



**Contract No. ML 16033
Regional PM10 Street Sweeping Program
April 23, 2018**

**Prepared for the Mobile Source Air
Pollution Review Committee (MSRC)
under the AB 2766 Discretionary Fund
Work Program**

Acknowledgement:

This project has been completed through the support of the Mobile Source Air Pollution Reduction Review Committee, Riverside County's Coachella Valley Air Quality Enhancement Program Funds, the South Coast Air Quality Management District, funding through AB 2766 funds, and the member agencies of the Coachella Valley Association of Governments.

This report was submitted in fulfillment of Contract AB2766/ML16033 the Street Sweeping Operations in the Coachella Valley program by the Coachella Valley Association of Governments (CVAG) under the partial sponsorship of the Mobile Source Air Pollution Reduction Review Committee (MSRC). Work was completed as of April 26, 2018.

Disclaimer:

The statement and conclusions in this report are those of the contractor and not necessarily those of the Mobile Source Air Pollution Reduction Review Committee (MSRC) or the South Coast Air Quality Management District (SCAQMD). The mention of commercial products, their sources or their uses in connection with material reported herein is not to be construed as either an actual or implied endorsement of such projects.



COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS

MSRC Contract No. ML 16033

Regional PM10 Street Sweeping Program

FINAL REPORT

April 2018

PROJECT SUMMARY AND CONCLUSIONS

1. Scope, purpose and background of the project:

The Coachella Valley's reputation for having clean, dry air is one of the many reasons tourists flock to this desert region. Since the early 1990s, CVAG and member agencies have cooperated on a Regional PM10 Street Sweeping Program ("Street Sweeping Program") as a proactive way to keep our air clean. This program is also critical for public health as street sweeping is one of the most significant air quality control measures to reduce PM10 (particulate matter of less than 10 microns). The major source of PM10 in the Coachella Valley is dust-generating activities, including vehicles traveling over paved or unpaved streets and construction. CVAG is pleased to submit this final report to the Mobile Source Air Pollution Reduction Review Committee (MSRC) on the Coachella Valley Regional PM10 Street Sweeping Program. CVAG appreciates the funding provided for the Street Sweeping Program through MSRC Contract ML16033 ("Contract").

The Coachella Valley was once a vast sea of sand resulting from a natural sand migration process that carried sand to the valley floor from the surrounding mountains via desert washes including the Whitewater River. Today, the Coachella Valley is a rapidly growing urban area with only remnants of the former sand dune system remaining. Though sand dunes are much more limited, the movement and deposition of desert sands continues across the network of roads on the valley floor. All regional arterials are subject to sand accumulation. CVAG has identified special wind impact streets that accumulate larger volumes of sand than the rest of the arterials. Known as "blowsand" this sand migration has direct and indirect effects on air quality, producing PM10 in two ways, through: 1) direct particle erosion and fragmentation, known as natural PM10, and; 2) secondary effects -- as sand deposits on road surfaces are ground into PM10 by moving vehicles and resuspended in the air, as man-made PM10.

The street sweeping program is an essential part of the Coachella Valley's efforts, in partnership with SCAQMD and the MSRC, to remain in compliance with the Coachella Valley State Implementation Plan (CVSIP) for air quality. In the Coachella Valley, PM10 is one of the primary air pollutants of concern as described in the SCAQMD 2016 Air Quality Management Plan (2016 AQMP). According to the SCAQMD's 2016 Air Quality Management Plan, the Coachella Valley remains a federal nonattainment area for the PM10. As noted, PM10 in the Coachella Valley results primarily from fugitive dust generated by various activities including construction activities, re-entrained dust from paved and unpaved road travel, and natural wind-blown sources. Frequent and often high intensity winds which move sand and dust into the air result in episodic PM10 concentrations. According to the 2016 AQMP, "All days in recent years that exceeded the 24-hour federal PM10 at Indio, Palm Springs, and Mecca would not have exceeded that standard except for

the contribution of windblown dust and sand due to strong winds in the upwind source area (high-wind natural events).”

The purpose of the Regional PM10 Street Sweeping Program is to make available and to provide street sweeping services to the Coachella Valley region which includes the cities of Palm Springs, Desert Hot Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio and Coachella as well as the unincorporated areas of Riverside County. Alternative fuel vehicles provided by the Operator are used to successfully remove the man made PM10 that is deposited on regional roadways and arterial highways before it is ground into fine particulates and re-entrained into the atmosphere.

2. Detailed description and analysis of work performed

To implement the Street Sweeping Program, CVAG hires a contractor (“Contractor”) to provide street sweeping services. According to the terms of their contract, the Contractor must ensure that their equipment used in CVAG’s program is alternative fuel equipment.

The Statement of Work for Contract No. ML16033 provides that the earliest date for which street sweeping may be reimbursed is May 1, 2015. Originally, the contract operator for CVAG was CleanStreet, from July 1, 2014 to June 30, 2016. CleanStreet used their own alternative fuel equipment. The equipment used by the CleanStreet for the Street Sweeping Program is listed in Table 1.

Table 1. Description of street-sweepers used by CleanStreet for CVAG Regional PM10 Street Sweeping Program.

Unit	Lic. Plate #	Year	Model/MP	VIN
T-714	6KCJ383	2009	Tymco 600-CNG	1FVACXDT79HAG3039
T-715	6GWM643	2009	Tymco 600-CNG	1FVACXDT69HAH1589
T-719	6GWM645	2009	Tymco 600-CNG	1FVACXDTO9HAG3044
T-721	6GWM644	2009	Tymco 600-CNG	1FVACXDT79HAK0583

In 2016, CVAG completed a competitive request for proposal process for the Street Sweeping Program. M&M Sweeping, Inc., a local firm, was selected to provide contract services. Their contract was effective on July 1, 2016 to June 30, 2018; the contract will be considered for renewal by the CVAG Executive Committee in May 2018.

A total of two street sweepers are used to perform sweeping operations. The vehicles were purchased by M&M Street Sweeping (“Contractor”) in 2016 when their contract with CVAG began. All sweepers are designated by the South Coast AQMD as PM10 efficient and are equipped with newer engines. The vehicles used by M&M are more efficient than the equipment used by previous contractors. A description of the engine and other features of these two vehicles is presented in Table 2.

Table 2. Description of two 2016 street-sweepers used by M&M Street Sweeping for CVAG Regional Street Sweeping Program.

Vehicle Engine	Description	Size	Fuel	hp/rpm	Other
Main Engine	Cummins ISL G	8.9L	Natural gas	320 hp / 2,200 rpm	Tier 4i compliant, ULEV certified, 30,000 GVW
Auxiliary Engine	Chevy Kem	5.7L	Natural gas	162 hp / 2,400 rpm	Tier 4i compliant, ULEV certified, 30,000 GVW

According to the contract terms, M&M provides regional PM10 street sweeping services on all regional arterials. The Contractor provides removal of sand/dirt accumulations and subsequent PM10 street sweeping services on roads designated as “special wind impact streets” as shown in Maps 1 through 7, in Attachment 2.



Street Sweeping vehicle in action.

To ensure that the street sweeping program is complying with all applicable federal, state and local laws and ordinances, the Contractor is required to:

1. Use only alternative-fuel equipment that complies with SCAQMD Rule 1186.1 and all applicable PM-10 rules.
2. Maintain all vehicles and equipment in good, safe, clean, operable condition at all times; complete daily vehicle inspections to ensure they are operating properly; perform scheduled maintenance; and keep accurate records of all maintenance.
3. Use equipment that complies with EPA noise emission regulations and all applicable noise control laws.
4. Remove any vehicle from service that is found to be in nonconformance with contract terms, if requested by CVAG.
5. Dispose of all sand and debris collected from street sweeping operations in accordance with all applicable federal, state, county and city ordinances and laws.

6. Comply with all city and county permitting requirements in its operating yard and other facilities and disposal sites for materials collected during street sweeping operations.
7. Ensure that on all roadways swept, all debris including “visible roadway dust” is removed from roadway surfaces. “Visible roadway dust” shall be interpreted to mean any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a regenerative air sweeper or water-induced broom sweeper under normal operating conditions.

Street sweeping was performed on identified regional arterials throughout the cities and unincorporated area of the Coachella Valley. It successfully removes “blow sand”, a major source of the region’s PM10. The Regional PM10 Street Sweeping Program sweeps approximately every other week. Regional streets, curbs and medians are swept in the nighttime hours so as not to impede or disrupt the flow of traffic. Approximately 897 curb miles are swept on a biweekly basis. CVAG staff monitor and review work performed by the Contractor.

The street sweeping program is coordinated through CVAG’s Street Sweeping Task Force, composed of representatives of Coachella Valley cities and Riverside County who meet on an as needed basis to provide input and oversight of the program. The curb miles swept are identified and agreed upon by the local jurisdictions as regional arterials which connect cities to each other and where there exists major traffic flow. Due to the growing population of the Coachella Valley, new streets may be added in the future to the regional program, based on input from the Street Sweeping Task Force.

Cost projections and economic analyses:

For 20 years, CVAG has put its annual PM10 Regional Street Sweeping Program out for competitive bid through an RFP. The resulting agreement uses a cost per curb mile of street sweeping for Regular Streets, with a separate unit cost for Wind Impact Streets. For the CleanStreet contract, the contract called for a unit price rate of \$21.99 per curb mile swept with a total of approximately 21,829 curb miles in the regional program. The M&M contract which was effective July 1, 2016 has a unit price rate of \$24.50. In both cases, this is a lower price than if each city were to individually contract with the operator.

Table 3. Number of curb miles for Regional PM10 Street Sweeping Program, 2017/2018

Map	Number of Curb Miles	
	Regular Streets	Wind Impact Streets
Map 1	54	0
Map 2	165	23
Map 3	169	15
Map 4	171	3
Map 5	57	23
Map 6	123	11
Map 7	83	0
Total	822	75
Rate/curb mile	\$25.24	\$37.13

The Regional PM10 Street Sweeping Program has been funded by three sources, the Coachella Valley Air Quality Enhancement Program through Riverside County, AB 2766 funds, and grants from the Mobile Source Air Pollution Reduction Review Committee (MSRC). Since 2010, CVAG has received funding from the MSRC's annual Local Government Match Program (LGMP). In 2015 CVAG was awarded its fifth year of MSRC funding for \$250,000 over two years. MSRC funding is not currently available for subsequent years.

The second funding source is AB2766 funds which are provided to cities and counties from a \$4 per vehicle surcharge on annual DMV registration fees. AB 2766 funds are specifically for programs to reduce air pollution. CVAG member agencies contribute 75% of AB2766 funds to CVAG for the street sweeping program. To make up for some of the loss of funding, in 2016 all participating members of CVAG approved Amendment Four to the AB 2766 Memorandum of Understanding (MOU) between CVAG and member jurisdictions. The amendment increased the contribution from 60% to 75% of AB 2766 funds.

The third funding stream is Coachella Valley Air Quality Enhancement Program (sometime referred to as "Colmac") funding through an agreement with Riverside County. In July 2010, the County formally agreed to provide \$150,000 per year for five years to assist CVAG and the member jurisdictions with the operations of the Regional Street Sweeping Program. This funding has been extended by the County for five years through the 2019/20 fiscal year. CVAG anticipates requesting additional funds for an additional five years in 2019.

Emission benefits derived:

The only calculations that are routinely conducted for the CVAG regional Street Sweeping Program are for AB2766 subvention fund reporting to the SCAQMD. These emissions reductions are estimates of emissions reduced by purchasing more efficient street sweepers. For fiscal year 2015/16, the most recent data available, total PM2.5 emissions reductions were 1,215 pounds per year and total NOx emission reductions were 3,456 pounds per year. Again, these reductions are representative of removing older sweepers from the road and replacing them with newer engines, not total fugitive dust collection.

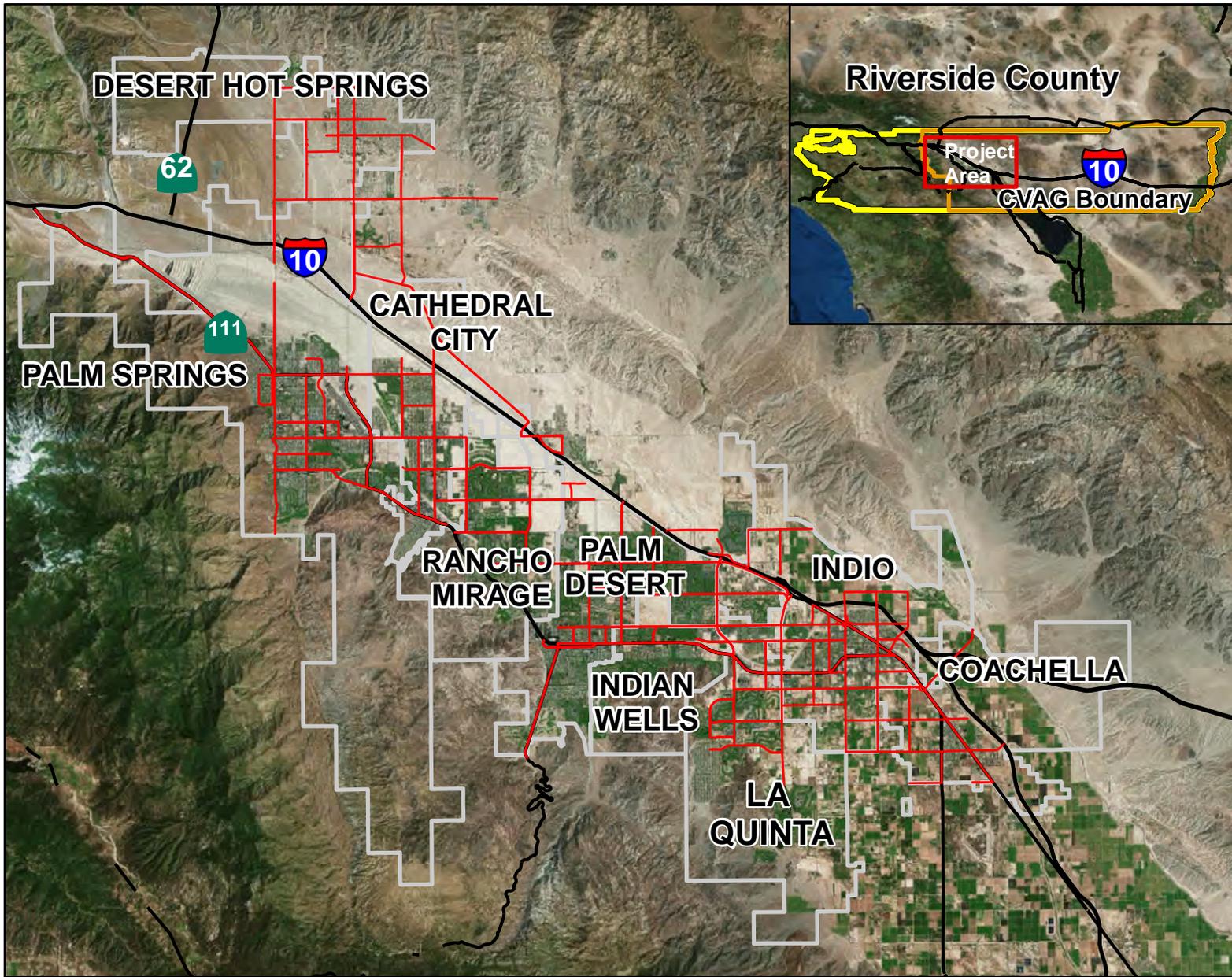
No annual quantification of the volume of sand collected from Coachella Valley roadways was conducted and the total PM10 emissions reductions accomplished by street sweeping have not been calculated. However, if the control effectiveness calculated by the SCAQMD of enhanced street sweeping is 10 percent and the entrained road dust from paved roads is approximately 3 tons per day on an annual average basis from the Coachella Valley 2007 AQMP, then we have accomplished significant PM10 emissions reductions. These past studies are the basis for determination of the value and benefit of regional street sweeping in the Coachella Valley.

3. **Any Recommended Future Actions:** The Regional PM-10 Street Sweeping Program has proven to be an effective and successful way to preserve air quality in the Coachella Valley. The Street Sweeping Program supports compliance with the Coachella Valley State Implementation Plan, the SCAQMD Air Quality Management Plan, and federal standards. The following recommendations will support the continue success of this program:
 1. Ensure ongoing funding of the Regional PM10 Street Sweeping Program

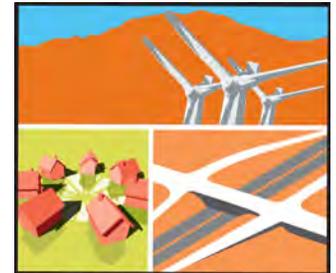
2. The CVAG Street Sweeping Task Force has recommended that the special wind impact streets be swept weekly during the windy season from mid-February to mid-June to control PM10.
3. Implement the program in the most efficient and cost-effective manner. CVAG is discussing a study to identify the most efficient use of street sweeping to maximize PM10 removal while minimizing costs.
4. **A photo** of one of the vehicles sweeping the streets of the Coachella Valley is provided on page 5. The vehicles are the property of M&M Sweeping but do carry a CVAG logo. A map of the project area is provided in Attachment 1. Maps showing the specific regional roads covered by this program are provided in Attachment 2.

Attachment 1: Map of the Regional PM10 Street Sweeping Program area

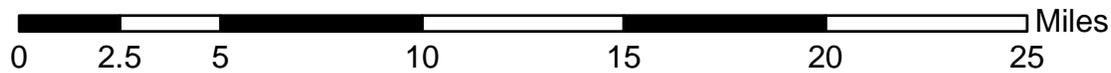
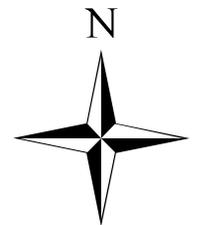
Figure 1: Street Sweeping in the Coachella Valley



- Legend**
- Street Sweeping Routes
 - Highways
 - City Boundaries



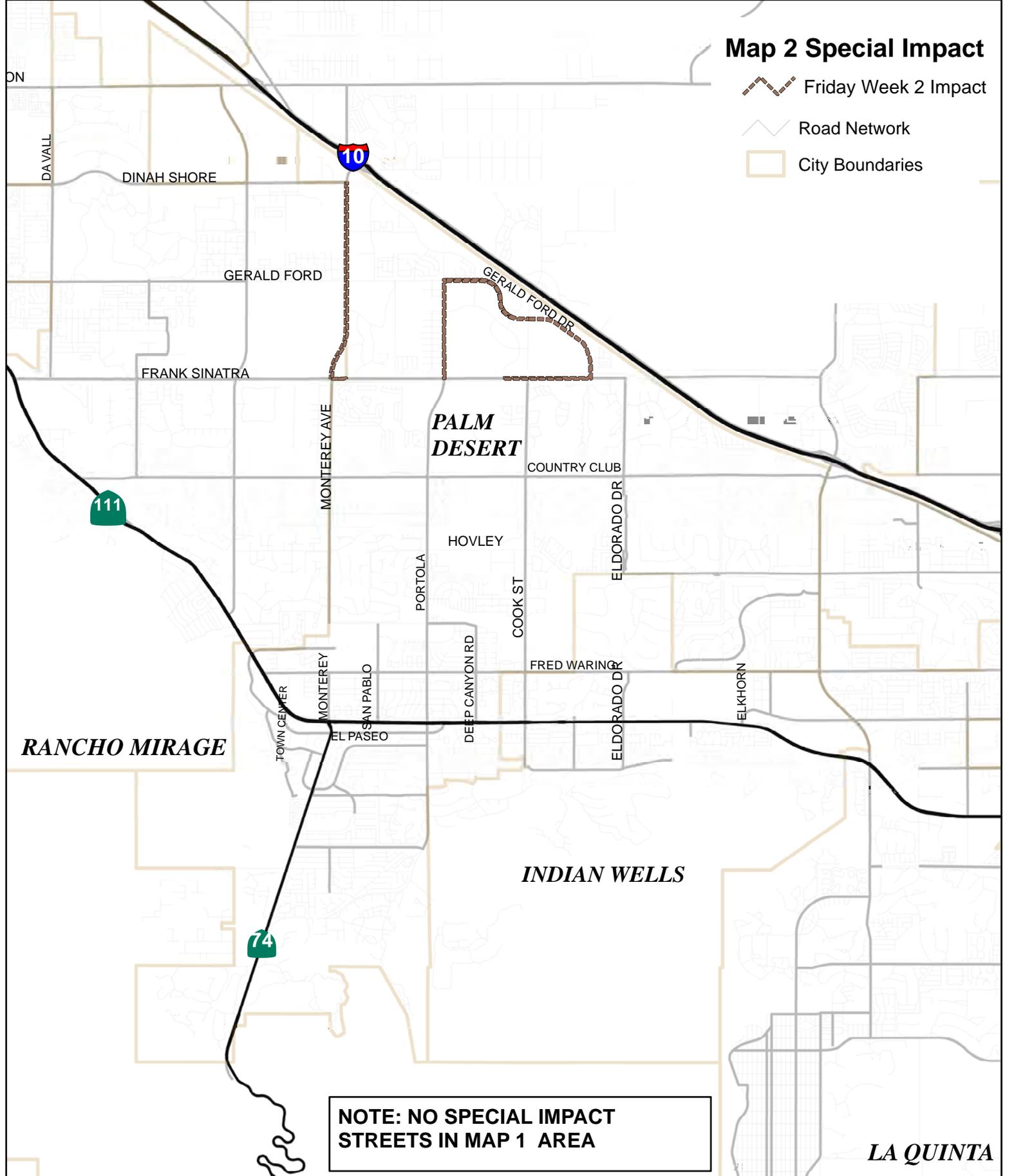
CVAG



**Attachment 2: Roads Covered by the Regional PM10
Street Sweeping Program**

Map 2 Special Impact

-  Friday Week 2 Impact
-  Road Network
-  City Boundaries



Palm Desert
Indian Wells

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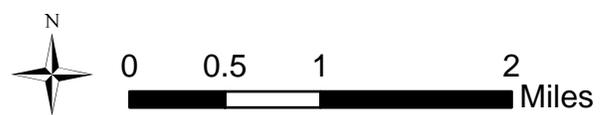
COUNTY OF RIVERSIDE

Map 3 Special Impact

-  Thursday Week 1 Impact
-  Friday Week 1 Impact
-  Road Network
-  City Boundaries

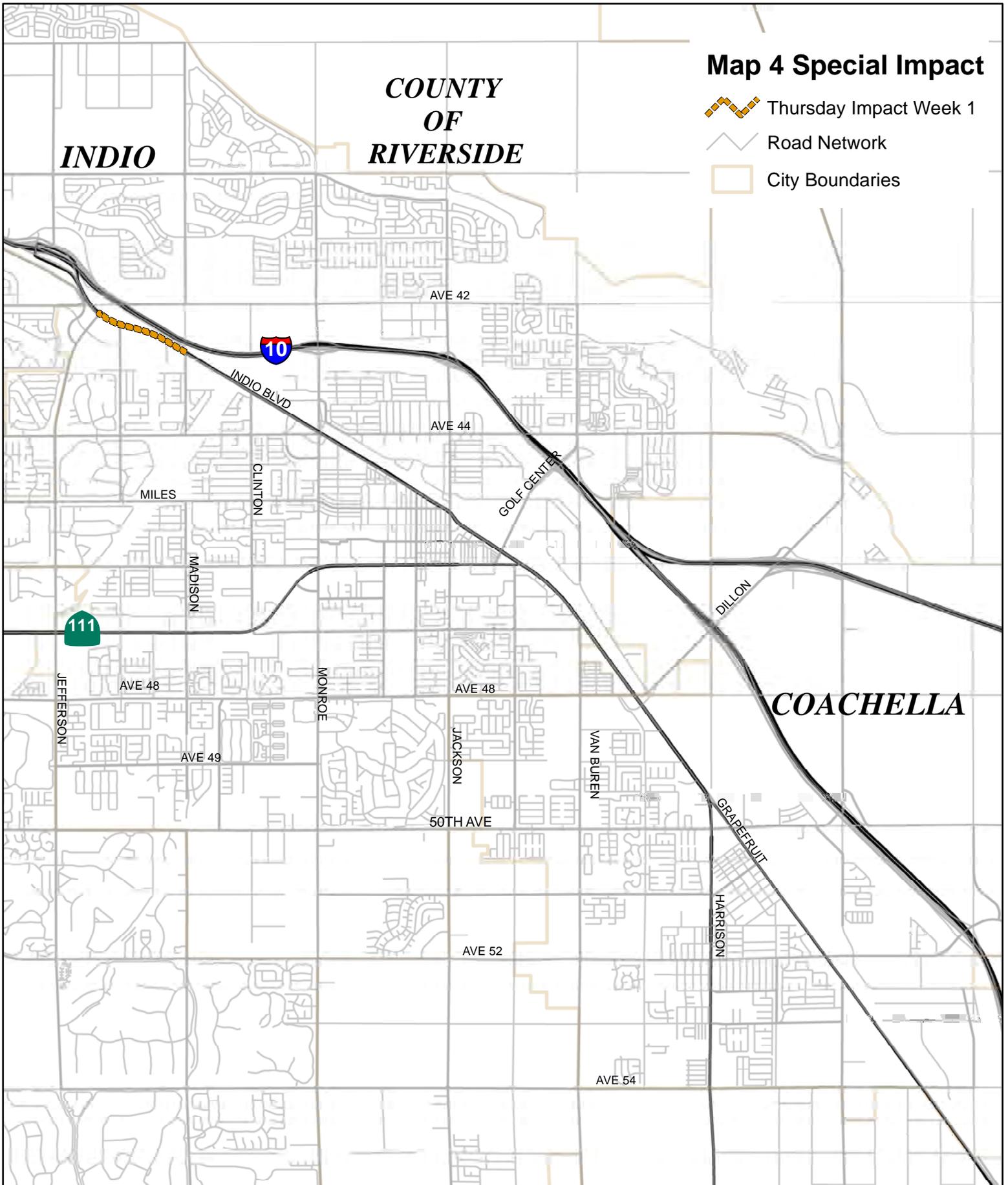


La Quinta
County



Map 4 Special Impact

-  Thursday Impact Week 1
-  Road Network
-  City Boundaries



Indio
Coachella
County



Map 5 Special Impact

-  Wednesday - Week 2 Impact
-  Thursday - Week 2 Impact
-  Road Network
-  City Boundaries

COUNTY OF RIVERSIDE

RAMON

DAVALL

DINAH SHORE

DATE PALM

GERALD FORD DR

BOB HOPE

MONTEREY AVE

VARNER

PORTOLA

FRANK SINATRA

COUNTRY CLUB

PALM DESERT

RANCHO MIRAGE

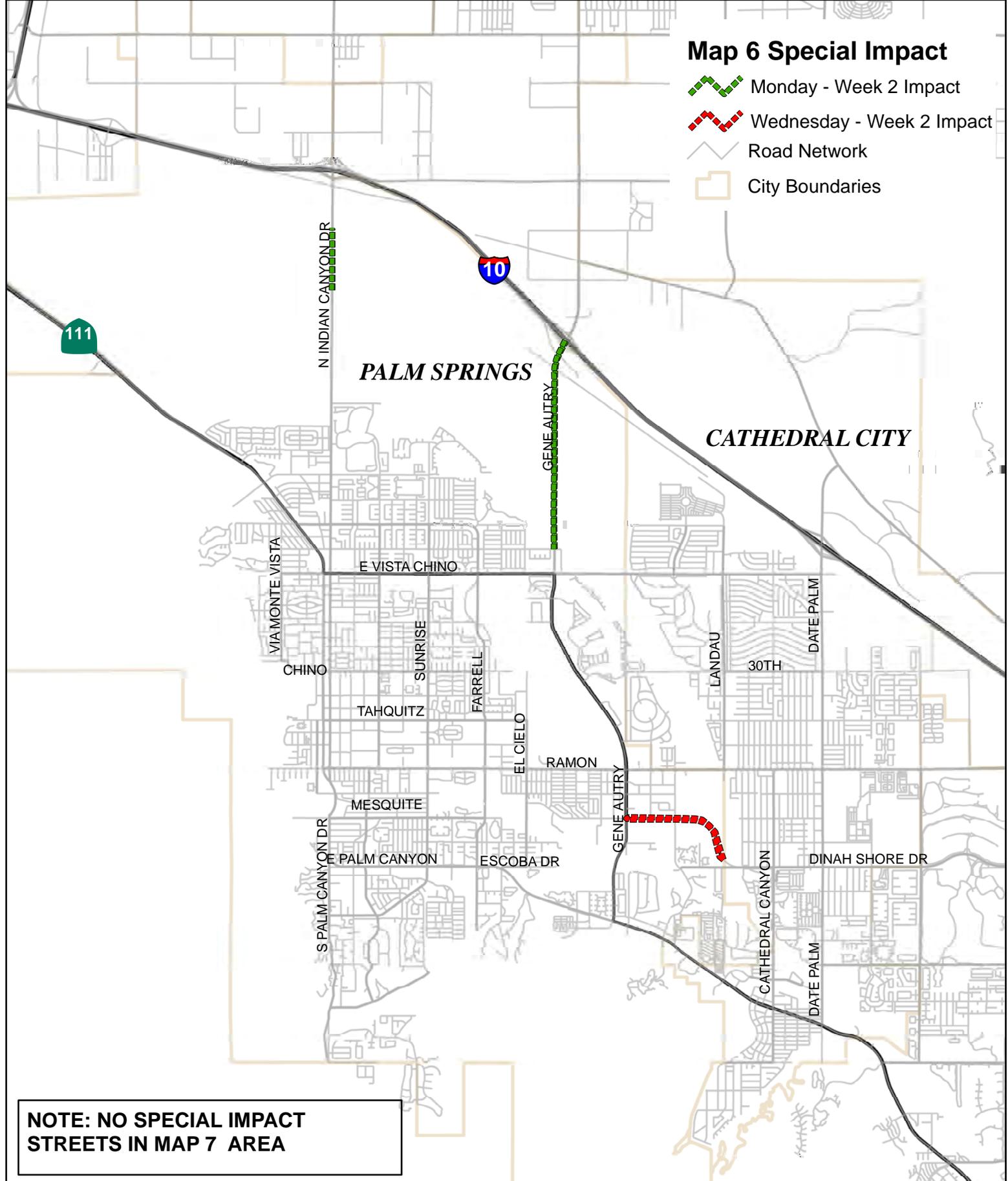


Rancho Mirage
Palm Desert
County



Map 6 Special Impact

-  Monday - Week 2 Impact
-  Wednesday - Week 2 Impact
-  Road Network
-  City Boundaries



**NOTE: NO SPECIAL IMPACT
STREETS IN MAP 7 AREA**

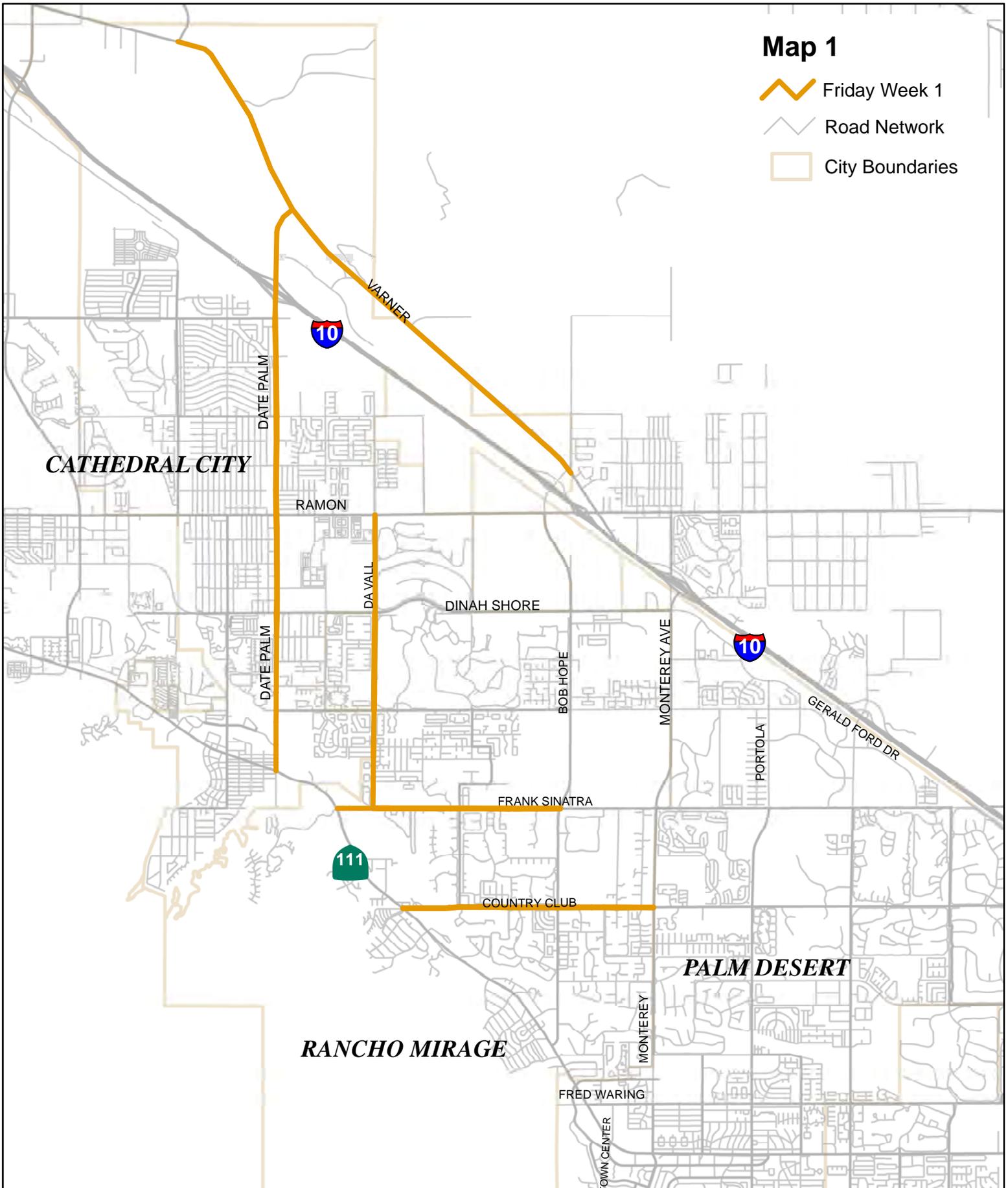


Palm Springs
Cathedral City

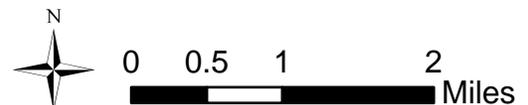


Map 1

-  Friday Week 1
-  Road Network
-  City Boundaries

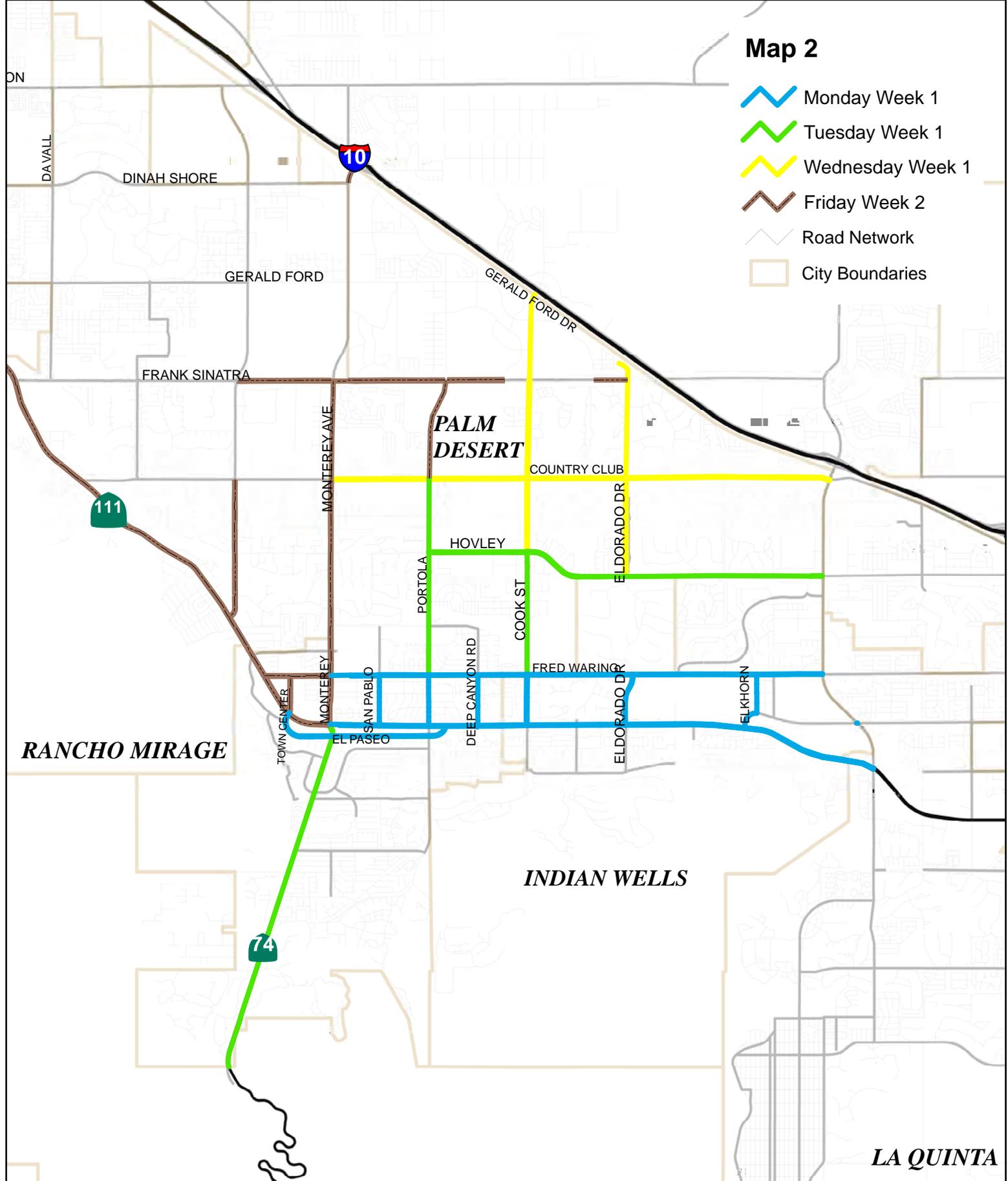


Cathedral City
Rancho Mirage
Palm Desert



Map 2

-  Monday Week 1
-  Tuesday Week 1
-  Wednesday Week 1
-  Friday Week 2
-  Road Network
-  City Boundaries



Palm Desert
Indian Wells

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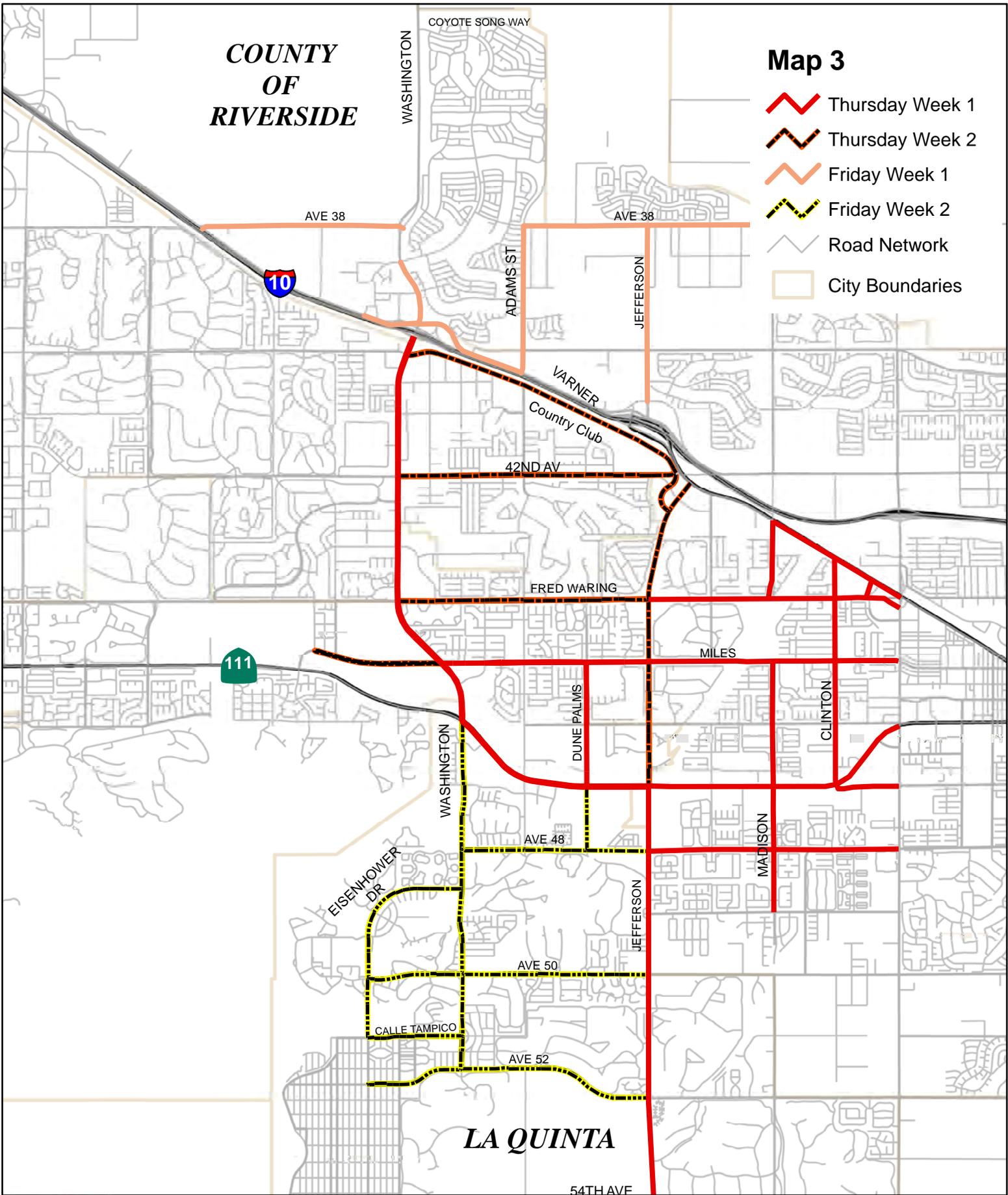


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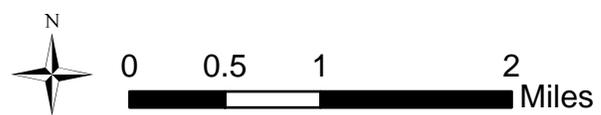
COUNTY OF RIVERSIDE

Map 3

-  Thursday Week 1
-  Thursday Week 2
-  Friday Week 1
-  Friday Week 2
-  Road Network
-  City Boundaries

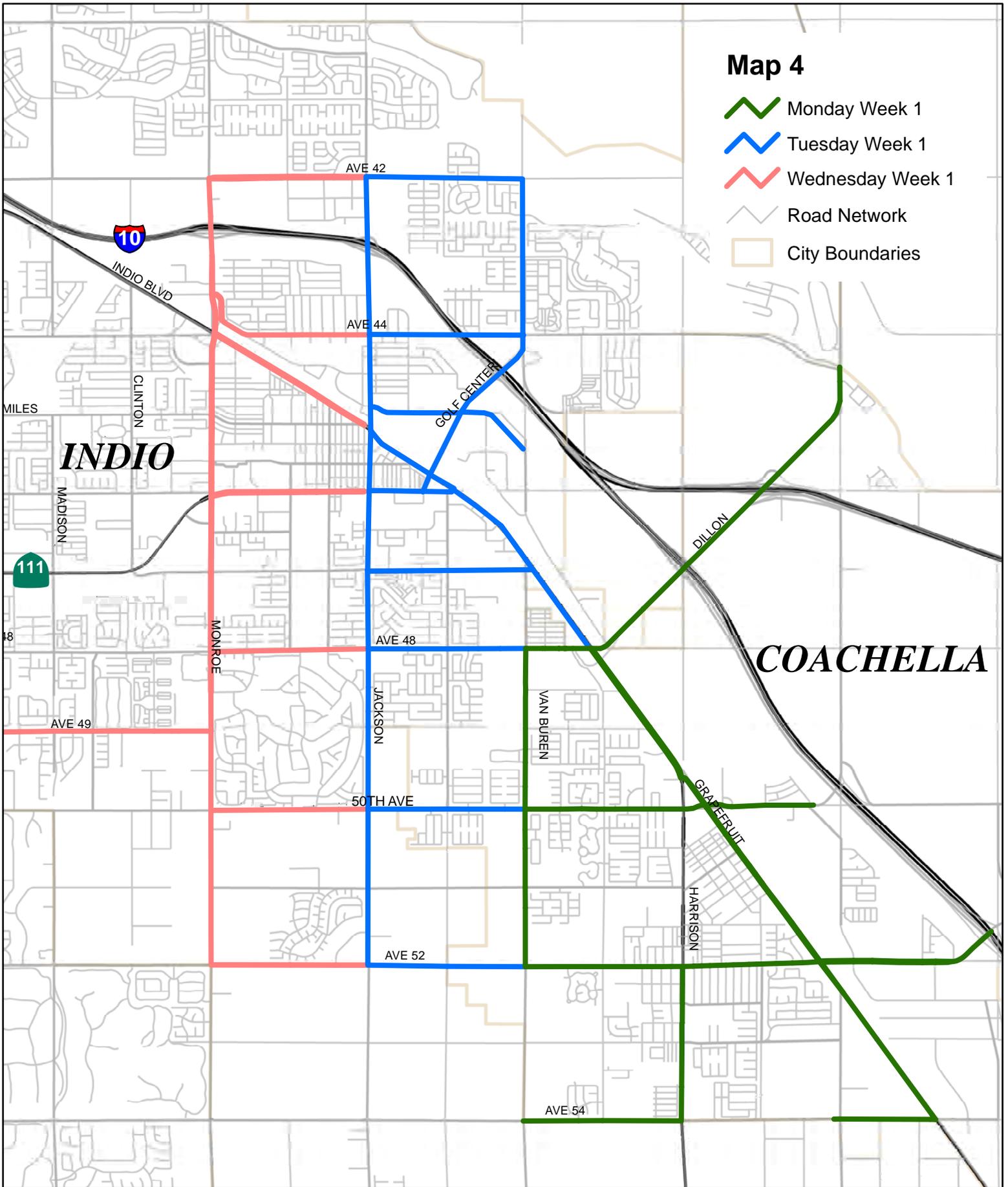


La Quinta County



Map 4

-  Monday Week 1
-  Tuesday Week 1
-  Wednesday Week 1
-  Road Network
-  City Boundaries



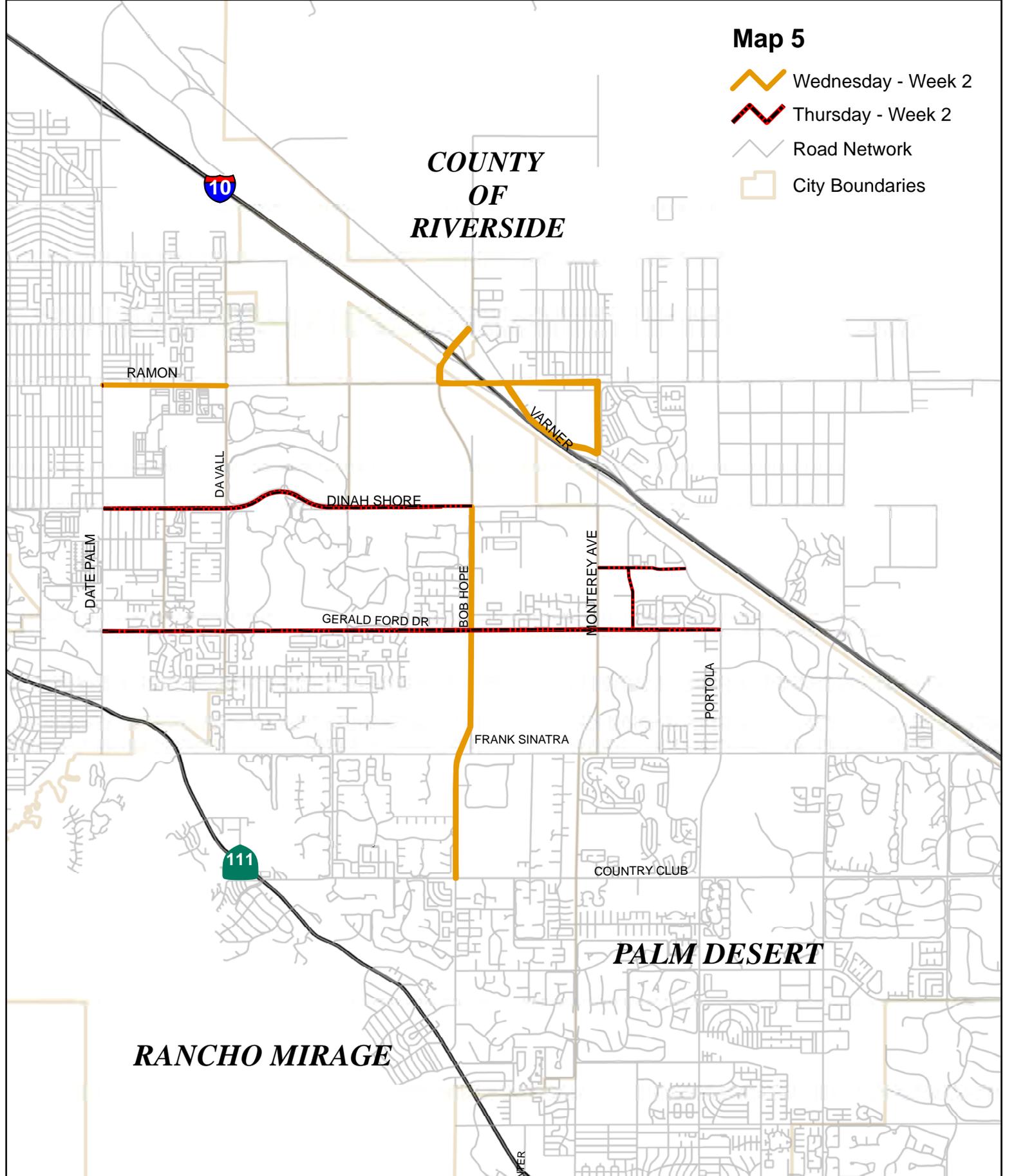
Indio
Coachella



Map 5

-  Wednesday - Week 2
-  Thursday - Week 2
-  Road Network
-  City Boundaries

COUNTY OF RIVERSIDE

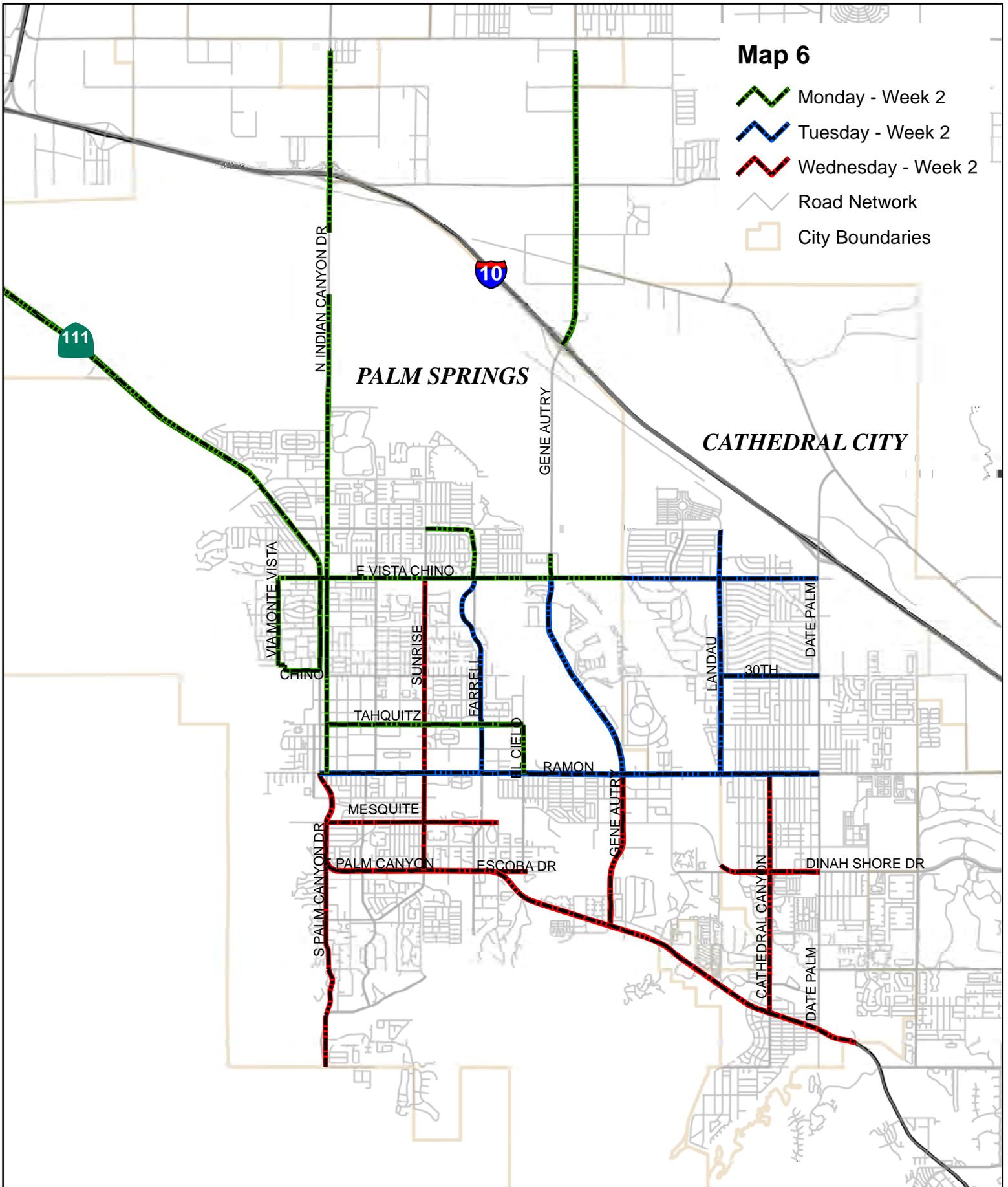


Rancho Mirage
Palm Desert
County



Map 6

-  Monday - Week 2
-  Tuesday - Week 2
-  Wednesday - Week 2
-  Road Network
-  City Boundaries



Palm Springs
Cathedral City

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0 0.5 1 2 Miles

Map 7

-  Monday - Week 2
-  Tuesday - Week 2
-  Road Network
-  City Boundaries

DESERT HOT SPRINGS

COUNTY OF RIVERSIDE



Desert Hot Springs
County

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