project Manager] has always worked hard for us and his professionalism and sense of humor are a great combination in addition to his working knowledge of Tower. "

Jason Barnes
Hillsboro Garbage Disposal, Inc.

ON-BOARD COMPUTER (OBC) SYSTEMS

The next generation of route management is here with our On-Board Computer (OBC) systems! With two-way communication, your company will benefit from real-time route data and electronic route books. Tracking and viewing vehicle collection progress has never been easier!

With PC Scale Technologies™ on-board computer systems, you can:

- Improve driver management with real-time visibility of vehicle, route and collection progress
- Reduce margin for error on collections and routes
- Track vehicles using GPS, with graphical representation of actual route vs. scheduled route
- Minimize customer call handling time
- Enhance office savings with a real-time, paperless system
- Obtain real-time reporting and updates between office, driver and vehicle
- Reduce missed pick ups and driver call backs with real-time service verification
- Provide proof of service with optional incorporation of RFID technology

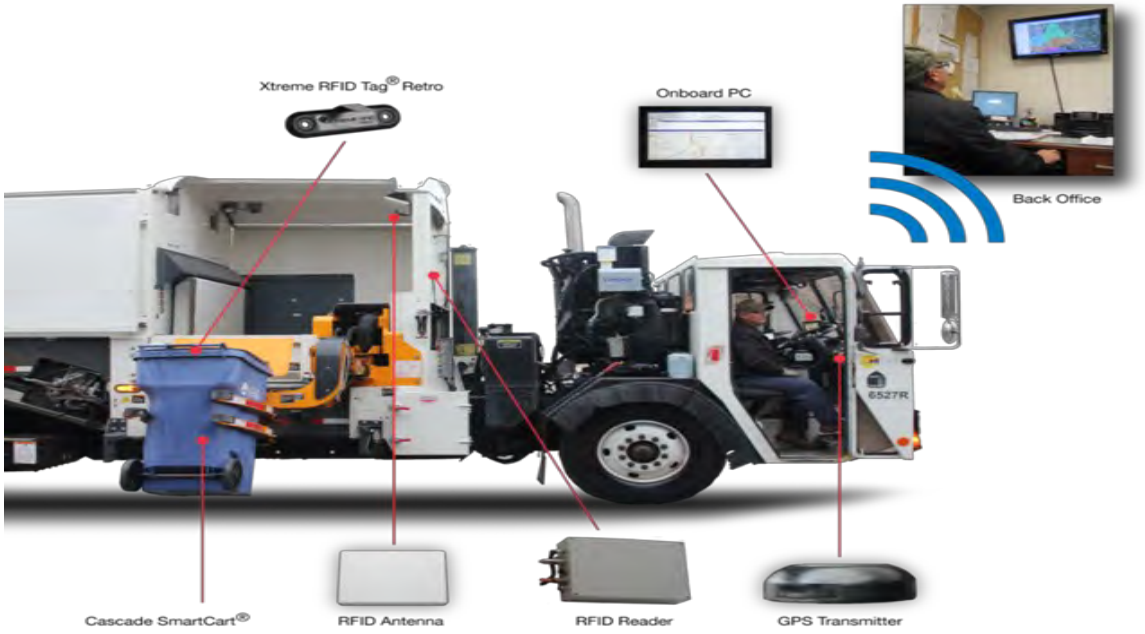
scan to visit website

RFID TECHNOLOGY

PCST & our parent company AMCS Group are pleased to offer the latest in RFID (Radio Frequency Identification) technology. The RFID Technology allows your organization to validate, monitor and optimize your collection!

By utilizing bins/containers with RFID technology you can:

- Provide Proof of Service and reduce missed pickup callbacks by 25%
- Experience major reduction in invoice queries and credit notes of approximately 75%
- Provides denial of service to prevent a lift in certain circumstances (i.e. the bin has no chip, chip is not recognized, or credit hold)
- Increase fleet efficiency
- Take advantage of UHF (Ultra High Frequency) for container requiring long range reading technology
- Increase the accuracy of container inventory
- Integrates seamlessly with OBC (On-Board Computer technology) to facilitate driver feedback when service exceptions exist.
- Real-time data provided to back-office
- Track precise # of lifts
- When used with optional GPS, track exact location of bin; thereby reducing # of missed pickups
- Utilize data collected to identify recycling presentation rates per city/region/street/ household
- Utilize technology to implement new PAYT (Pay as you Throw) programs
- Increase collection efficiency; reducing overall time per route



Appendix 5C

EnCore

R3

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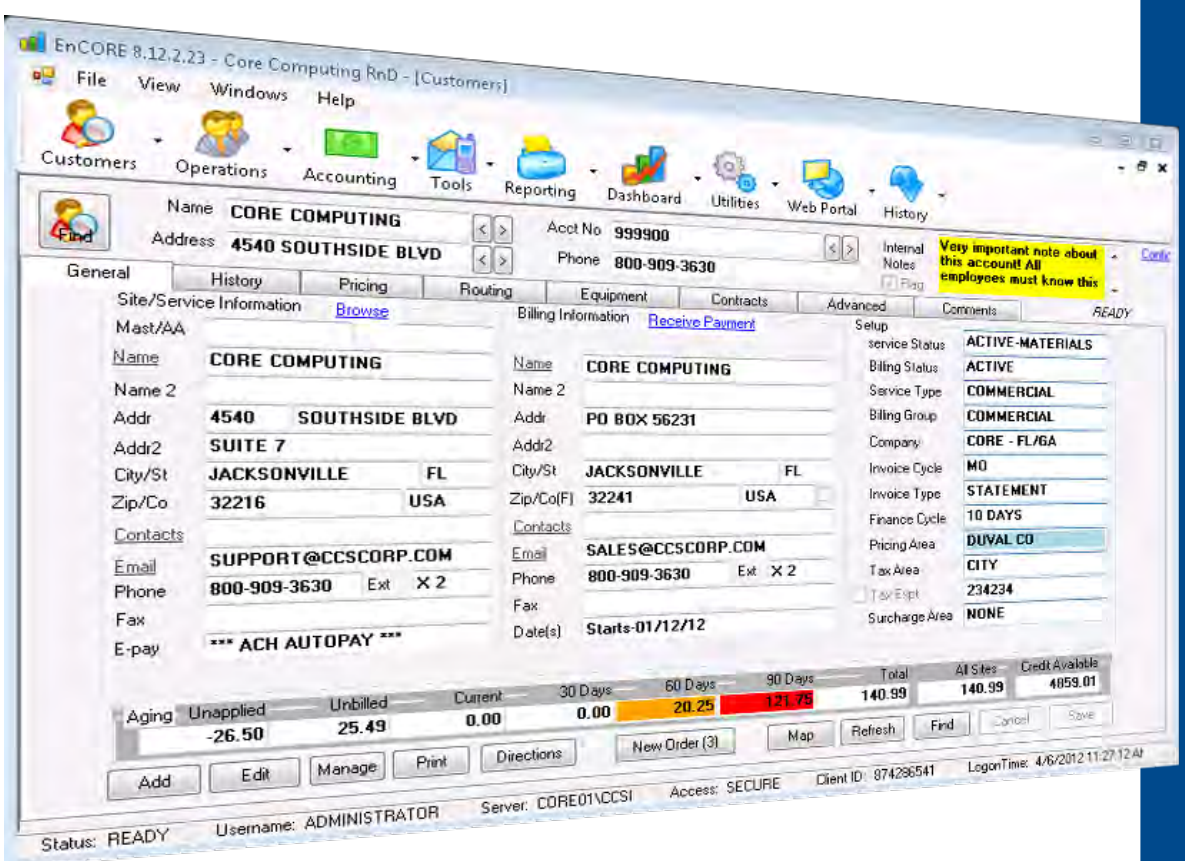
EnCORE™ | Financial & Operational Software System Overview

The Industry Standard for Waste & Recycling Software in One Complete Package

Increasing fuel cost. Shifting regulation. Mounting Competition. As a business in the waste and recycling industry, your success depends on how well you can manage your limited resources while quickly adapting to marketplace changes. With EnCORE™ your organization gains a competitive edge by streamlining operations, consolidating software systems and leveraging the most advanced and proven technologies available so you can focus on what you know best - running your business.

What is EnCORE™?

EnCORE™ is a comprehensive enterprise-class suite of software built on one centralized Microsoft SQL Server database. With EnCORE every aspect of your business is managed in one system... no more spreadsheets, separate scale, fleet, dispatch, production, onboard, customer web portals or sales applications to manage. EnCORE does it all in ONE comprehensive solution.



EnCORE™ | Core Office Application

The Core Office Application is the nerve center of it all. From this unified interface all aspects of your Financial & Operational activities are performed. This includes Customer Service, Billing, Collections, Dispatch, Scale Ticketing, Productivity and Financial Reporting. Every aspect of your organization is at your fingertips in one user-friendly easy-to-use interface. Enhance your organization's Customer Service Experience, Reduce Billing Times, Streamline Operations and Increase Efficiency all in the convenience of a Microsoft Certified Product.

EnCORE™

- Customer Management
- Billing & Collections
- Accounts Payable
- Recurring Routing
- On-call Dispatching
- Route Optimization
- Scale Management
- NTEP Certified
- Fleet Maintenance
- Productivity Analysis
- Financial Reporting
- Customer Web Portal
- On-Board Computers
- GPS Tracking
- Paperless Workflow
- Google Maps

Call today for a LIVE web demonstration

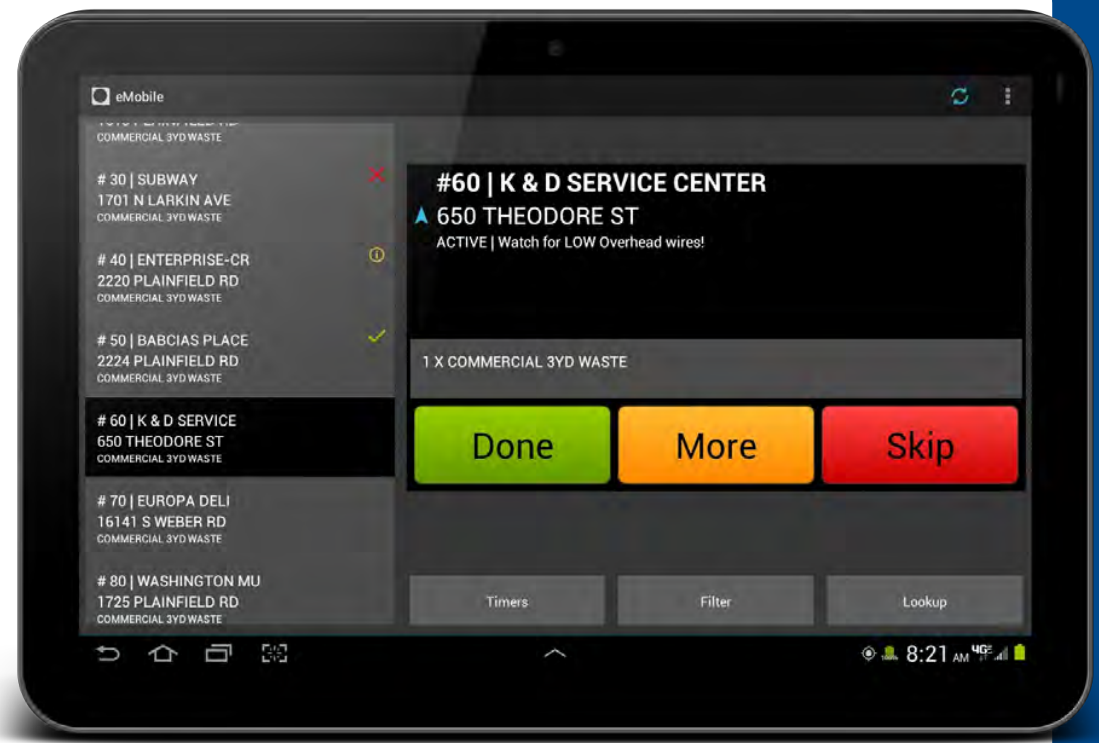
1-800-909-3630

sales@ccscorp.com

P +1.800.909.3630 | ccscorp.com | F +1.800.909.3630

CORE Computing Solutions, Inc

EnCORE™



- Customer Management
- Billing & Collections
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- On-call Dispatching
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- Scale Management
- NTEP Certified
- Fleet Maintenance
- Productivity Analysis
- Financial Reporting
- Customer Web Portal
- On-Board Computers
- GPS Tracking
- Paperless Workflow
- Google Maps

EnCORE | Mobile On-Board Truck Solution

Mobile is the Waste & Recycling industry's most affordable, powerful and technologically advanced touch-screen driver terminal system on the market. Mobile seamlessly extends the back-office functionality of EnCORE in the convenience and simplicity of an Android based tablet PC device. Mobile will improve your company's bottom line through increased driver productivity, faster and more accurate data entry and total accountability.

EnCORE | Customer Web Portal

Empower your customers through the deployment of our self-service Web Portal. Customers can reprint bills, make one-time and recurring payments via credit Card and ACH, enroll in electronic paperless delivery, request services, view payment history and much more.

Technologies & Certifications

Microsoft .NET

Microsoft SQL Server

Certificate # 11-085

Since 2003 Core Computing has been providing innovative high-quality solutions and service to the Waste and Recycling Industry. Members of WASTEC, NSWMA, SWANA, WRRA, CRRC, ISRI

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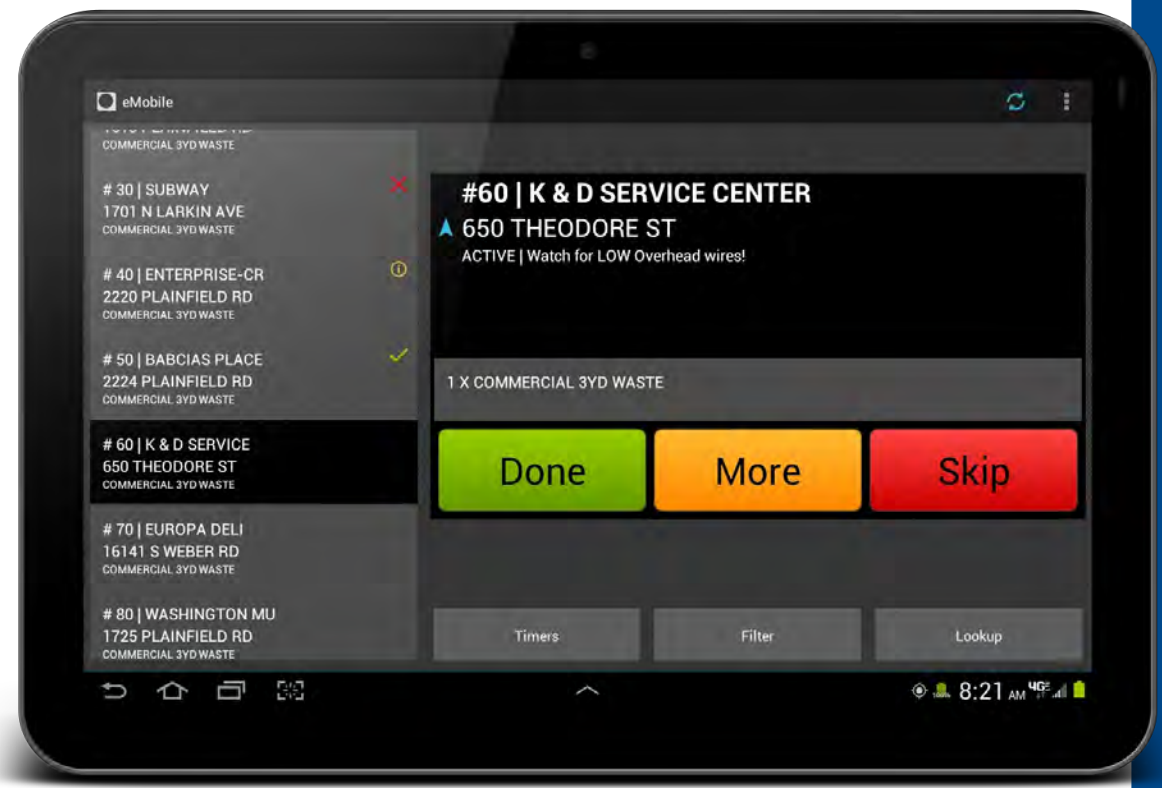
CORE Computing Solutions, Inc

EnCORE | eMobile On-Board Truck Terminal

EnCORE™



Features:

- Real-Time GPS Tracking
- Pre & Post Trip Entry
- Photo Verification
- Electronic Signature Capture
- Credit Card Processing
- Onscreen Mapping
- Turn-by-Turn Navigation
- VOIP & Two-way messaging
- Paperless Routesheets
- Electronic Workorders
- Material Tracking
- User-Friendly
- Bill Extras Instantly
- Rugged Solid-State Hardware
- Powered by Android OS

EnCORE | eMobile (EM) is the Waste & Recycling industry's most affordable, powerful and technologically advanced touch-screen driver terminal system on the market. Mobile seamlessly extends the back-office functionality of the EnCORE | Financial & Operational Software System in the convenience and simplicity of an Android based tablet PC.

How can EnCORE | Mobile help your Operations?

Increase Driver Productivity, Enhanced Data Collection and Total Accountability

When you enable your fleet with EM you make your driver's job easier and get total accountability. Real-time GPS Tracking tells you when, where and how long an event occurred. On screen Pre & Post Trip Entry ensures you meet or exceed DOT record keeping requirements. Eliminate go-backs with event Photo Verification, no can out, extras, blocks are all photographically recorded with time & date stamps.

Go Paperless. With EM paper Routesheets and Workorders are a thing of the past. Signatures are captured directly on the tablet when required, extra charges are billed immediately and accurately. Timer events are added at anytime to track breakdowns, delays, breaks, material site and refueling events. Who, what, where, when, why and how much are captured onscreen and transmitted to the Office real-time. Use Two-way instant messaging and VOIP to eliminate phone traffic to your dispatch center. Driver's unfamiliar with a route can use Onscreen mapping and Turn-by-Turn directions powered by Google Navigation.

EM works seamlessly with your existing Encore | Office system requiring minimal training of your staff and no additional software to manage. Utilizing off the shelf Android Tablet Computers, EM empowers your organization to buy the hardware anywhere at the best negotiated price. Give us a call to see this powerful solution in action and learn more about how EM can improve your operations.

Call today for a LIVE web demonstration

1-800-909-3630

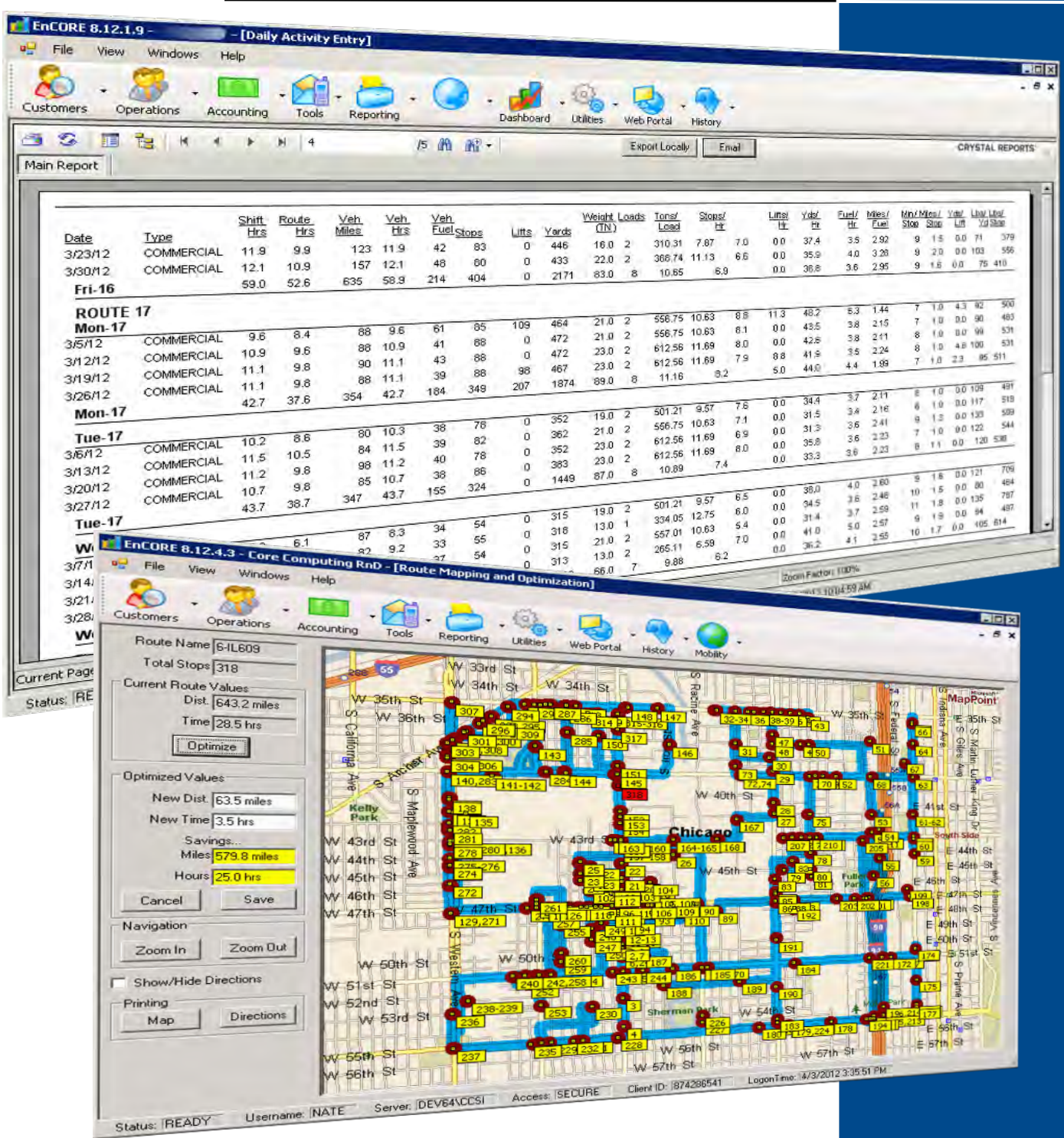
sales@ccscorp.com

EnCORE | Financial & Operational Software

P +1.800.909.3630 | ccscorp.com | F +1.800.909.3630

CORE Computing Solutions, Inc

EnCORE™



"EnCORE Mobile answers the who, what, where, when and why of your operations"

Microsoft® .NET

Microsoft® SQL Server®

EnCORE | Financial & Operational Software

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CORE Computing Solutions, Inc

Ver 10/15/11

Web Portal Overview

The customer web portal is a web based application that provides your customers with real time access to their EnCORE account information. They can view, print, and pay bills (CC & ACH). Also, they can enroll in automatic payments, sign up for recurring payments (ACH & Credit Card), update their billing information, request service, view payment history, and check their active services.

Many of the features are configurable to your preference. The "look & feel" of the web portal is also customizable. The colors can be changed, the menu can be moved, the header can be larger or smaller, and the footer can contain a range of items (security certificate, images, and information). Additionally, if your company wishes to require that customers agree to certain terms & conditions before they register for online access to their account, this can be enabled.

How Customers Access Your Portal

It is recommended that you place a link on your main website that will direct your customers to the secure web portal. Core will provide the portal hosting, security certificate, and domain name for all hosted clients. The link for your portal will be of the form: https://yourcompany.onlineportal.us.com.

Since the portal will have your logo and color scheme customers should be fairly comfortable with the web address changing. It is recommended that you inform the customer that they will be redirected to a secure web address when clicking the link. Example:

Figure 1 – Example Redirect Page

When your customer has finished using the web portal they will be redirected back to a page on your website. This page can be any page on your website that you choose.

Registering

Your customers will need to have their account number and any invoice number for that account. They will use this information on the registration page the first time they access the web portal. See Figure 2.

When customers are registering for access you have the option to enable a terms & conditions page. The customer will be told that by registering they are agreeing to the terms and be able to read the terms should they choose to do so. See Figure 3.

Note: If your customer has multiple accounts, they will want to register a single username/password with any of their accounts. Once they have access to the web portal they will be able to link the remaining accounts by providing matching account/invoice numbers.

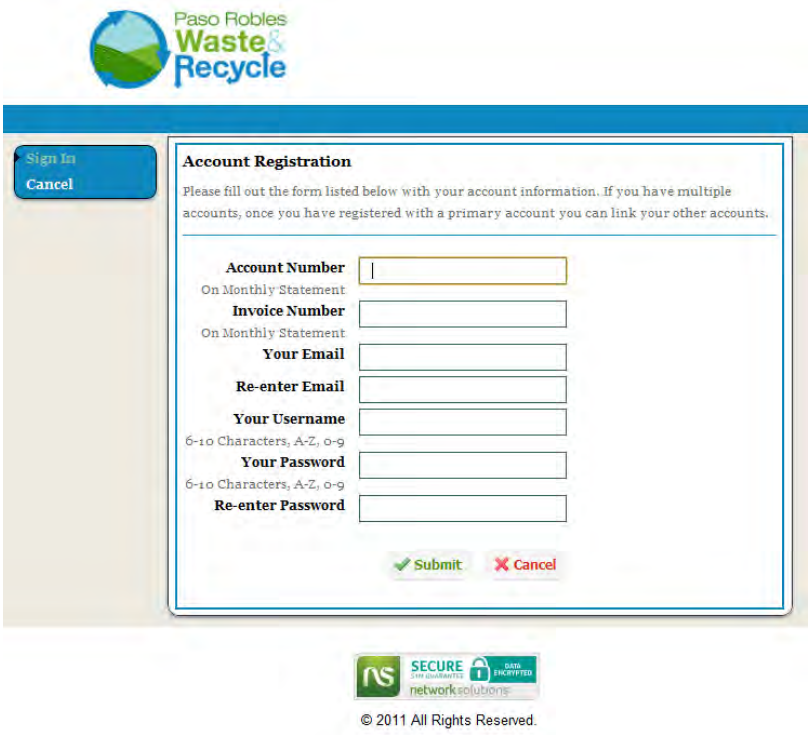


Figure 2 – Account Registration with Terms Disabled

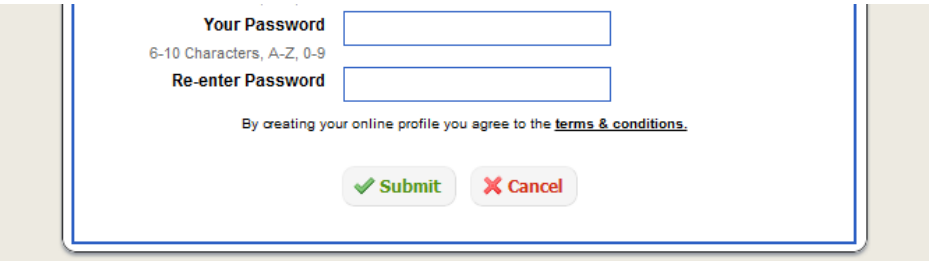


Figure 3 – Register with Terms Enabled.

Web Portal Features

Account Overview

When your customer signs into the web portal the first page they will see provides an account overview. Figure 4 shows a typical account overview. The service section can be modified by disabling pricing. Also, as shown in figure 4, if the account has a pending payment (payment in an unposted batch) the customer will be notified on the overview page.

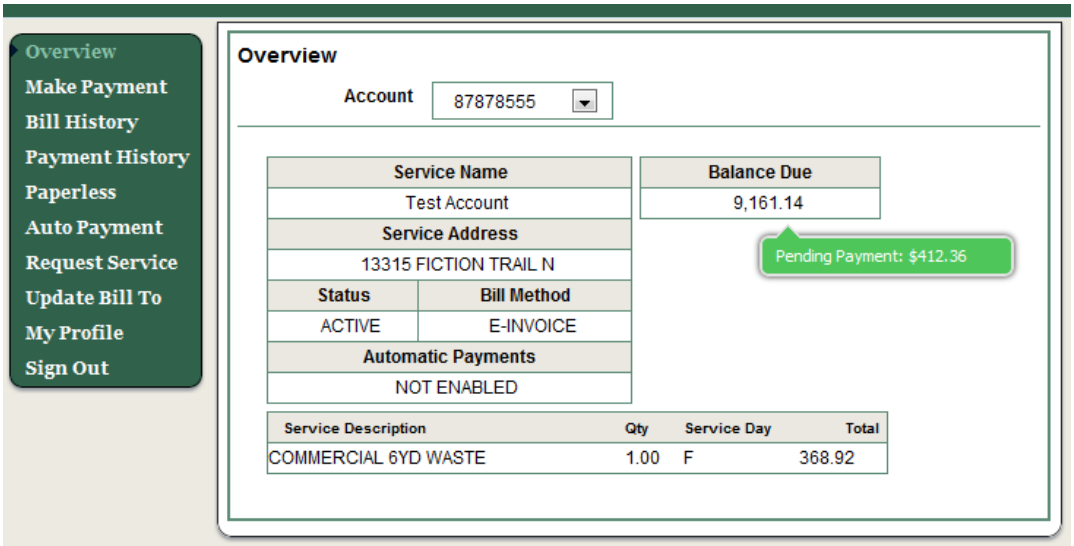


Figure 4 – Account Overview with pending payment and pricing enabled

When the customer has multiple accounts they are able to use the drop down menu at the top of the page to switch the currently selected account.

Account Overview Configuration

EnCORE Web Portal Settings

- Option 15 enables pricing in service overview

EnCORE Web Portal Customer Invoice Types

- Overview Bill Method name is the “EnCORE Invoice Type”

One-Time Payments

Credit Card Payment

Customers are usually accessing the web portal to make a one-time payment. The payment page will automatically populate the current balance due as well as the billing name and address. This makes the payment process quicker for most customers. Additionally, customers are not asked to provide their credit card type as this can be determined from the number provided.

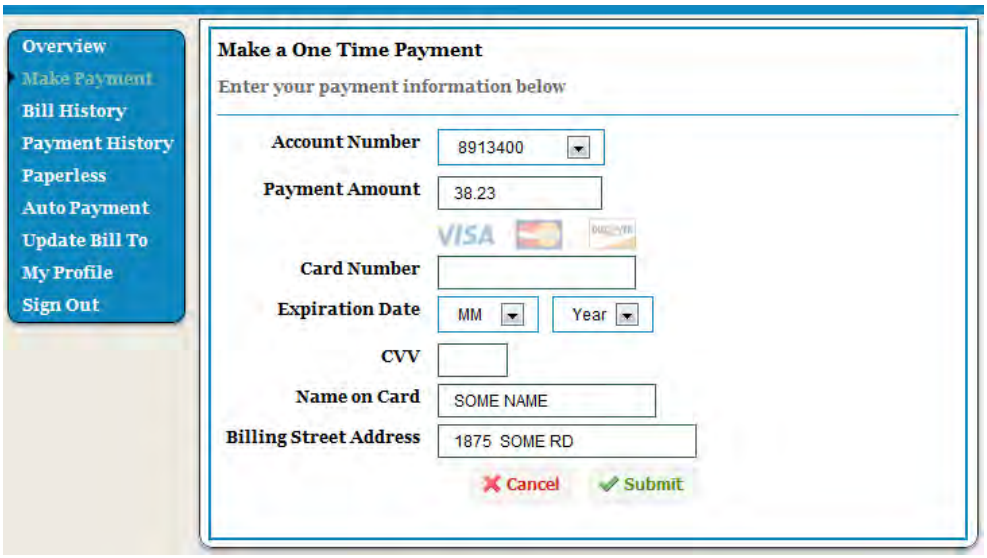


Figure 5 – One-time Payment. Credit Card Only.

The credit card logos that are displayed are the card types that are enabled for online use. Once a customer enters a card number that matches to a specific card type and is valid, the type is highlighted by the software giving the customer visual feedback that the card number is valid.

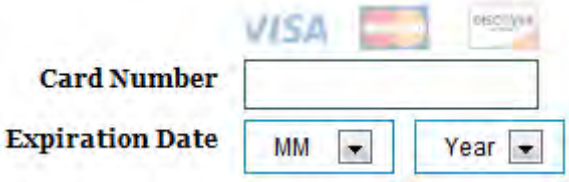


Figure 6 – Credit Card Number is Invalid

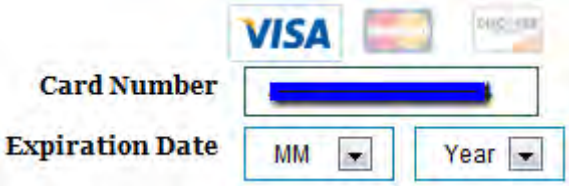


Figure 7 – Credit Card Number is Valid

This page also requires a valid expiration date and CVV number for the credit card entry. Once the information is entered, the customer can submit the payment for processing. The payment will be

entered into the EnCORE credit card batching system and as soon as it has processed the customer will be emailed.

ACH Payment

When one-time ACH payments are enabled, your customers will have the option to use ACH or CC.

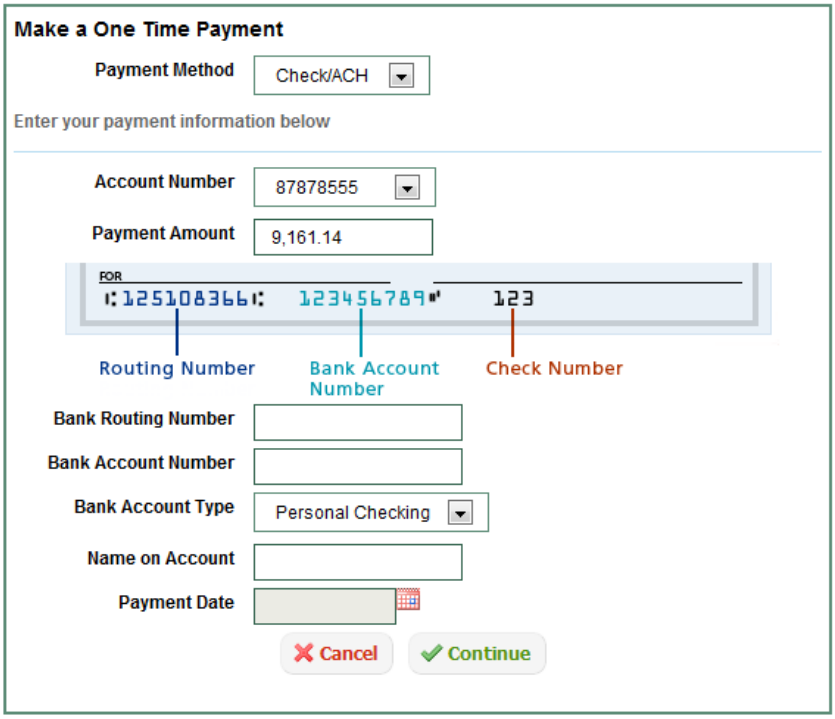


Figure 8 – One-Time ACH Payment Enabled and Selected

One-Time Payment Configuration

EnCORE Web Portal Settings

- Option 22 enables one-time ACH payments
- Option 19 enables immediate posting of CC payments

EnCORE Web Portal Credit Card Types

- Enables specific credit card types for use on the web portal
  - Please ensure that all credit card types that you wish to accept are enabled for web portal usage.
  - If a customer attempts to use a credit card type that is not enabled the web portal will tell them that the credit card is invalid as the validation algorithm only tests for card types that are enabled.

Bill History

Enabling this optional feature gives your customers access to view billing history on the web portal. Past invoices/statements can be viewed in a web form or PDF. Configuring and enabling the PDF option makes it the default view for your customers. The PDF view uses a report format that is configured in EnCORE.

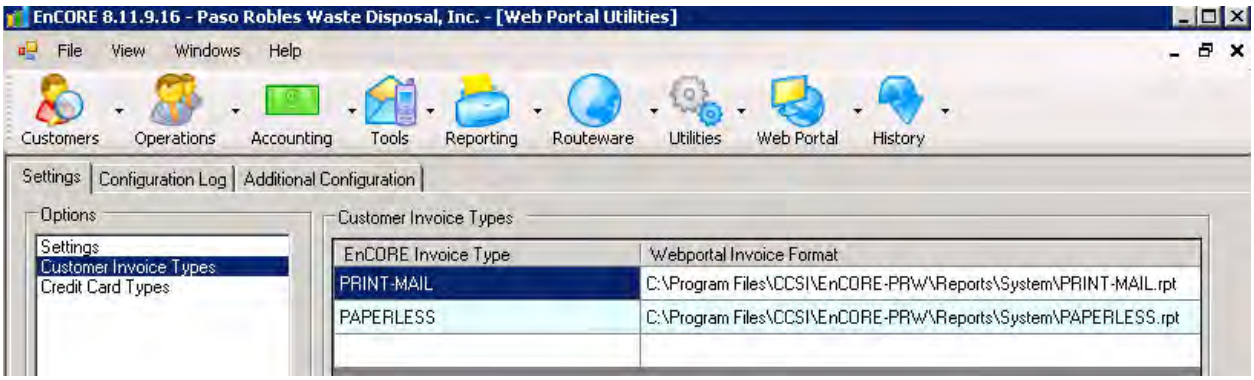


Figure 9 – Configure Web Portal PDF Invoice Format

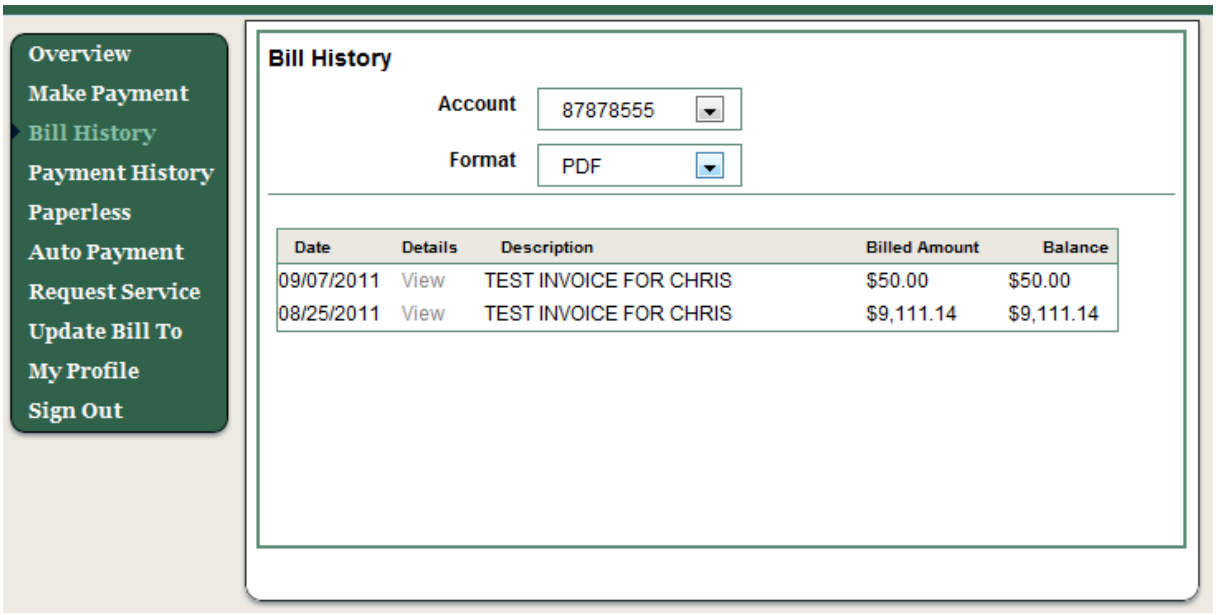


Figure 10 – Bill History with PDF enabled

Bill History Configuration

EnCORE Web Portal Settings

- Option 7 enables Bill History
- Option 25 enables PDF (requires invoice format be set under Customer Invoice Types)

Payment History

Like Bill History this is an optional feature of the web portal that displays a summary of all payments received on an account.

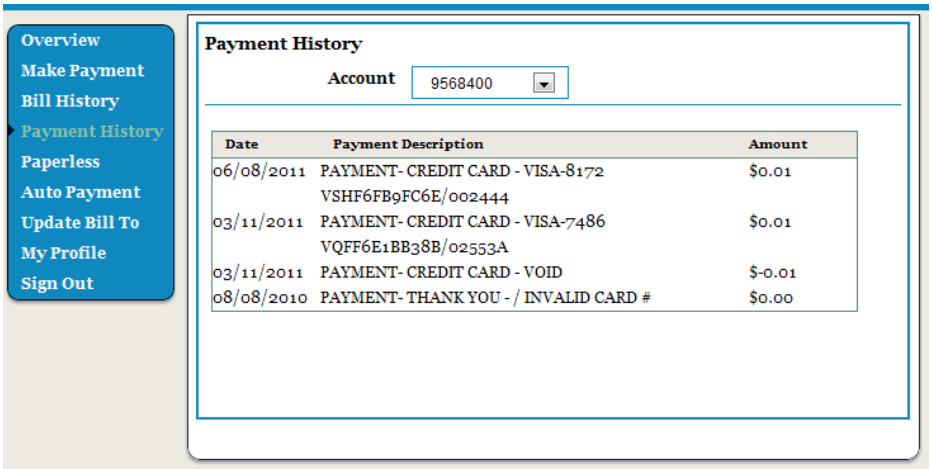


Figure 11 – Payment History

Payment History Configuration

EnCORE Web Portal Settings

- Option 3 enables Payment History

Paperless

Allow your customers to enroll in paperless invoice/statement delivery directly from the web portal. This feature can do all of the work for you. It asks the customer to confirm the delivery email address, then makes all of the changes required on their account(s) in order for them to be enrolled in your paperless program (when Automatic Changes is enabled).

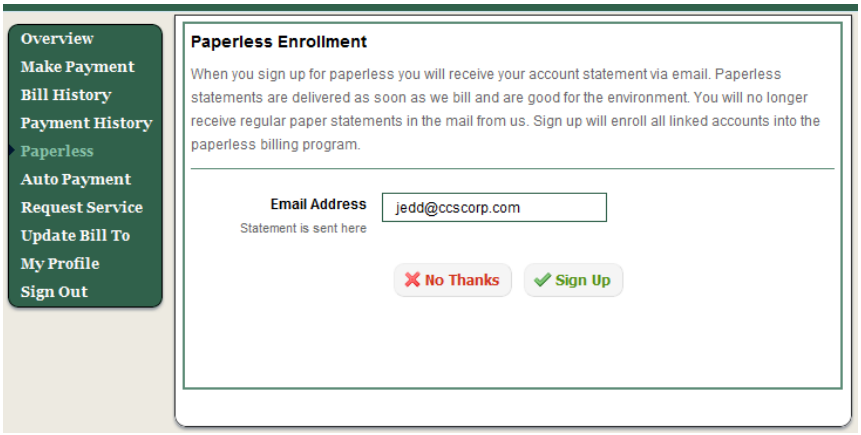


Figure 12 – Paperless Enrollment Confirmation

Paperless Configuration

EnCORE Web Portal Settings

- Option 1 enables Paperless Enrollment
- Option 30 enables Automatic Account Changes
- Option 12 sets internal email address for Paperless Requests

Automatic Payments

This feature allows your customers to directly enroll in either recurring credit card or ACH payments. The forms are very similar to the one-time payment pages however they do require some additional information and confirmation.

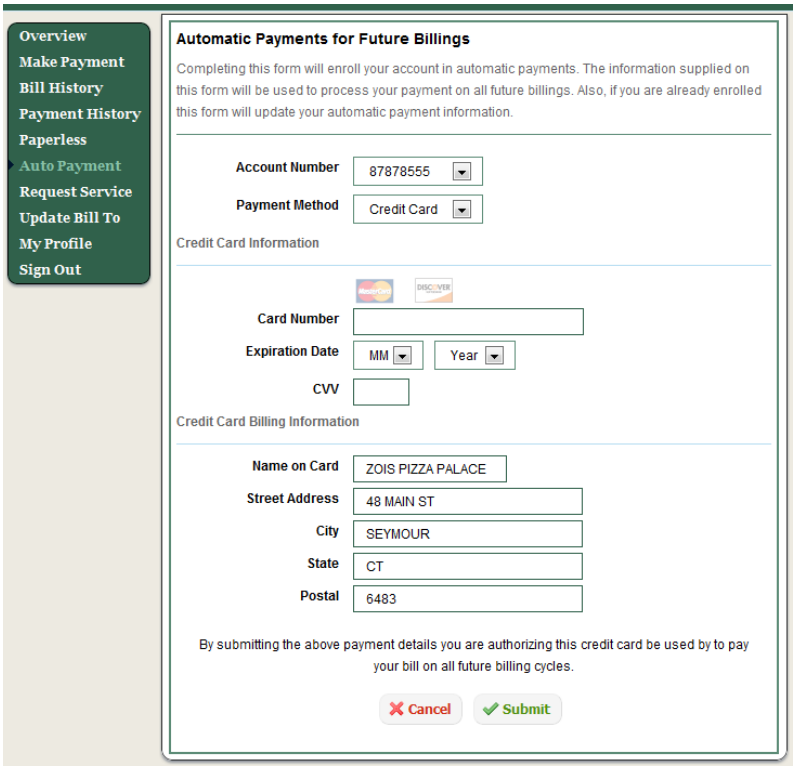


Figure 13 – Automatic Payments Credit Card Enrollment

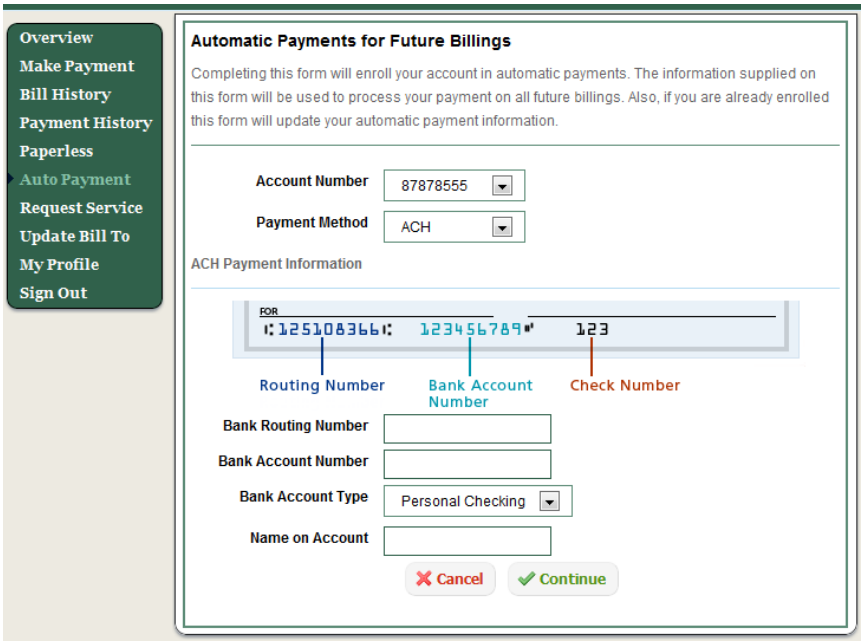


Figure 14 – Automatic Payments ACH Enrollment

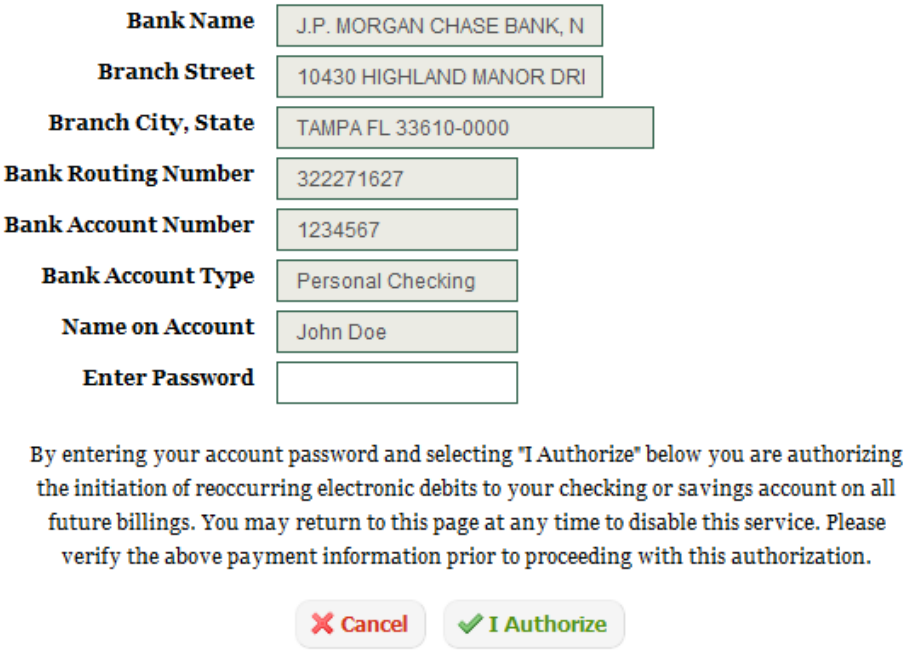


Figure 15 – Automatic Payments ACH Confirmation

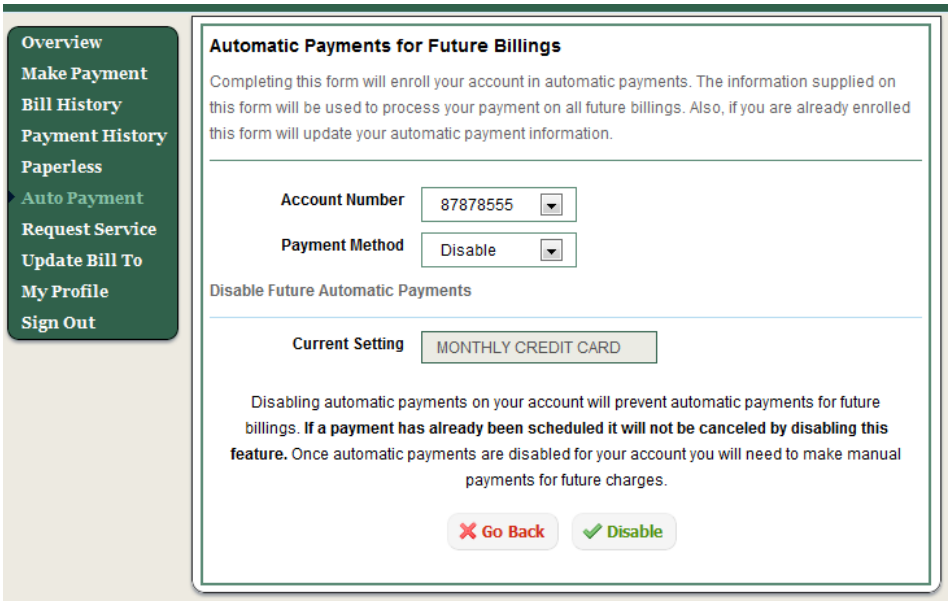


Figure 16 – Disable Automatic Payments with default message

Automatic Payments Configuration

EnCORE Web Portal Settings

- Option 6 enables Credit Card Enrollment
- Option 8 enables ACH Enrollment
- Option 20 allows CVV to be stored
- Option 24 sets alternative cancellation message
- Option 13 sets internal email address for CC Requests
- Option 14 sets internal email address for ACH Requests

Request Service

This feature allows customers with active web portal access to create a quote request.

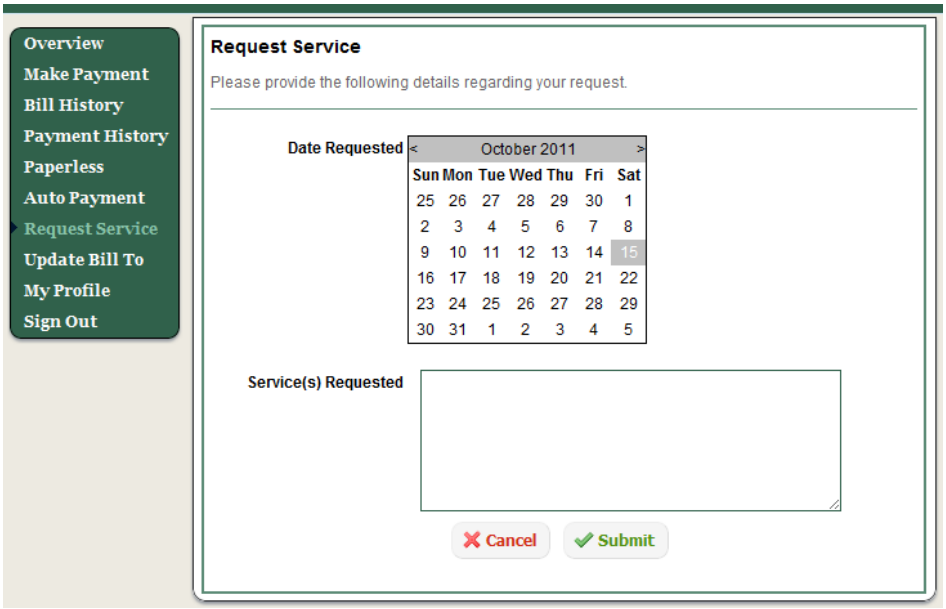


Figure 17 – Request Service

Request Service Configuration

EnCORE Web Portal Settings

- Option 5 enables Request Service
- Option 12 sets internal email address for Service Requests

Update Billing Information

This lets customers update the billing information on their account.

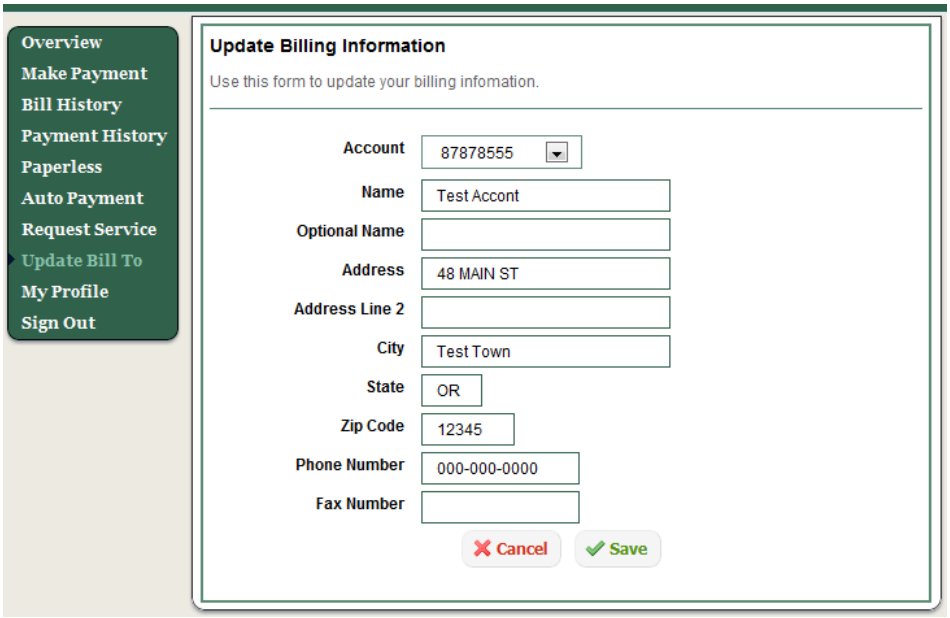


Figure 18 – Update Billing Information

Billing Information Configuration

EnCORE Web Portal Settings

- Option 4 enables Billing Information Updates

Web Portal Profile

Customers can use this feature to link additional accounts to their web portal username as well as update their username, email address, and password.

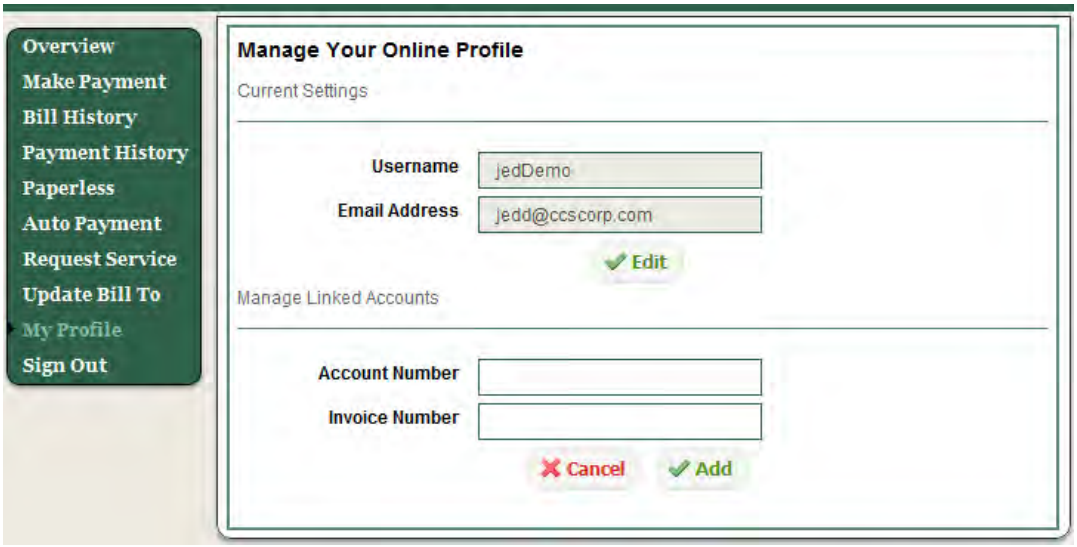


Figure 19 – Manage Online Profile

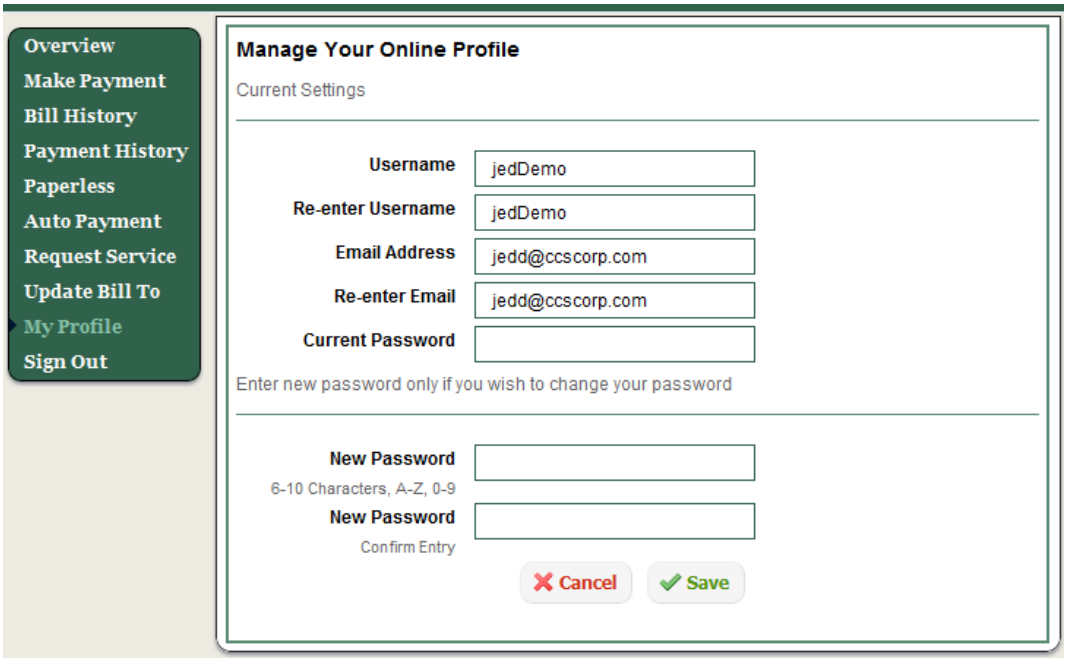


Figure 20 – Manage Account Settings

Miscellaneous Web Portal Pages

Get Help

This page allows the customer to request their web portal password be emailed to them. The email address that is entered must be the email address that is associated with their web portal account.

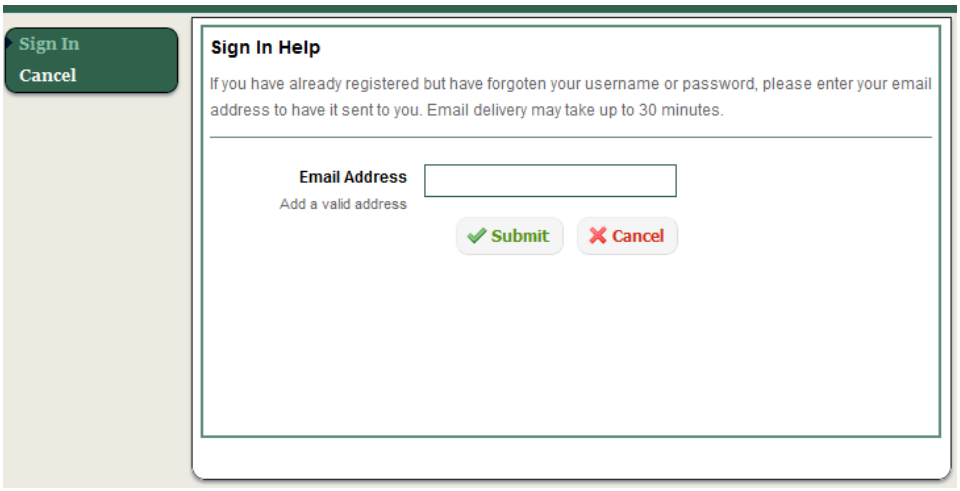


Figure 21 – Get Help

Request Quote

Users that do not have an account can use this feature to request a quote.

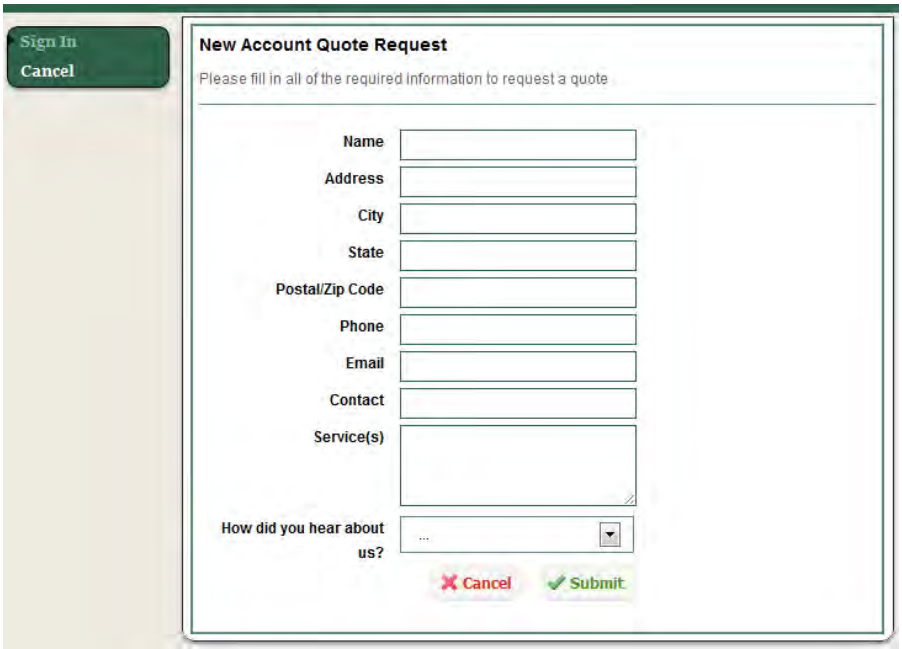


Figure 22 – Request Quote

Quote Configuration

EnCORE Web Portal Settings

- Option 2 enables Quote Requests
- Option 18 sets internal email address for quote requests

Disabled Access

Entire Customer Billing Statuses can have web portal access disabled (collections). If all linked accounts are disabled the customer will see this screen.

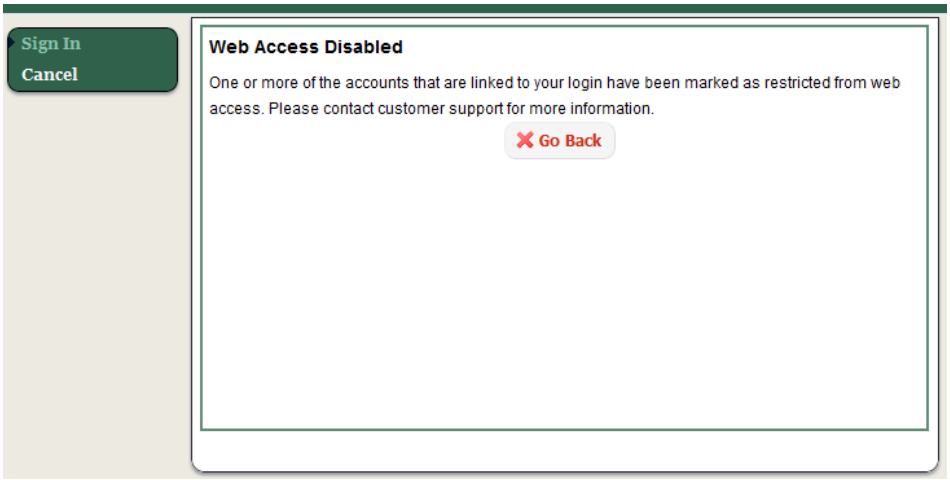


Figure 23 – Web Access Disabled

If the customer has multiple accounts linked to their online profile and at least one is able to access the web portal they will be allowed to log in. The disabled accounts will not show up in their drop down account list. On their My Profile page the accounts will list under “Manage Linked Accounts” as disabled.

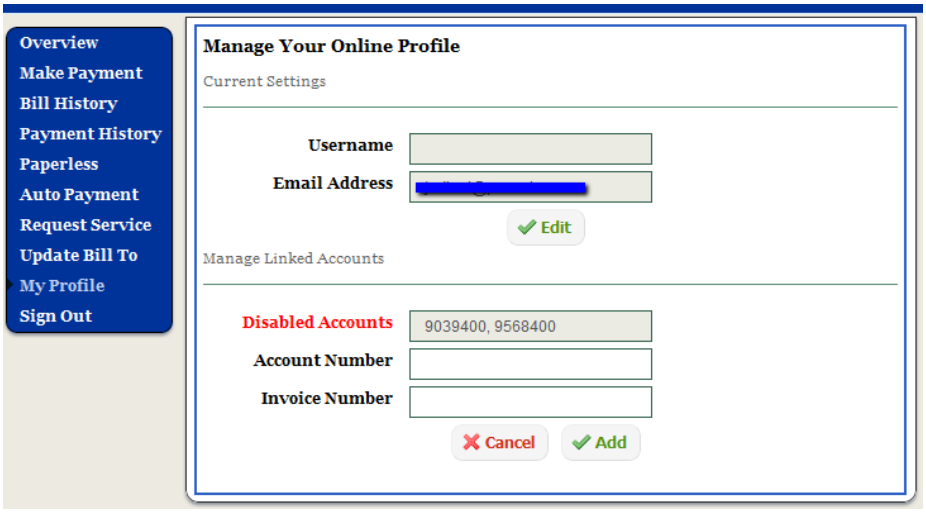


Figure 24 – Web Access Disabled on linked accounts

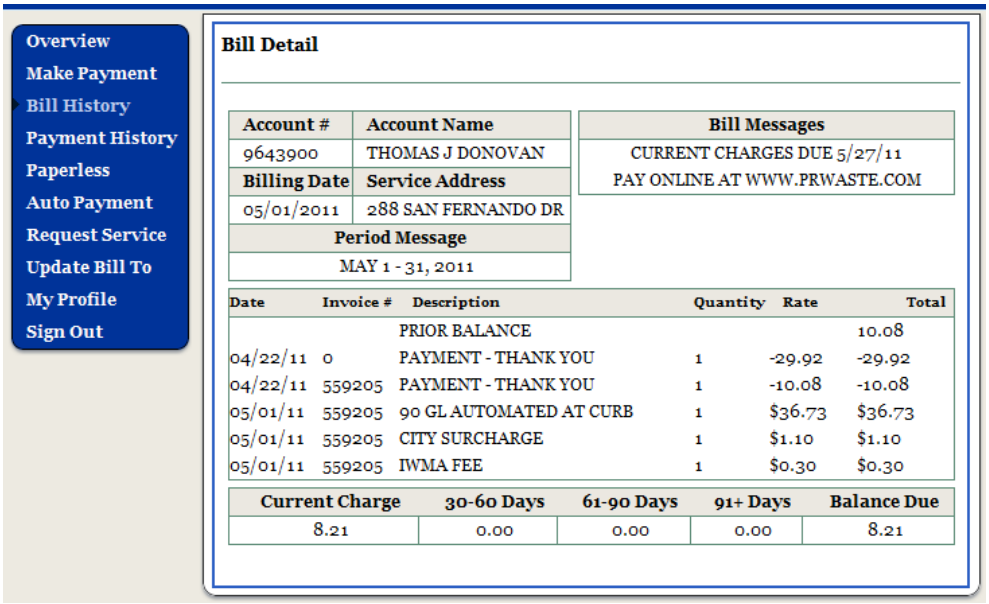
Disabling a Billing Status

EnCORE Options

- Customer Billing Status – Disable Web Portal

Bill Details Web View

Option web view of invoice/statement



Appendix

Web Portal Settings and Descriptions

The term "enable" refers to checking the "Enabled" box in EnCORE.

Option 1: Paperless

- When this feature is enabled customers will be able to enroll all of their linked accounts in E-Invoices by agreeing to the enrollment form.
- See related option 30.

Option 2: Quotes

- This feature allows potential customers to request a service quote. The quote form is accessible from the sign in page when enabled.
- You will receive an email at the address indicated on option 18 when a quote is requested.

Option 3: Payment History

- The feature lists the recent whole payments for each linked account.
- Pending & unposted payments are also displayed.

Option 4: Update Billing Information

- This feature allows customers to update their billing information for each linked account. Updates to billing information are automatic and will be logged on the account comments if option 11 is enabled.

Option 5: Service Requests

- Existing customers will have the option of requesting services through the web portal when this is enabled. You will receive an email at the account indicated under option 18 when a request is made.

Option 6: Autopay via Credit Card

- Customers will be able to enroll their linked accounts in credit card autopay.
- Customers will also be able to update their autopay credit card or disable autopay using this feature.

Option 7: Transaction History

- Customers will be able to view the summary and details of the last 12 invoices/statements on each of their linked accounts.
- The default option is to allow the customer to view the details of each invoice via a "web view" which is an HTML table that shows the details.
- An additional option (25) enables viewing the details in a PDF. See option 25 for more information.

Option 8: Autopay via ACH

- Customers will be able to enroll, update, and disable ACH autopay using this feature.

- The NACHA web requirement is met by requiring the customer to re-enter their web portal password to "sign" an authorization for your company to initiate ACH transactions. Also, the customer's IP is logged with a timestamp of the authorization.

Option 9: Not used

Option 10: Cut-Off Hour

- This is the business day cut off hour for all one-time credit card transactions. Any transaction that is entered after this time will be processed at the beginning of the next business day.
- Core must configure this option.

Option 11: Log Billing Changes to Customer Comments

- See option 4.

Option 12 -14: Internal email addresses for notifications

Option 15: Show Pricing

- This shows pricing information on the overview of the customer's currently active services.

Option 16: Log Paperless Requests to Customer Comments

Option 17: Log Web Portal Registration to Customer Comments

Option 18: Internal email address for Quote/Service Requests notifications

Option 19: Automatically Post One-Time Credit Card Payments

Option 20: Store Autopay CC CVV

Option 21: Log Autopay CC Changes to Customer Comments

Option 22: Enable One-time ACH payments

Option 23: Internal email address for One-time ACH payment notifications

Option 24: Enable alternative Autopay Disable Message

- Message must be set under Additional Configuration

Option 25: Enable viewing/printing/saving of PDF invoices

- Notify Core if you want to enable this feature. There are some behind the scenes modifications that need to be made.

Option 26: Require Terms & Conditions

- This feature prompts all users of the web portal to agree to the terms and conditions before allowing access.
- You must provide a plain text file of the terms and conditions that will be stored on the portal server before enabling this.

Option 27: Disable SSL Validation in Footer

- Only recommended if you are hosting your own web portal

Option 28: Automatically update Billing Email when customer successfully registers account via web portal.

Option 29: Enable Alternative confirmation email message

- Core must enable this.
- Send us the message text and we will configure it for you.

Option 30: Automatically apply paperless request

CORE Computing Solutions, Inc

Overnight Address:
4540 Southside Blvd, Suite 7
Jacksonville, FL 32216

Mailing Address
PO Box 56231
Jacksonville, FL 32241

The EnCORE Implementation Process

The EnCORE Implementation process has been proven over many years as the best way to get our new clients up and running in EnCORE in the shortest amount of time possible. You will be working with a dedicated CORE representative who will be involved at every phase of the project. As the project proceeds you will receive weekly reports that show progress being made toward the ultimate goal of Go Live in EnCORE.

The process can be broken down into the following phases. Many of the procedures are different for each new client, but the basic phases of the process always apply.

New Client Questionnaire

(Go Live - 50 days) The New Client Questionnaire serves as the basis for the entire implementation process. It is broken into three parts; company, customers, and configuration. You will complete the questionnaire and all other documentation in the implementation process online using Google Docs.

EnCORE Installation

(Go Live - 50 days) The first phase of the process is to get you into EnCORE. For local installs, Your IT staff will need to build a terminal server, a database server, and a web server. The requirements for these servers are outlined in New Client Questionnaire - Part 1. For hosted clients, CORE engineers will configure the EnCORE system and database and make it ready for you to access securely over the Internet.

Data Migration

(Go Live - 45 days) The specific steps for data migration vary widely from client to client. In some cases, all the data are entered into EnCORE manually. In other cases, extensive customer demographic, pricing, and routing data are migrated from your old system to EnCORE through data conversion. For conversions, the process usually begins by capturing screenshots of your old system. Then we get a copy of your data and develop programs to migrate the data into EnCORE. The screenshots are used to validate the conversion and you will have a chance to work with the data during training and compare it to your old system. We usually do a second cut a week or so before Go Live (see below).

Implementation Training

(Go Live - 15 days) Implementation training employs the "Train-the-Trainer" method and is conducted in four phases: Introduction, Configuration Training, Training Documentation, and Hands-on Training. Training can be conducted on site at the client's location, remotely over the Internet, or at CORE Headquarters. See Implementation Training Overview for more information.

Go Live

Go Live is when you completely transition to EnCORE for all of your operational and billing requirements. This always takes place on the first of the month. We will delete all transaction data from EnCORE for the previous month including all of last month's service orders, scale tickets, payment and charge batches, invoices, and all financial transaction history in the EnCORE database. Once you've completed billing out of your old system for the previous month, we will bring over your open balances and credits from your

old system into EnCORE so that you will be able to receive all payments in EnCORE from that point on.

Complete first monthly close-out

(Go Live + 35 days) Your trainer will help walk you through your first monthly close-out at the end of the Go Live month. Close out involves your first monthly billing for recurring charges from EnCORE, period lockdown for the closeout month, and CORE financial and general ledger reporting.

Move to maintenance status

(Go Live + 90 days) For approximately three months after Go Live you will be in "Critical Care" status when you will enjoy priority support and have unlimited data conversion and report customization services without additional charge. You will also be able to contact your trainer directly for any issues identified during training. At the end 3 months you will be moved to "Maintenance Status" for the duration of your relationship with CORE under the terms of your contract.

EnCORE™ 8.0 | Server & Workstation Requirements

EnCORE™ makes extensive use of industry standard hardware and software technologies. Almost any scale of implementation may be supported using inexpensive microcomputers and network servers. The following are the hardware and software requirements for the EnCORE™ | Financial and Operational Software System

LAN Network Requirements

- LAN Protocols supported by Microsoft Windows 2003, 2008, 2012 and .NET including TCP/IP
- LAN Cabling must be no less than ANSI Category 3 for a 10 Mbps Network and ANSI Category 5 for a 100 Mbps.
- Recommended baseline cabling configuration is verified ANSI Category 5.
- Hardware must be installed to enable LAN/WAN (via Secure Port) connectivity ie: NICs, Switches, Firewalls
- All network hardware must meet the minimum requirements of the network operating system and manufacturers recommendations to perform in a robust manner.

Workstation Requirements

Local Installation of EnCORE™ client only - No SQL Database

- Windows™ XP, 7 or 8 - Pro or better
- Intel™ based Processor Pentium or better (32 bit +)
- 2 GB or higher Ram
- 250 MB of available hard disk space
- + 500 MB Hard disk space if installing MapPoint
- VGA or higher resolution video adapter (1024 X 768 or better)
- Available USB port or CD/DVD Drive at the time of installation
- Wireless or Wired Network interface card (NIC) using TCP/IP protocol
- Keyboard & Compatible Mouse or other Point device

Local installation of EnCORE™ client with SQL Database

- Windows™ 7 Pro or better
- Intel™ based i7 Processor with 4 Cores (32 or 64 bit) or better
- 4 GB or higher Ram (8 GB Recommended)
- 8 GB of available hard disk space
- + 500 MB Hard disk space if installing MapPoint
- VGA or higher resolution video adapter (1024 X 768 or better)
- Available USB port or CD/DVD Drive at the time of installation
- Wireless or Wired Network interface card (NIC) using TCP/IP protocol
- Keyboard & Compatible Mouse or other Point device

Remote EnCORE Users - RDP, Citrix™, VM and other Thin Clients

- Any hardware device capable of running thin client software supported by provider
- VGA or higher resolution video adapter (1024 X 768 or better)

- Wireless or Wired Network interface card (NIC) using TCP/IP protocol
- CORE Cloud Users require installation of Tricerat ScrewDrivers Client v 4.7

Server Requirements

Minimum 1-10 Users

- Windows™ Server 2003 R2 or 2008 - Standard Edition - 64 bit
- SQL Server ™Version 2008 Standard Edition
- Intel™ Based Single Xeon™ or Itanium™ Processor 4 Core minimum
- 4GB Ram
- Hard Disk Storage of 50 GB on software RAID
- Backup software and recovery strategy
- VGA or higher resolution video adapter (1024 X 768 or better)
- Wired Network interface card (NIC) using TCP/IP protocol
- Keyboard & Compatible Mouse or other Point device
- Uninterruptible Power Supply

Minimum Recommended for 10+ Users

- Redundant Power Supplies
- Dedicated Quad Channel Hardware Raid 5/10 controller
- Dual Xeon™ or Itanium™ Processor 6 Core minimum
- 8GB Ram

Virtualized Application Server Requirements - Remote Desktop, Citrix™ , HyperV™, VMWare™

- Windows Server 2003 R2 or newer
- .NET Framework 4.0
- 256 MB Ram per user
- Max 12 Users per Core

Microsoft SQL Server™ Requirements - Scaled Usage

Not all users in EnCORE™ perform the same business functions so the relationship between the number of users and SQL server resources used is not linear, nor is the number of customers and db size. To more accurately determine these requirements CORE uses a method called *Weighted Monthly Transaction Volume* (WMTV), see figure 1.1, which is based on EnCORE usage in live production systems. Once a WMTV has been calculated the actual resources needed can be accurately determined in figure 1.2 .

Transaction Type	Monthly Trans Volume	X Weight Value	= *WMTV*
Recurring Charges	22500	0.85	19125
Manual Charges	12500	0.78	9750
Tax Line Entries	20000	0.35	7000
Fee Line Entries	20000	0.25	5000
Invoices Generated	35000	0.5	17500
Lockbox Entries Imported	22000	0.18	3960
Payments Entered in batches	8500	0.45	3825
Credit Card Transactions Processed	5000	0.55	2750
Customer Call Volume	2200	0.36	792
Scale Tickets	2598	2.25	5845.5
Oncall/Service Orders	2500	3.75	9375
Web Portal Customer Logons	5000	0.25	1250
Customer Route Pickups	97425	0.25	24356.25
Cutomer Route Pickups eMobile	0	0.25	0
Routeware Customers Serviced	0	0.75	0
Routeware Oncall Orders Serviced	0	0.85	0
Fleetmind Customers Serviced	85000	0.75	63750
Fleetmind Oncall Orders Serviced	2000	0.85	1700
		Total MWTV	175978.75

Figure 1.1 - WMTV Sample Calculation Methodology

SQL RAM	# Proc Cores	*WMTV*
8	4	< 50,000
8	6	75,000
16	6	100,000
16	8	150,000
16	8	200,000
16	12	300,000
16	12	350,000
16	12	400,000
32	16	450,000
32	16	500,000
32	16	550,000
32	16	600,000
64	24	650,000
64	24	700,000

Figure 1.2 - MWTV Resource Requirements SQL Ram & Processor Cores

Additional Server Requirements & Recommendations

- Microsoft™ recommends that the Domain Controller, SQL Server™, IIS™ Server and Terminal Server ™ be installed on separate server instances.
- Separate volumes for the Server OS, Applications and paging files on all servers recommended.
- When EnCORE™ client is installed locally on multiple workstations across domain, deployment via MSI Group Policy required.
- Customer Web Portal requires: IIS™ Ver 5 or better, 2 GB Ram, SSL Certificate installed on web server
- Routeware™ & Fleetmind™ Integrations require a FTP server for inter system communications

For additional information or clarification on the contents of this document please contact us at: support@ccscorp.com or 800-909-3630 X 2.

Appendix 5D

RAMS Pro

R3

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VISUAL RAMS-PRO

OFFICE SOLUTIONS THAT DRIVE SUCCESS

ONE LOOK AT THE ROUTE ACCOUNTS MANAGEMENT SYSTEM

(RAMS) exposes a highly evolved and well balanced design. This refined solution brings benefit to every department in your business. For over 34 years we have listened to our clients and as a result, our design team has considered every nuance of the industry to bring you Visual RAMS-Pro, a solution representing what only time and experience can attain; The Route to Success!

Alpine TECHNOLOGY CORPORATION

KEY FEATURES

- Customer Information
- Billing
- Route Integration
- Container Tracking
- Work Flow
- Service Diagram
- Application Links
- In / Out Trays
- Reports
- Accounting
- Security
- Help & Documentation
- Custom Features

OFFICE

BENEFITS

Retain Your Customers

Your biggest asset is your customers. Visual RAMS Pro (VRP) allows you to service them accurately and quickly with instant access to customer details.

Work more efficiently

Double-entry, miscommunication and multiple applications can bog a company down. VRP is a comprehensive solution that gives you the tools to fine tune your office processes so information, work orders and communication is streamlined. Your dispatchers, entry operators and CSR's will work more efficiently and productively.

Automate your billing

You do not need a third-party billing system, VRP's billing module is fully integrated and allows you to perform all the functions you need to manage charges, invoices, Electronic Funds Transfers, and transaction detail history.

Track your drivers

Fully integrates with Visual On-Route to provide dispatchers and operations real-time communication from your drivers as to where exactly trucks are, the status of each job and much more.

Run your business

Management needs to have the right information to make the right financial decisions. VRP gives you accurate, bottom-line figures and extensive reporting capabilities so you can not only allow your business to run more efficiently, but more profitably as well.

Customize your experience-Empowerment Tools

Our mission is to provide the most comprehensive core product available, and then to further enhance its application to your business style. Empowerment Tools allow you to extend Visual RAMS Pro to fit your exact business practices. These tools take the core product far beyond the typical canned software solution into the realm of possibilities. You can refine existing processes and maximize productivity.

RAM SCAN

Custom Process Codes do complicated sequences of tasks with the swipe of a barcode and eliminate hours of administrative work. Up to 100 signed tickets scanned into your Database at the touch of a button. Invoices printed along with Service receipts RAMScan guarantees to save your company time and money, as well as improve your efficiency with any system that we install. We will gladly meet with you to discuss how we can help you with any data capture requirement that you currently perform or are in the process of developing, that is not currently utilizing barcodes.

Alpine TECHNOLOGY CORPORATION

1.888.852.7267

www.rams-pro.com | info@rams-pro.com

Alpine Technology Corporation has a reputation of over 34 years of bringing reliable and usable software to the waste industry and stands behind its solutions. Visual RAMS Pro is more than an ERP or CRM system, it is a tool to help you run your business…not it run you!

VISUAL ON ROUTE

MUCH MORE THAN JUST A GPS SYSTEM

VISUAL ON ROUTE IS MORE

than just a GPS system, it is like putting an administrative assistant in every truck. VOR provides the optimum path to efficient navigation, communication, billing and customer service. And while helping improve route operations, it quietly collects information to take productivity tracking and reporting to a level of accuracy unattainable until now.

Alpine TECHNOLOGY CORPORATION

KEY FEATURES

- Moving Map
- Map calculates route
- Automatically senses and records service
- Records data real-time
- Driver can record “not outs”
- Dispatches sent real-time
- General instant messaging
- Productivity and profitability reports
- Rugged equipment

FIELD

BENEFITS

Save on fuel and labor costs

On-Route warns the driver if a service is missed or out of sequence preventing costly return trips. The Navigator route service map display cuts the learning time for new and temporary drivers.

Connect the office and the driver

On-Route continuously reports truck position and service status to the office while dispatched service changes are quickly sent to the truck computer. The Dispatch Desk displays service status and can split routes or re-route to cover breakdowns.

Total Integration

Total integration is a key factor to saving valuable time in the office. On-Route talks directly with our premiere waste office management system, Visual RAMS-Pro, to automatically produce route lists including up to the minute changes and dispatches. It also takes care of billing extra services and notifies the proper personnel to resolve service issues. Combine the time saved in the office and on the route to that of fuel and maintenance, and you'll find an exceptionally quick return on investment and faster profitability.

Lower truck maintenance

On-Route uses GPS to continuously record truck acceleration, speed and braking data. Route playback reports provide color coded driving profiles to show how adjusting driving habits can reduce wear and tear on the truck.

Technology you can trust

On-Route has been specifically designed from the start to meet the special demands and harsh environments of the Waste Industry. Our design team evaluated the actual driving conditions and observed the challenges faced by drivers. As with all our Waste Management Technology solutions, we continue to research ways to improve On-Route to help businesses become more efficient.

Increase driver safety

No more missed cell phone calls or forgotten instructions to distract the driver while trying to navigate traffic. Message Manager provides instant text messaging displayed on the map next to the service location.

Generate additional revenue

Too often events occur on a route that unfortunately are forgotten and not captured. Not only does this make it impossible to accurately update the office but it also removes the opportunity to capture the extra revenue. Additional containers, special collections and extra yard trimmings are just a few of those events that, if accurately recorded, can represent substantial revenue.

Alpine TECHNOLOGY CORPORATION

1.888.852.7267

www.rams-pro.com | info@rams-pro.com

Alpine Technology Corporation has a reputation of over 34 years of bringing reliable and usable software to the waste industry and stands behind its solutions. The advanced GPS and Routing technology is unrivaled in the industry.

On-Route/RAMS Pro Software Specifications

Alpine Technology Corporation has 34 years serving the Waste Industry. All its software is designed specifically for the solid waste industry. Alpine's on-truck computer system, Visual On-Route, integrates seamlessly with the industry's premier office solution, RAMS-Pro. The combination of these two solutions allows any hauler or municipality to maximize productivity of the drivers, respond quickly and competently to customers, and ensure efficiency in communication and work order flow. Also, the integration of On-Route with ruggedized tablet has been, in our experience, seamless and without problems.

On-Route Software Solution (Visual On-Route) for the vehicle computer. Some of the features include:

- Solution integrates seamlessly with Visual RAMS-Pro Version 10.
- Proposed solution shall be able to guide drivers through a route. Such routes can be imported at any point and updated real-time to drivers.
- System provides real time GPS tracking coupled with moving Google maps.
- System shall be able to archive all route activity, service exceptions and customer request information for three (3) years.
- System has touch-technology for ease-of-use for driver and minimizing distractions.
- System automatically logs service without driver intervention.
- System has multiple displays for driver including map view and route sequence.
- System automatically displays notes specific to customer account when driver reaches location.
- System automatically notifies office when route sequence is not followed or driver moves beyond specific geo-zone.
- System provides for geo-fencing capabilities to log specific activities within a geographic area as well as notify office when these geographic areas are crossed.
- System audibly notifies driver when location is serviced.
- System provides real-time messaging capabilities between office and driver.
- System, via touch technology, allows driver to log extras, not outs, and service issues.
- System integrates with cameras; linking photos automatically to customer account in RAMS.
- System allows for driver to generate work orders and link real-time to customer account.
- System allows for routes and sequences to be updated real-time.
- System allows routes to be portable, real-time, to other trucks.
- System has the ability to generate reports to track productivity and profitability of routes. User can also create customizable reports as needed.
- Route Management Solution shall capture the following data sets:
  - Type of Service
  - Truck number
  - Starting hour meter
  - Material on board
  - Custom zones (Geofence) entry and exit times, alerts
  - **Routing activity Times:**

    Departure
    First Stop

Last stop before dump run
Time at each service
Arrive at dump
Left dump
Sequence repeat unit route terms
Return to yard
Breaks
Lunch
Time on route
Stops longer than “x” time

- **Mileage Tracking**
  Service confirmation
  Service failure and reason
  Route sequence
  Extra pickups
  Special pickups
  Container condition
  Lifts
  Location
  Average Speed
  Direction
  Landfill events
  Dump location Arrival time
  Weight (gross, net)
  Departure time
  Route restrictions
  Pre and post inspection information
  Hydraulic leak walk-around inspections

RAMS-Pro Version 10 (Visual RAMS Pro)- Back Office Software Solution. Some of the features include:

- Solution seamlessly integrates with in-cab proprietary software, Visual On-Route.
- Solution allows staff to easily create routes and reconfigure them as necessary.
- Solution allows “not-outs”, exceptions, and service issues to be updated real-time and connected to the customer account.
- Solution provides for real-time communication between office and drivers.
- Solution provides a map-interface that displays all the trucks and their location.
- Solution displays all alarms that are preconfigured by office staff that alert the office when a zone is breached, route sequence is breached, etc…
- Solution allows staff to modify route sequences or create new routes and update real-time specific vehicles.

- System allows photos, work orders, and service exceptions/completions to be displayed when CSR views the customer service diagram (a single-screen view of all the customer information and services).
- Solution displays all documents associated with the customer in the service diagram.
- Service diagram allows for instant access to customer information and the ability to make modifications.
- Solution enables CSR's to quickly and efficiently modify all customer information including:
  - Service starts, stops, changes
  - Container management
  - Billing information
  - Extra pick-ups and more
- Solution allows for the tracking and management of the organization's container inventory.
- Solution allows for the creation and flow of work orders, including On-Call contract scheduling
- Solution provides for a "tray" communication system that allows work orders to move through departments without additional entries. This feature integrates with truck computers as well.
- Solution integrates with third party financial and billing applications.
- Solution provides an extended list of reports as well as the ability to generate custom reports.
- Solution is SQL based and can be accessed to generate additional reports or export data to another application.

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Appendix 5E

Soft-Pak

R3

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Soft-Pak™
Integrated Software Solutions
for the Waste Industry

e-Pak

WEB BASED CUSTOMER MANAGEMENT, BILLING AND OPERATIONS SOFTWARE

Our powerful **e-Pak** solution provides all the tools needed to effectively manage your business without the hardware investment. Find out why so many companies trust **e-Pak** for their software needs.

Soft-Pak's e-Pak web service solution can be accessed using a high speed internet connection, virtually eliminating up front hardware costs. Soft-Pak will manage the server and backups allowing you to focus on your business.

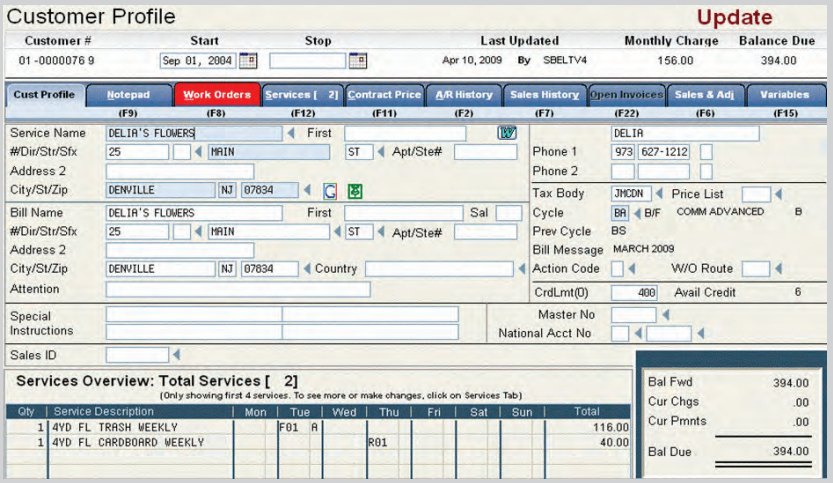
- Customer Service
- Billing and Collections
- Dispatching & Routing
- Credit Card Processing
- Accounts Receivable
- Standard & Customized Reports
- Use Existing Printers and Workstations
- Productivity and Costing Analysis for:
  - Roll-Off
  - Commercial
  - Residential

Soft-Pak also offers option software modules for e-Pak :

- Web-Pak website payment & email billing
- Scale-Pak scale house management
- Vehicle Management for fleet maintenance
- Sales-Pak managing sales force activities
- On-Board Computers for paperless routes and real time route activity
- Interface with most accounting packages.

Additional e-Pak advantages:

- Free annual upgrades
- Annual user conference
- Free introductory webinars available



Many software packages offer service, billing and routing functions, only **e-Pak brings them all together** in a seamless integrated web solution to guarantee proper customer billing!

Why e-Pak?

Soft-Pak provides scalable solutions to support our customer's current and growing business needs. **e-Pak is a secure internet based solution** that provides complete customer management and billing functionality without the initial hardware investment. Ideal for small and medium sized businesses, all you need is internet access.

SOFT-PAK DATA CENTER HIGHLIGHTS

- **Continual investment to state of the art data center**
- **Secure data storage, redundant backups and full disaster recovery capabilities**
- **Engineered to require little bandwidth for fast data transmission**
- **e-Pak is a platform independent solution that will work with existing hardware**

FEATURE AND FUNCTION OVERVIEW

CUSTOMER SERVICE FEATURES

Customer profile • A/R history • Customer notes
Sales history • Work orders
Open invoices • Routed services • Service history
Contract pricing • All changes tracked

All accessible from the Customer Profile screen

OPERATIONS FEATURES

Live dispatch screen • Mapping • Inactivity reporting
View route lists screen • Route manager
Scheduled route list • Container tracking • Geo coding
On call work order list • Services reporting

All accessible from the Operations screen

ACCOUNTING FEATURES

Credit card payments • Cash & accrual basis
Batch payments • On demand aging
Interactive payments • Collections
Service prorations • Excel data downloads
Tax and fees reporting • Financial reporting

All accessible from the Customer Profile screen

BILLING FEATURES

Recurring charges • Test billing function
Tax & fee generation • Correct billing errors
Finance charges • Smart billing template
Invoices & statements • Billing messages
Master/sub accounts • Flexible bill schedules

All accessible from the Billing screen

ADDITIONAL FUNCTIONS

Accounting Interfaces - export journal entries to your accounting package
Address Master - default service and pricing information based on location
Collections Processing - manage past due customers internally or via 3rd party collection agency
Credit Card Processing - one time processing with instant authorization and available recurring transactions
Credit Limits - individual or system generated credit limits with supervisor override ability
Customer Service Module - Allows for one centralized point to answer all customer service questions
Dispatch - Real time updates to manage all work orders. Sort screen views by dispatcher preference
Disposal Site Reconciliation - Report on all materials taken to every disposal site
Electronic Funds Transfer (EFT) Module - Automatically debits customer bank account for recurring charges
Lock Box Processing - Upload cash receipts file from your bank directly into e-Pak
Microsoft Integration - Seamless integration with Microsoft Word®, Excel®, MapPoint® and Outlook®
ODBC Integration - Access e-Pak data using standard ODBC
Route Management - Allows you to move stops between routes and re-sequence them interactively - all on one screen
Security - User defined software access with audit trail tracking
Variable Reports - User defined reports can be printed or exported to Microsoft Excel®
Work Orders - Manage on call and extra work on a daily basis for painless, accurate billing

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Mobile-Pak

Soft-Pak™
SOFTWARE SOLUTIONS

IN-TRUCK COMPUTING MADE EASY AND AFFORDABLE

EXTEND THE VALUE OF YOUR **i-Pak** OR **e-Pak** APPLICATION WITH **Mobile-Pak**

With **Mobile-Pak,** drivers can easily view and scroll through their route list, update stop activity, and locate their next stop in Google maps. All route activity is entered via drop down selections and instantly transmitted back to i-Pak or e-pak. The driver's activity and GPS location is sent to i-Pak or e-Pak in real time, updating the stop information in the customer's account as well as productivity, work orders, billing and route follow-up.

Mobile-Pak is designed on the Android tablet platform, allowing devices to be mounted in the cab for easy viewing/one click use. The tablets are also mobile and rugged to allow for signature capture or picture taking with the images available in the customer's account. All **Mobile-Pak** tablets report their GPS location in real time so customer service and dispatching are aware of vehicle locations (requires **Map-Pak**). **Mobile-Pak** provides reliable in-cab computing that improves efficiency for drivers and customer service.

Easy one-click 'COMPLETE' or 'HOLD" with capability for drivers notes.

Finally... an affordable mobile device that extends data communication to increase driver efficiency.

Mobile-Pak COMES WITH:

- Scheduled and on call work sent instantly to the drivers
- GPS vehicle display with viewable map to locate next stop
- Picture taking for overloaded / blocked containers
- Capture signatures for customer verification
- Geo Code each stop for route management
- Enter scale information from disposal /transfer facility
- Proven reliable with no downtime for software updates
- All driver activity is recorded for playback purposes
- Connect to OnBoard Scales for automated weight entry
- Optional rugged cases and in-cab mounts available

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Soft-Pak™
SOFTWARE SOLUTIONS

Web-Pak

LET CUSTOMERS VIEW & PAY THEIR BILLS ONLINE AND REQUEST NEW SERVICES.

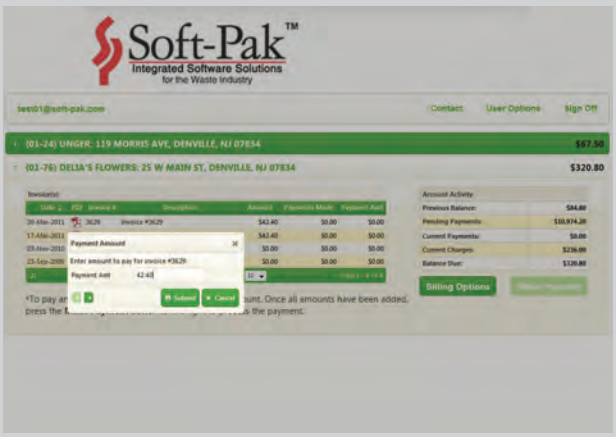
WEB-PAK ALLOWS **i-Pak** & **e-Pak** CUSTOMERS TO VIEW THEIR CURRENT BILLS, MAKE PAYMENTS, ORDER SERVICES, AND RECEIVE MONTHLY E-MAIL STATEMENT ALERTS… ALL FROM YOUR CURRENT WEBSITE.

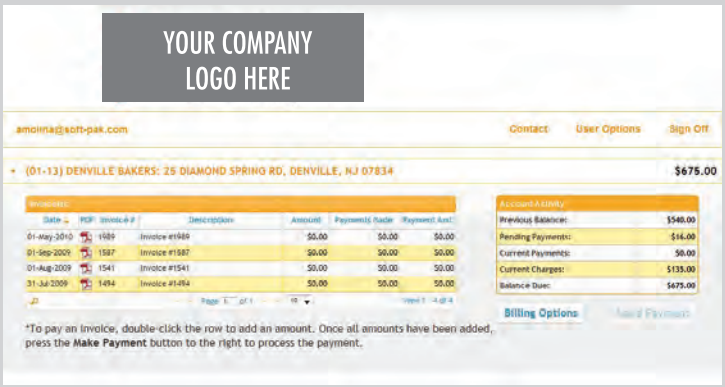
Web based payments are here to stay, and Soft-Pak has made it easy for waste haulers to extend this convenience. A link on your website "pay bills here" and **Web-Pak** provides secure access to your clients account. Customers can view their bills, make payments online, and order new services.

All payments are posted real time in **i-Pak** and **e-Pak**, allowing instant feedback for your clients and eliminating the concern of manual credit card processing and collection efforts.

Reduce your printing and mailing expenses while collecting receivables faster. All transactions are secure and recorded with audit trails. Separate your business from the competition and offer the service your clients are asking for.

Looking for lower VISA/MasterCard/AMEX processing rates? Soft-Pak partners have utility rate pricing for waste haulers. Visit our website to learn more: www.soft-pak.com/modules





WITH **Web-Pak**, YOUR CUSTOMERS CAN:

- Have the convenience of paying bills online
- Review invoice details
- Make full or partial payments to invoices
- Receive e-mail alerts for monthly statements
- No more printing/mailing of bills
- Request new services
- View route activity

THE BENEFITS OF **Web-Pak**

- Allow your customers to sign up for paperless billing
- PCI Compliant with tokenization built in
- Lower your monthly postage and printing costs
- Allow customers to view account services and make payments on selected invoiced
- Customers can request service: new service, changes in service, extra pick ups, etc.
- Lower credit card processing rates with increased traffic
- Collect payments faster
- Provide services that your competition does not

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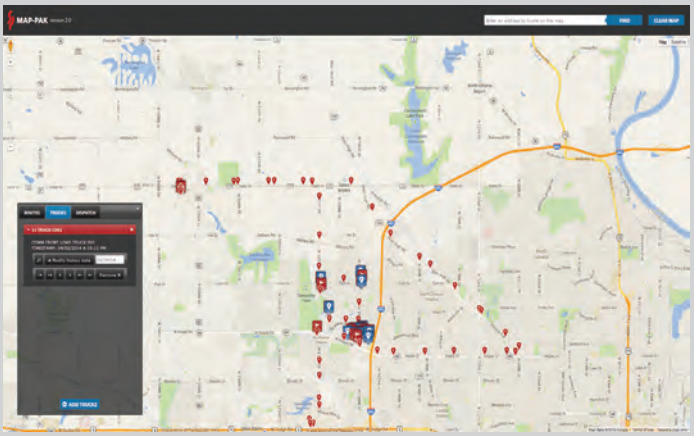
Soft-Pak™
SOFTWARE SOLUTIONS

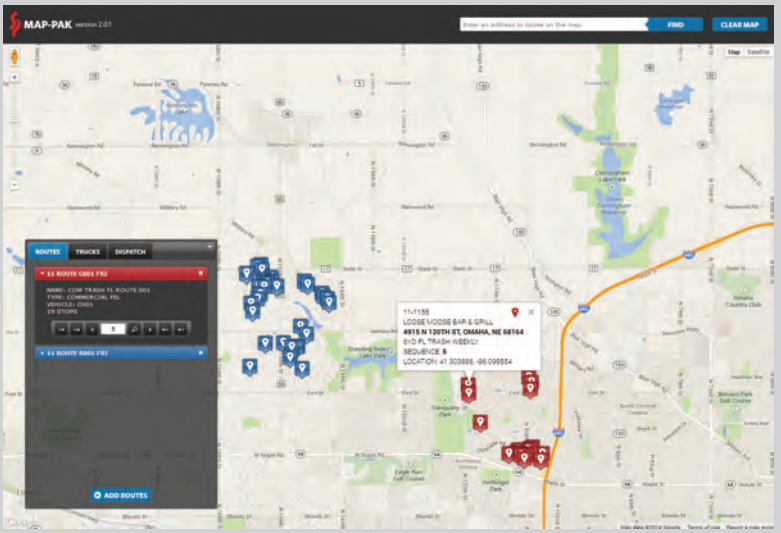
Map-Pak

EASILY VIEW ROUTES, STOPS & GPS TRACKING

Map-Pak works on the Google Maps™ platform, the most powerful and cost effective mapping application on the market. Easily view and display all routes and their stops from the Soft-Pak dispatching center. Click on any stop to verify account information while easily identifying overlapping stops to improve route efficiencies. Take advantage of Google Maps™ route optimization to re-sequence and improve route performance and profitability. All data flows back to Soft-Pak for easy accountability and back office reporting.

Map-Pak and **Mobile-Pak** work together by displaying the location of all active mobile devices. Each driver's GPS location is sent to Soft-Pak in real time, providing instant vehicle verification and playback purposes to insure driver efficiencies.





Identify your different routes in real time with **Mobile-Pak**. Red is route C1, Blue is an route R1 (see above)

THE BENEFITS TO **Map-Pak:**

- Visually display routes in various colors
- No software to load
- Everything is run via 'the cloud'
- Utilize Google Map™ for terrain, traffic, or satellite views
- Live traffic updates for drivers and dispatching
- Geo Code directly from hand held to 'pin point' a stop
- Route optimization and re-sequence via Google Maps™
- Display and record all driver activities for playback purposes
- Increased customer service with driver and route verification

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Appendix 5F

FleetMind

R3

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GD4010:
Ruggedized Smart Displays for Waste Collection Vehicles

FleetMind

Tough environments demand tough solutions

FleetMind's new GD4010 Smart Display by General Dynamics Canada is a lightweight, rugged touchscreen display that provides waste and recycling organizations with the most robust and the toughest onboard computing platform. In a complete package that is fully-integrated and easy-to-install, the GD4010 provides unprecedented real-time information to drivers and dispatchers about a truck's load-weight, route status, service completion, vehicular telemetry, driver activities and much more.

The GD4010 is part of the General Dynamics tactical computing and display product line for vehicle and handheld applications. It manages a wide range of inputs from a vehicle's on-board systems including cameras, scales, RFID readers, tire pressure and fuel monitoring, as well as other devices. Developed for tanks and harsh military environments, the GD 4010 includes an advanced feature set within a smaller, more compact package eliminating the need for multiple individual components.

GENERAL DYNAMICS
Canada

Key Benefits:

- Designed for demanding operating environments
- View-able in the brightest sunlight or snow-glare conditions
- Reduces clutter by combining advanced functionality in a single housing
- Easily integrates into existing vehicle and back-office systems
- Multiple inputs for cameras, scales, CANbus, USB and other serial devices
- Meets the MIL870 standards for shock, vibration and temperature
- Meets IP65 standards for dust and waterproofing
- Can be operated with gloved hands

Advanced features:

10.4” diagonal 1024x768 pixel, sunlight view-able display

Vehicle bus (CANbus) interfaces

Intel™ Atom processor: 1.6 GHz, 2 GB Ram, 16 GB SSHD Micro SD card support

Ethernet, serial and USB ports

Camera/video input and digitization

VOIP capabilities

Video switching and multi-plexing, video recording & shapshot capture

Shock detection circuitry

4G multi-network and Wi-Fi communications

A simpler, more flexible installation

Why buy or upgrade to the GD4010?

The GD4010 has the following distinct advantages over other display products:

- Most powerful display/computing platform on the market
- Durability and leading-edge technology ensures long-term ROI
- Easier to install
- All-in-one unit eliminates need for multiple solutions
- Military grade unit can withstand toughest environments
- Runs the latest Windows embedded versions
- Expanded memory and superior processing power
- Shock detection for accident and vehicle damage alerts
- Video recording and ability to see live camera feed from back office
- Picture capture capabilities
- Integrates with FleetMind scales and RFID reader
- Automated service verification
- J1939 and J1708 support (J1708 requires converter)
- Improved driver experience
- Improved safety due to automation and reaction speeds
- Complete visibility in direct sunlight or snow glare
- Touchscreen can be operated with gloves
- Ensures real-time remote connectivity between back office and vehicle

Technical Specifications

PROCESSING

Robust computing capabilities ensure longevity

- Windows Embedded Standard 7
- Intel ATOM E680T processor operating at 1.6 GHz
- Intel EG20T I/O Hub
- 2 GB DDR2 SDRAM
- 16 GB Solid State Drive
- Support for MicroSD storage expansion card

DISPLAY

Advanced touchscreen is easier to use

- 10.4" touchscreen display
- 1025 x 768 resolution (XGA)
- Resistive touchscreen suitable for gloved operation
- Anti-glare protective glass
- Adaptive backlight technology
- 500:1 minimum contrast ratio
- Automatic ambient light adjustment
- Viewable in bright sunlight or snow glare

I/O AND DATA ACQUISITION

Advanced connection capabilities

- 4 Discrete Digital Inputs
- 4 Discrete Digital Outputs
- 1 amplified audio output
- 1 microphone input
- 2 CAN interface for connection to the truck ECM
- Triaxial accelerometer for 3 dimensional shock detection
- High precision GPS receiver (3m resolution)

VIDEO

Complete and real-time visibility

- Integrated QUAD video switcher / multiplexer
- Supports up to 4 truck cameras with audio and power
- Video recording from any of the 4 connected truck cameras
- Snapshot capture from any of the 4 connected truck cameras
- Remote live video streaming

COMMUNICATIONS

Advanced communications capabilities

- Integrated GOBI3000 Multi-network modem (supports EVDO and HSPA)
- WiFi client or hotspot
- Voice over IP support
- 2 serial ports
- 2 Gigabit Ethernet Interfaces
- 2 USB ports

ENVIRONMENTAL STANDARDS

Withstands extreme temperatures and conditions

- IP65 dust and water proofing
- Mil-STD-1275B for voltage fluctuations
- MIL-STD-810F for shock and vibration
- Operating range from -30C to +70C
- Storage Temperature from -30C to +80C
- MIL-STD 810F for aggravated temperature and humidity cycles
- FCC47 part 15
- CSA Approved

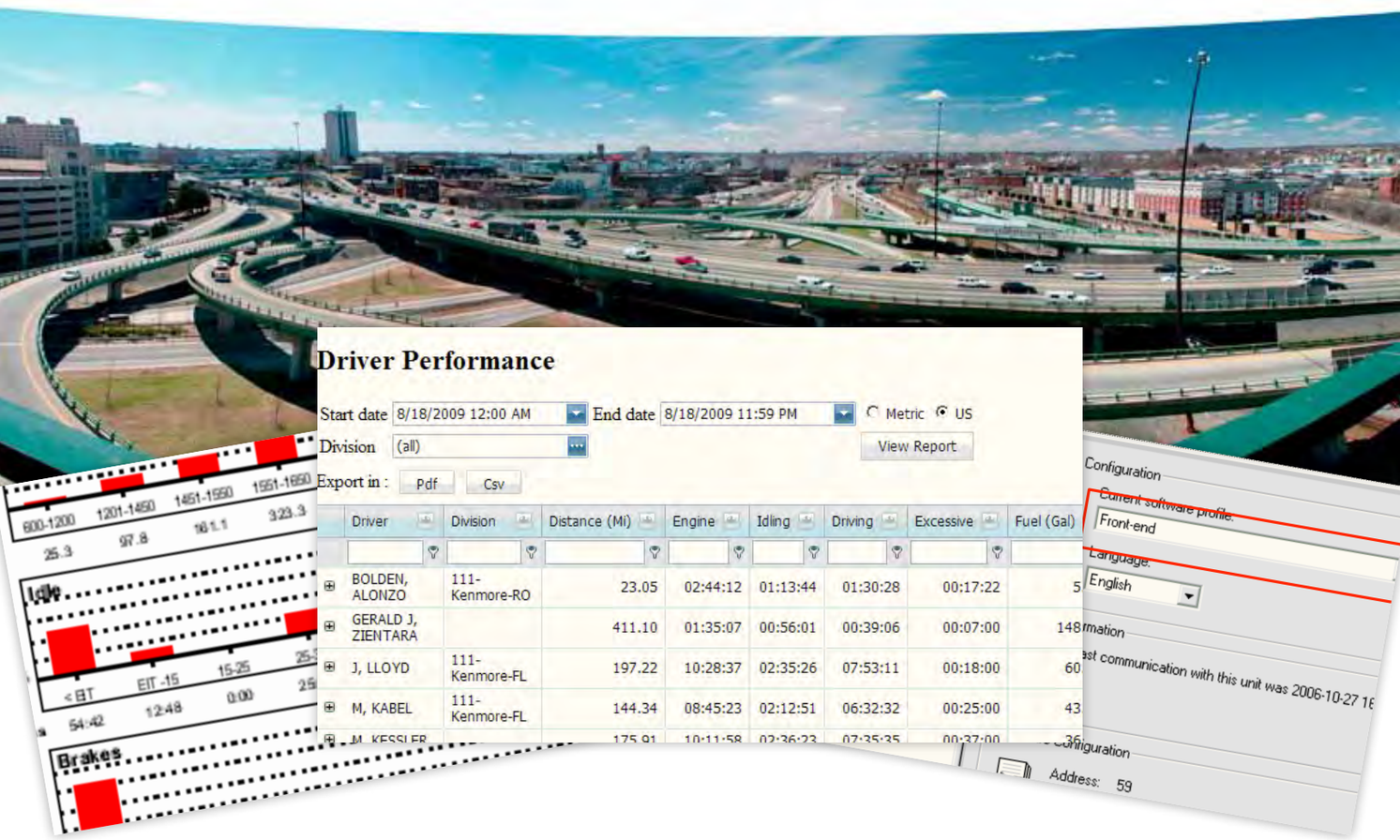
FleetMind Solutions, Inc. is the award-winning technology leader for fleet management solutions. FleetMind's technology is derived from over 10 years and millions of dollars invested in developing the industry's best and most advanced fleet solutions specifically designed for waste and recycling environments. FleetMind solutions have been successfully installed in thousands of vehicles across North America. Our products have allowed the industry's largest waste and recycling fleets to link their drivers and vehicles to business operations in real-time to ensure improved productivity, safety, sustainability, profitability and customer service.

FleetMind Solutions Inc.
Fleet management solutions for better business results

www.fleetmind.com
888 639 1666 ext. 350

Link your mobile assets to your fleet management operations

Tap into valuable truck data to improve performance and reduce costs



FleetMind combines its onboard computer (OBC) with mobile communications capabilities to capture and store electronic control module (ECM) and other vehicular data to provide accurate performance reporting and real-time alerts. This information is essential toward improving fleet performance and reducing costs.

To gain the best insights for fleet operations improvements – you need to collect information from multiple locations on a vehicle. FleetMind's fleet management solution digs deeper to collect data from sensors connected directly to the OBC from key vehicle points such as the contact key, brakes, lift switch and power take-off (PTO).

The FleetMind system further links vehicle and sensor data with GPS information that is also sourced from the OBC. Not only can you monitor a vehicle's performance and function, you can also link this information to its physical location. This is particularly valuable in accident reporting situations.

For example, if a driver is involved in an accident, the FleetMind system can provide a detailed and accurate report to verify truck and driver activity. Alarms for issues such as over-speeding, hard-braking and idling are also geo-coded for location-based reference.

A sampling of the real-time data collected by the FleetMind fleet management system includes:

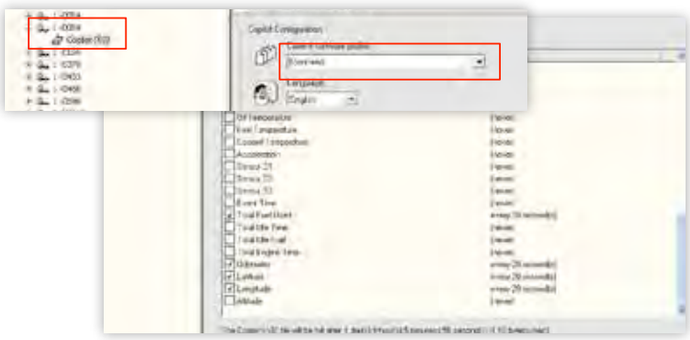
- Vehicle speeds
- Hard braking events
- Idling times
- Oil Pressure
- Engine Hours
- PTO

Benefits:

- Reduces fuel consumption
- Reduces route times
- Reduces maintenance costs
- Supports fleet's regulatory compliance
- Eliminates manual logging and processes
- Provides automatic updates into maintenance systems
- Provides up-to-date and accurate data
- Automatic logging of data saves hours of time
- Real-time reporting speeds up ability to respond
- Improves due diligence capabilities
- Immediately flags alarms for quick intervention

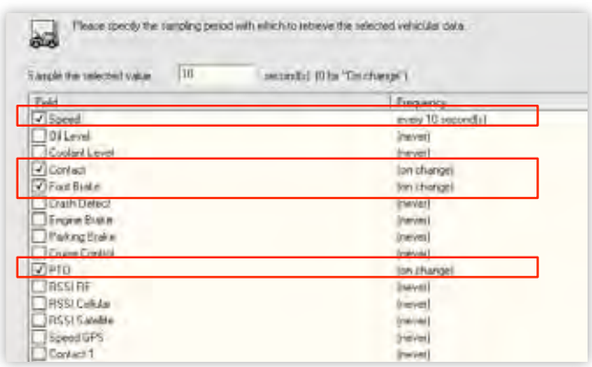
How it works

FleetMind collects ECM and sensor data via a J1708 connection to its onboard computer. Working with sensors and vehicle equipment, it broadcasts a variety of data from the brakes, automated arm switch, onboard scales and more. Each vehicle can have its own acquisition profile letting you select the data to be collected. All collected data is stored into a SQL server database where you can either use the reports provided with the system or build your own reports with the report designer of your choice. This allows you to combine the FleetMind data with any other corporate data for a comprehensive view toward improving performance and reducing costs.



Acquisition profiles:

Vehicle data is collected based on acquisition profile criteria which define what is collected and the frequency at which it is saved in the FleetMind database. Data is captured every time the ECM or sensors publish it and stored according to the profile. This data is then available for reporting and real-time vehicle alarms. Profiles can be created based on vehicle type (i.e. roll off, front load), geographical area and more. A profile can also be associated to one or multiple trucks.



Setting alarms

Alarms are defined by a user and associated to a profile so they can be used by a group of trucks. Any data collected via the acquisition profile can be used to create an alarm. Alarms are generated as soon as the data is collected from the ECM or sensors, and conditions are evaluated every second for greater accuracy.

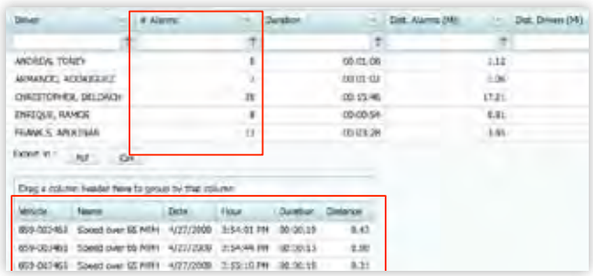
Presenting alarms

Alarms can be presented in a number of ways – they can inform drivers in the cab when a condition occurs, send the data in real-time to the dispatch system for immediate action, and/or transfer the data to the server for reporting. These can be sent individually or simultaneously to all designated recipients.

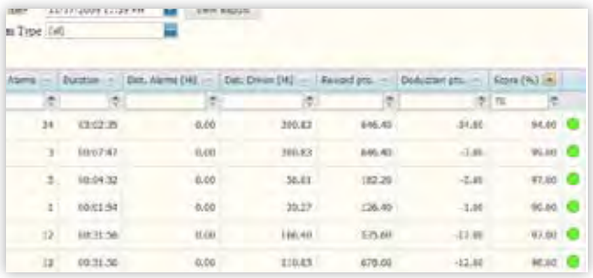
The FleetMind Reporting Portal

The FleetMind reporting portal provides multiple levels of information across driver and vehicle performance. For example:

Alarm reports



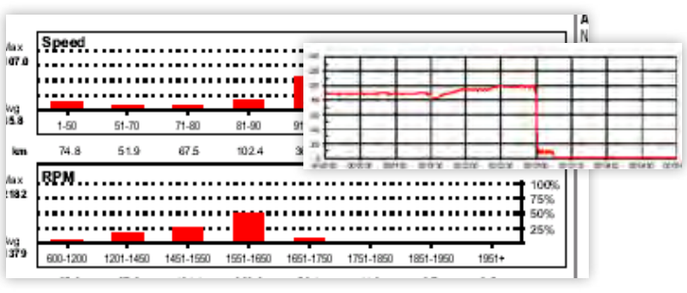
Driver scoring



Fuel efficiency

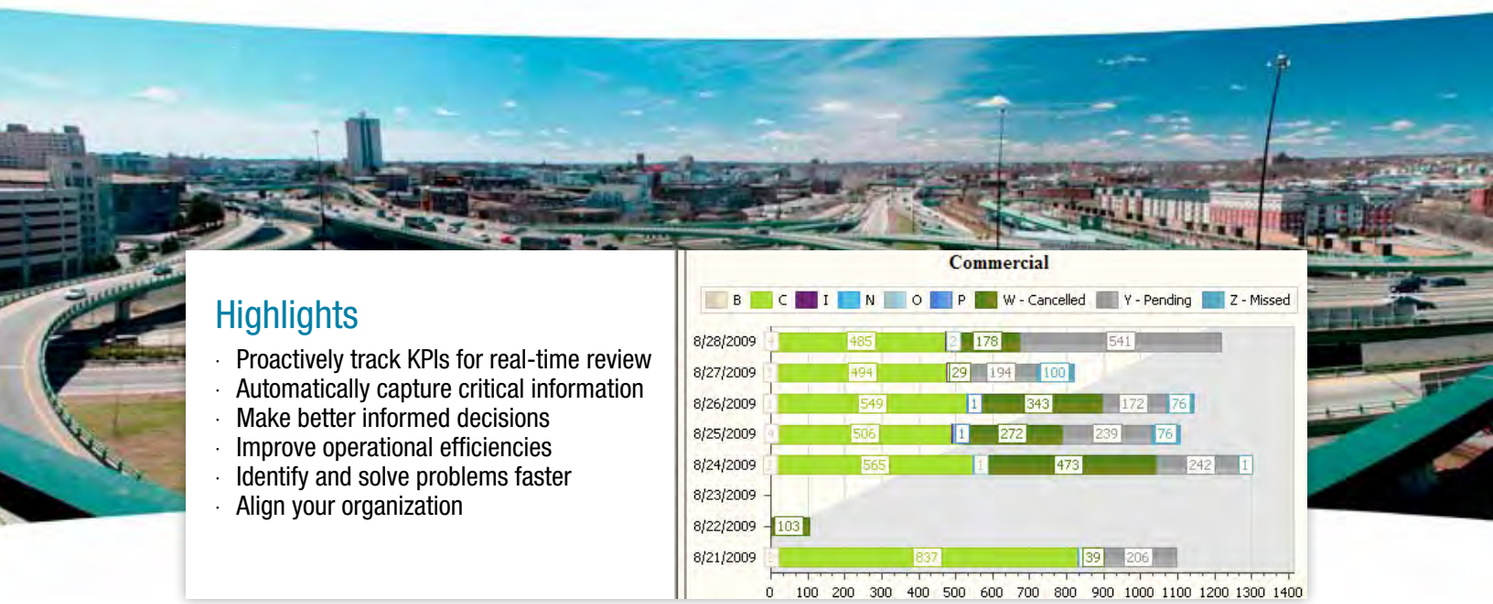
Truck performance

Vehicle Profile & Accident Graphs Reports



Fleet Management Dashboard & Reporting

A bird's eye view into your entire fleet operations



Highlights

- Proactively track KPIs for real-time review
- Automatically capture critical information
- Make better informed decisions
- Improve operational efficiencies
- Identify and solve problems faster
- Align your organization

Overview

Waste fleet operations are all about maximum efficiencies.

To improve efficiencies, you need a detailed understanding of what's going on. This usually means hours spent poring over countless reports and data to identify trends and anomalies for better decision-making. Often the process is simply too time-consuming to undertake effectively, so the required monitoring and analysis is not done thereby creating a negative impact on the business over time. While big companies have the resources to conduct research and analysis, smaller companies typically don't.

With the FleetMind Dashboard, this information is proactively tracked and presented to you for immediate review, regardless of your company size. You no longer have to pull the data from multiple sources, analyze it and extrapolate key findings – the FleetMind system tracks and distils the information you need and displays it on the Dashboard in real-time.

The Dashboard let you specify your desired key performance indicators (KPIs) and set thresholds that are positive, cautionary or negative to automatically highlight key results. All your critical information is provided on a single screen for quick and easy monitoring – green is an acceptable threshold, yellow is cautionary, and red is negative. From excess speed to customer stop time to idle times – you can easily track virtually every aspect of daily fleet and driver activity to understand the problems and respond effectively.

For example, if your goal is to shave 30 minutes from every route per day, you no longer need to follow up information from manual or other disparate sources. You can now set the Dashboard to proactively track time sensitive KPIs to flag problem areas and let you to address these toward achieving your time reduction goal. The dashboard will also help you track regulatory and safety related KPIs.

Description

FleetMind's fleet management dashboard provides you with a single-view interface into your fleet operations and performance. You can easily track key performance indicators (KPIs) and flag any potential problem areas. Your FleetMind Dashboard and FleetLink Reports let you check on fleet and driver activity and trends at a glance. You can view everything from weekly or monthly high-level trends, or track detailed and individual performance data.

The FleetMind Dashboard works seamlessly with FleetLink Reports to monitor the KPIs that are important to your business. These can be:

- **Driver related** – such as excess speeds, hard braking, break times, delayed starts, idle times
- **Customer related** – such as service times, average yards per lift, average lbs per yards
- **Route related** – such as drive time between stops, time to first stop, number of stops

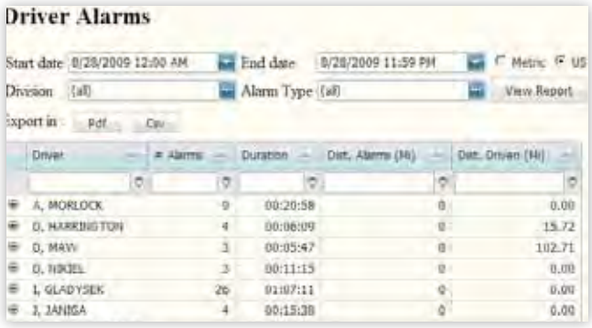
FleetLink Reports include the following:

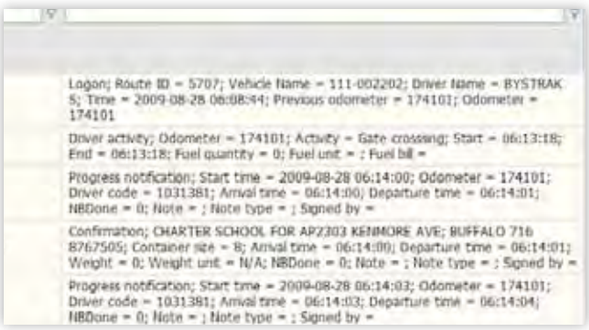
Fleet reports that allow you to evaluate overall operational efficiency:

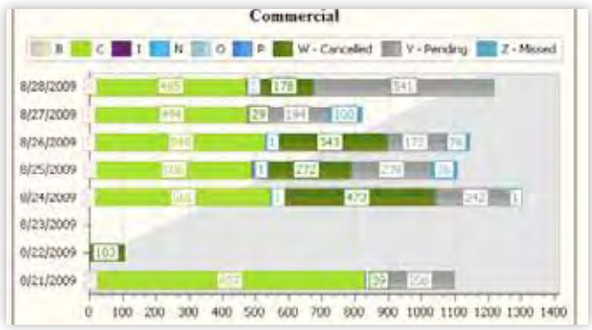
- Driver activity
- Driver performance
- Driver scoring
- Fuel consumption
- Fleet performance

Vehicle reports that allow you to monitor vehicle usage:

- Accidents
- Accident graph
- Alarms
- Fuel tax
- Vehicle usage







Driver	Division	Distance (Mi)	Engine	Idling	Driving	Excessive	Fuel (Gal)	Gal/Hour	MPG	Usage %
BOLDEN, ALONZO	111-Kenmore-RO	23.05	02:44:12	01:13:44	01:30:28	00:17:22	5.79	2.11	3.98	55
GERALD J, ZIENTARA		411.10	01:35:07	00:56:01	00:39:06	00:07:00	148.73	93.82	2.76	41
J, LLOYD	111-Kenmore-FL	197.22	10:28:37	02:35:26	07:53:11	00:18:00	60.42	5.77	3.26	75
M, KABEL	111-Kenmore-FL	144.34	08:45:23	02:12:51	06:32:32	00:25:00	43.98	5.02	3.28	74
M, KESSLER		175.91	10:11:58	02:36:23	07:35:35	00:37:00	36.56	3.58	4.81	74

Why you need reports and dashboards

With continuing pressures to reduce costs and improve productivity, tracking your fleet and drivers is becoming increasingly important to your business's long-term profitability. Fleet and driver statistics can provide a new level of insight into your fleet's operational efficiency and assist in identifying those areas where you can reduce costs or improve productivity. Because many of the statistics provided by FleetLink Reports are produced according to your desired settings and configuration, you will obtain the most relevant and actionable information possible – all presented through the central fleet management dashboard.

With Fleetlink's flexible Report Center, you can:

- Log time and location for breaks, customer stops, refuelling and more
- Report the exact route each vehicle took for any day
- Verify payroll information such as overtime
- Record detailed events during accident situations
- Choose from preformatted reports or export data to create your own

How it will improve your business

The benefits of FleetLink Reports and the FleetMind Dashboard are wide-ranging:

- You have a vastly improved ability to make decisions - a visual presentation of performance measures lets you identify trends in driver behaviour, track vehicles and service performance, and measure efficiencies.
- You can better align your organization – by working from a universal set of metrics and a single view into these, all internal functions can track organizational goals and performance.
- You increase operational efficiencies – you save time over running multiple reports, gain total visibility into all information, better manage routes and drivers, and can respond faster to customer service issues.
- You can deal with problems faster – by being able to detect and identify problem areas, you can better manage exceptions, deal with driver or vehicle issues, and ensure route efficiencies.

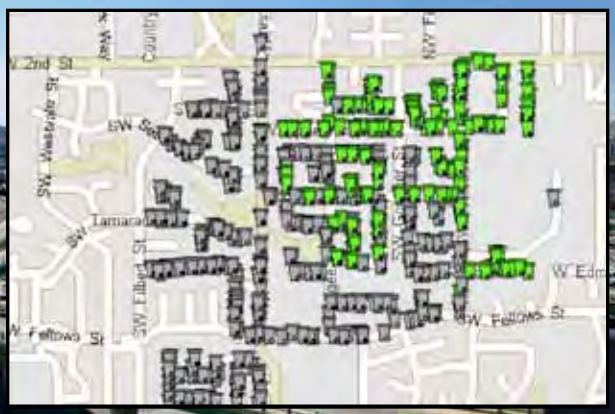
FleetMind Solutions Inc.
Fleet management solutions for better business results

www.fleetmind.com
888 639 1666 ext. 350

Automated Service Verification

Dramatically improve customer service and efficiencies

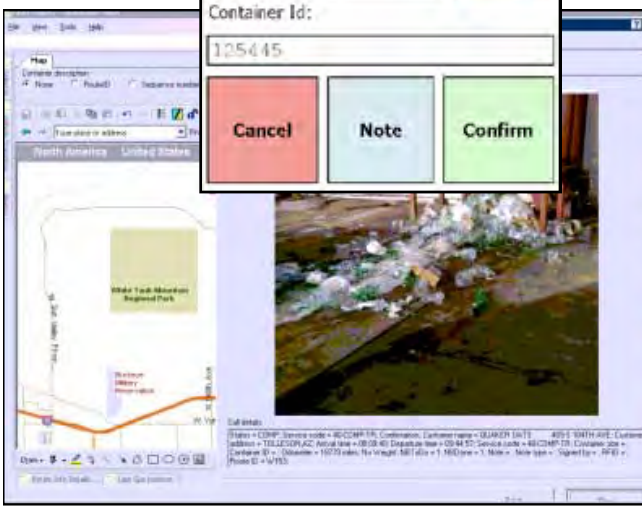
FleetMind



Improve customer service
Heighten accountability
Ensure accurate billing
Verify recycling credits
Monitor driver and truck activity
Track waste and recycling assets

Inefficient service verification is a critical issue for waste and recycling firms. FleetMind's fleet management solution ensures real-time and fully automated service verification to track individual container and customer activity.

FleetMind takes service verification to a whole new level with the integration of RFID technologies to enable fully automated service verification. Using RFID tags, each garbage can or cart can be associated with a specific customer address. Drivers can quickly verify cart details by scanning these with handheld devices. Inventory management capabilities can update backend databases in real-time on service or replacement and repair requirements.



Fleet operations personnel now have immediate visibility into customer activity:

- Automatically select the customer being serviced when a container is lifted
- Verify accuracy of containers being serviced against driver run sheets
- Identify containers that have been moved, stolen or relocated

The result – significantly improved customer service efficiencies!

California Waste Recovery Systems

California Waste Recovery Systems (Cal-Waste) is a privately owned, full service waste removal company providing commercial, industrial and residential collection services in Northern California.

The Problem

Customer Service Delays: Cal-Waste wanted to be able to quickly react to customer service requests for immediate service with detailed information about the call.

The Solution

The FleetMind onboard computer, FleetLink reporting system, and the interactive real-time FleetMap solution.

The Results

Within one year:

- Increased Operational Efficiencies: Reduced time for customer service reps to input a work request, and provide that precise order (special instructions, details, contact name/number) to the driver on his screen the next day.
- Service Verification: When a call comes in that requires immediate attention, Cal-Waste is now able to dispatch the entire work order to the driver task to ensure the promised service.

Western Oregon Waste

Western Oregon Waste (WOW) provides commercial, industrial and residential waste removal services to the McMinnville, Astoria and Warrenton areas of Oregon.

The Problem

Inefficient Service Verification: WOW needed a better way to verify service, track a vehicle's real-time location and identify reasons for missed service.

The Solution

The FleetMind solution was installed for all locations and fully integrated with WOW's Soft-Pak back office system.

The Results

- Improved Service Efficiencies: Customer service efficiencies increased with real-time service verification, and credits and write offs decreased accordingly.
- Improved Operations: Operations was able to dispatch daily calls and extras for roll-off and commercial business in real-time. This significantly cut down on missed call distribution within operations and kept the quality of service high.

U-Pak Disposals

U-Pak Disposals is a leading recycling services provider in the Greater Toronto and Southern Ontario area.

The Problem

- Inefficient Service Verification: U-Pak needed a more reliable way to confirm service completion and for customer service staff to have real-time access to data for issues resolution.
- Lack of Truck/Driver Visibility: U-Pak needed a real-time view into truck locations, progress and call times.

The Solution

The FleetMind on-board computer and driver terminal solutions.

The Results

- U-Pak has achieved the following benefits from the FleetMind system.
- 80% reduction in data entry times (from 10 minutes per route in roll off to less than 2 minutes) with real-time direct entry from the driver.
- Customer service efficiencies increased for dealing with missed calls.
- Decreased credits and write offs due to real-time service verification.
- Accurate service times for operations and pricing evaluations.
- Overall reductions in time for driver check in, dispatching and service verification.
- Cost reductions on maintenance and verification of driver usage of the rolling stock.
- Achievement of top grade fleet status for insurance purposes.

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Appendix 5G

Recycle Coach

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Exhibit B

recycleCoach™

Recycle Coach *is a technology solution that helps local governments manage resident inquiries more efficiently, and educates and encourages your residents to be better recyclers.*

A recent study by Nuance Enterprise shows **67% of residents prefer online self service** over talking to a representative. Another study conducted by SSI determined **the majority of consumers favor a self-service solution**, including the safety net of personal contact if the consumer so chooses. This is truly welcome news to local recycling programs, which are increasingly having to **'do more with less'**.

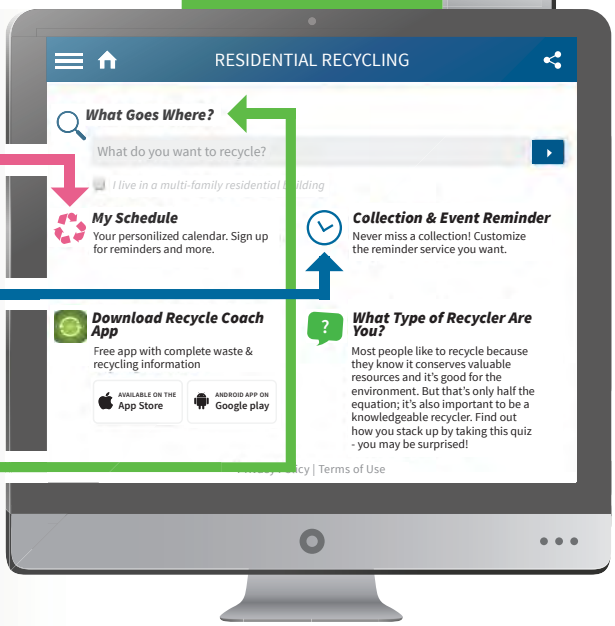
Recycle Coach *helps provide residents with fast answers to their most common questions, freeing up staff time for other tasks.*

PROVIDING FAST ACCESS TO INFORMATION

Analysis shows the majority of calls to municipal solid waste programs are for "What do I do with…?", "Does the holiday affect collection?" or "I have a cart issue". These inquiries and others are routinely answered in seconds through the web app inserted on your website, Facebook app (on your Facebook page) and the Recycle Coach mobile app. All information is customized for your program, and personalized for each resident.

KEY FEATURES AND FUNCTIONALITY

Active in recycling education since 2001, Recycle Coach has led the shift to personalization and self service solutions. **Recycle Coach technology provides these features:**



My Schedule

Simply by entering their address, a personalized schedule can be viewed using any of the apps (web, Facebook or mobile), exported to an everyday calendar (e.g. Outlook, iPhone, etc.), or downloaded as a PDF and printed (for those who like their calendar on their fridge!).

Pick-up & Event Reminders

Never miss another collection with reminders that can be customized for each event or pick-up. Residents even get two reminders for holiday changes (one for the "No Collection" day, and one for the rescheduled pick-up day).

What Goes Where?

Offers instant recycling and disposal information for almost any item or material. Includes a 'smart lookup' search tool that recognizes most misspelled words, and is updated monthly by with new search terms from users around the world.

OUTREACH IS MORE THAN JUST FAST ANSWERS

Exhibit B

With an average of only 16% of residents visiting a municipality's website each year, the challenge is how to reach the rest – particularly on your own with limited budgets and resources.

What Happens Next? ★

Many residents are naturally curious about how materials are recycled. We include this information for many materials.

Recycling Articles ★★

We produce a variety of articles that help residents learn more about their local waste & recycling program - like a report on light bulb disposal and even what to do with pet waste!

Messages With Reminders ★★★

Imagine being able to include educational messages or event notifications with all the reminders sent to your residents each week – well we did, and you can!

Emergency and Non-Emergency Notifications ★★★

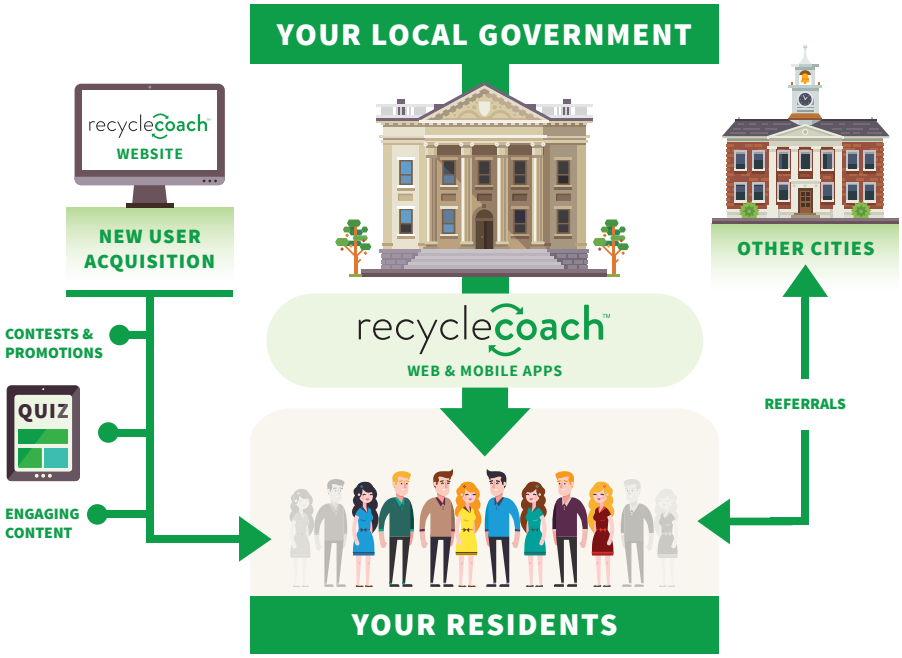
Sometimes outreach means sending timely information to residents, or perhaps only a limited number of residents who are affected (such as a weather-related collection delay).

'What Type of Recycler Are You?' (WTORAY) Quiz ★★★

Complacency is arguably the biggest barrier to improving the quality of recyclables (and quantity). Most residents believe they are good recyclers, so there's little need for them to devote attention to it. The WTORAY quiz – personalized for your program - uses a variety of modern e-learning techniques that cause residents to re-evaluate their recycling behaviour, and provides them with information and incentives to be better recyclers.

REACH MORE RESIDENTS

With an average of only 16% of residents visiting a municipality's website each year, the challenge is how to reach the rest – particularly on your own with limited budgets and resources.



As much as we focus on education and encouragement, we know deep down that success depends on connecting with as many residents as possible.

Perhaps the most important aspect of Recycle Coach is our ability to attract these residents with unique content and referrals, and convert them into subscribers that grow your audience.

SET-UP AND SUPPORT

Set-up is easy. We handle the initial set-up using information from your website and any other materials you provide; ongoing changes and updates are done by you, in real time. We also include promotional assistance to make sure you get off to a strong start, and advanced reporting that helps you pinpoints areas that need attention. Then there's initial Admin training, regular training webinars to help you get the most from the technology, and ongoing support via live chat, phone and email.

*For more information, contact **John MacDonald** at jmacdonald@recyclecoach.com, or 1- 855-343-3363 ext. 119*

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www.recyclecoach.com

Technical factsheet

WEB APP

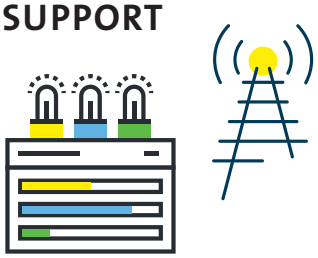
The web app (sometimes called a 'widget' or 'plug-in') meets WCAG 2.0 AAA accessibility requirements and is supported by all popular browsers (Chrome, Firefox, Safari & Internet Explorer). It is easily inserted on your website via an iframe using HTML code that looks similar to this:

```
<iframe src="https://app.my-waste.mobi/widget/556-wayn/home.php"
width="100%" height="1300" frameborder="0">
</iframe>
```

MOBILE APP

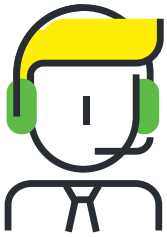
The Recycle Coach app is available for free download from both the **iTunes** store and **Google Play.**

HOSTING & SUPPORT



This entire solution is hosted by **Municipal Media Inc.**, owners of **Recycle Coach™** technology. Information is hosted on multiple high-availability servers in a 'mission critical' configuration, meaning data is automatically replicated in different physical locations. In the event of a server failure, another site automatically takes up its role, allowing us to offer a 99.9999% uptime guarantee.

The application and its information is supported by the **Recycle Coach™** team. For technical support or other related questions, contact us by email at support@recyclecoach.com or call our office at 1-855-343-3363 and select option 2. Live chat is also available.



SECURITY AND PRIVACY

Various layers of security are in place to protect the data and server communications, and all login pages are secured by Extended Validation SSL Certificates. Our **privacy policy**, which can be viewed on the **Recycle Coach™** website, is comprehensive and meets the requirements of the jurisdictions in which we operate.

MANAGEMENT CONSOLE

Our online management console is easy to use and we provide initial training and unlimited support via email, phone and online chat. The console allows you to:

- **Make changes to program information**
- **Send real time emergency and non emergency notifications**
- **Get extensive reports that help you manage your program**

Exhibit B

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Getting started is EASY!

WHAT WE REQUEST FROM YOU

'What Goes Where?' Database

Initial set-up is done by our implementation team using existing website content and any other materials you provide. We ask you to review and approve it (1-3 hours).

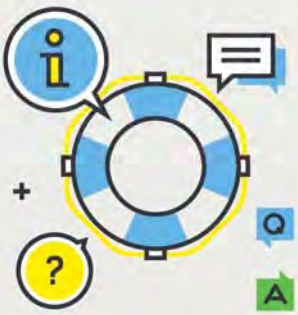
Collection and Event Schedules

Typically, residents will select their collection day using their address, and for this we'll need an address database with zone information from your GIS department. Other than that, we just need a quick chat to understand your schedule details and holiday changes.

Placing the Web App on Your Website

Our Marketing Coordinator helps you and your web team decide where the web app should be placed. It's a simple task to paste the code on to the website page(s). For more details, refer to the ***Technical factsheet***.

START-UP ASSISTANCE



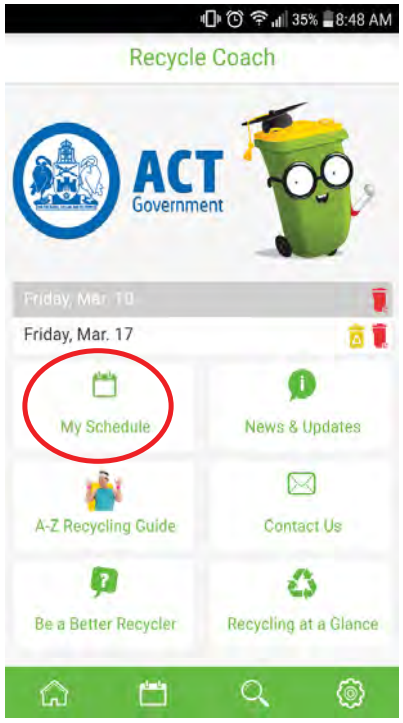
Getting off to a strong start is important. Our Promotional Toolkit contains a wealth of ideas and materials you can use, and our Marketing Coordinator is available to help you develop your official launch plan.

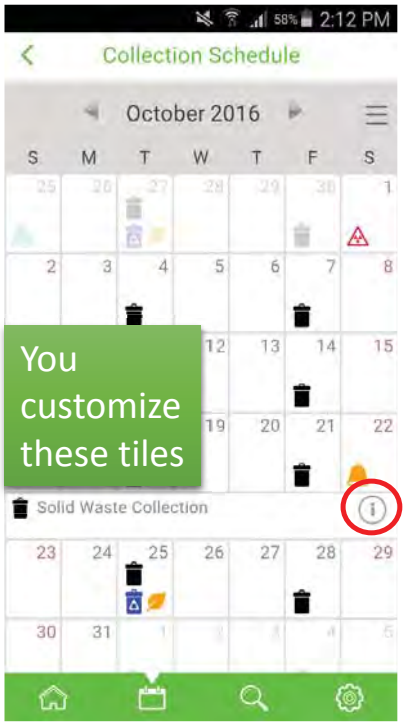
We understand that starting to manage your program can be daunting. That's why we offer:

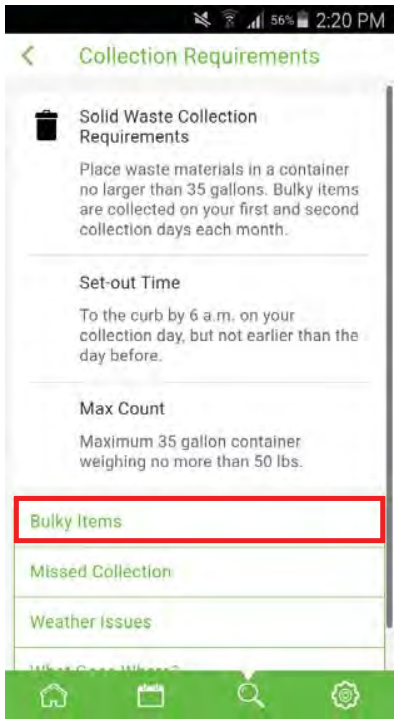
- **Initial one-on-one training on the Admin Console**
- **A 12-week training plan (5-10 minutes per week)**
- **Unlimited support by phone, email or live chat (forever)**
- **Ongoing monthly training webinars**

Exhibit B

Creating a customized mobile App for your program







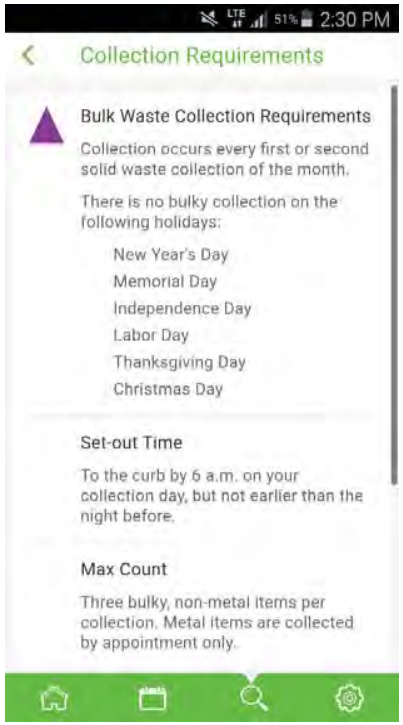


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Exhibit B

Enter your address to find collection/event info

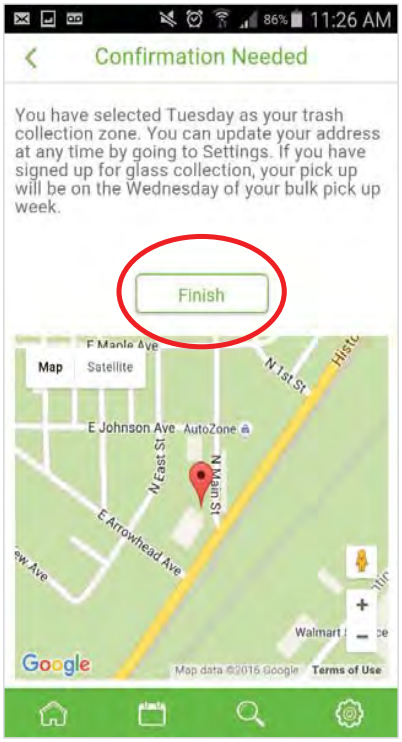

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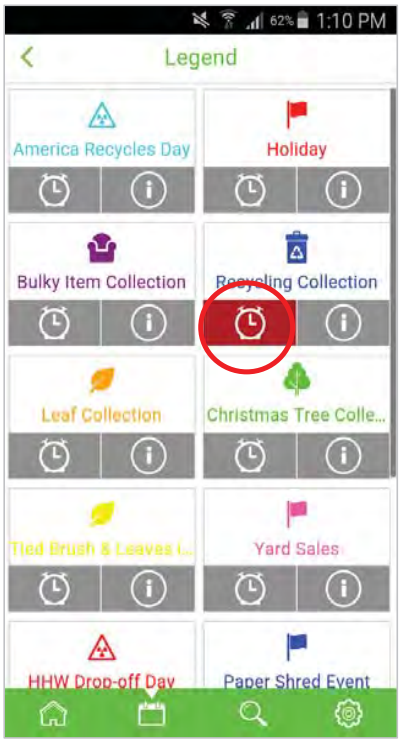
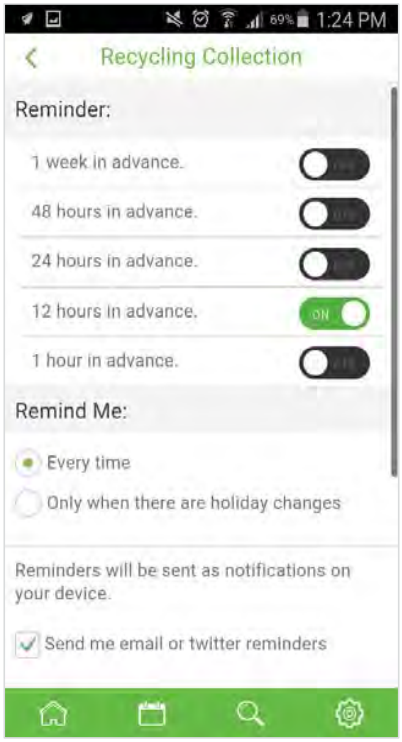
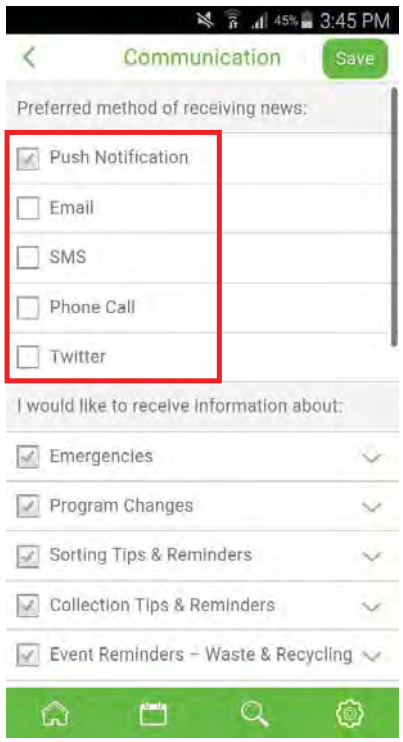
Exhibit B

Set reminders, and sign up for notifications/alerts







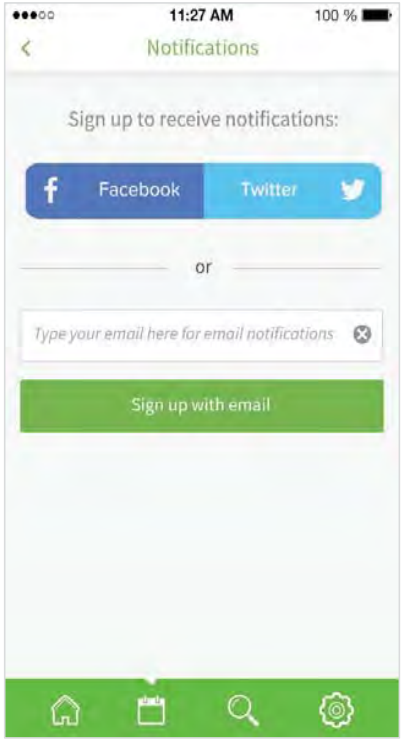


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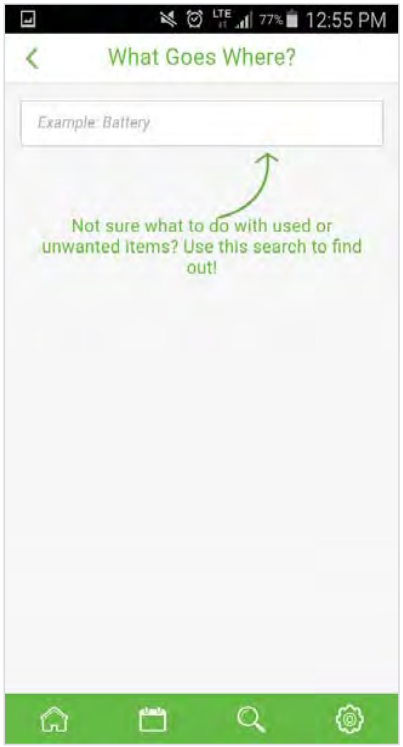
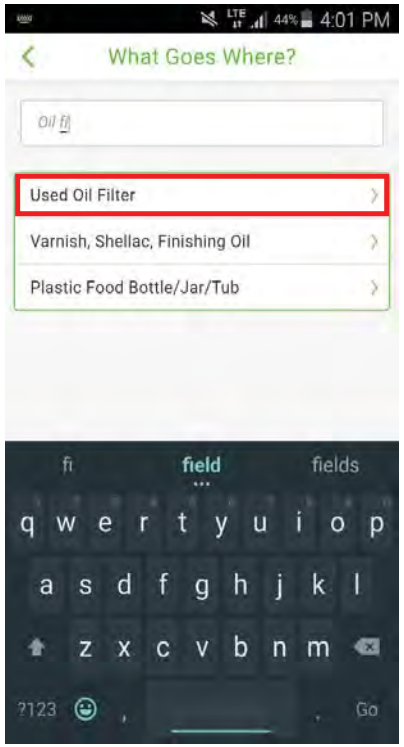
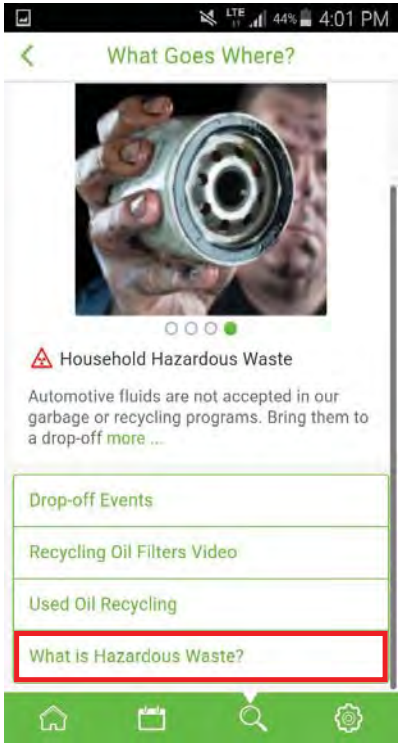
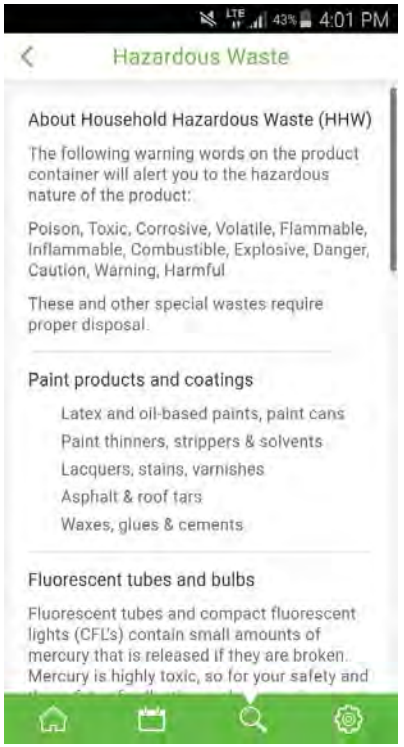
Exhibit B

Find out how to properly dispose of any item









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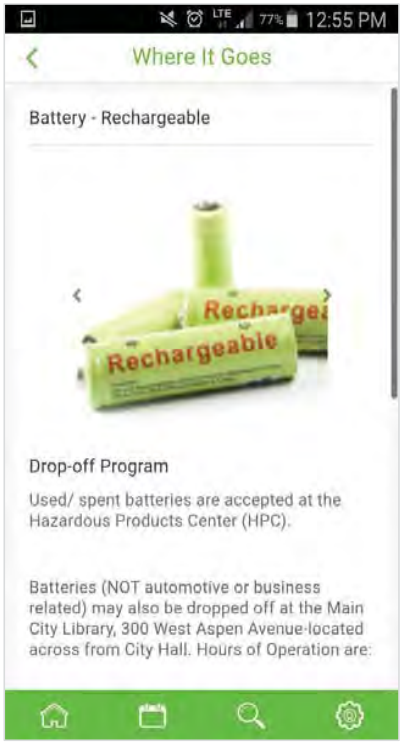

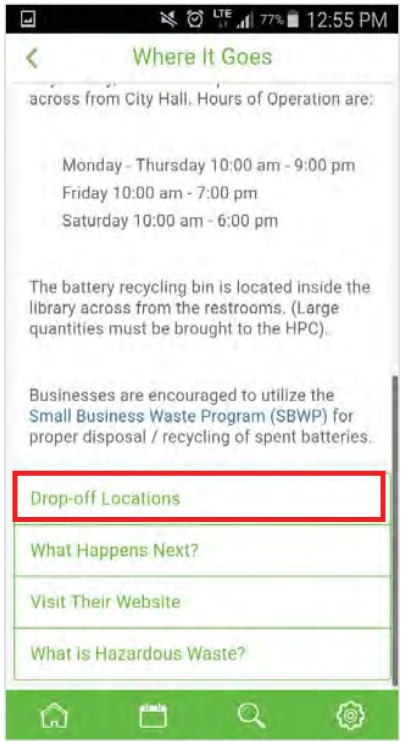

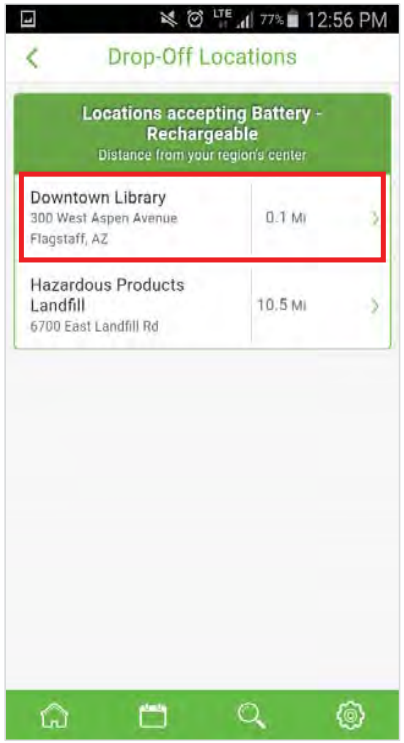

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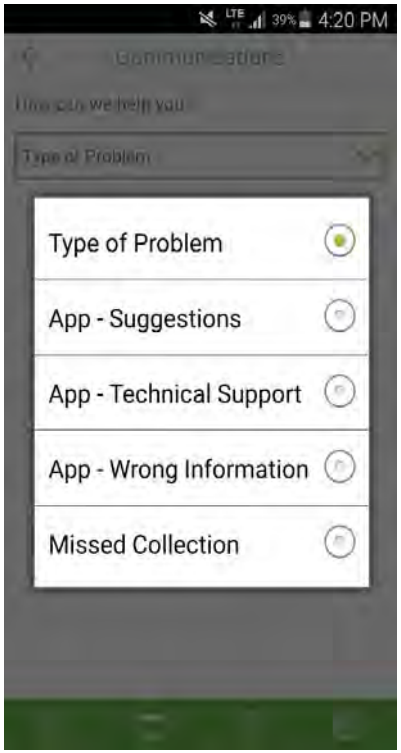
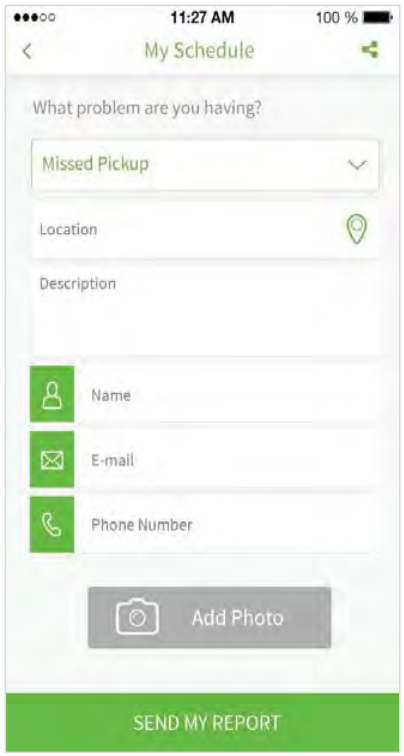
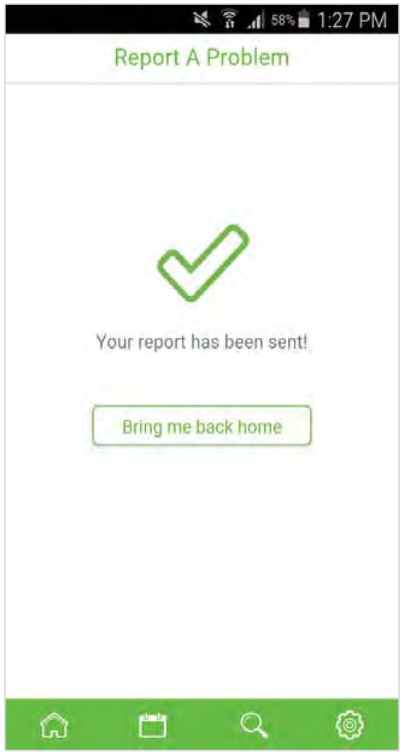
Exhibit B

Allow residents to report common problems







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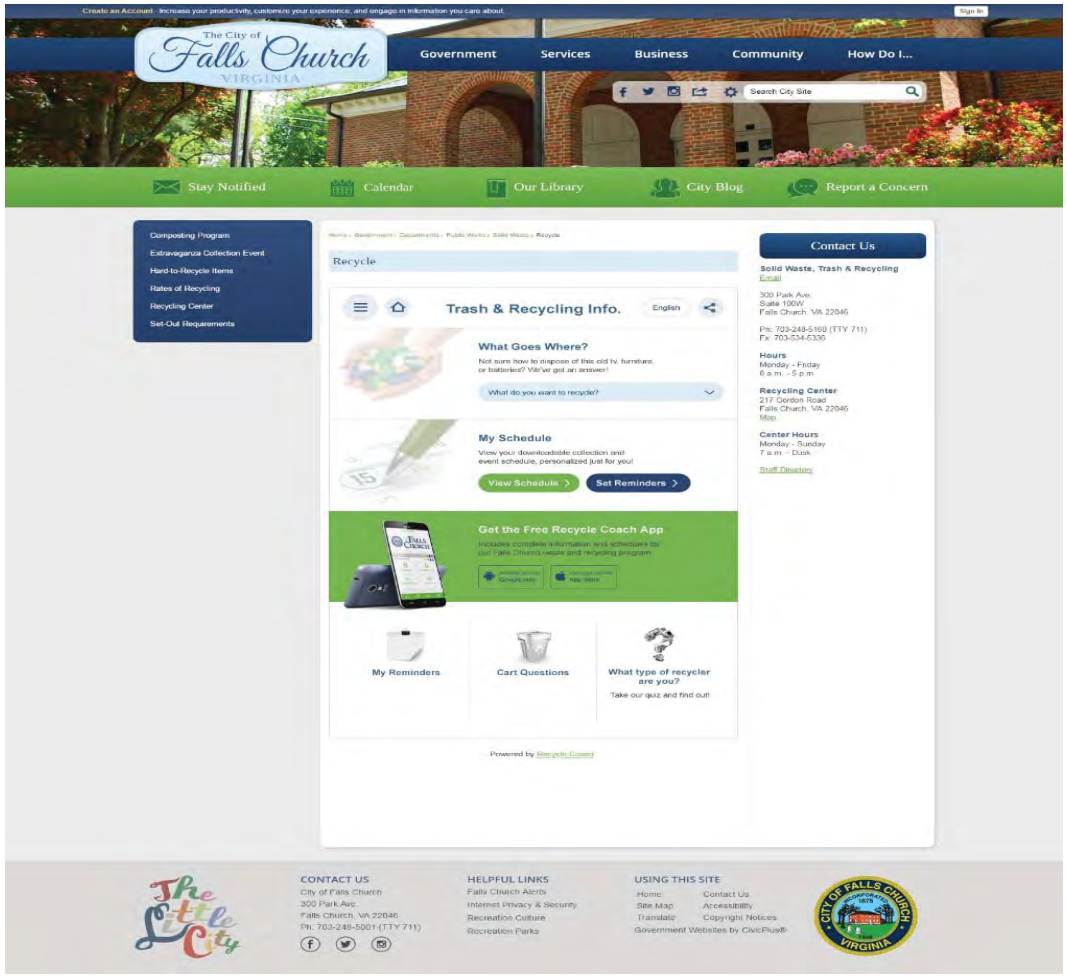
Website App



- Easy to use
- Fits on your website
- Completely customized
- No download required

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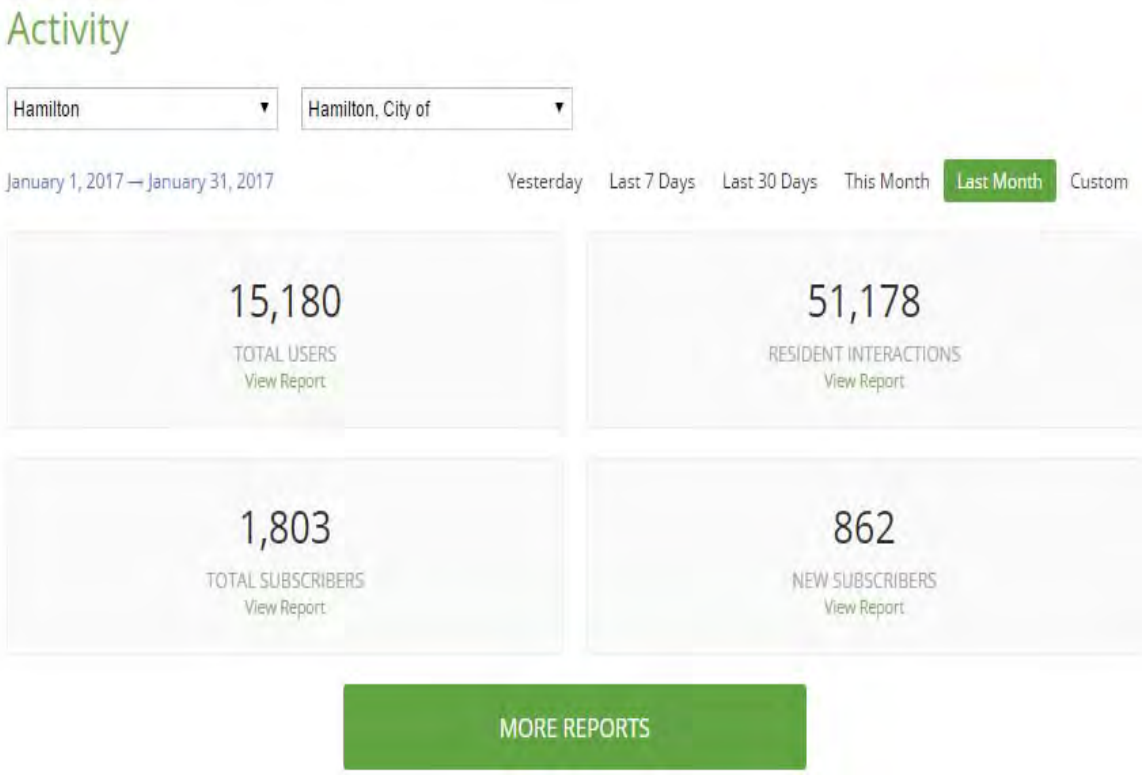
Exhibit B

Analytics



- Numbers are updated in real time
- Find out how many people are participating, and where they're coming from (Website, Mobile App, Facebook, etc.)
- Find out what items your residents are having trouble disposing of
- Export stats for year end reports

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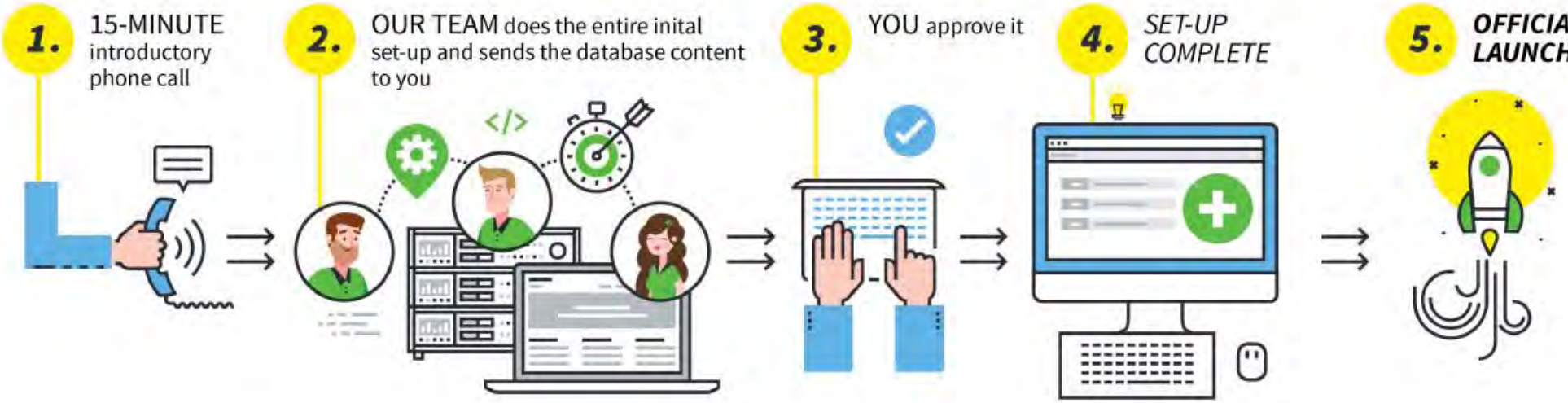
Exhibit B

Setup

Getting started is EASY!



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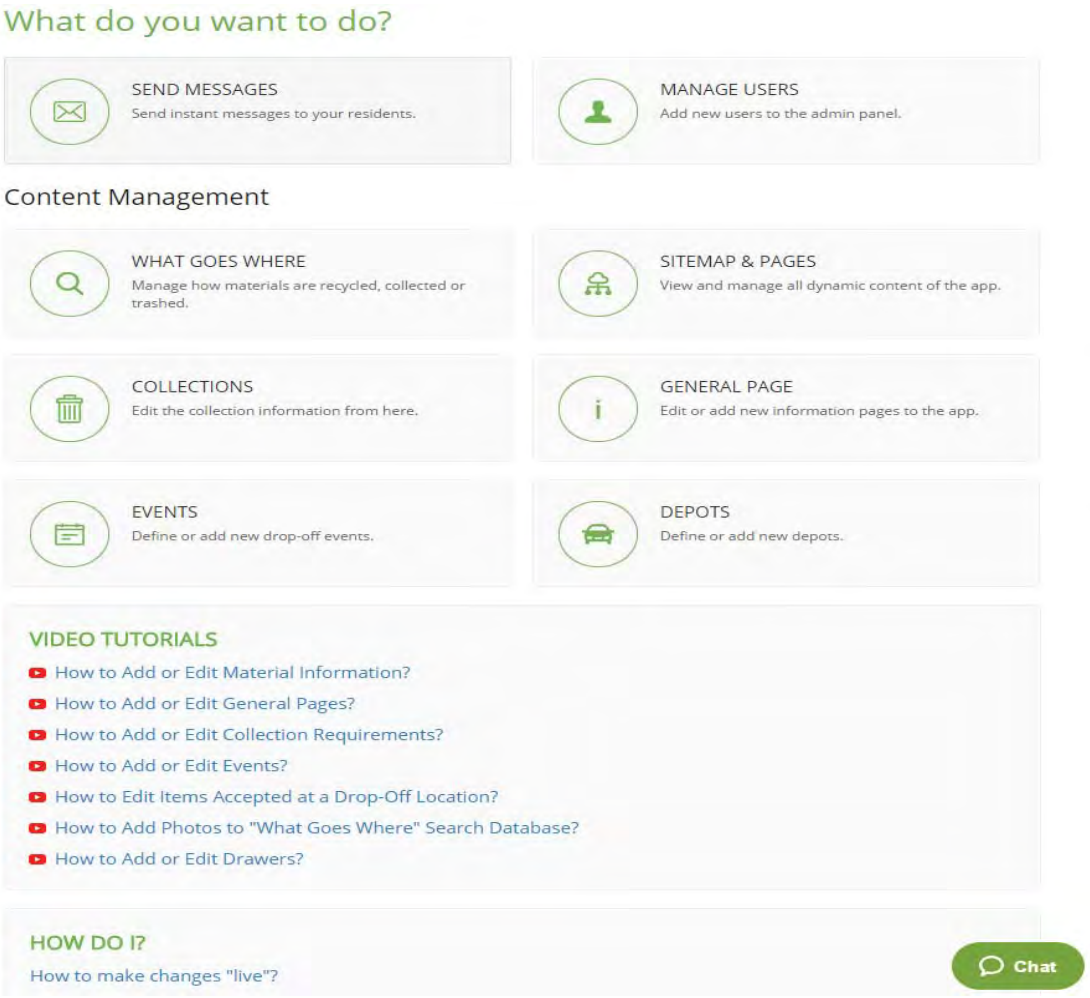
Support

Exhibit B



- We offer **full end-to-end support**
- We provide you with **your own success coach and marketing specialist**
- We provide all the **setup, maintenance,** and **ongoing support**

recyclecoach™

Marketing

- Your Marketing Specialist is there to help
- We can create customized marketing materials
- Our "Marketing Toolkit" provides you with proven methods that are free, quick, and easy to implement
- We are constantly innovating, and developing new ways to make the program more successful

recyclecoach™

Examples of Free Accounts

Lancaster, TX

- http://lancaster-tx.com/1098/Regular-Trash-Collection

Walpole, MA

- http://www.walpole-ma.gov/solid-waste-recycling

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Pricing for The City of Tulare, CA

Exhibit B

* All plans include: A Customized Application for your website, and a Customized Mobile Application.

Feature	Free	Communicate	Educate	Engage
Customized Application for Your Website	✓	✓	✓	✓
Customized Mobile Application	✓	✓	✓	✓
Your own dedicated page on RecycleCoach.com	✓	✓	✓	✓
Ongoing Support, Marketing, and Analytics	✓	✓	✓	✓
Customized Calendar for each resident (curbside collections + events)	✓	✓	✓	✓
Ability to set reminders for any collection, event, holiday	✓	✓	✓	✓
Outgoing notifications to residents (emergencies, program changes, etc.)		✓		✓
Report-a-Problem (Optional)		✓		✓
Personalization of 'What type of recycler are you?' quiz			✓	✓
Complete 'What Goes Where?' search tool			✓	✓
Yearly Renewal: (No contract or set-up fees)	**~~$999~~ $0**	**$3,700**	**$5,700**	**$7,900**

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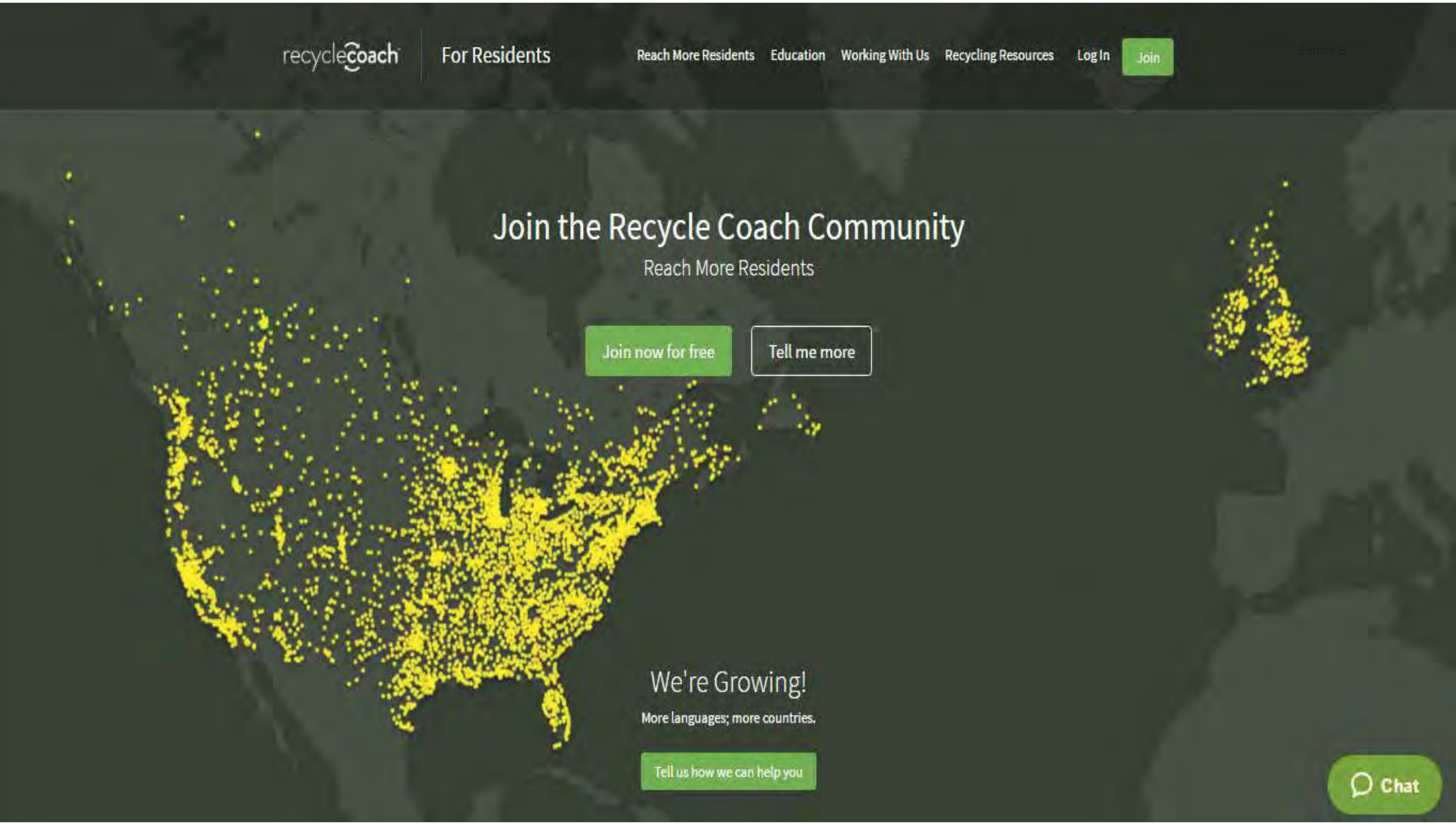
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For Residents
Reach More Residents
Education
Working With Us
Recycling Resources
Log In
Join
Join the Recycle Coach Community
Reach More Residents
Join now for free
Tell me more
We're Growing!
More languages; more countries.
Tell us how we can help you
Chat

Appendix 6A

Fleet Replacement Fund Annual Transfers

R3

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CITY OF TULARE

Solid Waste Rate Model

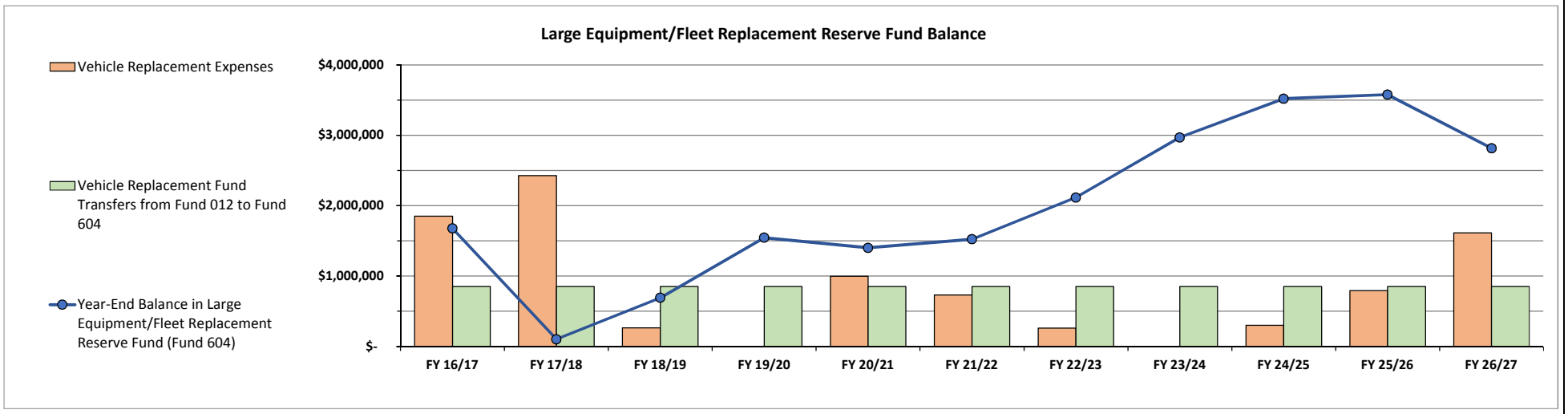
Vehicle Replacement Fund (RM 5)

Prepared by R3 Consulting Group, April 2017

CELL DATA SOURCES	
User Input	Calculated Surplus
Calculated Value	Calculated Shortfall

Note: All non-"User Input" cells on this sheet are protected to prevent accidental changes. There is no password to unprotect. *(Go to "Review" tab → click "Unprotect Sheet" to unprotect.)*

	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	FY 26/27
Vehicle Replacement Expenses		$ 1,850,000	$ 2,425,900	$ 265,000	$ -	$ 997,500	$ 730,000	$ 260,000	$ -	$ 303,000	$ 795,000	$ 1,615,000
Vehicle Replacement Fund Transfers from Fund 012 to Fund 604		$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990	$ 852,990
Surplus/(Shortfall)		$ (997,010)	$ (1,572,910)	$ 587,990	$ 852,990	$ (144,510)	$ 122,990	$ 592,990	$ 852,990	$ 549,990	$ 57,990	$ (762,010)
Year-End Balance in Large Equipment/Fleet Replacement Reserve Fund (Fund 604)	$ 2,674,181	$ 1,677,171	$ 104,261	$ 692,251	$ 1,545,241	$ 1,400,731	$ 1,523,721	$ 2,116,711	$ 2,969,701	$ 3,519,691	$ 3,577,681	$ 2,815,671
Reduced Division Annual VR Fund Expense =		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Check =		$ 852,990										



Appendix 6A

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Appendix 7A

WMI TRIR & DART Performance

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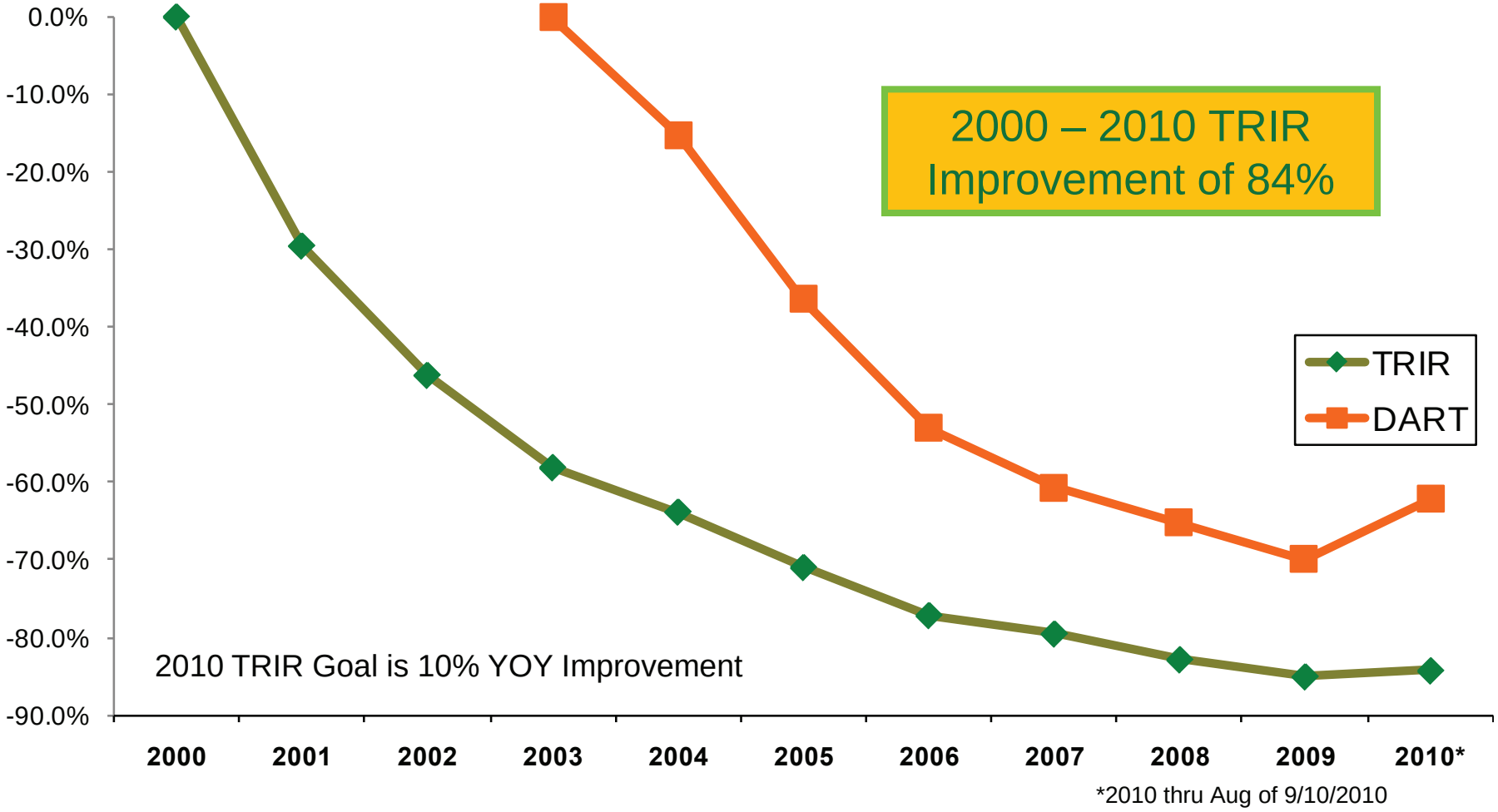
TRIR & DART Performance

Total Recordable Injury Rate & Days Away Restricted or Transferred
(# OSHA injuries per 100 employees)



*2010 thru Aug of 9/10/2010

Appendix 7A

R3 CONSULTING GROUP, INC.
RESOURCES · RESPECT · RESPONSIBILITY

Solid Waste Rate Study

RATE MODEL AND FINANCIAL PLAN

SUBMITTED TO:

City of Tulare, CA

February 10, 2018

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Tables

Appendices

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1 Objectives

- Conduct a Rate Survey up to ten (10) municipalities within the greater San Joaquin Valley region to be used as a comparative baseline for existing rates and proposed rates developed from the rate study; and
- Develop an Excel-based Rate Model to be used to project the Division's costs over a ten (10) year planning period to assist the City with setting rates sufficient to cover annual operating and capital costs, while maintaining reasonable Operating Reserve Funds and Vehicle Replacement Reserve Funds (i.e., Financial Plan).

2 Findings

1. The Division is in a Good Financial Position with a More than Adequate Operating Reserves

The Division is in a good financial position, with significant Operating Reserves and a reasonably funded Vehicle Replacement Fund. The last rate increase was on July 1, 2011, and the Enterprise Fund has generated an annual revenue surplus for the past six years. In fiscal year (FY)[1] 15/16, the Enterprise Fund generated a revenue surplus of $839,000, and in FY 16/17 it realized a revenue surplus of $1.311 million, bringing its Operating Reserve balance to more than $6.0 million as of July 1, 2017.[2] This Operating Reserve balance is more than 60% of the Division's annual operating budget; the equivalent of more than seven (7) months of operating expenses. A common target balance for operating reserves is 60 to 90 days of operating expenses (17%-25% of operating expenses). Assuming a 90-day Operating Ratio target balance, the current Operating Reserve has approximately $3.5 million in "surplus" reserves.

2. The Division's Vehicle Replacement Fund Appears to be Adequately Funded Over the Next 10 Years

In addition to its Operating Reserve Fund, the Division also funds a Vehicle Replacement Fund, which is managed by the City's Fleet Maintenance Division (Fleet Services). The Vehicle Maintenance Replacement Fund had a FYE 16/17 fund balance of $2.9 million. **Appendix A** provides a projection of the Vehicle Replacement Fund annual funding and vehicle replacement expenses over the 10-year planning period, assuming current Division annual funding levels (~$1,032,000).

---

1 The City's fiscal year runs from July 1st through June 30th.

2 Operating Reserves are generally intended to cover unforeseen circumstances, and the impact of operational costs resulting in unforeseen revenue shortfalls, including, but not limited to: drops in recyclable material commodity revenues; increases in facility tip fees; facility issues that would require the City to deliver materials to an alternative site with higher tip fees and/or increased transportation costs; unfunded mandates; new regulatory fees; and extraordinary expenses (e.g., vehicle accidents or a vehicle fire that renders one or more vehicles inoperable).

3. The Division Capital Costs are Projected at $500,000+ Annually Over the Next 10 Years

In addition to annual operating expenses, the Division is planning to undertake a corporation yard upgrade over the next three years (FY 17/18 – FY 19-20), with projected annual capital costs of $500,000 (**Appendix B**). The Division's budget also projects a $500,000 annual capital expense for the construction of a new corporation yard building starting in FY 20/21 through FY 24/25, and then increasing to $750,000 for the next two years at least, through the end of the current 10-year planning period FYE 26/27. The Rate Model assumes those expenses would be funded with available Operating Reserves.

4. The City's Board of Public Utilities Has Approved Additional Expenses to Improve the Division's Operations

The Division's recent Solid Waste Study, conducted by R3, recommended a number of recommended changes to the Division's staffing levels, and supporting resources. Acting on those recommendations, the Board of Public Utilities approved the following one-time cost (**Table 1**), and recurring costs (**Table 2**), which have been factored into the Rate Model and the analysis that is presented in this report:

Table 1
New One-Time Costs

Expense Item	FY 17/18	FY 18/19
Tech Needs Analysis	$0	$25,000
Customer Relations Management System	$0	$90,000
On Board Computers	$0	$365,000
GIS	$0	$50,000
Servers	$0	$7,000
Total	**$0**	**$537,000**

Table 2
New Recurring Costs

Expense Item	FY 17/18	FY 18/19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
Staffing	$451,000	$451,000	$451,000	$451,000	$451,000	$451,000	$451,000	$451,000
Safety Resources	$0	$50,000	$50,000	$50,000	$100,000	$100,000	$100,000	$100,000
Technology	$0	$84,000	$84,000	$84,000	$84,000	$84,000	$84,000	$84,000
GIS	$0	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
Vehicle Impact Fee	$0	$75,000	$110,500	$146,000	$181,500	$217,000	$252,500	$283,500
Total	**$451,000**	**$735,000**	**$770,500**	**$806,000**	**$891,500**	**$927,000**	**$962,500**	**$993,500**

5. The Enterprise Fund Will Not Break Even in FY 17/18

Absent a rate increase for FY 17/18, the Division will not breakeven for the first time in more than five years (i.e., a $219,000 (2.5%) revenue shortfall is projected) (**Table 3**), assuming expenditures as planned, actuals expenses may be less. As shown, however, under this scenario, the Division would still have more than $5.8 million in Operating Reserves as of FYE 17/18. This is approximately still $3.1 million more than is necessary for a 90-day Operating Reserve, which we suggest is a reasonable maximum target fund balance.

Table 3[3]
FY 17/18 Projected Revenue Shortfall and Operating Reserve Balance

SUMMARY RESULTS	FY 17/18 Projected
Revenue	$ 8,876,090
Expenditures	$ 9,095,314
Overall Surplus/(Shortfall)	$ (219,224)
as % of Total Expenditures	-2.4%
% Revenue Adjustment Required to Eliminate Surplus/Shortfall	**2.5%**

Operating Reserve

Beginning of FY (July 1)	$ 6,023,585
End of FY (June 30)	$ 5,804,361
% of Expenditures	63.8%
Months of Expenditures	7.7

6. An Overall Rate Increase is Not Needed in the Short Term

While the Division is not projected to break even for FY 17/18, it could use its "surplus" Operating Reserves to cover its projected short-term annual revenue shortfalls, delaying any required rate adjustment. If the Division used its surplus Operating Reserves to offset its upcoming annual revenue shortfalls, it would not need to increase rates until FY 21/22 to maintain a minimum 3-month Operating Reserve, as shown in **Table 4** below. We suggest at a minimum, however, that the City consider increasing commercial and roll-off rates in the near term (e.g., by July 1, 2018) to address the projected FY revenue shortfall. There is no immediately need to increase residential due to availability of reserve fund.

[3] This and the other similarly formatted tables in this report are screen shots taken from the Rate Model's "Rate Model Summary (RM1)" worksheet.

Table 4
Enterprise Fund Projections without any Rate Increase

SUMMARY RESULTS	FY 17/18 Projected	FY 18/19 Projected	FY 19/20 Projected	FY 20/21 Projected	FY 21/22 Projected
Revenue	$ 8,876,090	$ 8,876,090	$ 8,876,090	$ 8,876,090	$ 8,876,090
Expenditures	$ 9,095,314	$ 10,164,960	$ 9,949,393	$ 10,371,761	$ 10,948,489
Overall Surplus/(Shortfall)	$ (219,224)	$ (1,288,870)	$ (1,073,303)	$ (1,495,671)	$ (2,072,399)
as % of Total Expenditures	-2.4%	-12.7%	-10.8%	-14.4%	-18.9%
% Revenue Adjustment Required to Eliminate Surplus/Shortfall	**2.5%**	**14.5%**	**12.1%**	**16.9%**	**23.3%**
Operating Reserve					
Beginning of FY (July 1)	$ 6,023,585	$ 5,804,361	$ 4,515,491	$ 3,442,188	$ 1,946,517
End of FY (June 30)	$ 5,804,361	$ 4,515,491	$ 3,442,188	$ 1,946,517	$ (125,882)
% of Expenditures	63.8%	44.4%	34.6%	18.8%	-1.1%
Months of Expenditures	7.7	5.3	4.2	2.3	-0.1

7. The Residential Rates are Supporting the Commercial Rates

Residents are currently paying more than it costs the Division for both residential collection services, while the Division's commercial customers are paying less than it costs the Division to provide those collection services. FY 17/18 roll-off rates are currently covering the associated cost (i.e., are cost of service rates). Street sweeping services are also generating a revenue surplus. As shown in **Table 5** (percentages) **and Table 6** (dollar values) on the following page:

- Residential collection services are projected to generate a 2.9% Surplus in FY 17/18 (~$150,000), assuming no rate adjustment;
- Commercial collection services are projected to realize a revenue shortfall of approximately 35% in FY 17/18 (~$630,000), assuming no rate adjustment
- Roll-off services are projected to effectively break even in FY 17/18, assuming no rate increase.
- Street Sweeping is projected to generate a 25% surplus in FY 17/18 (~260,000), assuming no rate increase.

Table 5
Percentage Surplus | Shortfall by Line of Business

SUMMARY RESULTS	FY 17/18 Projected	FY 18/19 Projected	FY 19/20 Projected
Revenue	$ 8,876,090	$ 8,876,090	$ 8,876,090
Expenditures	$ 9,095,314	$ 10,164,960	$ 9,949,393
Overall Surplus/(Shortfall)	$ (219,224)	$ (1,288,870)	$ (1,073,303)
as % of Total Expenditures	-2.4%	-12.7%	-10.8%
% Revenue Adjustment Required to Eliminate Surplus/Shortfall	**2.5%**	**14.5%**	**12.1%**
Operating Reserve			
Beginning of FY (July 1)	$ 6,023,585	$ 5,804,361	$ 4,515,491
End of FY (June 30)	$ 5,804,361	$ 4,515,491	$ 3,442,188
% of Expenditures	63.8%	44.4%	34.6%
Months of Expenditures	7.7	5.3	4.2
Revenue Adjustment Required to Eliminate Surplus/Shortfall, by Line of Business (LOB)	Click Here to Show as $		Click Here to
Residential	**-2.9%**	**9.1%**	**6.4%**
Commercial	**35.3%**	**48.4%**	**47.4%**
Roll Off	**0.0%**	**13.0%**	**9.8%**
Street Sweeping Overall	**-25.0%**	**-15.4%**	**-18.0%**
Grand Total Overall	**2.5%**	**14.5%**	**12.1%**

Table 6
Dollar Surplus | Shortfall by Line of Business

SUMMARY RESULTS	FY 17/18 Projected	FY 18/19 Projected	FY 19/20 Projected
Revenue	$ 8,876,090	$ 8,876,090	$ 8,876,090
Expenditures	$ 9,095,314	$ 10,164,960	$ 9,949,393
Overall Surplus/(Shortfall)	$ (219,224)	$ (1,288,870)	$ (1,073,303)
as % of Total Expenditures	-2.4%	-12.7%	-10.8%
% Revenue Adjustment Required to Eliminate Surplus/Shortfall	**2.5%**	**14.5%**	**12.1%**
Operating Reserve			
Beginning of FY (July 1)	$ 6,023,585	$ 5,804,361	$ 4,515,491
End of FY (June 30)	$ 5,804,361	$ 4,515,491	$ 3,442,188
% of Expenditures	63.8%	44.4%	34.6%
Months of Expenditures	7.7	5.3	4.2
Revenue Adjustment Required to Eliminate Surplus/Shortfall, by Line of Business (LOB)	Click Here to Show as $		Click Here to
Residential	**$ (150,339)**	**$ 478,185**	**$ 334,629**
Commercial	**$ 632,427**	**$ 868,504**	**$ 848,995**
Roll Off	**$ 240**	**$ 103,930**	**$ 78,787**
Street Sweeping Overall	**$ (263,104)**	**$ (161,748)**	**$ (189,108)**
Grand Total Overall	**$ 219,224**	**$ 1,288,870**	**$ 1,073,303**

Cost of Service FY 17/18 Rate Adjustments

The Division considered the following four ($) rate adjustment scenarios shown in **Table 7** below. Each of these three scenarios are intended to move the City's residential, commercial, roll-off and street sweeping rates to cost of service rates, were the revenues for each line of business generated by those rates support the associated expenses, without any surplus or shortfall. [4]

Table 7
Cost of Service Rate Adjustment Scenarios

RATE ADJUSTMENTS	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23
Scenario 1					
SFD Res. Garbage Rates	9.6%	0.0%	0.0%	3.0%	3.0%
Comm. Garbage Rates	50.2%	0.0%	0.0%	3.0%	3.0%
Roll Off Garbage Rates	13.4%	0.0%	0.0%	3.0%	3.0%
Street Sweeping Rates	0.0%	0.0%	0.0%	0.0%	0.0%
Scenario 2					
SFD Res. Garbage Rates	4.0%	4.0%	4.0%	3.0%	3.0%
Comm. Garbage Rates	20.0%	20.0%	8.0%	3.0%	3.0%
Roll Off Garbage Rates	14.0%	0.0%	0.0%	3.0%	3.0%
Street Sweeping Rates	0.0%	0.0%	0.0%	0.0%	0.0%
Scenario 3					
SFD Res. Garbage Rates	3.0%	3.0%	0.0%	3.0%	3.0%
Comm. Garbage Rates	20.0%	20.0%	10.0%	3.0%	3.0%
Roll Off Garbage Rates	14.0%	5.0%	2.5%	3.0%	3.0%
Street Sweeping Rates	0.0%	0.0%	0.0%	0.0%	0.0%
Scenario 4					
Residential Garbage Rates	0.0%	0.0%	0.0%	3.0%	3.0%
Commercial Garbage Rates	20.0%	20.0%	10.0%	3.0%	3.0%
Roll Off Garbage Rates	14.0%	5.0%	0.0%	3.0%	3.0%
Street Sweeping Rates	0.0%	0.0%	0.0%	0.0%	0.0%

[4] The cost of service for a given line of business can vary from year to year, sometimes considerably due to differences in operating and capital costs. We suggest that rates that generate revenues that fall within ~ 5% +/- of the associated expenses represent cost of service rates.

3 Rate Survey

The City has not increased rates since July 1, 2011. **Table 8** below provides a comparison of the City's residential rates to the surveyed jurisdictions. As shown, the City's residential rates are generally comparable to those jurisdictions that we surveyed.

Table 8
Residential Rate Comparison

Jurisdiction	County	Population	Hauler	Current Rates	
			Residential	68-Gal	95-Gal
Tulare	**Tulare**	**62,315**	**Municipal**	**$ 25.30**	**$ 25.30**
Dinuba	Tulare	21,453	Pena		$ 29.53
Farmersville	Tulare	10,588	Mid-Valley		$ 22.08
Porterville	Tulare	54,165	Municipal	$ 17.85	$ 17.85
Visalia [(1)]	Tulare	130,104	Municipal	$ 23.85	
Clovis	Fresno	104,108	Allied	$ 30.21	$ 31.36
Coalinga	Fresno	13,380	Mid Valley		
Fresno	Fresno	496,112	Municipal		$ 32.98
Reedley	Fresno	24,194	Municipal		$ 33.54
Sanger	Fresno	24,270	Mid Valley		$ 27.57
Selma	Fresno	23,219	WMI	$ 30.25	
Delano	Kern	52,733	Municipal	$ 15.25	
Hanford	Kings	54,076	Municipal	$ 15.00	$ 19.05
Bakersfield	Kern	373,640	Municipal	$ 23.22	$ 23.22
Chowchilla	Madera	18,720	Mid Valley		$ 22.38
Madera	Madera	61,416	Mid Valley		$ 23.22
Merced	Merced	82,436	Municipal	$ 34.61	
			Average	$ 23.78	$ 25.71
			Tulare Rate	**$ 25.30**	**$ 25.30**
			Tulare vs. Average	**$ 1.52**	**$ (0.41)**
				6%	**-2%**

Table 9 below, provides a comparison of the City's commercial rates are, in general, significantly lower than the rates in the surveyed jurisdictions. It should be noted that the City's rates include free recycling. In many of the surveyed jurisdictions there is an additional charge for recycling that has been included in the rate and assumes the same size garbage and recycling container and frequency of collection.

Table 9
Commercial Rate Comparison

Jurisdiction	County	Population	Hauler	Current Rates			
				2 yard		3 yard	
			Commercial	1x / week	2x / week	1x / week	2x / week
Tulare	**Tulare**	**62,315**	**Municipal**	**$ 77.24**	**$ 153.80**	**$ 98.65**	**$ 196.67**
Dinuba	Tulare	21,453	Pena	$ 102.05	$ 187.03	$ 134.39	$ 237.40
Porterville	Tulare	54,165	Municipal	$ 86.80	$ 173.60	$ 130.20	$ 260.40
Visalia	Tulare	130,104	Municipal	$ 113.35		$ 133.65	
Clovis	Fresno	104,108	Allied	$ 167.96		$ 249.24	
Fresno	Fresno	496,112	Franchised	$ 97.96	$ 195.85	$ 144.48	$ 286.26
Reedley	Fresno	24,194	Municipal			$ 171.47	$ 267.57
Sanger	Fresno	24,270	Mid Valley	$ 85.40	$ 167.87	$ 115.58	$ 219.30
Hanford	Kings	54,076	Municipal	$ 76.70	$ 135.10	$ 102.20	$ 183.60
Bakersfield	Kern	373,640	Municipal	$ 101.32	$ 137.61	$ 121.55	$ 165.15
Chowchilla	Madera	18,720	Mid Valley	$ 70.57	$ 135.91	$ 90.35	$ 178.08
Madera	Madera	61,416	Mid Valley	$ 83.33	$ 158.38	$ 107.73	$ 203.06
Merced	Merced	82,436	Municipal	$ 151.52	$ 290.37	$ 166.37	$ 320.09
			Average	$ 103.36	$ 175.75	$ 138.93	$ 232.09
			Tulare Rate	**$ 77.24**	**$ 153.80**	**$ 98.65**	**$ 196.67**
			Tulare vs. Average	**$ (26.12)**	**$ (21.95)**	**$ (40.28)**	**$ (35.42)**
				-34%	**-14%**	**-41%**	**-18%**

4 Rate Model Design

The "Rate Model" that was developed is designed to project revenues and expenses for the Division over a 10-year planning period by each of the Division's four (4) lines of business (LOB), and by individual collection program within each of those LOBs. This gives the City the capacity to set and adjust rates separately for each of LOB, and by individual collection program, should it wish to do so. A primary consideration in the evaluation of various rate adjustment options for the City was to provide cost of service (COS) rates by LOB, such that the rates for each LOB cover the associated costs without generating any surplus or shortfall.

A copy of the Excel Rate Model has been provided to the City, along with Rate Model Guidelines and a copy of a Draft Proposition 218 Hearing Notice.

4.1 Cost of Service by Line of Business

Expenses

The Rate Model mirrors the structure of the Division's budget which assigns/allocates the Division's operating and capital expenses among the Division's four (4) lines of business (LOB). The Rate Model also provides for tracking the COS for the various LOB individual collection operations shown below: [5]

1. **Residential Collection Services (4710)**
    - Refuse collection
    - Recycling collection
    - Yard Waste | Organics collection
2. **Commercial collection services (4711)**
    - Refuse collection
    - Recycling collection
    - Organics collection
3. **Roll-Off Services (4713)**
    - Refuse collection
    - Recycling collection
    - Organics collection
4. **Street Sweeping Services (4712)**
    - Residential streets
    - Commercial streets

Note: The Rate Model results referenced in this Report account for the allocation of the budgeted residential, commercial and roll-off LOB expenses to the associated refuse, recycling and organics collection operations based on the number of routes. Street sweeping expenses were allocated to residential and commercial streets based on the percentage of the total monthly miles of each street type swept.[6]

Rate Revenues

The Division's budget, and the Rate Model, assign rate revenues to each of the four LOBs as follows:

1. **Residential Collection Services (4710)** – Refuse Disposal Receipts – Residential
2. **Commercial collection services (4711)** – Refuse Disposal Receipts – Commercial
3. **Roll-Off Services (4713)** – Special Hauls Roll-Off, and Special Hauls
4. **Street Sweeping Services (4712)** – Street Sweeper Receipts

[5] Additional capacity is provided to add additional subcategories to each of the four lines of business.

[6] 67.5% residential streets | 32.5% commercial streets (arterials and commercial).

Non-Rate Revenues

Non-rate revenues, including the following, were allocated to each LOB in proportion to each LOB's rate revenues:[7]

- Advertising
- Bad Debt Collections
- Special Container Rental Fees
- Utility Penalty
- Sale of Property
- Sale of Recycled Materials
- Loan Repayment – Water Fund Principal | Interest

The only exceptions were for "Street Sweeping – Caltrans" non-rate revenues, which have been directly assigned to Street Sweeping Services (4712), and Sale of Recycled-Residential, Sale of Recycled – Commercial, and Sale of Recycled - Roll-Off, which were directly assigned to the corresponding LOB.

4.2 Annual Expense Adjustment Assumptions

The Rate Model results discussed in this Report account for the following annual expense adjustments over the 10-year planning period:

- Labor – 2%
- PERS/PARS (retirement) – 4.8% average[8]
- Workers Compensation and Health Insurance – 10%
- Fuel – 5%
- Other Expenses (including Vehicle Maintenance and Disposal expense) – 3%
- Vehicle Replacement Fund funding expense – 0%

5 Special Rate Adjustments

As part of our review, R3 conducted time and motion analysis of the Division's residential solid waste, recycling and yard waste, and commercial solid waste and recycling collection operations. One of the objectives of that effort was to obtain real time data on how long it takes collection drivers to perform various "special" services for which the City has established certain charges, to assess the reasonableness of those charges. **Table 10** below provides a comparison of the current and proposed cost of service rate for the special services noted.

[7] Residential = 59% of total Rate Revenues, Commercial = 21%, Roll-Off = 8%, and Street Sweeping = 12%. See Rate Model worksheet (RM6).

[8] 5.5%, 5.7%, 6.0% 3.8% and 2.9% FYs 18 – 22, and 4.8% average for the remaining planning period.

Table 10
Special Services Cost of Service Rates

Special Service Fees	Current Rates	Costs of Service	Variance	
			$	%
Carryout Service Fee *($/month)*	$5.00	**$40.60**	$35.60	712.0%
Non-Scheduled Collection Fee *($/service)*	$10.00	**$20.30**	$10.30	103.0%
Gated Access Service Fee *($/service)*	$2.00	**$2.00**	$0.00	0.0%
Roll-Out Access Service Fee *($/service)*	$3.00	**$3.00**	$0.00	0.0%
Combined Access Service Fee *($/service)*	$4.00	**$5.00**	$1.00	25.0%
Second Container	$8.00	**$8.66**	$0.66	8.3%

1. **Carryout Service** – The Division currently provides subscription-based "carryout residential service" for a fee of $5.00 per month. Free carryout service for elderly and handicapped residents with medical note is common practice. Subscription carryout service within a fully-automated collection system, however, is not common. Additionally, the true cost of providing that service is considerable more (i.e., 2 times more), than the average fully-automated account. We strongly suggest that the City eliminate the option of subscription carryout service, as it is a major productivity killer. If, however, the City wishes to continue offering this service, we suggest that the additional monthly cost be set no less than twice the associated monthly rate. At the current rate of $20.30 per month for residential collection service, the monthly bill for carryout service would be $60.90.
2. **Non-Scheduled Automated Collection** – The City offers non-scheduled automated collection at an additional cost of $10.00 per collection. The cost to return from off-route to an account to service their container is considerable. If that time were available to collect additional accounts, that route could service multiple accounts in the time it takes to return to an account once the route has passed. There is a customer service value to this service, but $10.00 is a very nominal cost. We suggest the rate be increased to the same as the monthly rate ($20.30), but a case could be made for setting it even higher.
3. **Extra Cans** – Additional automated refuse container or green waste container is $8.00 per month. That falls very much in line with our calculated cost - Keep the existing rate.
4. **Gated Access Service** – $2.00 per week collection ($8.00 per month) to basic rate. This is effectively the same rate we calculated per collection – Keep the existing rate.
5. **Roll-Out Access Service** – $3.00 per week collection ($12.00 per month) to basic rate per container. Maximum container size is three (3) yard. This is effectively the same rate we calculated per collection – Keep the existing rate.

R3

6. **Combined Access Service** – $4.00 per week collection ($16.00 per month) to basic rate per container. Maximum container size is three (3) yard. [9] This is effectively the same rate we calculated per collection – Keep the existing rate.

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[9] ***Note:*** *COS Rate Adjustment percentages may vary from the associated revenue surplus or shortfall percentage, which is calculated as the revenue surplus or shortfall as a percentage of total expenses, not revenues. "Non-rate" revenues associated with the various LOBs, which are not impacted by any rate adjustment.*

Appendix A

Vehicle Replacement Fund

R3

CITY OF TULARE

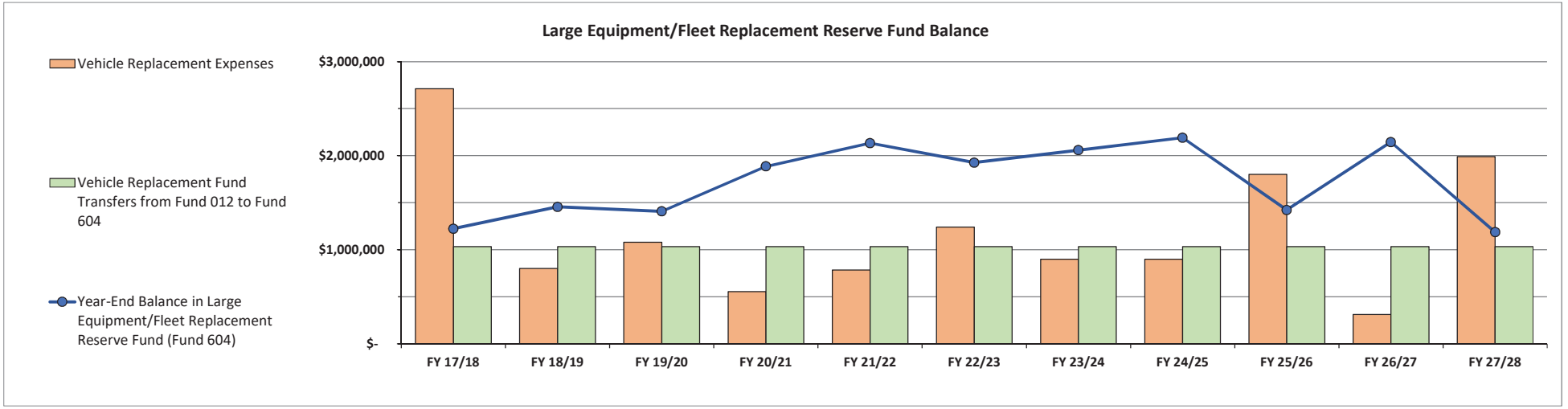
Solid Waste Rate Model

Vehicle Replacement Fund (RM 5)

CELL DATA SOURCES	
User Input	Calculated Surplus
Calculated Value	Calculated Shortfall

Note: All non-"User Input" cells on this sheet are protected to prevent accidental changes. There is no password to unprotect. *(Go to "Review" tab → click "Unprotect Sheet" to unprotect.)*

	FY16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	FY 26/27	FY 27/28
Vehicle Replacement Expenses		$ 2,712,000	$ 800,000	$ 1,080,000	$ 553,000	$ 785,000	$ 1,240,000	$ 900,000	$ 900,000	$ 1,800,000	$ 310,000	$ 1,990,000
Vehicle Replacement Fund Transfers from Fund 012 to Fund 604		$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180	$ 1,032,180
Annual Surplus/(Shortfall)		$ (1,679,820)	$ 232,180	$ (47,820)	$ 479,180	$ 247,180	$ (207,820)	$ 132,180	$ 132,180	$ (767,820)	$ 722,180	$ (957,820)
Year-End Balance in Large Equipment/Fleet Replacement Reserve Fund (Fund 604)	$ 2,903,505	$ 1,223,685	$ 1,455,865	$ 1,408,045	$ 1,887,225	$ 2,134,405	$ 1,926,585	$ 2,058,765	$ 2,190,945	$ 1,423,125	$ 2,145,305	$ 1,187,485
Reduced Division Annual VR Fund Expense =		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Check =		$ 1,032,180										



Appendix A

Appendix B

Capital Cost Projections

CITY OF TULARE

Solid Waste Rate Model

Capital Cost Allocations (RM 7)

CELL DATA SOURCES
User Input
Calculated Value

Note: All non-"User Input" cells on this sheet are protected to prevent accidental changes. There is no password to unprotect. (Go to "Review" tab → click "Unprotect Sheet" to unprotect.)

	Year	1	2	3	4	5	6	7	8	9	10	11	TOTAL
	Fiscal Year	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	
612 Solid Waste CIP													
Aqueous Parts Washer Cabinet		$ 5,000											$ 5,000
Automated Fluid Dispensing System		$ 9,000											$ 9,000
Corporation Yard Phases 1-3		$ 500,000	$ 500,000	$ 507,000									$ 1,507,000
Fuel Island Standby Generator Corp Yard				$ 15,750									$ 15,750
Rehabilitate Fuel Island Service Bunker		$ 5,000											$ 5,000
Standby Battery Power for Corporation Yard		$ 1,750											$ 1,750
Training Room Corp Yard		$ 4,000											$ 4,000
Equipment Camera Systems		$ 40,000											$ 40,000
Container Storage Lot Improvements						$ 175,500							$ 175,500
Subtotal		**$ 564,750**	**$ 500,000**	**$ 522,750**	**$ -**	**$ 175,500**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**		**$ 1,763,000**
Corp Yard Administration Building					$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 750,000	$ 750,000	$ 750,000	$ 4,750,000
Total Capital Costs		**$ 564,750**	**$ 500,000**	**$ 522,750**	**$ 500,000**	**$ 675,500**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 750,000**	**$ 750,000**	**$ 750,000**	**$ 6,513,000**
LOB Allocations (wp 25)													
Residential	**60%**	**$ 338,850**	**$ 300,000**	**$ 313,650**	**$ 300,000**	**$ 405,300**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$ 450,000**	**$ 450,000**	**$ 450,000**	**$ 3,907,800**
Commercial	**20%**	**$ 112,950**	**$ 100,000**	**$ 104,550**	**$ 100,000**	**$ 135,100**	**$ 100,000**	**$ 100,000**	**$ 100,000**	**$ 150,000**	**$ 150,000**	**$ 150,000**	**$ 1,302,600**
Roll-Off	**10%**	**$ 56,475**	**$ 50,000**	**$ 52,275**	**$ 50,000**	**$ 67,550**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 651,300**
Street Sweeper	**10%**	**$ 56,475**	**$ 50,000**	**$ 52,275**	**$ 50,000**	**$ 67,550**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 651,300**
Total Capital Costs		**$ 564,750**	**$ 500,000**	**$ 522,750**	**$ 500,000**	**$ 675,500**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 750,000**	**$ 750,000**	**$ 750,000**	**$ 6,513,000**
Annual % change			**-11.5%**	**4.6%**	**-4.4%**	**35.1%**	**-26.0%**	**0.0%**	**0.0%**	**50.0%**	**0.0%**	**0.0%**	

Appendix B

AGENDA ITEM: Consent 5

CITY OF TULARE, CALIFORNIA
BOARD OF PUBLIC UTILITIES COMMISSIONERS
AGENDA ITEM TRANSMITTAL SHEET

Submitting Department: Public Works - Wastewater Division

For Board Meeting of: March 1, 2018

Documents Attached: ☐ **Ordinance** ☐ **Resolution** ☒ **Staff Report** ☐ **Other** ☐ **None**

AGENDA ITEM:
Award a contract to LT Environmental of Visalia, CA, in the amount of $75,254.00 for the dewatering operation of sludge at the City of Tulare Wastewater Treatment Plant.

IS PUBLIC HEARING REQUIRED: ☐ **Yes** ☒ **No**

BACKGROUND/EXPLANATION:
Over the last few years, typically during the winter months, operations staff at the Wastewater Treatment Plant (WWTP) have run out of room in the industrial drying beds for the sludge produced daily through plant processes. In years past, the additional sludge has been deposited into the bulk volume fermenter (BVF). Staff routed this material to the BVF as a result of having nowhere else to place the sludge while the material in the drying beds dried enough to be taken to the landfill or moved to another location for storage.

As the Board may recall, the PPA with Fuel Cell Energy (FCE) for the biogas fuel cell requires a minimum amount of gas production from the City to operate the fuel cells. The majority of the biomethane produced at the plant comes from the BVF. Hydros Agritech is in the process of finalizing a process engineering study which evaluated the gas production at the WWTP and will make recommendations for improvements to the plant to ensure we produce the amount of gas required in the PPA with FCE. The draft study found that the BVF can produce 126% of the gas required by the PPA. Through evaluation of the BVF, staff and Hydros have determined that the BVF has not been operated according to design parameters resulting in over twenty feet of built up material that requires immediate removal in order to operate the system effectively and efficiently. A system to remove the material has been designed and staff is currently working to remove the accumulated solids.

With all of that said, for the current operations, the drying beds are full. With the BVF being evaluated and the built up layer being removed, we have looked at short term options to deal with the sludge. Attached is a quote from LT Environmental out of Visalia, CA to bring in a portable belt dryer to dewater the sludge and provide for more efficient solids handling until the industrial drying beds can be dried and cleaned. The quote includes a full turn-key operation for 4 weeks at 50 hours per week. LT Environmental will provide one operator to run the belt press so WW staff will not be responsible for their equipment.

STAFF RECOMMENDATION:
Award a contract to LT Environmental of Visalia, CA, in the amount of $75,254.00 for the dewatering operation of sludge at the City of Tulare Wastewater Treatment Plant.

CITY ATTORNEY REVIEW/COMMENTS: ☐**Yes** ☒**No** ☐**N/A**

IS ADDITIONAL (NON-BUDGETED) FUNDING REQUIRED: ☐**Yes** ☒**No** ☐**N/A**

FUNDING SOURCE/ACCOUNT NUMBER:

Submitted by: Trisha Whitfield **Title: Public Works Director**

Date: February 21, 2018 **City Manager Approval: _____**

LT ENVIRONMENTAL
Environmentally sensitive mobile dredging and dewatering solutions

Israel Garza
WWTP Supervisor
1875 South West Street
Tulare, Ca. 93274

February 14, 2018

Scope or work:

Provide dewatering operation for industrial sludge located at Tulare, Ca. The system is to be set up to discharge 20% dry solid cake into drying bed 7A and use drying bed 5A as storage flow pond from plant that is estimated at 180 GPM intermit at 1.5% solids. Water is to be provided by city of Tulare and is estimated to be within 30 feet of location for equipment lay down area. Effluent form the dewatering operation (Belt press) will be discharged back to the head works and hookup location is within 30 feet of equipment laydown area. Rental company (LTE) is to provide generator power, mixing tank for slurry material, one 2.2 meter belt press, one equipment operator, polymer make trailer and dry polymer, storage tank for water to be used for belt wash water and polymer make down water, diesel powered submergible pump to pump from 5A to mix tank and from 7A to 5A during set up of equipment. Hours of operation to be 10 hours per day five days per week. All fuel, labor, consumables (polymer) are to be provided by the rental company, this is a turnkey operation with city personnel assisting as needed to increase production as they see fit. Rental company (LTE) to provide insurance naming City of Tulare as additional insured and to hold harmless all city officials and city employees.

List of equipment:

- (1) 2.2 meter belt press
- (2) 20,000 gallon mix tanks (1) water (1) slurry
- (1) 10,000 gallon polymer dry make down unit
- (1) Thompson submergible pump inch with hydraulic hoses and 6 inch HDPE lines
- (1) 350 kw generator rental not included in monthly rate
- (1) misc. pump package to feed operation
- (1) misc. pipe package to connect complete operation
- (1) misc. electrical cord and panels package to connect complete operation
- One operator during operations, three operators during set up and tear down

Description of charges and estimated amounts:

- Mobilization of all equipment in and out ----------$ 8,681.00
- 100% turnkey dewatering operation 50 hours per week for 4 weeks ----------$66,573.00

Thank You

Dennis Thomas

PO BOX 7232 Visalia, CA 93290 • off (559) 250-2666
www.ltenviro.com

AGENDA ITEM: Gen. Bus. 1

CITY OF TULARE, CALIFORNIA
BOARD OF PUBLIC UTILITIES COMMISSIONERS
AGENDA ITEM TRANSMITTAL SHEET

Submitting Department: Public Works - Solid Waste

For Board Meeting of: March 1, 2018

Documents Attached: ☐Ordinance ☐Resolution ☐Staff Report ☐Other ☒None

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AGENDA ITEM:
Receive update on mailing of Proposition 218 notices and set the public hearing date for the adoption of the proposed Solid Waste rates for April 19, 2018.

IS PUBLIC HEARING REQUIRED: **☐Yes ☒No**

BACKGROUND/EXPLANATION:
On November 3, 2016, the BPU authorized a contract with R3 Consulting Group of Roseville, CA to carry out a series of studies (Solid Waste Routing, Operational Review, Vehicle Impact Fee Study and 10 Year Financial Plan) that culminated in a Rate Study and proposal of changes to the existing Solid Waste rates.

On January 18, 2018, the Board approved the draft Proposition 218 notice and moving forward with a proposed five year rate scenario designed by R3 Consulting to establish fees that meet the cost of service for Solid Waste divisions and are compliant with Proposition 218 requirements.

Staff is working with The Presort Center of Fresno to mail the notices by Monday March 5, 2018 in order to meet the Proposition 218 noticing requirement. It is requested the public hearing date be set for April 19, 2018. At that time, the Board will hold a hearing to receive public comments and take action regarding the proposed rates.

STAFF RECOMMENDATION:
Receive update on mailing of Proposition 218 notices and set the public hearing date for the adoption of the proposed Solid Waste rates for April 19, 2018.

CITY ATTORNEY REVIEW/COMMENTS: **☐Yes ☐No ☒N/A**

IS ADDITIONAL (NON-BUDGETED) FUNDING REQUIRED: **☐Yes ☒No ☐N/A**

FUNDING SOURCE/ACCOUNT NUMBER:

Submitted by: Benjamin Siegel **Title: Management Analyst**

Date: February 22, 2018 **City Manager Approval: _____**