JUNE 16, 2015

LOS ANGELES FIRE DEPARTMENT

RALPH M. TERRAZAS
FIRE CHIEF

June 1, 2015

BOARD OF FIRE COMMISSIONERS
FILE NO. 15-060

TO: Board of Fire Commissioners

FROM: Ralph M. Terrazas, Fire Chief

SUBJECT: FIRE PREVENTION BUREAU WORKFLOW ANALYSIS AND OVERVIEW

FINAL ACTION:	____ Approved	____ Approved w/Corrections	____ Withdrawn
	____ Denied	____ Received & Filed	____ Other

SUMMARY

The vision of the Los Angeles Fire Department, as expressed in the Strategic Plan 2015 2017 (strategic plan), is to provide exceptional fire protection and medical services by being metric driven, technologically sophisticated, and community focused while reflecting the people that we serve.

The mission of the Department is to preserve life and property, promote public safety, and foster economic growth through a commitment to prevention, preparedness, response, and recovery as an all-risk life safety response provider.

RECOMMENDATION

That the Board:
Receive and file this report.

FISCAL IMPACT

The projected fiscal impact for fiscal year 2015-20156 is based on the data analysis showing the need for seven new Fire Inspector I positions at a cost of $809,130 (at a yearly cost of $115,590 per inspector).

DISCUSSION

The Department adopted nine goals in the strategic plan as noted below. The goals relevant to in the Fire Prevention Bureau (FPB) and its service delivery and operations are presented below.

- Provide exceptional public safety and emergency service.
  This goal had eight strategies for achieving the goal including, but not limited to, improve delivery of all Department internal and external services through implementation of the Four Bureau reorganization. This strategy included evaluating the Fire Prevention Bureau field office staffing and modifying as needed to align with the Four Bureau reorganization.

- Identify cost effective solutions to manage expenditures.
  This goal had five strategies including, but not limited to, (1) develop revenue enhancement strategies; (2) optimize fiscal efficiencies; and (3) develop long-term, multi-year budget plans that address current and projected needs.

- Support new business and improve development services.
  This goal had two strategies including (1) stimulate the local economy by expediting new construction; and (2) providing consistent and effective customer service.

The Los Angeles Fire Department strategic plan provides a sound foundation for improvement in the services delivered by the Fire Prevention Bureau, and how these services are organized.

The following staffing requirements were evaluated based on the assumptions, data from the Fire Prevention Application (FPA) inspection system, and interviews from subject matter experts (SME). Additionally, the analysis assumes effective and consistent scheduling and optimized travel routes.

The findings in this report are meant to serve as foundations and baselines. As a metric driven organization we will continue to monitor and adjust staffing accordingly.

Historical Perspective of Eliminated Positions:

	Position	Position #	Unit	Reason	FY	Funding		
						Full	Partial	General
1.	Secretary		Industrial & Commercial Unit	Eliminated	8/9			X
2.	Senior Clerk Typist		Public Assemblage Unit	Eliminated	9/10			X
3.	Inspector II	405	Reg 4	Eliminated	9/10		X	
4.	Captain I	470	Low Rise Plan Check	Eliminated	10/11	X		
5.	Inspector II	474	Low Rise Plan Check	Eliminated	10/11	X		
6.	Inspector II	473	Low Rise Plan Check	Eliminated	10/11	X		
7.	Inspector II	472	Low Rise Plan Check	Eliminated	10/11	X		
8.	Inspector II	471	Low Rise Plan Check	Eliminated	10/11	X		
9.	Management Analyst I		Technical Section	Eliminated	10/11	X		
10.	Management Analyst II		Technical Section	Eliminated	10/11	X		
11.	Management Assistant		Technical Section	Eliminated	10/11	X		
12.	Secretary		Technical Section	Eliminated	10/11	X		
13.	Senior Clerk Typist		Technical Section	Eliminated	10/11	X		
14.	Community Service Rep			Eliminated	10/11			X

	Position	Position #	Unit	Reason	FY	Funding		
						Full	Partial	General
15.	Exec. Admin Asst II		Bureau	Eliminated	10/11			X
16.	Inspector I	249	LAUSD	Eliminated	10/11			X
17.	Inspector I	248	LAUSD	Eliminated	10/11			X
18.	Inspector I	176	Brush Clearance Unit	Eliminated	11/12	X		
19.	Management Analyst I		Brush Clearance Unit	Eliminated	11/12	X		
20.	Inspector I	225	Public Assemblage Unit	Eliminated	11/12		X	
21.	Inspector I	222	Public Assemblage Unit	Eliminated	11/12		X	
22.	Fire Protection Engineer		Technical Section	Eliminated	11/12	X		
23.	Inspector I	136	Central Industrial Unit	Eliminated	11/12			X
24.	Inspector I	135	Central Industrial Unit	Eliminated	11/12			X
25.	Inspector I	143	Harbor Industrial Unit	Eliminated	11/12			X
26.	Inspector I	482	Reg 4	Eliminated	11/12		X	
27.	Inspector I	168	Valley Industrial Unit	Eliminated	11/12			X
28.	Inspector I	165	Valley Industrial Unit	Eliminated	11/12			X
29.	Inspector I	154	West Industrial Unit	Eliminated	11/12			X
			TOTALS			**13**	**4**	**12**

Staffing Requirements

The reality of analyzing data to determine capacity for inspectors was carefully analyzed with the assistance of Senior Statistical Analyst Zack Bouz from the FireStatLA Section.

Utilizing assumptions, fire permit cost of services fees, and the experience of seasoned inspectors and supervisors, recommendations have been made below for the appropriate staffing of Industrial Commercial Inspections, Schools Inspections, and Certified Unified Protection Agency (CUPA) Inspections. The FPB has undertaken steps to clean up data, and being mindful of the effects on productivity and the consistency required to make informed decisions.

	Current Staffing	Average District Size	Recommended Additional Staffing	Recommended District Size
Industrial Commercial[1]	20	395	2	359
Schools – Day Care	11	434	4	320
CUPA Underground Storage Tanks (UST)	8	166	1	148

Industrial Commercial Units

Excluding oil wells, 20 inspectors are responsible for 7,909 industrial inspections according to FPA report. This report also suggests that the units completed about 93% of 1st quarter inspections driven primarily by a strong performance in the Valley Industrial Unit.

[1] Exclude Oil Wells

SME survey suggests that onsite activities average about 2 hours per inspection. Additionally, the inspection process requires about 30 minutes, on average, for research and computer entries and an additional 1 to 1.5 hours, on average, for re-inspection activities[2]. The analysis assumes 33.33% re-inspection rate and 1.5 hours for re-inspection.

Based on the assumptions above and a total of 1,070 hours per inspector capacity, it is estimate that the four industrial commercial units require 22 inspectors in order to complete their current workload on a one year cycle.

During the economic downturn six positions were eliminated from the Industrial Commercial Section. This new metric driven and validated proposal ensures that we meet our responsibilities to providing appropriate fire prevention inspections to the citizens and businesses in Los Angeles.

The average district size is currently 395 inspections. The additional 2 inspectors would reduce it down to a more manageable 359 inspections.

With the recommended district size, an industrial inspector is expected to average 90 inspections every quarter. FPA reports show that 50% of industrial inspectors were able to meet or exceed this goal in the 1st quarter of 2015.

Schools & Churches

FPA reports about 6,500 citywide Schools & Churches inspections of which 1,722 are assumed (but not totally verified) to relate to Large Family Day Care and approximately 1,000 relates to Los Angeles Unified School District (LAUSD).

Permit data suggest 6.5 hours, on average, for an LAUSD school inspections, and 2.5 hours, on average, for other school and day care inspections, excluding Large Family Day Care.

Based on the assumptions above and a total of 1,070 hours per inspector capacity, we estimate that Schools & Churches inspections, excluding Large Family Day Cares, would require 15 inspectors. Currently, there are 11 inspectors allocated to this function.

The average district size is currently 434 inspections. The addition of 4 more inspectors and the exclusion of Large Family Day Care inspections would reduce the average district size down to a more manageable 320 inspections.

Based on permit data and a total of 1,722 inspections we estimate that three inspectors would be required to inspect the large family day care facilities. The FPB is evaluating these inspections with the State Fire Marshal and will be coming forward with a recommendation to either adjust or eliminate these annual inspections.

---

[2] Re-inspection time varies significantly depending on the type and the size of inspection.

During the economic downturn two positions were eliminated from the Schools, Churches and Institution Unit. This new metric driven and validated proposal ensures that we meet our responsibilities to providing appropriate fire prevention inspections to schools as mandated by the State Fire Marshal.

CUPA Underground Storage Tanks (UST)

The FireStat section conducted a separate analysis on CUPA Underground Storage Tanks (UST) inspections back in March 2015. The scope of the study was limited to the UST facilities with less than five units (about 95% of the reported 1327 facilities).

Simulation results suggest that eight Inspectors are likely to have the capacity to complete inspecting facilities between one and four units in a one-year cycle. Although the remaining 5% larger facilities (ranging from 5 to 27 tanks) were not evaluated, they are unlikely to require more than one additional Inspector.

The adjusted average district for a unit of nine Inspectors is about 148 facilities / Inspector. A UST Inspector is expected to average about 13 complete inspections every month or 156 inspections a year.

Capacity Data

In order to determine the capacity of an inspector, the following assumptions were made:

Hours	Description
2080	**52 Weeks x** 40 Hours = 2080 (52 weeks multiplied by 4 days equals 208 days
377	Compensatory Time off = 18.22%
1703	**Total Hours** (2080) Minus Total Compensatory Hours off (377) = 1703
633	Sum of Deductions = Training, Wellness, Admin, Vehicle, Travel time
1070	Theoretical Inspector Capacity

Overdue Inspection and Strategy To Catch Up

In January of 2015, a decision was made to move all enforcement inspections from a fiscal year with multiple frequencies to a calendar year annual frequency schedule. These decisions were made based on providing consistent service over the calendar year and the frequency needed to have a strong risk based analysis prior to extending past the annual frequency.

In evaluating our vulnerabilities, we determined that immediate attention was required in the following areas:

1. Increase staffing in CUPA based on State Audit recommendations.
2. Increase staffing to focus on School inspections as mandated by the State.
3. Engage supervisors to review data and performance on a weekly basis.
4. Reorganize Development Services by reallocating staffing and partnering with Department of Building and Safety (LADBS) on a new scheduling system.
5. Leverage technology for a Regulation 4 system management.
6. Use Geographic Information System (GIS) technology for Brush Inspections.
7. Review all State-mandated inspection requirements.

The strategy to catch up is based on improving efficiencies, right sizing units, right sizing districts, and maintaining focus on task. FireStat continued review of productivity ensures we are staying on target and identifying problems early so adjustments can be made.

Evaluating our business model and looking for options to improve the availability of inspectors requires improved technology and moving to a mobile platform for data management.

Business Model Evaluation and Changes

The FPB has recently conducted an evaluation of several different options for adjustments to our business model, some of the options considered include; doing away with the district concept, administrators scheduling daily work, one inspector one building concept, decentralization of inspectors, decentralization of additional units, and reconfiguring units to align with the new Four Bureau model.

A strength, weakness, opportunity, and threats (SWOT) analysis was conducted for each option. This analysis revealed strengths and weakness for each option with customer service. The option to change must be proceeded with in a careful and thoughtful manner to ensure that the changes to the business model do not have a negative impact on the public and our members. The FPB will release its strategic plan which is in alignment with the Department's strategic plan.

Additionally, Phase I reorganization was recently approved by the Fire Chief and will be implemented in the near future. Phase II reorganization will align the FPB with the Four Bureau model.

California State Inspection Mandates

The State of California Health and Safety Code (H&S) has established four specific inspection frequency mandates, which are:

High-Rise, Annual H&S 13217 (a),
Schools (both public and private), Annual H&S 13146.3,
Jails every 2 years H&S 13146.1,
Residential occupancies more than two units, Annual H&S 13146.2.

The State Health and Safety Code 13146(f) also provides authority to charge for all inspections regulated under state authority, with a limitation not to exceed the cost of service. The State Health and Safety Code in 13143 establishes the State Fire Marshal's authority and responsibility which is delegated to the local authority to inspect several other occupancy classifications. All occupancies requiring Operational Fire Permits based on Los Angeles Fire Code Section 57.105.6 are based on an annual inspection, thereby creating an annual mandate on those inspections as well.

Additional Inspection Responsibility not currently being conducted

The State Health and Safety Code require the local fire authority to conduct annual inspections of all multi-unit residential buildings over two units on an annual basis. Currently, the fire stations inspect all residential apartment building over 16 or more units and hotels with 20 or more guest rooms and when it reaches five stories or more

the responsibility will reside with the FPB. These inspections fall into a state-mandated inspection that the Los Angeles Fire Department has never historically inspected. Having been informed of the requirement, the FPB is working to develop a plan to address these inspections. At the current time there is not a complete inventory of these inspections. The Los Angeles Fire Department is working with the Housing Department and Department of Building and Safety to capture this data set. Once identified, a plan will be developed to work them into the fire station inspection cycle. Additionally, we will be developing a legislative request for cost recovery for the inspection of all residential inspections. The Los Angeles Fire Department has the ability to charge fees to pay the cost of enforcement under Health and Safety Code Section 13146.2.

A subsequent board report is being developed to address this issue in more detail.

Transfer of Inspection Responsibilities

The FPB has been conducting inspections of state buildings in the City of Los Angeles for over 20 years under a Memorandum of Understanding (MOU) with the Office of the State Fire Marshal. The Fire Chief instructed the Fire Marshal to evaluate the possibility of transferring those responsibilities back to the Office of the State Fire Marshal.

The State Fire Marshal Tonya Hoover has already been in discussion with the Los Angeles Fire Department asking to revisit the agreement. After consideration, it was determined that these inspections are the state's responsibility and we could no longer afford to do this work without compensation. By releasing these responsibilities back to the state, LAFD inspectors can be reallocated to other responsibilities within the FPB.

Automation of Regulation 4 Process

Fire protection systems tests "Chief's Regulation 4" (Reg. 4) represent a major administrative challenge for our inspectors and the fire stations. Code compliance is a critical component of the Los Angeles Fire Department's fire prevention mission in terms of reducing risk for our citizens, visitors, and firefighters. In light of the greater demands for all of us to do more with fewer resources, the Los Angeles Fire Department has implemented the Compliance Engine to revolutionize our Reg. 4 fire protection system testing process to ensure public safety through improved compliance and metric driven risk reduction.

The Compliance Engine is a web-based application that streamlines the communication between the Los Angeles Fire Department's fire protection testing companies and the Los Angeles Fire Department, affording the Los Angeles Fire Department a tool to aggregate, track, and drive code compliance. The goal of this solution is to allow the Los Angeles Fire Department to manage over 125,000 fire protection systems installed at buildings covering over 470 square miles. These systems are tested annually by over 500 technicians certified by the Los Angeles Fire Department. Utilizing technology to streamline the process is a need identified by the Los Angeles Fire Department in order to sustain the fire protection systems testing program and ensure the systems are working properly.

The Los Angeles Fire Department has completed Phase 1 implementation of the Compliance Engine with the high-rise buildings. Within the first 100 days, we have

reduced the number of fire protection systems past due for testing by 21% and identified over 1,500 system deficiencies that are now in the process of being repaired. The goal is to increase the fire protection systems testing and maintenance compliance to greater than 90% within the first 18 months. The Los Angeles Fire Department is on pace to accomplish this mission.
The Compliance Engine manages this administrative process, maintains required timelines, and manages filing of all reports. Our preliminary reviews have indicated that The Compliance Engine is meeting our expectations on all of these elements. Expansion to the entire FPB is being organized while a pilot is being initiated for the field with a full implementation in the fall of this year. The field implementation will provide workload relief to field fire prevention responsibilities.

Cloud based / Mobile Inspection System
A cloud based mobile inspection solution is an essential part of the overall inspection optimization plan. A new cloud based mobile inspection application was just implemented in Fire Development Services. This is Los Angeles' first cloud based inspection system which allows the inspector to access the system from any computer or tablet and schedule, manage, and perform inspection while on customer site.

A GIS enabled solution also provides supervisors and fire department analysts with access to consolidated inspection data for better risk reduction analysis. An integrated inspection solution is also expected to allow public customers to submit, reschedule, and cancel inspection requests online.

Expanding this system to the rest of the FPB and field resources to replace current inspection systems will allow all inspection services to be done on a mobile platform.

CONCLUSION
The FPB's thorough analysis of data, inspection practices, vulnerabilities, and personal experiences has evaluated the inspection process. This analysis determined the actual effects from the personnel cuts created through the economic downturn. The data identified in schools, industrial commercial, and CUPA inspection districts revealed the need to increase the number of inspectors. Through an increased number of inspectors, improved technology, increased engagement of supervisors, and other efficiencies that are being implemented, the FPB will be able to accomplish one of Mayor Garcetti's Back to Basics priorities, "Making our Communities the Safest in the Nation."

Board report prepared by John N. Vidovich, Deputy Chief, Bureau of Fire Prevention and Public Safety.

Attachment

Workload Analysis for the BFP&PS Inspections

Submitted and written by: Zack Bouz – Senior Fire Statistical Analyst
5/19/2015

Executive Summary:

The office of the Los Angeles Fire Marshal requested assistance in evaluating staffing needs for various units in the bureau. The request was followed by several meetings with Inspector II Chris Da Broi, Captain Scott Miller (Valley Public Safety), and Captain Gary Carpenter (Schools & Churches).

The following staffing requirements were evaluated based on the assumptions listed below, data from the FPA inspection system, and interviews with the subject matter experts listed above. Additionally, the analysis assumes effective and consistent scheduling and optimized travel routes.

Additionally, the findings in this report are meant to serve as foundations and baselines. BFP&PS should continue to monitor and adjust accordingly.

Industrial Commercial Units:

Excluding Oil Wells, the 20 inspectors are responsible for 7,909 industrial inspections according to FPA report. The report also suggests that the unit completed about 93% of 1st quarter inspections driven primarily by a strong performance in the Valley Industrial Unit.

SME survey suggests that onsite activities average about 2 hours for this inspection type. Additionally, the inspection process requires about 30 minutes, on average, for research and computer entries and an additional 1 to 1.5 hours, on average, for re-inspection activities[1]. The analysis in this report assumes 33.33% re-inspection rate and 1.5 hour for re-inspection.

Based on the assumptions above and a total 1,070 hours inspector capacity, we estimate the four industrial commercial units to require 22 inspectors in total

Unit	Current Staffing	#Inspections	Total Setup Time	Total Onsite Inspection Time	Total Re-Inspection Time	Total Time	Required Staffing
a	b	c	d=c*0.5	e= c*2	f=c*0.33*1.5	g=e+f	h=g/1070
Central	7	2,864	1,432	5,728	1,432	8,592	8.03
Harbor[2]	3	761	381	1,522	381	2,283	2.13
Valley	6	2,365	1,183	4,730	1,183	7,095	6.63
West	4	1,919	960	3,838	960	5,757	5.38
Total	20	7,909					22.17

[1] Re-inspection time varies significantly depending on the type and the size of inspection.
[2] The Number of inspections in the Harbor unit excludes 1217 Oil Wells inspections

The average district size is currently 395 inspections. The additional 2 inspectors would reduce it down to a more manageable 359 inspections.

With the recommended district size, an industrial inspector is expected to average 90 inspections every quarter. FPA reports shows that 50% of industrial inspectors were able to meet or exceed this goal in 1st quarter 2015.

We also caution that the Harbor unit seems to exhibit attributes different than the remaining three units.

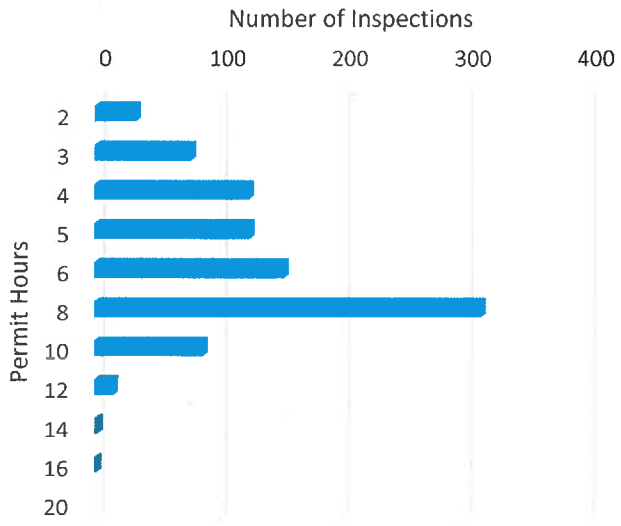
Schools & Churches

FPA reports about 6,500 citywide Schools & Churches inspections of which 1,722 are expected (but not verified) to relate to Large Family Day Care (LFDC) and approximately 1,000 to relates to LAUSD.

The bureau provided the following LAUSD permit statistics:

Distribution of LAUSD Inspections By Permit Hours

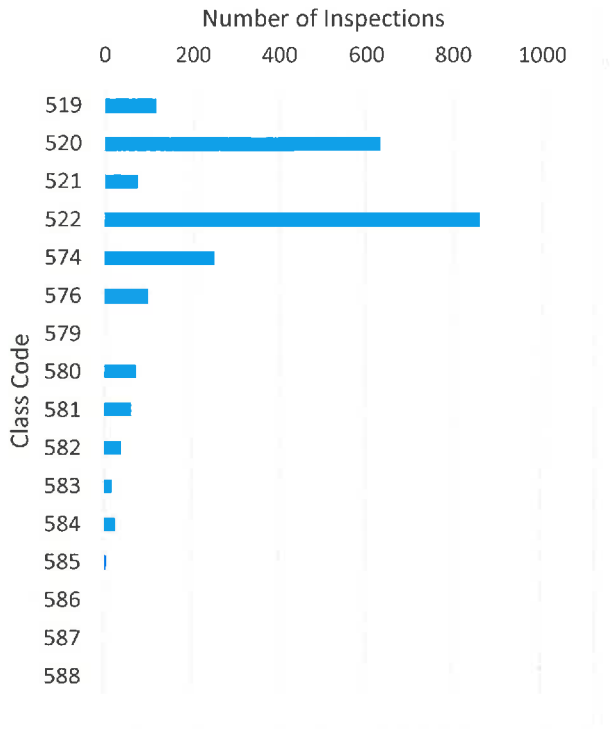
Number of Inspections	Code	Permit Hours	Total hours
33	F-574	2	66
78	F-580	3	234
125	F-581	4	500
126	F-582	5	630
154	F-583	6	924
314	F-584	8	2512
88	F-585	10	880
15	F-586	12	180
2	F-587	14	28
1	F-588	16	16
	F-579	20	0



The bureau also provided Other Schools/Day-care permit statistics thought to represent half of the permitted inspections and assumed (but not verified) to closely represent the true distribution of the different permit class codes.

Partial Distribution of Other Schools Inspections By Permit Hours

Description	Class code	Number	Hours
Day care 7-14	519	114	1.5
Day care 15-100	520	631	2
Day care >100	521	74	3
Day care LFDC	522	861	1.5
School <101	574	249	2
Special School	576	98	2
School >5000	579	1	20
School 101-200	580	71	3
School 201-300	581	60	4
School 301-400	582	38	5
School 401-500	583	18	6
School 501-1000	584	26	8
School 1001-2000	585	5	10
School 2001-3000	586	1	12
School 3001-4000	587	1	14
School 4001-5000	588	0	16



Permit data suggest 6.5 hours, on average, for an LAUSD school inspection, 1.5 hours for LFDC, and 2.5 hours, on average, for day care and other school inspections.

Based on the assumptions above and a total 1,070 hours inspector capacity, we estimate that Schools & Churches inspections, excluding LFDC, would require 17.5 inspectors. Currently, there are only 11 inspectors allocated to this function.

	Average Inspection Time	#Inspections	Total Inspection Time	Required Staffing
a	b	c	d=b*c	e=d/1070
LAUSD	6.5	1,000	6,500	6.07
Other Schools	2.5	3,778	9,445	8.83
LFDC	1.5	1,722	2,583	2.41
Total		6,500	18,528	17.32

The average district size is currently 591 inspections which translates to 148 quarterly inspections. Excluding district 244, FPA reported an average of 100 inspections per inspector in 1st quarter 2015. The 1st quarter average, however, is likely to represent the maximum

inspection capacity. Adding 6.5 inspectors would reduce district size to more manageable 371 inspections, or 93 quarterly inspections.

Excluding the smaller 1,722 LFDC inspections, the addition of 4 inspectors would reduce the district size to 320 or 80 inspections/quarter.

CUPA Underground Storage Tanks (UST)
The FireStat section conducted a separate analysis on CUPA Underground Storage Tanks (UST) inspections back in March 2015. The scope of the study was limited to the UST facilities with less than 5 units (about 95% of the reported 1327 facilities).

Distribution of UST Facilities
By Number of UST Units Installed

Number of Installed Tanks	Number of Facilities	Percent of Total
1	384	28.94%
2	258	19.44%
3	368	27.73%
4	247	18.61%
5	36	2.71%
6	5	0.38%
7	9	0.68%
8	5	0.38%
9	3	0.23%
10	2	0.15%
11	2	0.15%
12	2	0.15%
13	3	0.23%
14	1	0.08%
18	1	0.08%
27	1	0.08%

The analysis followed a statistical estimation method that incorporated variability in certain parts of the program, such as the new inspection checklist, Division-5 work, mandated CERS electronic submission and increased volume of customer service requests. The study also recommended another evaluation once the program enters a stable state.

A simulation model evaluated the following scenarios based on the assumptions and methodology explained in the "UST Inspection Workload Analysis" report. The estimated inspector quota and unit utilization are based on the number of active Underground Storage Tank (UST) facilities with less than 5 units (95% of the total facilities in the system).

Number of Inspectors	Inspector Quota	Inspector Workload Per Pay Period	Expected Unit Utilization	
	(Facilities with 1-4 units)	(26 Periods a Year)	Optimistic Estimate	Safe Estimate
7	180	6.9	91%	119%
8	157	6	79%	104%
9	140	5.4	71%	92%
10	126	4.8	64%	83%

Simulation results suggest that 8 inspectors are likely to have the capacity to complete inspecting facilities between 1 and 4 units in a 1 year cycle. Although the remaining 5% larger facilities (ranging from 5 to 27 tanks) were not evaluated, they are unlikely to require more than 1 additional inspector.

The adjusted average district for a unit of 9 inspectors is about 148 facilities/inspector. A UST inspector is expected to average about 13 complete inspections every month or 156 inspections a year.