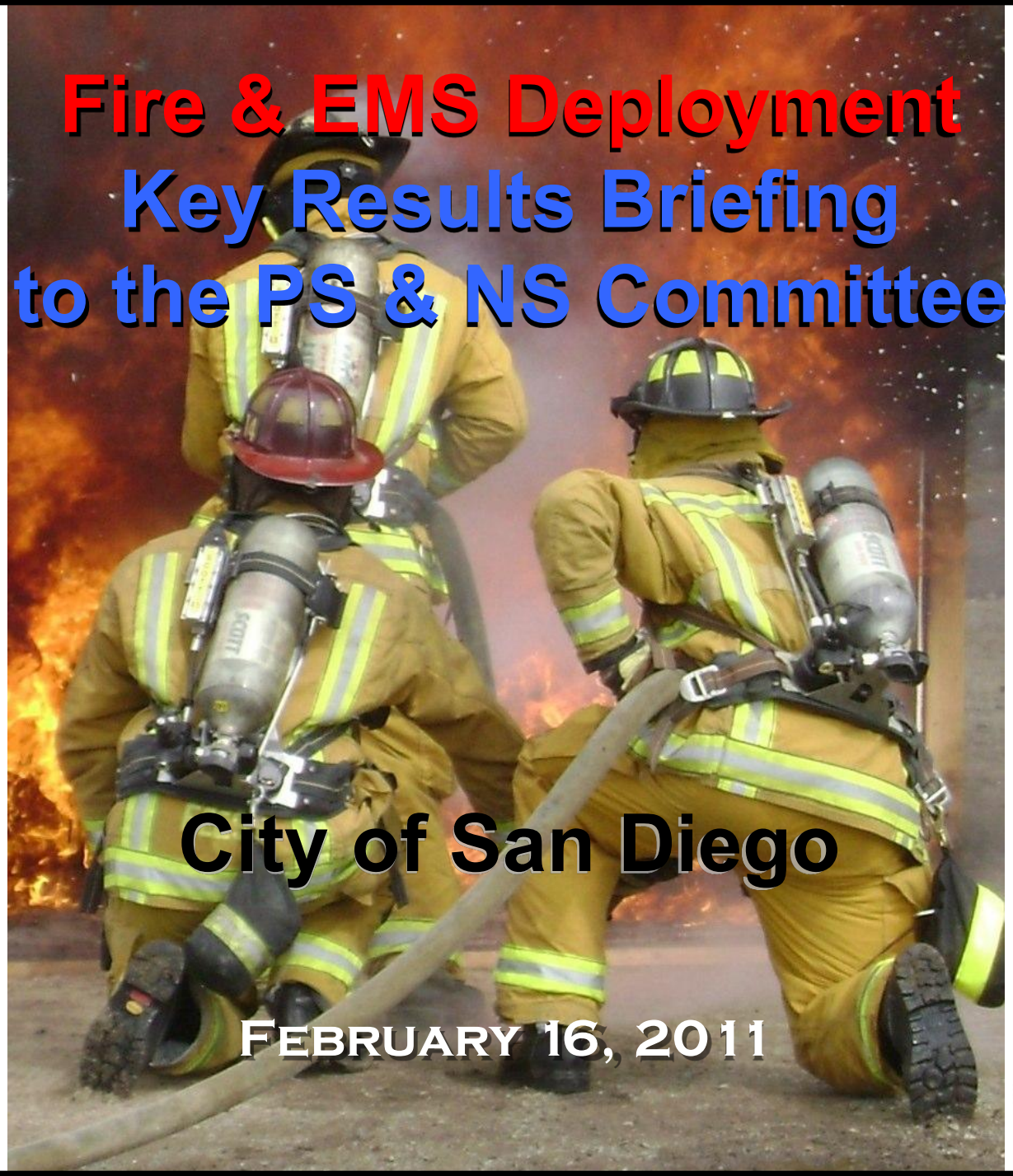
Fire & EMS Deployment
Key Results Briefing
to the PS & NS Committee



City of San Diego

February 16, 2011

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Policy Choices Framework

- No mandatory federal or state minimum service levels
- If fire services are provided, they have to be delivered safely, following standards
- Fire service levels are determined by need and available resources
- The challenge is matching need with fiscal capacity

Policy Discussion

- **Why** – Does San Diego Fire Rescue *exist*?
  - Neighborhood response to mitigate and terminate emergencies while small. To lessen the human and economic impacts of threatening situations.
- **How** – Does SDFD *lessen emergency severity*?
  - With a layered service approach, sensitive to risks, population densities and demands for service.
- **What** – Does SDFD *do to control* emergencies?
  - Deploy the appropriate type of unit for quick 1st response, followed up as needed with multiple, diverse unit types for complex emergencies.

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Study Objectives

- Refine the findings of the Regional Study that pertain to SDFD
- Analyze if SDFD's performance measures are appropriate and achievable given the risks, topography and special hazards to be protected in the City of San Diego
- Provide a full Standard of Response Cover planning analysis
- Review existing SDFD deployment models for efficiency and effectiveness
- Determine how and where alternative deployment models could be beneficial to address current and projected needs
- Identify additional fire station and staffing infrastructure triggers
- Outline order of magnitude costs

Fiscal Constraints

- It must be acknowledged that the deep and prolonged recession has negatively impacted local government finances
- The projected slow recovery will likely constrain the City's ability to fund and fully implement the added resource recommendations of this study
- As such, this study provides policy choices for level of service decisions over time as the fiscal resources allow improved customer service

Incident Types

- 274,325 incidents dated for 3 years
- An average of **250** incidents per day
- 3.51% of incident responses were to fire
- **80.43**% to EMS
- 16.06% to other types of incidents
- Simultaneous incident rate:
  - 10 underway 49% of the time (25% of Eng. Co.)
  - 15 underway 12% of the time

Demand by Hour of Day

	1 Mon	2 Tue	3 Wed	4 Thu	5 Fri	6 Sat	7 Sun	Total
00:00-00:59	371	375	319	336	362	492	570	2,825
01:00-01:59	347	332	291	326	357	566	597	2,816
02:00-02:59	241	268	269	257	320	495	552	2,402
03:00-03:59	239	263	245	239	252	320	361	1,919
04:00-04:59	211	208	198	217	187	269	253	1,543
05:00-05:59	227	236	209	244	277	238	284	1,715
06:00-06:59	348	306	316	324	333	320	279	2,226
07:00-07:59	499	503	494	504	450	392	323	3,165
08:00-08:59	587	594	577	613	552	463	463	3,849
09:00-09:59	726	721	700	683	679	590	500	4,599
10:00-10:59	779	772	758	747	746	659	647	5,108
11:00-11:59	798	813	768	774	729	669	644	5,195
12:00-12:59	852	749	787	766	838	688	711	5,391
13:00-13:59	777	809	760	772	776	761	685	5,340
14:00-14:59	768	811	766	782	829	759	657	5,372
15:00-15:59	828	815	770	782	746	729	638	5,308
16:00-16:59	792	759	764	788	773	653	728	5,257
17:00-17:59	831	701	802	781	858	723	723	5,419
18:00-18:59	708	733	692	740	702	713	723	5,011
19:00-19:59	720	657	696	723	685	724	658	4,863
20:00-20:59	620	630	649	622	676	705	659	4,561
21:00-21:59	548	539	576	595	670	700	638	4,266
22:00-22:59	486	456	468	510	590	646	530	3,686
23:00-23:59	381	394	367	408	536	603	476	3,165
Total	13,684	13,444	13,241	13,533	13,923	13,877	13,299	95,001

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Response Time Data Time Period

- Data for 3 years through 12/31/2009
- Thus the data is before the economic-crisis-driven "brownout" reductions of eight engine companies per day that began on February 6, 2010
- The response time performance in this study is the *best that the system delivers with all previously budgeted resources available*
- This study did not analyze performance after the brownouts were operating

Total Response Time Results

Measure	90% Minute Goal	Goal Source	Actual Performance
Fire Receipt to Arrival	<= 06:00	Current City of SD	49.7%
Fire Receipt to Arrival	<= 07:30	Citygate Recommendation	77.2%
Fire Receipt to Arrival	<= 08:50	City of SD Actual Compliance	90.2%

- Only 18 stations (38%) have total response time *less than 9:00 minutes for 90% of all incidents*

Dispatch & Crew Turnout Time Increments

Measure	90% Minute Goal	Goal Source	Actual Performance
Call Processing	<= 01:00	Desired NFPA Goal Point	66.5%
Call Processing	<= 01:40	City of SD Actual Compliance	89.9%

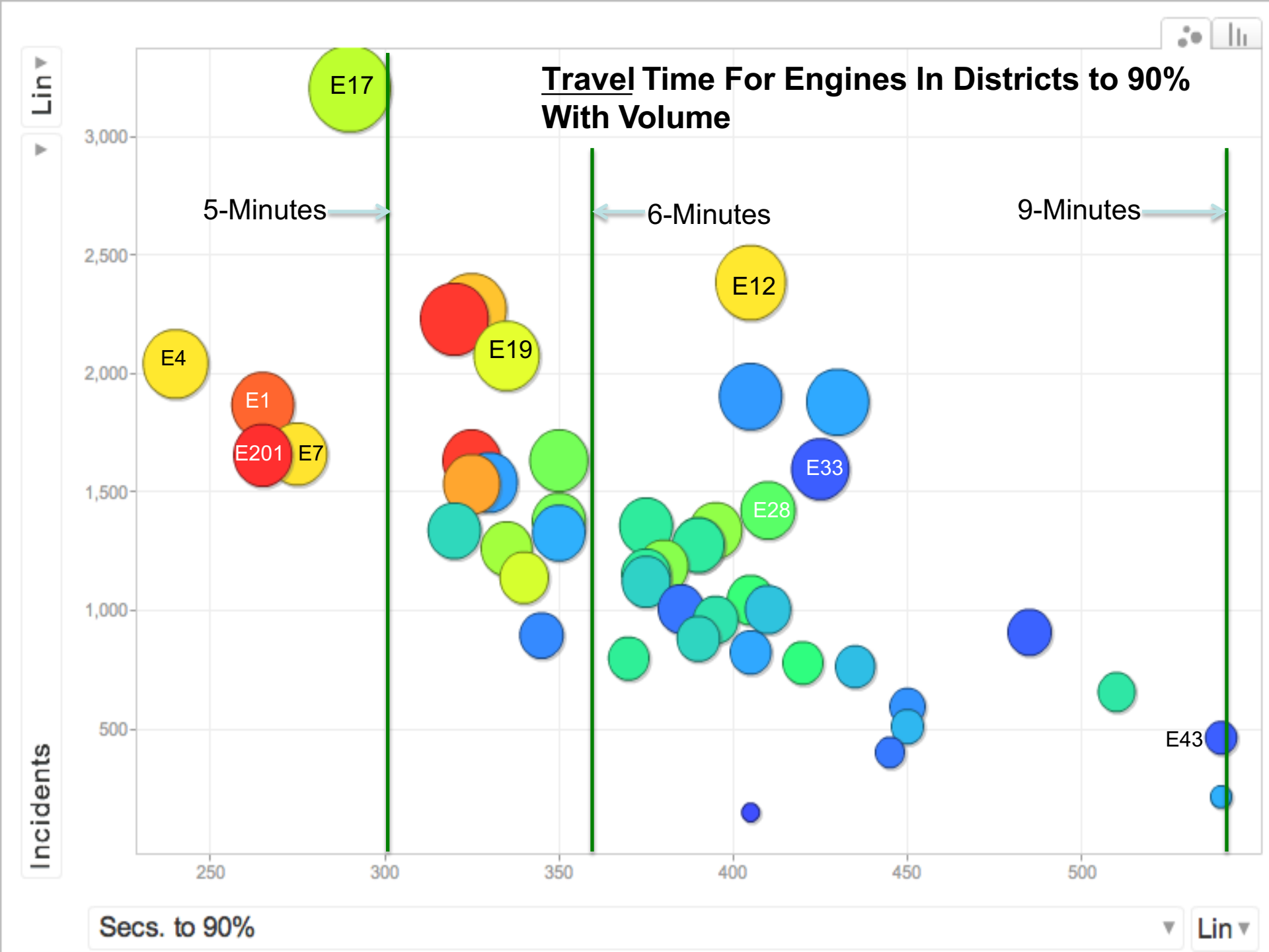
Measure	90% Minute Goal	Goal Source	Actual Performance
Turnout	<= 00:80	Desired Goal Point in NFPA 1710	86.1%
Turnout	<= 00:90	City of SD Actual Performance	90.3%
Turnout	<= 02:00	Citygate Recommendation	96.6%

Travel Time Increments

Measure	90% Minute Goal	Goal Source	Actual Performance
Travel	<= 04:00	Desired San Diego City Performance Minute	55.2%
Travel	<= 06:20	Act ual Performance Minute	90.9%

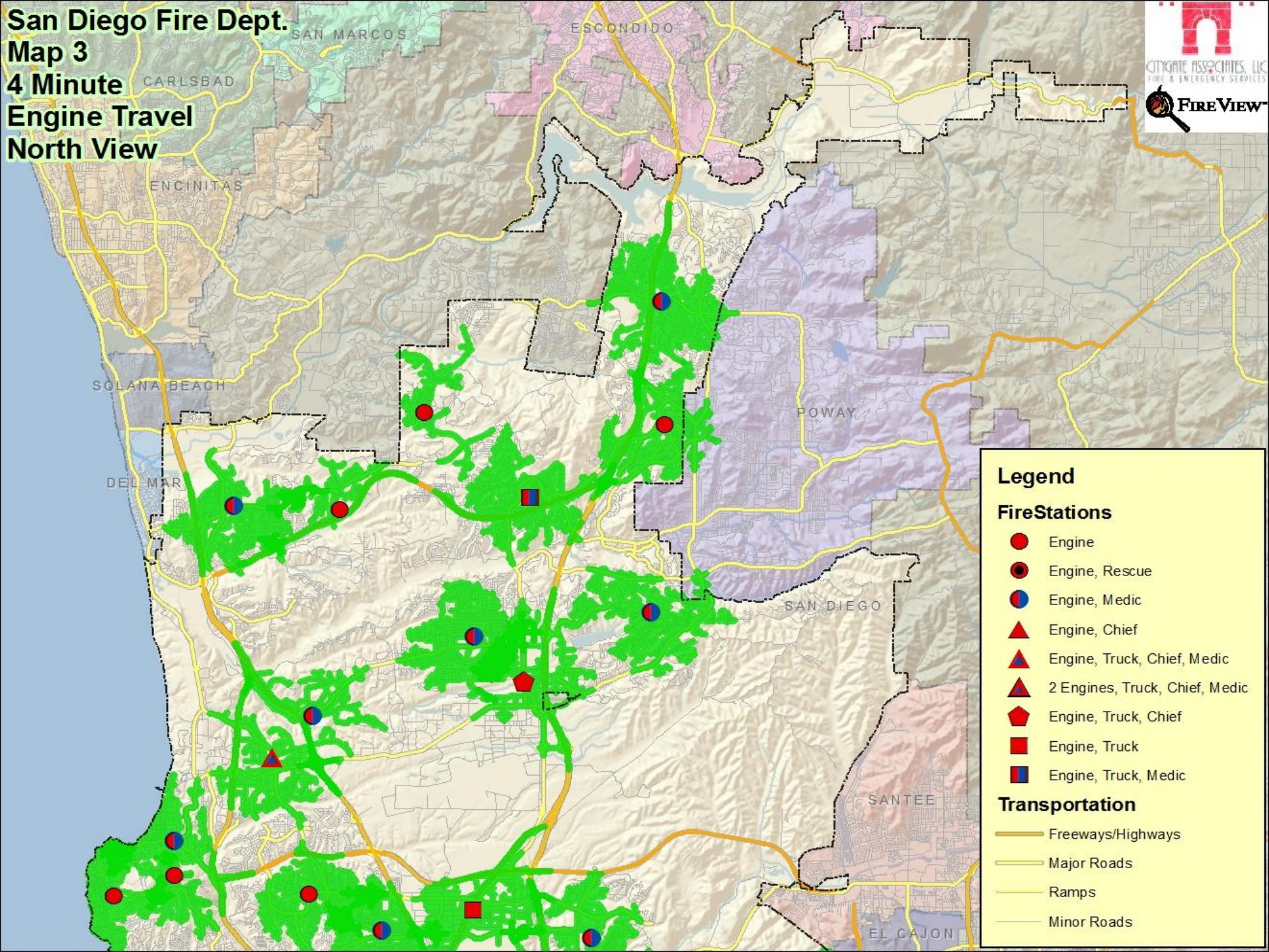
First Alarm
Effective Response Force Time –
Where 3 engines, 1 ladder truck and 1 battalion chief all arrived

Measure	90% Minute Goal	Goal Source	Actual Performance
Fire Receipt to Arrival	<= 10:00	Current City of SD	49.8%
Fire Receipt to Arrival	<= 10:30	Citygate Recommendation	55.4%
Fire Receipt to Arrival	<= 15:00	City of SD Actual Compliance	89.7%


Travel Time For Engines In Districts to 90% With Volume
5-Minutes
6-Minutes
9-Minutes
E17
E12
E19
E4
E1
E201
E7
E33
E28
E43
3,000
2,500
2,000
1,500
1,000
500
250
300
350
400
450
500
Incidents
Secs. to 90%
Lin
Lin

4, 5 & 6TH Minute Travel Coverage

	Existing Station Coverage	
Travel Time	**Miles**	**Percent Covered**
4 Minute	2,329	60.32%
5 Minute	3,146	81.50%
6 Minute	3,544	91.80%
Total	**3,860**	**100.00%**


San Diego Fire Dept.
Map 3
4 Minute
Engine Travel
North View
SAN MARCOS
ESCONDIDO
CARLSBAD
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
SAN DIEGO
SANTEE
EL CAJON
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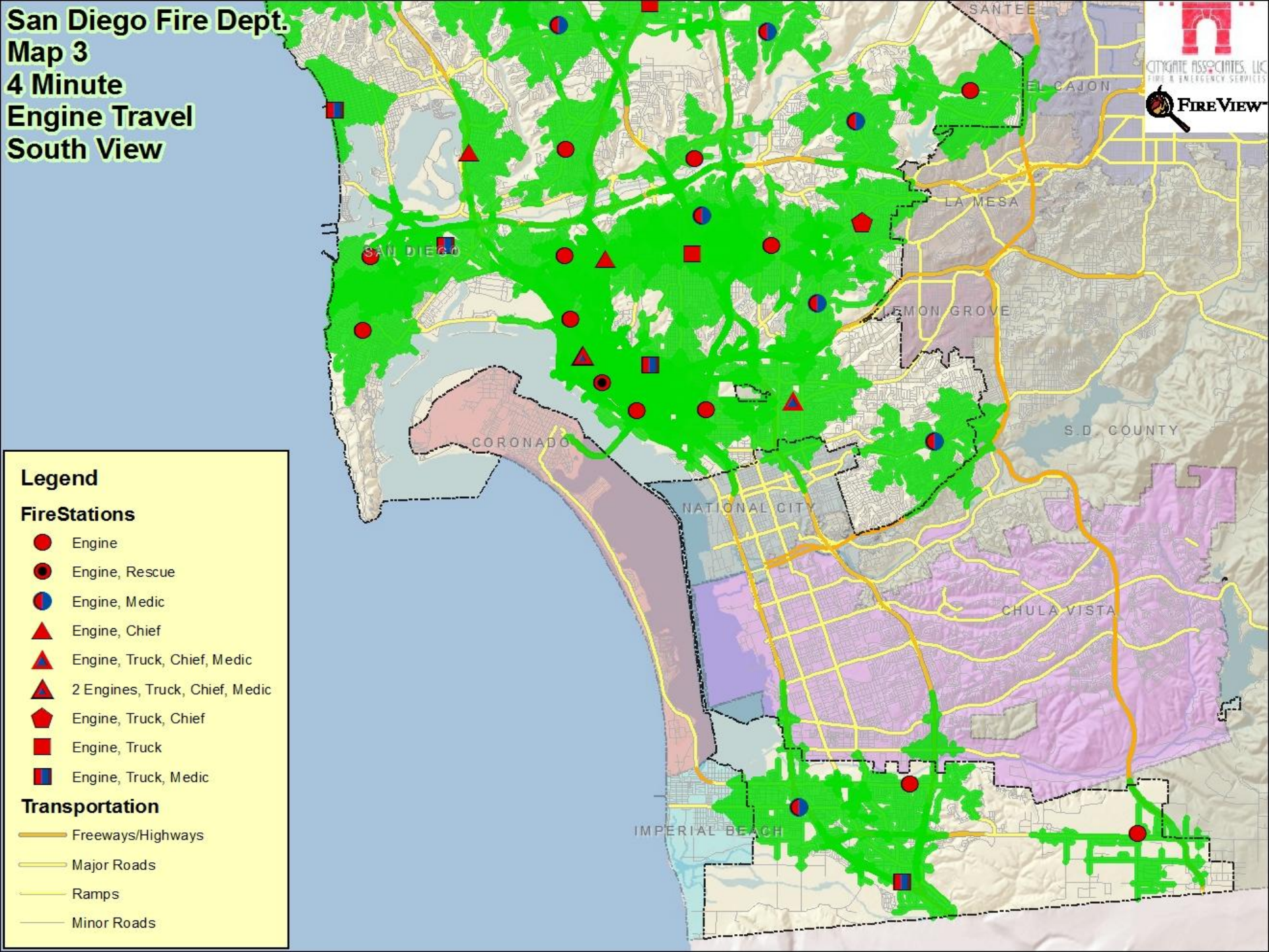
FIREVIEW
Legend
FireStations
Engine
Engine, Rescue
Engine, Medic
Engine, Chief
Engine, Truck, Chief, Medic
2 Engines, Truck, Chief, Medic
Engine, Truck, Chief
Engine, Truck
Engine, Truck, Medic
Transportation
Freeways/Highways
Major Roads
Ramps
Minor Roads

San Diego Fire Dept.
Map 3
4 Minute
Engine Travel
South View



Fire Station Gap Areas

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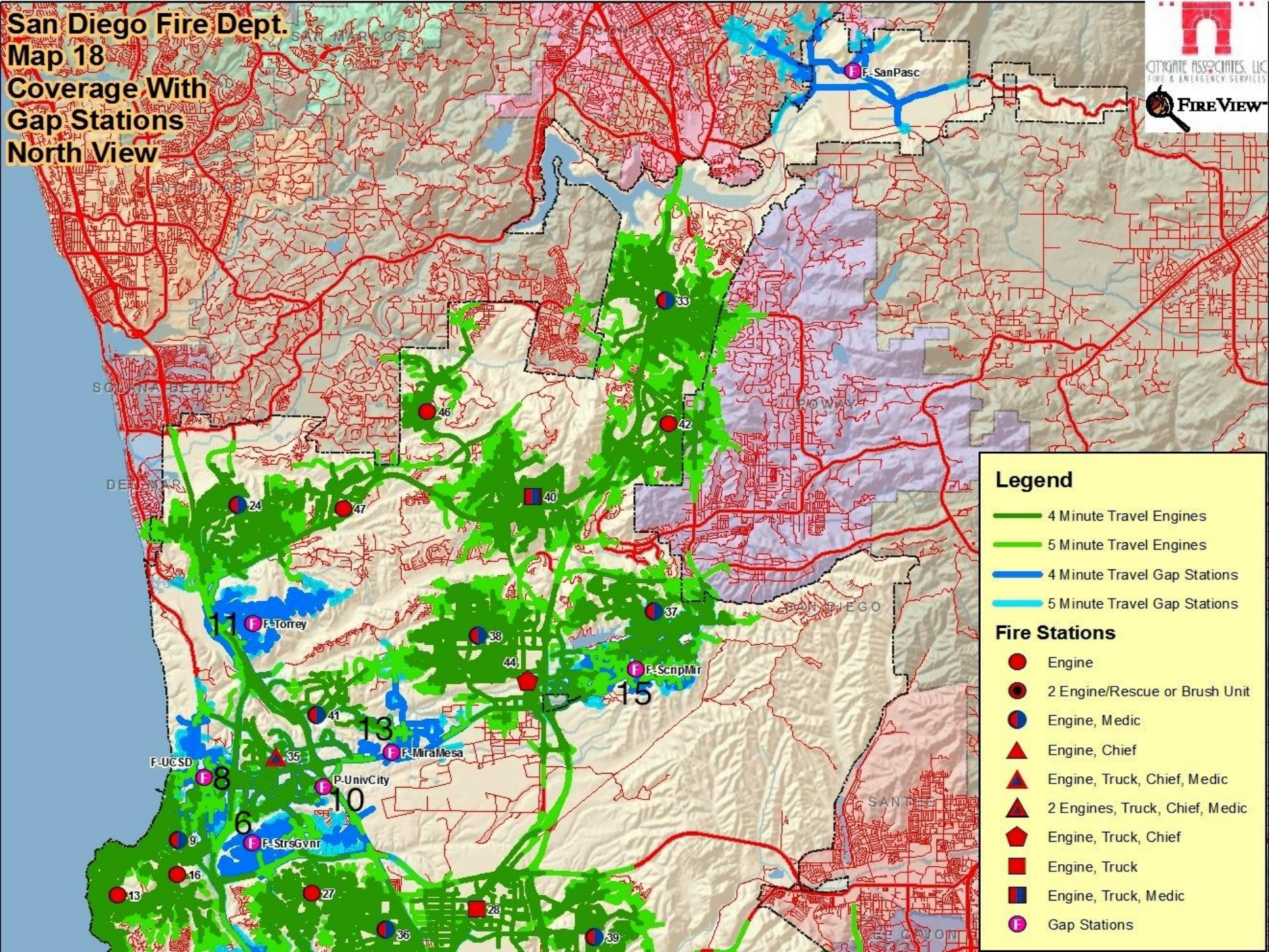
San Diego Fire Dept.
Map 18
Coverage With
Gap Stations
North View
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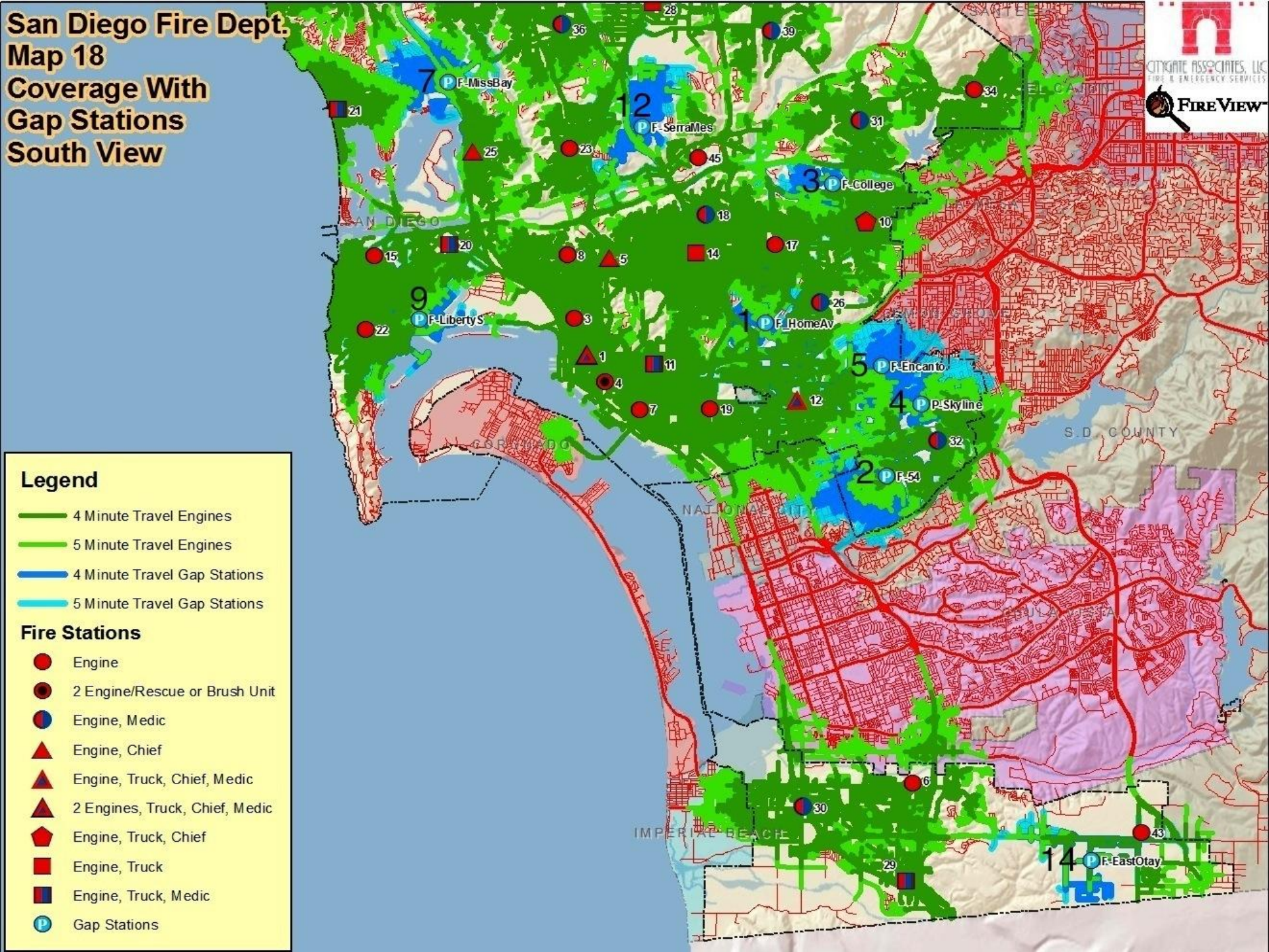
FIREVIEW
F-SanPasc
33
46
42
24
47
40
11
F-Torrey
38
37
44
F-ScnpMir
15
41
13
F-MiraMesa
F-UCSD
35
8
P-UnivCity
10
6
F-StrsGvnr
9
16
13
27
28
36
39
Legend
4 Minute Travel Engines
5 Minute Travel Engines
4 Minute Travel Gap Stations
5 Minute Travel Gap Stations
Fire Stations
Engine
2 Engine/Rescue or Brush Unit
Engine, Medic
Engine, Chief
Engine, Truck, Chief, Medic
2 Engines, Truck, Chief, Medic
Engine, Truck, Chief
Engine, Truck
Engine, Truck, Medic
Gap Stations


San Diego Fire Dept.
Map 18
Coverage With
Gap Stations
South View
Legend
4 Minute Travel Engines
5 Minute Travel Engines
4 Minute Travel Gap Stations
5 Minute Travel Gap Stations
Fire Stations
Engine
2 Engine/Rescue or Brush Unit
Engine, Medic
Engine, Chief
Engine, Truck, Chief, Medic
2 Engines, Truck, Chief, Medic
Engine, Truck, Chief
Engine, Truck
Engine, Truck, Medic
Gap Stations
F-MissBay
F-SerraMes
F-College
F-LibertyS
F_HomeAv
F-Encanto
P-Skyline
F-54
F-EastOtay
SAN DIEGO
CORONADO
NATIONAL CITY
IMPERIAL BEACH
S.D. COUNTY
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FIREVIEW

Gap Summary

- 25 response coverage gaps/growth areas identified
- 19 gaps have to be closed to attain 90% travel time coverage at 5 minutes -currently 81.5%
- 27 stations only increases 4-minute coverage to 72% - currently 60.3%

4-Minute Gap Miles

Station Site	Added Miles @ 4 Minutes	% Covered Increase
Skyline	31.62	61.16%
Serra Mesa	34.09	62.04%
Mission Bay / Pacific Beach	37.63	63.01%
Paradise Hills	31.79	63.84%
Home Ave	24.79	64.48%
Navajo	23.64	65.09%
Encanto	18.93	65.58%
Mission Valley	13.04	65.92%
Torrey	31.24	66.73%
USCD	23.51	67.34%
Liberty Station	24.41	67.97%
West Mission Vly	18.76	68.46%
College	16.07	68.87%
Stresemann / Governor	23.81	69.49%
Tierrasanta	14.03	69.85%
Scripps Miramar	21.35	70.41%
Linda Vista	8.56	70.63%
Research Park	10.58	70.90%
Mira Mesa	13.55	71.25%
University City	10.33	71.52%
South Park	8.75	71.75%
Kensington	3.68	71.84%
Black Mountain Ranch	3.75	71.94%
San Pasqual	7.68	72.14%
East Village	0.84	72.16%
East Otay	6.28	72.32%
Rancho Encantada	3.00	72.40%
Bayside	0.00	72.40%

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Final Priority Sort - 5th Minute

Citygate Priority	FRS Eligible	Stats Weighting			GIS Priority	Sites @ 5-min, equal weight to 90%
7	*NO*				1	Mission Bay / Pacific Beach
11	*NO*				2	Torrey
12	*NO*				3	Future Serra Mesa
6	*NO*				4	Stresemann/Governor
5	*YES*				5	Future Encanto
4	*NO*	**2**			6	Skyline
8	*NO*				7	UCSD
2	*NO*			**2**	8	Paradise Hills
13	*NO*				9	Future Mira Mesa
9	*YES*				10	Future Liberty Station
10	*YES*				11	University City
16	*YES*				12	Future San Pasqual
1	*NO*	**3**	2	2	13	Future Home Ave
3	*NO*			2	14	Future College
15	*YES*				15	Future Scripps Miramar
14	*YES*				16	East Otay
17	*YES*				17	Future Linda Vista
18	*YES*				18	Black Mountain Ranch
19	*YES*				19	Mission Valley
	9 FRS's					

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Improvements Gained

- 161,283 residents receive improved coverage by at least 1-minute travel time
- 14,377 incidents receive improved service
- A mix of 19 resources also adds weight of attack to first alarm coverage as well as depth of capacity in high workload areas

Highest Priority Gaps

- Of the 19 total additional stations to cover all public road miles by the **5th** minute at 90%:
  - 10 are the top priority, all help overworked existing stations
  - Sites 10 through 19 all cover less than 10 more road miles each
  - Of the 10 highest priority stations, **6** are the most critical
  - The top six additional stations by *priority order* are:
    - Home Avenue
    - Paradise Hills
    - College
    - Skyline
    - Encanto
    - Stresemann/Governor

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Deployment Needs for 5th minute 1st Due and 8th Minute First Alarm Coverage

- 10 additional 4-FF Engines
- 9 new “Fast Response Squad” (FRS) Units
- 4 additional 4-FF Ladder Trucks
- 2 Additional Field Battalion Chiefs

Fast Response Squad - *FRS's*

- 2-FF crew, one is a paramedic
- Smaller unit capable of
  - EMS Assessment
  - 1-patient transport when no ambulance available
  - Provides "recon" at serious emergencies
  - Equipped with small quantity of water/foam for small fires –"knock down" capability
  - Increases 1st alarm staffing
  - Can be part-or full-time deployed
  - If 24-hour staffed, placed in smaller buildings
  - Can be moved to areas of need, following the population and call trends per hour of day

3-FF versus 4-FF Unit Staffing

- Many areas are under-deployed, with little to no overlap from an adjoining unit at 4 minutes travel
- Some areas are very busy and drop calls to other units
- Either of the above means a 3-FF unit is less effective than a 4-FF unit, as the 1st arriver, ***if*** the 2nd due unit is farther away
- Analysis finds only 12 engines that have significant overlap from adjoining units, with modest workloads, and are not next to one or more major gap areas that could allow their staffing to be at 3-FF/unit, which is a 25% efficiency loss per unit
- Thus 12 re-deployed FF's equals:
  - 3 more engines at 4-FF each, or
  - 4 more engines at 3-FF each, or
  - 6 new FRS units

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Recommendation #1 – Adopt Deployment Measures

1.1 Distribution of Fire Stations: To treat medical patients and control small fires, the first-due unit should arrive within 7:30 minutes, 90 percent of the time from the receipt of the 911-call.

This equates to 1-minute dispatch time, 1:30 minutes company turnout time and 5 minutes drive time in the most populated areas.

Recommendation # 1(cont)

1.2 Multiple-Unit Effective Response Force for Serious Emergencies: To confine fires near the room of origin, to stop wildland fires to under 3 acres when noticed promptly and to treat up to 5 medical patients at once, a multiple-unit response of at least 17 personnel should arrive within 10:30 minutes from the time of 911-call receipt, 90 percent of the time.

This equates to 1-minute dispatch time, 1:30 minutes company turnout time and 8 minutes drive time spacing for multiple units in the most populated areas.

Recommendation #6

Fire Engine Dispatch Process:

The Department has to improve the procedures to achieve a decrease of the dispatch queue time for the first responding engine company.

Recommendation #7

Fast Response Squads:

The Department should immediately begin detailed planning to fully design and cost a pilot program of two-firefighter Fast Response Squads to assist in smaller deployment gaps where there are high simultaneous incident workloads.

Create a task force to fully study the Fast Response Squad concept. Bring forward an implementation pilot project and costs.

Recommendation #8

Replace In-Station Alerting System:

The City should make it a priority to replace the 21-year-old fire crew in-station alerting system at an approximate cost of $3.4 million.

This will improve response times via a one-time capital expense without adding any more response crews.

Operating Macro Costs

Resource – Staff & Operating	Cost in Millions	Quantity for 5-Minute Coverage @ 90%	Totals
2-FF FRS	1.0	9	9.0
Single engine staffed station	2.2	6	13.2
Double staffed station	4.4	4	17.6
Batt Chief	0.53	2	1.1
Total			**40.9**

Capital Macro Costs

Resource	Cost in Millions	Quantity for 5-Minute Coverage @ 90%	Totals
Engine	0.78	10	7.8
Ladder	1.1	4	4.4
FRS	0.4	9	3.6
Single station	7	6	42.0
Double station	8	4	32.0
FRS Station	.5	9	4.5
Fire Crew Alert Sys	3.4	-	3.4
Total:			**97.7**

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Deployment Options

- Maintain the status quo
- Add back the 8 brownout engines
- Add back some of the 4-FF brownout engines as peak hour demand 4-FF engines*
- Implementgap area engines and/or Fast Response Squads.*

* *Meet and confer on impacts, work schedules, position compensation*

Questions