

Appendix D: Emergency Response Time and Coverage

EMERGENCY RESPONSE TIME AND COVERAGE MODELS

Average Rural Community Structure Fire Response Model

Estimated Total Call Response Time-Interval Model for one engine and one Chief Officer

911 Call Received	0:00
Average Call Processing Interval	1:00
Average Volunteer(s) response time to apparatus location combined with	
Average Turnout Time Interval	5:00
Average Travel Time Interval	6:00
Average Response Time Subtotal:	11:00

Total Call Time
11:00

On-scene Attack Time Model

0:00		1 st Response Engine On scene Scene size-up begins; Primary fire hose attack line deployment begins; Setup of Engine; fire pump begins
12:30	1:30	VFD Chief Officer On scene Firefighter accountability system established
14:30	3:30	Scene size-up completed & Primary fire hose line deployment completed; Forcible and interior fire attack begins

Rural VFD Response Travel Time Model Parameters: Varying address/location information, longer than average response times, larger response areas, single response fire stations, longer backup & aid time. Rural terrain, some steep up/down slopes, few stop signs, varying road class/conditions.

Average Urban Community/City Structure Fire Response Model

Estimated Total Call Response Time-Interval Model for two engines and one Battalion Chief

911 Call Received	0:00
Average Call Processing Interval	1:00
Average Turnout Time Interval	1:30
Average Travel Time Interval	4:30 (ISO Standard Response Time @ 1.5 mile)
Average Arrival Time Subtotal:	7:00

Total Call Time
7:00

On Scene Attack Time Model

0:00		1 st Response Engine 1 On scene 1 st Response Medic/Rescue On scene Rapid Intervention Crew (RIC) setup begins Scene size-up begins; Primary fire hose attack line deployment begins
8:00	1:00	Engine2 On scene (hydrant) Battalion 1 On scene Eng. 2 begins hydrant supply hose lay RIC established; Firefighter accountability system established; Setup of Engine 2 fire pump completed
8:30	1:30	Scene size-up completed Primary fire hose attack line deployment completed; Forcible entry and interior fire attack begins

Exposure protection initiated as necessary

Urban Response Travel Time Model Parameters. Reliable address information, short average response times, smaller average response areas, multiple fire station coverage & backup. Urban terrain, flat-moderate slope, stop signs, cross-streets, visible addresses, intermittent traffic congestion, stop light signals

EMERGENCY VEHICLE RESPONSE COVERAGE AND TRAVEL TIME MODEL MAPS

The computer-aided coverage and time analysis models the distance each engine company travels within specified travel time zones. Individual travel time zones represent the geographic boundary that an emergency vehicle could reach in that given amount of time.

The spatial analysis tool uses an average, over-the-road speed appropriate for the roadway type. Therefore, this analysis is only a “model” of the real world. Actual response times may vary due to local road characteristics, traffic lights, congestion, road networks, weather conditions, visibility, etc. This model also does not account for the fact that the engine company may be assigned to a prior call and another unit would be called to cover the incident, thus extending the response time.

MAP OVERVIEW

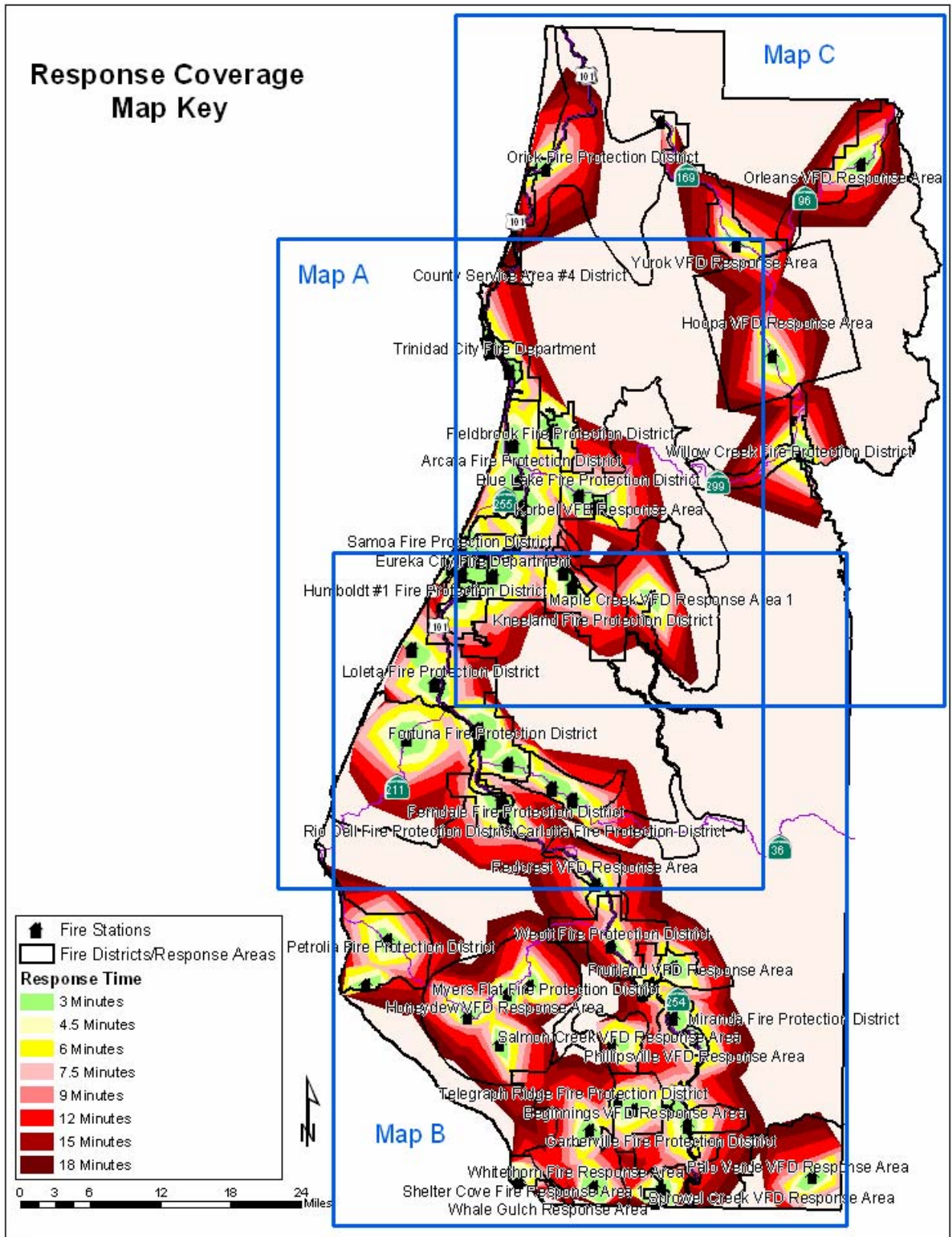
These maps collectively illustrate individual fire station coverage and travel time models for those districts/departments that reside within Humboldt County. Each travel time zone is reflected by a specific, standard color, to assist in distinguishing individual response time zones within the respective fire districts.

Map Key

This view shows the selected Humboldt County fire station locations (representing all local fire departments). This is a station location reference map for the other Humboldt County fire response time maps that follow.

Maps D-1, -2 & -3

These maps are the response time map index key to the more detailed emergency response travel time analysis areas.



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Map D-1

This map specifically illustrates the response time coverage model for each station located within Humboldt Bay Planning Compartment. Most local fire departments that reside within this planning compartment would be defined as “urban/semi-rural” fire organizations.

The matrix below further defines the urban response time model parameters used to devise the coverage/travel time maps. To calculate the total call response time using the travel time map: add the average turnout time (or other appropriate turnout time) to the selected travel time zone.

Table D-1 Urban Department Response Time Model Parameters

Response TIME Characteristics	Terrain and Average MPH Characteristics
<ul style="list-style-type: none"> ○ reliable address information, ○ short average response times, ○ smaller average response areas, ○ multiple resource/fire station coverage ○ relatively rapid backup & mutual/auto aid 	<ul style="list-style-type: none"> ○ urban terrain, ○ flat-moderate slope, ○ stop signs, cross-streets, ○ generally good location info, visible addresses, ○ intermittent congestion
Turnout Time add: +1:30	
Travel Time Response Boundaries:	
3.0 min – Green	38 mph
4.5 min – Light Yellow	“ “
6.0 min – Yellow	“ “
7.5 min – Light Pink	“ “
9.0 min – Pink	“ “
12.0 min – Light Red	“ “
15.0 min – Red	“ “

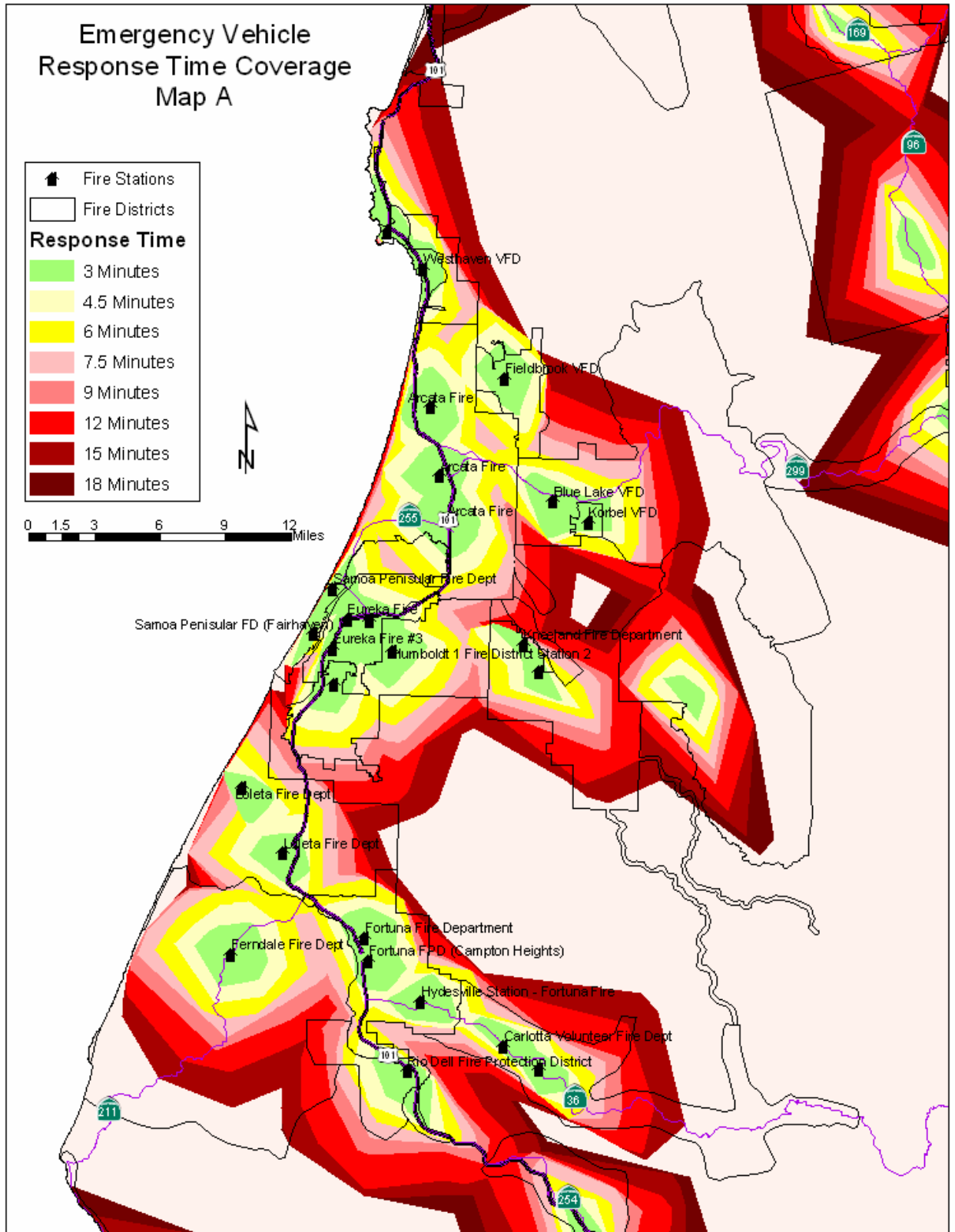
These maps specifically illustrate the response time coverage model for each station located within the remainder of Humboldt County, excluding the Humboldt Bay Planning Compartment. Most, if not all, fire districts/departments that reside within this planning compartment would be defined as characteristically “rural” fire organizations.

The matrix below further defines the rural response time model parameters used to devise the coverage/travel time maps. To calculate the total call response time using the travel time map: add the average turnout time (or other appropriate turnout time) to the selected travel time zone.

Table D-2 Rural Department Response Time Model Parameters:

Response TIME Characteristics	Terrain and Average MPH Characteristics
<ul style="list-style-type: none"> ○ No resident station personnel, ○ Often vague or inaccurate address/ location information, ○ longer than average response times, ○ larger response areas, ○ single resource/response fire stations, ○ longer backup & mutual aid times 	<ul style="list-style-type: none"> ○ rural terrain ○ some steep up/down slopes ○ rural, narrow roads ○ few stop signs ○ some highway travel ○ varying road class/conditions
Turnout Time add: + 5:00	
Travel Time Response Boundaries:	
3.0 min – Green	34 mph (speed reflects rural road characteristics)
4.5 min – Light Yellow	“ ”
6.0 min – Yellow	“ ”
7.5 min – Light Pink	“ ”
9.0 min – Pink	“ ”
12.0 min – Light Red	“ ”
15.0 min – Red	“ ”
18.0 min – Dark Red	“ ”

MAP D-2

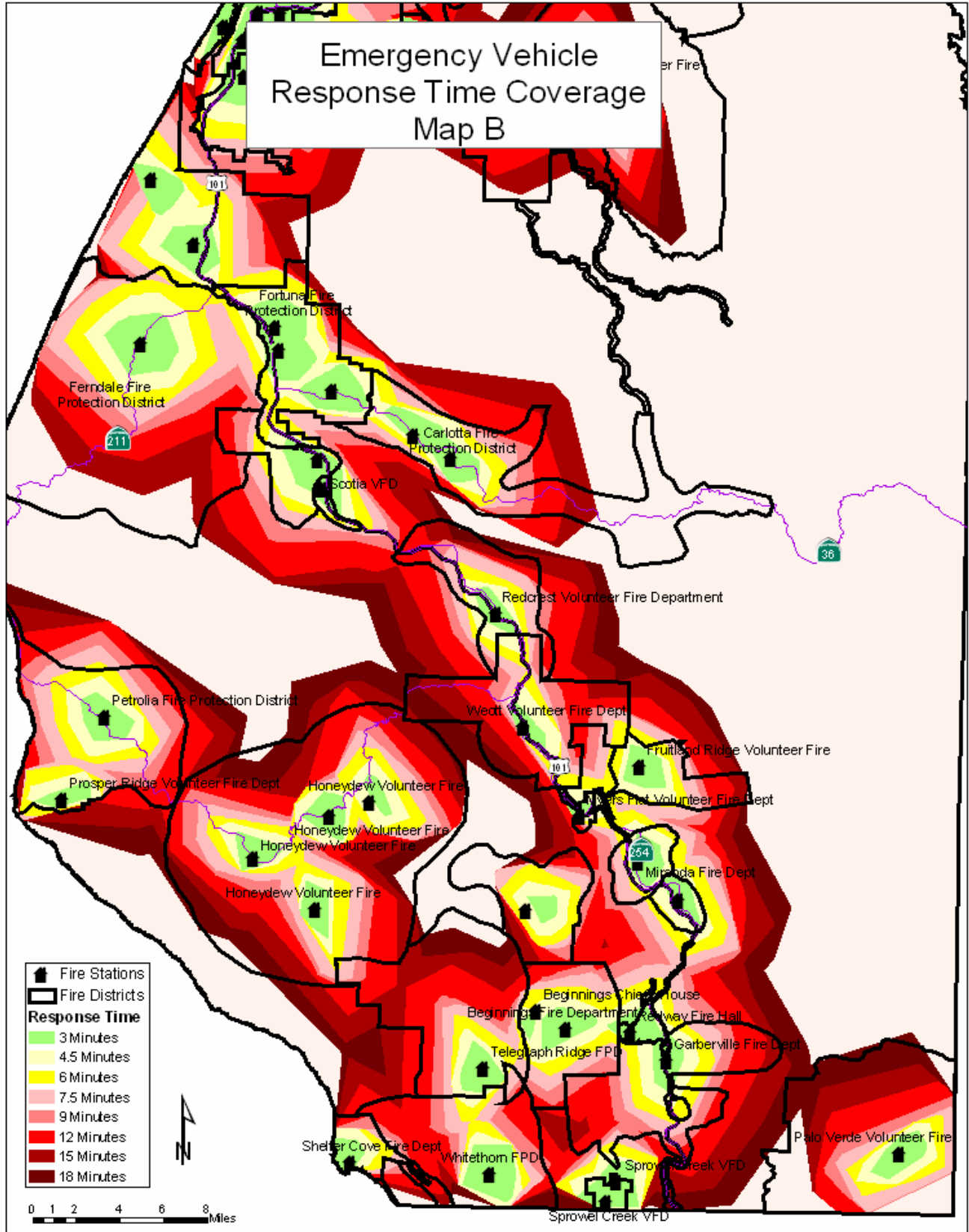


The table and figure below quantify the response time analysis by putting acres and relative percent to each category.

Table D-3

Times	Acres	Percent
3 Min	109,019	10.6
4.5 Min	105,679	10.3
6 Min	127,636	12.4
7.5 Min	122,665	12.0
9 Min	109,787	10.7
12 Min	231,089	22.5
15 Min	219,679	21.4
18 Min*	141,594	N/A

*The 18 Minute statistic is for the rural fire stations and does not include any stations inside the Humboldt Bay planning compartment.



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