Rohnerville Airport Connectivity Report

Humboldt County Association of Governments
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Eureka, California

Prepared for:

Humboldt County Association of Governments

February 2019
017262

Reference: 017262

Rohnerville Airport Connectivity Report

Prepared for:

Humboldt County Association of Governments

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QA/QC:JOB___

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Abbreviations and Acronyms

AIP	Airport Improvement Program
ACV	Arcata-Eureka Airport
BUILD	Better Utilizing Investments to Leverage Development
Caltrans	California Department of Transportation
HCAOG	Humboldt County Association of Governments
HCM	Highway Capacity Manual
LOS	Level of service
PPM	Planning Programming and Monitoring
RPA	Rural Planning Assistance
SCASDP	Small Community Air Service Development Program
SSSC	Side-street stop-controlled intersection
STIP	State Transportation Improvement Program

1.0 Introduction

1.1 Scope of Project

This report provides an assessment of design alternatives to improve connectivity from Rohnerville Airport to U.S. Highway 101 and State Highway 36. Rohnerville Airport is designated as a General Aviation Airport, and it is owned and operated by the County of Humboldt. The goals of developing an alternative route to the airport are to establish a more direct route from Rohnerville Airport to U.S. Highway 101, and State Highway 36; minimize airport traffic on local roads; expand airfreight services and general aviation abilities; expand CAL FIRE emergency response abilities; and develop complementary commercial and industrial uses near the airport. SHN teamed with TJKM Transportation Consultants to provide the transportation engineering analysis of the existing conditions and the proposed alternatives.

This report is the culmination of preliminary engineering, geologic, environmental, and planning studies that were conducted to identify the various opportunities and constraints associated with potential access routes to the airport.

2.0 Project Background

2.1 Project Funding

The Rohnerville Airport Connectivity Study was funded by two separate sources of state funding that are administered through Humboldt County Association of Governments (HCAOG). The majority of the project was funded with Planning Programming & Monitoring (PPM) funds, and a smaller portion of the project was funded with Rural Planning Assistance (RPA) funds.

2.2 Humboldt County General Plan (2017)

The Humboldt County General Plan formalizes a long-term vision for the County's future land uses. It outlines policies, standards, and programs to guide day-to-day decisions concerning future development. Rohnerville Airport is one of the County's five general aviation airports. The Humboldt County General Plan recognizes the important role that Rohnerville Airport has in maintaining the County's emergency response abilities and general aviation needs when it states:

> *Five general aviation airports in Garberville, Murray Field (Eureka), Rohnerville, Kneeland, and Dinsmore provide important services for air couriers, air ambulance, air charter, law enforcement, and private pilots. Each airport is critical to the community it serves during natural disasters due to the rural nature of the county.*

2.2.1 Humboldt County General Plan Policies

Improving connectivity to Rohnerville Airport aligns with a number of specific policies, programs, and goals established in the Humboldt County General Plan. These policies include:

- Policy ED-P13 Airport-Related Business Development. Support efforts to maintain and develop airports to accommodate air service-dependent and -associated industries, including air freight.
- Policy ED-IM9 Transportation and Infrastructure. Operate economic development programs that promote and seek funding for transportation and infrastructure development critical to economic growth, including telecommunications, regional highway improvements, port development, airport expansion, and water and wastewater systems.

2.3 City of Fortuna General Plan (2010)

The City of Fortuna General Plan 2030 (General Plan) formalizes a long-term vision for the City's physical evolution. It outlines policies, standards, and programs to guide day-to-day decisions concerning future development. During the General Plan Update effort, the City identified a number of community values to help develop a vision for Fortuna's future. Improving connectivity to Rohnerville Airport supports the following visions that were identified in the General Plan:

- Support controlled growth that is adequately served by public services and infrastructure.
- Support economic growth and diversity, particularly through local businesses, retail development, and other employment opportunities that will provide city residents with a living wage.
- Promote a multi-modal transportation system (i.e., roadways, bike paths, sidewalks) that will provide strong connectivity among neighborhoods and districts, is free of congestion, provides convenient transit opportunities, and greater safety for pedestrians and motorists.

Additionally, this project enhances employment opportunities associated with the airport, which is one of the primary city-wide opportunities identified in the General Plan. According to the General Plan:

> *The airport is an economic development asset. There is potential for regular air freight and courier services at the airport to serve Fortuna and its environs. Currently (2010), air freight comes through Murray Field on the north end of Eureka due to delivery commitment times and its more-central location. If both Murray Field and the Arcata/Eureka Airport are fogged in, Rohnerville Airport becomes the option for airfreight pilots. Prospects for increased service-sector employment in the areas of information, business and professional services, finance, insurance, and real estate could be enhanced by the development of regular air freight and courier services at the airport. Expansion of Cal Fire operations at the airport might also bring more jobs to Fortuna. Finally, more private aviation, recreational aviation, or aviation tour businesses could be developed at the airport.*

2.3.1 City of Fortuna General Plan Policies

This project aligns with a number of specific policies, programs, and goals established in the City of Fortuna's General Plan. These policies include:

- Policy LU-9.3 Location of Employment-Generating Uses. The City shall encourage employment-generating land uses to concentrate in the following areas of the city: Main Street, the Mill District, Fortuna Boulevard, Redwood Hospital, and Rohnerville Airport.
- Program ED-6. The City shall work with local aviation interests to prepare a feasibility study regarding the expansion of air freight services, air courier services, general aviation, and unified fire services at the Rohnerville Airport.
- Program ED-15. The City shall identify road and other infrastructure limitations that restrict economic development in the Rohnerville Airport area, and seek out grants and other funds to remove these limitations.
- Policy TC-6.1 Airport Capacity and Services. Since Rohnerville Airport is one of the most significant economic development opportunities and transportation resources for the region, the City shall work with the Aviation Department of the Humboldt County Department of Public Works to improve and expand the capacity of the airport and services in the region.
- Policy TC-6.3 Aviation Services Expansion. The City shall explore opportunities for expanding aviation services for the region from Rohnerville Airport.
- Policy TC-6.4 Airport Industrial Area. The City shall encourage commercial and industrial developments that utilize air service to locate near the airport.

3.0 Project Purpose and Need

3.1 Project Purpose

The purpose of this project is to conduct a Connectivity Study to identify up to three alternatives for establishing a more direct route between the Rohnerville Airport, U.S. Highway 101, and State Highway 36.

3.2 Project Need

The Rohnerville Airport is one of Humboldt County's five general aviation airports and has access to U.S. Highway 101 and State Highway 36 via a route of arterial and minor local roads. The routes range from approximately 2.35 to 3.51 miles long. The lack of direct airport-highway access constrains opportunities to expand the airport's airfreight services, general aviation abilities, and emergency response abilities. Lack of direct access also limits the ability to develop complementary commercial industrial uses near the airport. Aviation is part of the region's multimodal transportation system and links to interregional, interstate, and international aviation systems, as well as to seaport, and surface (highway) transport.

In addition to serving as one of the County's general aviation airports, the Rohnerville Airport is home to Cal Fire's Rohnerville Air Attack base, which typically has two firefighting aircraft assigned during the months of June through October.

According to the *Humboldt County Airports Division Strategic Initiatives* report prepared by Volaire Avaition Solutions:

> *Because of their location, large number of based aircraft, mix of traffic, and the relatively good condition of their physical plants, Arcata-Eureka Airport (ACV), Rohnerville Airport, and Garberville Airport are the three best positioned airports for the future of the County.*

Volaire Aviation Solutions also prepared the *Humboldt County Aviation Division Financial Review* report, which states:

> *Of Humboldt County's general aviation airports, Rohnerville Airport has the longest and widest runway that can be used by larger general aviation aircraft. It is located three miles southeast of Fortuna, covering 541 acres, which is the largest physical plant of the county's general aviation airports, and 70% the size of Arcata-Eureka Airport's physical plant...Arguably, the airport's most important role is that of a Cal Fire base. Cal Fire has two based air tankers at Rohnerville, along with offices and its regional operations center. The airport is critical to northern California's wildland firefighting efforts.*

4.0 Existing Conditions

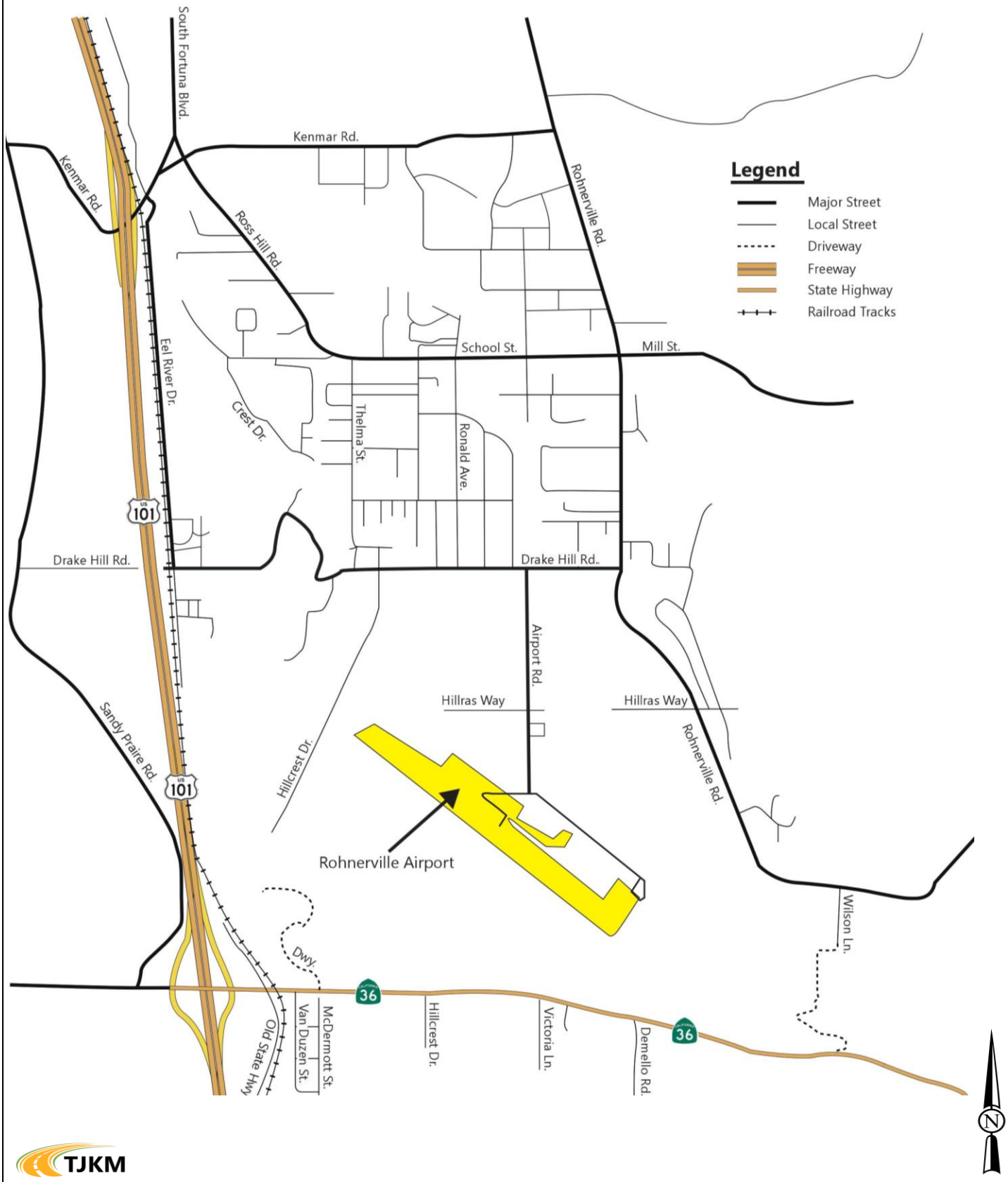
4.1 Study Area

The project study area is located on the southern end of Fortuna, east of U.S. Highway 101, and north of State Highway 36. The project study area is shown in **Figure 1.**

Initially, the project had few specified constraints regarding the potential routes between U.S. Highway 101, State Highway 36, and the Rohnerville Airport. As described further in the following sections, the study area was gradually narrowed down to a few select alternatives. The geologic assessment was the first effort in narrowing down the potential route alternatives. After the geologic assessment, TJKM identified eight potential route alternatives. SHN and TJKM then met with staff from HCAOG, Humboldt County, the City of Fortuna, and the California Department of Transportation (Caltrans) to narrow down the options to three preferred route alternatives for further evaluation.

4.2 Geologic Assessment

A preliminary Geologic Assessment was conducted to evaluate potential routes to the airport. Rohnerville Airport is located on an uplifted terrace, while U.S. Highway 101 and State Highway 36 run along the base of the terrace. The main focus of the Geologic Assessment was to consider potential routes up the bluff that separates the airport from US Highway 101 and State Highway 36. The geologic assessment (provided in



TJKM

Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Vicinity Map SHN 017262
	September 2018 \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\1-20180917-VicinityMap.doc	Figure 1

Appendix A) included a review of available literature, available aerial imagery, and site reconnaissance. The site reconnaissance was limited to visual observations made on public and airport lands. A thorough subsurface exploration and a geotechnical analysis based on collected soil samples and lab testing will need to be conducted in order to provide specific recommendations regarding potential routes.

The geologic assessment considered three basic options for gaining access up the bluff to the Rohnerville Airport site. The three options, along with a brief summary of the analysis provided in the Geologic Assessment, include:

1. **The Western Slope**–Achievable access routes are extremely limited on the steep slope west of the airport. Potential routes are expected to have gradients on the order of 20% to 23%, which is likely prohibitively steep for the types of vehicles that need access to the airport (including CAL FIRE trucks and trailers). Additionally, the numerous cliffs along the western slope would present an ongoing landslide hazard that may impact these potential alignments. Development of these alignments would require significant geologic (landslide) mapping and geotechnical characterization in order to develop a suitable access route.
2. **The Southern Slope**–The southern slope is a hummocky, grass-covered slope. The hummocky geomorphic expression of the slope may reflect the relative resistance of the individual sedimentary beds to erosion and appear unrelated to landsliding. Therefore, it is conceivable to develop a low to moderate gradient road extending up the slope at an oblique angle. The gradient of the longest feasible alignment is estimated at about 7% - 10%. The side-hill nature of this potential alignment would require balanced cut-fill construction, where the outboard edge of the road would be supported on engineered fill generated during the grading of the road bench. Construction of retaining walls is likely to be necessary in order to limit the amount of excavation. A cut slope on the uphill side of the road would be of variable height, becoming progressively higher in the upper parts of the slope where it becomes steeper. Access using the existing, undeveloped extension to Wilson Lane at the eastern end of the southern slope is feasible from a geotechnical standpoint, but is associated with a narrow road bed with tight curve radius, and location within a residential neighborhood. Developing a suitable road with appropriate turn radius would require significant grading.
3. **The Mid-Slope Terrace**–At the western end of the southern slope, directly above the intersection of Highways 36 and 101, a broad mid-slope terrace provides an opportunity to access the airport. An existing private road accesses the terrace from Highway 36. This is currently a narrow, unimproved road. Alternate routes from the Old State Highway and the end of Eel River Drive appear feasible to reach the mid-slope terrace from the north or west. Assuming access to the mid-slope bench could be developed from one of these options, a new road connecting the mid-slope terrace with the Rohnerville terrace above would need to be developed. Development of the road alignment above the mid-slope terrace would require side-hill construction resulting in a relatively high cut bank (the upper slope becomes relatively steep in this area). From a strictly geotechnical standpoint, this is probably the simplest, most cost-effective alternative for new road access from Highway 36 up to the top of the bluff.

4.3 Existing Facilities along State Highway 36

There are existing drainage ditches along the north and south sides of State Highway 36 through the vicinity of the proposed alternatives. The northern ditches are drained by culverts that cross the highway to the southern ditch. The southern ditch flows from east to west and extends from Hillcrest Drive to Old State Highway. There is another drainage ditch on the southern side of State Highway 36 between Victoria Lane and the driveway immediately to the east. All other drainage appears to sheet flow to the south across adjacent parcels. Where the southern drainage ditch crosses driveways or intersecting roads, culverts are used to convey the flows through the crossing.

Power poles are present along the south side of the highway between the edge of the road and the ditch. There are several service drops on the north side of the highway with additional poles. There are several poles located along the north side of the highway that are used for horizontal bracing of the power poles. There is a Pacific Telephone "Cable Underground" warning sign located on the south side of the highway in-line with McDermott Street; although, the alignment of the cable is unclear.

The old railroad crosses State Highway 36 at two locations within the vicinity of the proposed alternatives: one crossing is adjacent to the Old State Highway, and the second crossing is just east of Van Duzen Street. North of Highway 36, the railroad runs parallel to the Old State Highway.

4.4 Existing Circulation Network

4.4.1 Key Roadways

The existing roadway network within the study area is illustrated in **Figure 1.** Street classifications for the major City of Fortuna streets serving the study area are illustrated in **Figure 2.** Each major street is designated as an arterial or collector street, indicating their role in accommodating regional and citywide travel, which differs from local streets that are primarily intended to serve local access needs.

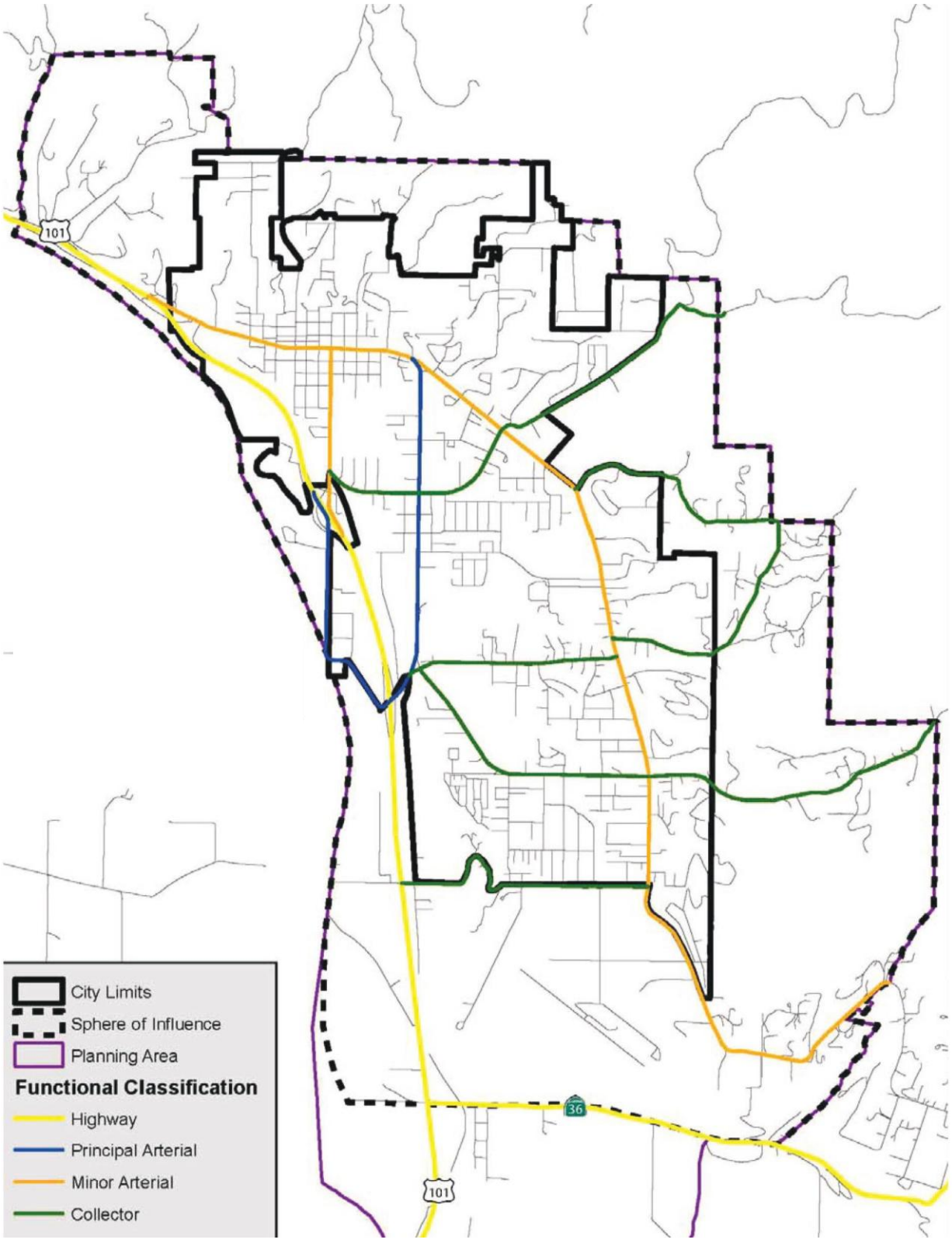
4.4.2 Existing Airport Access

The current primary access route between the airport and U.S. Highway 101 is illustrated in **Figure 3.** Primary access to the airport is provided by Ross Hill Road (a collector street), Thelma Street (a local street), and Drake Hill Road (a collector street).

Past access to the airport included a direct at-grade connection to U.S. Highway 101 via Drake Hill Road that was closed in recent years, which is consistent with Caltrans' preference for eliminating at-grade intersections and increasing the distance between interchanges on U.S. Highway 101.

4.4.3 Characteristics of Key Roadways

Table 1 summarizes characteristics of the key roadways within the study area. Existing traffic volumes are well below the capacity of each of the key roadways in the area, with volumes under 40% capacity on most street segments with the exception of Kenmar Road, which carries an estimated 13,000 daily vehicles for the short segment between U.S. 101 and South Fortuna Boulevard/Ross Hill Road, which equates to



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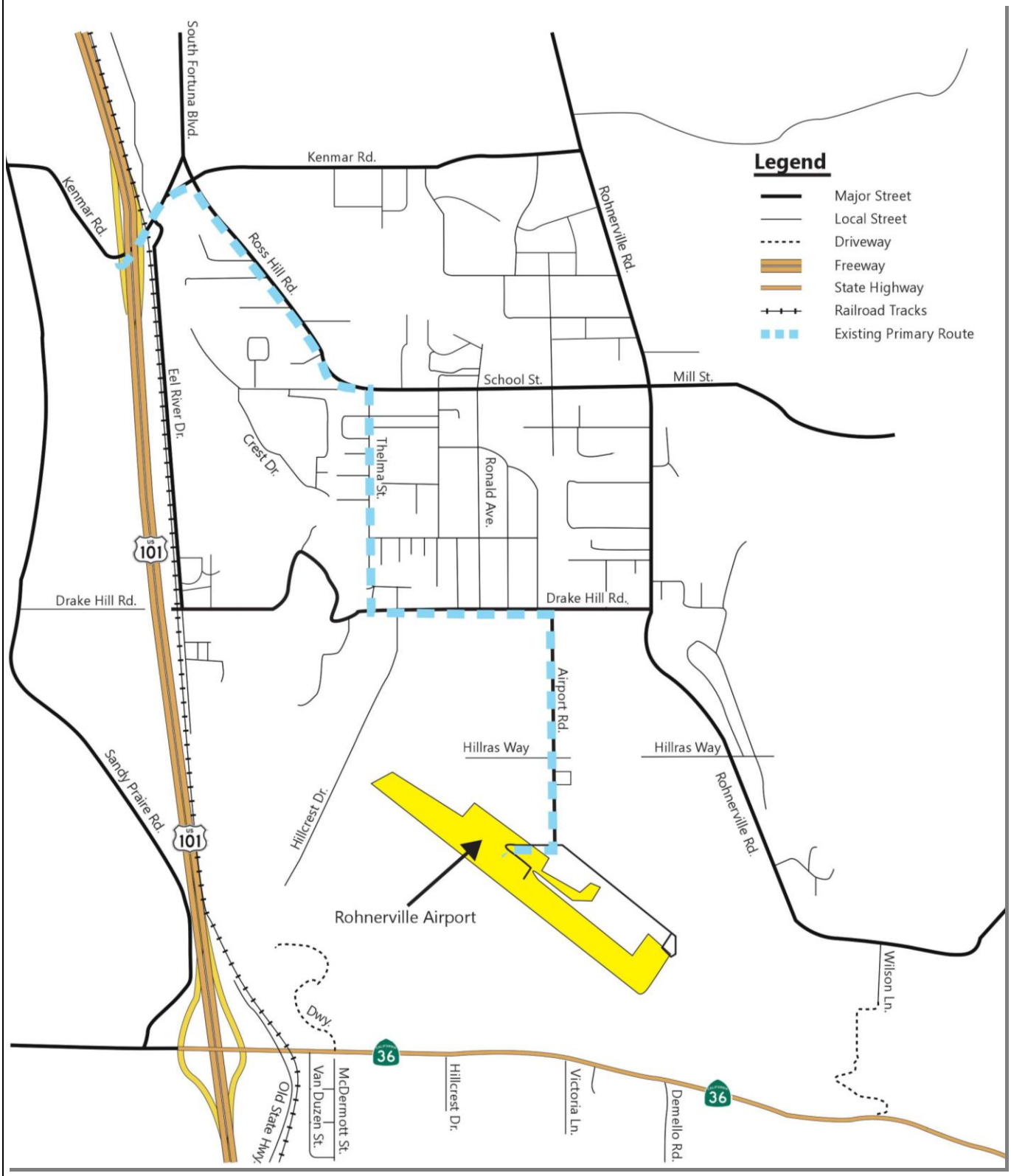
Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments (HCAOG)
Rohnerville Airport Connectivity Study
Fortuna, CA

Transportation and Circulation
Figure from Fortuna General Plan
SHN 017262

September 2018 | \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\13-20180917-TransCirc.doc | Figure 2



TJKM

Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Existing Primary Route to/from US-101 SHN 017262
	September 2018 \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\2-20180917-ExisPrimRoute.doc	Figure 3

approximately 65% capacity. Highway 36 carries approximately 4,500 daily vehicles, which is less than 25% capacity. Traffic congestion generally equates to volumes approaching 100% capacity. None of the street segments in the study area approach 100% capacity. Traffic volumes on Airport Road are estimated at less than 300 daily vehicle trips (total of inbound and outbound) including an estimated 200 vehicles traveling to/from the airport and traffic generated by several adjacent land uses, which is a very low volume that equates to roughly 3% of capacity.

Table 1. Existing Circulation Network Characteristics
Rohnerville Airport, Rohnerville, California

Facility	Characteristics	Daily Motor Vehicle Traffic Volume & Capacity (approximate)		
		Capacity*	Volume**	Volume/Capacity (V/C)
Highway 36	2-lane state highway with at-grade intersections, narrow shoulders and frequent curves	20,000	4,400	<25%
Kenmar Road	2-lane collector street connecting Ross Hill Road/South Fortuna Boulevard and Rohnerville Boulevard with U.S. Highway 101. Left-turn and right-turn slip lanes are provided at the intersection with Ross Hill Road/South Fortuna Boulevard.	20,000	13,000	65%
Drake Hill Road	2-lane collector street connecting Eel River Drive and Rohnerville Road, including a narrow segment without shoulders or sidewalks west of Thelma Street.	10,000	<2,000	<20%
Eel River Drive	2-lane frontage road on the east side of U.S. 101, connecting Kenmar Road with Drake Hill Road.	10,000	<1,000	<10%
Rohnerville Road	2-lane minor arterial operating north/south near the airport.	13,000	<5,000	<40%
School Street	2-lane collector street connecting Kenmar Road, Ross Hill Road and Rohnerville Road.	13,000	<5,400	<42%
South Fortuna Boulevard	4-lane principal arterial street connecting Kenmar Road and Ross Hill Road/School Street with destinations to the north.	40,000	14,000	<40%
Ross Hill Road	4-lane collector street connecting South Fortuna Boulevard with School Street.	30,000	7,200	<30%

Table 1. Existing Circulation Network Characteristics
Rohnerville Airport, Rohnerville, California

Facility	Characteristics	Daily Motor Vehicle Traffic Volume & Capacity (approximate)		
		Capacity*	Volume**	Volume/Capacity (V/C)
Airport Road	2-lane county road connecting Rohnerville Airport with Drake Hill Road.	10,000	<300	<3%
Ronald Avenue	2-lane local street connecting School Street and Drake Hill Road (thus serving a portion of airport traffic). Lacks sidewalks on most segments.	N/A	<1,000	N/A
Thelma Street	2-lane local street connecting School Street and Drake Hill Road	N/A	2,800	N/A

**Daily capacity is based on ten times the peak-hour capacity, which reflects typically traffic patterns in which the a.m. or p.m. peak hour volume is generally about 10% of daily volumes. Typically, one-way lane capacities on collector and arterial streets range from 5,000 to 8,000 per lane per direction, increasing to roughly 10,000 per direction where left-turn pockets are provided at intersection (while freeway capacities are roughly 25,000 per lane).*

***Daily volume on Highway 36 derived from Caltrans Project Study Report (PSR) 2014 which indicates a 2014 volume of 4,280 daily vehicles, and projected a 2018 volume of 4,450 daily vehicles and a 2028 volume of 4,870 daily vehicles. Daily volumes on Kenmar and Ross Hill Roads were estimated based on peak hour intersection volumes collected for the 2016 Fortuna Highway 101/Riverwalk Connection Study, with daily volumes estimated to be 10 times the peak-hour volume based on typical peaking patterns. Daily volume on the remaining segments were estimated based on the 2010 Fortuna General Plan intersection counts.*

Traffic operations are typically evaluated based on average peak-hour delay to motor vehicles at intersections. The peak hours occur during the morning and afternoon commute periods–typically between 7 and 9 a.m. and between 4 and 6 p.m. **Table 2** summarizes level of service definitions (LOS A to LOS F) for signalized and unsignalized intersections based on average stopped delay to motor vehicles in seconds. LOS at signalized and all-way stops is based on the average stopped delay for the vehicles from all approaches during the peak 15 minutes of the peak hour. LOS at side-street, stop-controlled intersections is based on delay to the "worst approach" (i.e., side-street approach to the stop sign) during the peak 15 minutes of the peak hour. LOS standards vary by jurisdiction–many California cities identify LOS D or E as acceptable, while efforts to meet motor vehicle LOS goals often conflict with related efforts to improve pedestrian and bicycle circulation. The City of Fortuna defines LOS C or better as acceptable, consistent with Caltrans goals.

Table 2. Level of Service Thresholds Based on Intersection Delay
Rohnerville Airport, Rohnerville, California

Level of Service	*Signalized Intersection Delay (sec)*	*Unsignalized Intersection Delay (sec)*
A	0 ≤ D ≤ 10	0 ≤ D ≤ 10
B	10 < D ≤ 20	10 < D ≤ 15
C	20 < D ≤ 35	15 < D ≤ 25
D	35 < D ≤ 55	25 < D ≤ 35
E	55 < D ≤ 80	35 < D ≤ 50
F	80 < D	50 < D
Source: Highway Capacity Manual (HCM) 2010		

Table 3 summarizes existing LOS based on the most recent available data. As shown: intersections in the area operate acceptably at LOS C or better, with the exception of the side-street stop-sign controlled intersection of Kenmar Drive & Eel River Drive intersection where the LOS is based on the side-street approach (northbound Eel River Drive) which has a very low volume (less than 44 peak hour vehicles). By contrast: the peak-hour volume of traffic on Kenmar Drive is approximately 1,300 vehicles (roughly 600 to 700 in each direction), with no stop-control and minimal delay to the majority of motorists–thus most motorists experience operations consistent with LOS A. Signalization of the intersection is not warranted since peak-hour approach volumes on Eel River Drive are less than 100 vehicles.

Table 3. Peak Hour Level of Service at Key Intersections
Rohnerville Airport, Rohnerville, California

Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Avg Delay	LOS	Avg Delay
U.S. 101 Southbound Off/On Ramps & Kenmar Road	Side-street stop	C	17.6	C	18.9
U.S. 101 Northbound Off/On Ramps & Kenmar Road	Side-street stop	B	10.8	C	18.9
Kenmar Road & Eel River Drive	Side-street stop	*E**	*37.9*	*E**	*37.7**
Kenmar Road & South Fortuna Blvd./Ross Hill Road	Signal	C	30.8	C	19.2

Table 3. Peak Hour Level of Service at Key Intersections
Rohnerville Airport, Rohnerville, California

Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Avg Delay	LOS	Avg Delay
Rohnerville Road & School St.	Side-street stop	A	7.1	A	7.6
Rohnerville Road & Drake Hill Road	Side-street stop	B	10.1	B	10.1
U.S. 101 Southbound Off/On Ramps & Highway 36	Side-street stop	A**	<10**	A**	<10**
U.S. 101 Northbound Off/On Ramps & Highway 36	Side-street stop	A**	<10**	A**	<10**
Highway 36 & Old State Highway	Side-street stop	A**	<10**	A**	<10**

Source: Fortuna Highway 101/Riverwalk Connectivity Study (2016) for Kenmar Road intersections; Fortuna General Plan (2010) for Rohnerville Road intersections; and TJKM estimate for Highway 36 intersections.

1. *LOS C or better is considered acceptable based on City of Fortuna LOS standards.*
2. Signal= Signalized intersection. (LOS based on average delay for all approaches).
3. SSSC = Side-street stop-controlled intersection. (LOS based on average delay to side-street approach only).

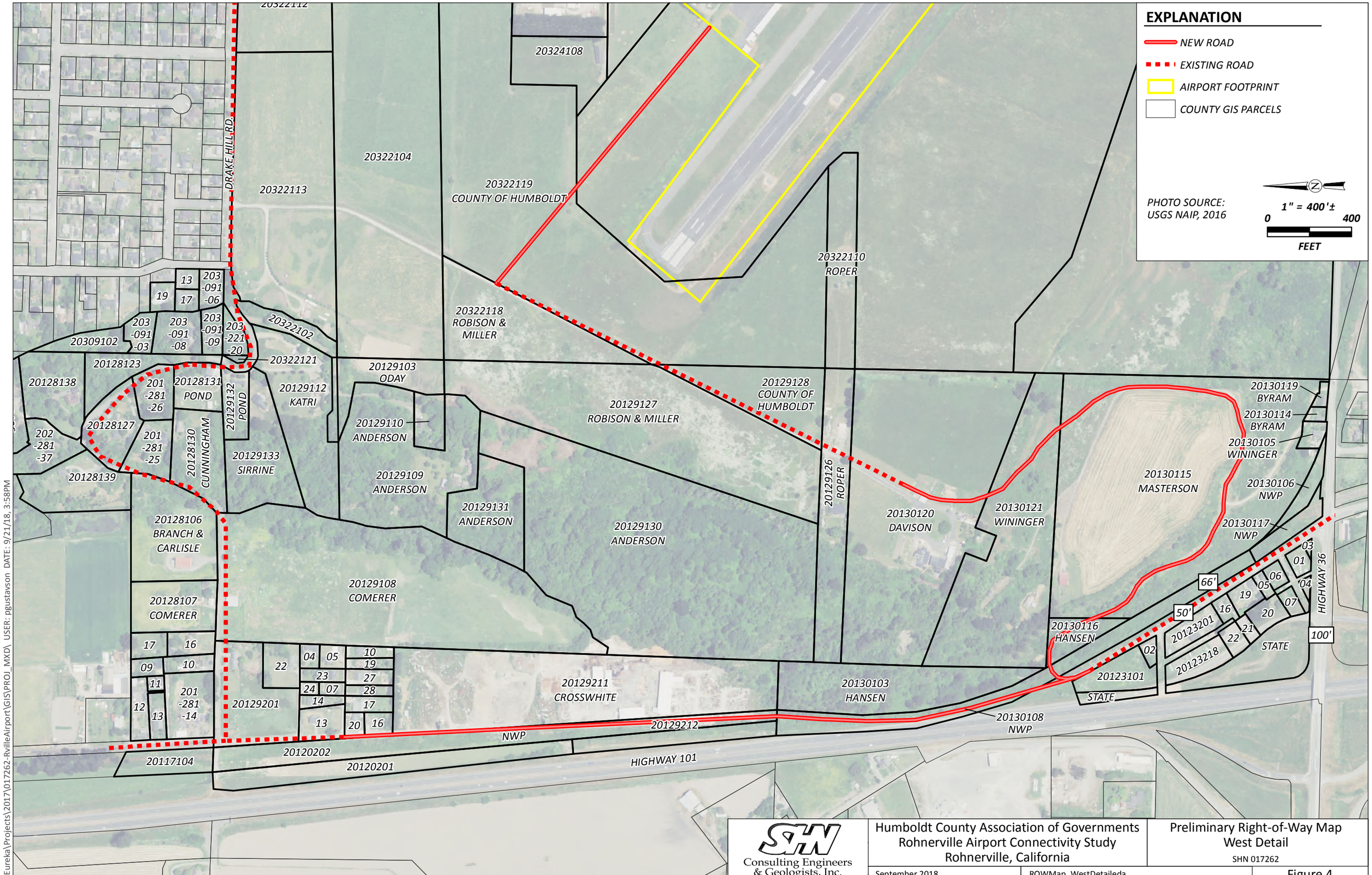
**Peak-hour LOS E at the Kenmar Road/Eel River Drive intersection reflects average delay to the low volume side-street approach to the stop-sign on Eel River Drive that carries less than 44 peak-hour vehicles, much lower than the peak-hour volume on Kenmar Drive (approximately 1,300 vehicles) that is not stop-controlled and experiences very little delay at this intersection, consistent with LOS A. Airport traffic is estimated to be less than 20 peak-hour vehicles.*

***Peak-hour LOS at Highway 36 intersections was estimated based on traffic volume data for Highway 36, and peak-hour observations conducted by TJKM.*

4.5 Right-of-Way and Property Ownership

A preliminary right-of-way evaluation has been conducted for this project in order to determine the ownership of parcels that are either adjacent to or potentially impacted by the project, and to identify right-of-way widths within the project study area. Additional right-of-way investigation efforts will be necessary for design purposes.

The right-of-way widths of various corridors were determined from publically available parcel maps obtained from publicly available recorded maps obtained from the County of Humboldt and Caltrans. The reference parcel maps are provided in **Appendix B.** A summary of ownership and the various right-of-way widths is provided in **Table 4.** Property ownership in the project vicinity is provided in **Figure 4** and **Figure 5.**



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Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments Rohnerville Airport Connectivity Study Rohnerville, California	Preliminary Right-of-Way Map West Detail SHN 017262
	September 2018 | ROWMap_WestDetaileda	Figure 4

EXPLANATION

- NEW ROAD
- EXISTING ROAD
- AIRPORT FOOTPRINT
- COUNTY GIS PARCELS

N

1" = 400'±

0 400

FEET

PHOTO SOURCE:
USGS NAIP, 2016

20324109

20323105
ALVES

203
-172
-02
ALVES

ROHNERVILLE RD.

20318138

20318128

20318133

20318139

20323103
WILKINSON

20318141
KERCHER

20318145

20318131

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20318134

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GRAY

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203
-181
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HIGHWAY 36

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Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments Rohnerville Airport Connectivity Study Rohnerville, California		Preliminary Right-of-Way Map East Detail SHN 017262
February 2019	ROWMap_EastDetaila	Figure 5

Table 4. Right-of-Way and Property Ownership in Project Vicinity
Rohnerville Airport, Rohnerville, California

Feature	Right-of-Way Width	Ownership	Reference Parcel Maps
Airport Road	40-50 feet	County of Humboldt	31 PM 151
Drake Hill Road	40 feet–50 feet (varies)	County of Humboldt	22 PM 54, 14 PM 53
Eel River Drive	50 feet	County of Humboldt	30 RS 84
Hillcrest Drive	50 feet	Private	3 PM 82
Rohnerville Road	50 feet (with additional 10 ft public road easement)	County of Humboldt	31 PM 79
Old State Highway	50 feet	County of Humboldt	1-HUM-36-A
Railroad Corridor	66 feet	NCRA	27 PM 99
State Highway 36	Approx 100 feet (varies)	State of California	51 RS 11

5.0 Site Analysis

5.1 Geometric Design Deficiencies and Safety Review

5.1.1 State Highway 36

Caltrans prepared a Project Study Report (PSR) in 2014 that evaluated existing conditions on Highway 36.

Under existing conditions, Highway 36 east of U.S. 101 and Old State Highway has a relatively narrow width for a high-speed facility, with 11-foot travel lanes and minimal shoulder space, and exceeds the statewide average compared to similar facilities. In addition, curves in the roadway, and crests where the roadway elevation changes, limit visibility at driveways and intersections.

Caltrans conducted a 5-year collision analysis for the period 2006–11 that indicated a total of 19 collisions resulting in 5 involving injuries (no fatalities). Nine collisions were classified as "Run-Off-Road" collisions and resulted in six vehicles overturning. Compared to similar facilities, this segment of Highway 36 is below the statewide average for fatal and injury collisions, but 1.44 times the statewide average for total collisions. More recent collision data highlighted by Caltrans indicated two subsequent fatal collisions between 2011 and 2013.

5.1.2 Intersections

Collision data from the Statewide Integrated Traffic Records System (SWITRS) database at 21 key intersections on Ross Hill Road/School Street, Drake Hill Road, Rohnerville Road, Airport Road, and Highway 36 was reviewed for the 5-year period from 2013 to 2017. **Table 5** provides a comparison of the total number of collisions reported at each intersection. **Table 6** summarizes the types of collisions. During the five-year period, a total of 98 collisions were reported at the 21 intersections, including 5 fatal and 4 serious-injury collisions. More than half of the reported collisions occurred at just 4 intersections, where the U.S.

101 On & Off ramps intersect with Kenmar Road (combined total of 28 reported collisions at 2 intersections, northbound and southbound) and Highway 36 (combined total of 24 reported collisions at 2 intersections, northbound and southbound). The intersections of Kenmar Road with Ross Hill Road and Eel River Drive reported 8 and 6 collisions, respectively.

The intersection of Ross Hill Road with Thelma Street (which currently serves as a primary access point to/from the airport) had 4 reported collisions during the five-year period, tied for the 9th highest total number of reported collisions among the 21 intersections surveyed.

Table 5. Intersection Collision Comparison
Rohnerville Airport, Rohnerville, California

5-Year Reported Collisions (2013-2017)	
Intersection	**Reported Collisions**
U.S. 101 Southbound Off/On Ramps & Kenmar Dr.	20
U.S. 101 Southbound Off/On Ramps & Highway 36	16
U.S. 101 Northbound Off/On Ramps & Highway 36	8
U.S. 101 Northbound Off/On Ramps & Kenmar Dr.	8
Kenmar Road & Ross Hill Road	8
Kenmar Road & Eel River Dr.	6
School St. & Ronald Ave.	6
Highway 36 & Demello Road	5
Ross Hill Road & Thelma St.	4
Eel River Dr. & Drake Hill Road	4
Highway 36 & Van Duzen St.	3
Rohnerville Road & Drake Hill Road	3
Rohnerville Road & Hillras Way	2
School St. & Mill St.	1
Highway 36 & Old State Highway	1
Highway 36 & Hillcrest Dr.	1
Rohnerville Road & Wilson Ln.	1
Ronald Ave & Drake Hill Road	1

Table 5. Intersection Collision Comparison
Rohnerville Airport, Rohnerville, California

5-Year Reported Collisions (2013-2017)	
Intersection	**Reported Collisions**
Rohnerville Road & Toyoka Ln.	0
Drake Hill Road & Thelma St.	0
Drake Hill Road & Airport Road	0
Total Reported Collisions at 21 intersections	***98***
Source: Statewide Integrated Traffic Records System (SWITRS) Database of Reported Collisions 2013-17	

Table 6. Intersection Collision Types
Rohnerville Airport, Rohnerville, California

5-Year Reported Collisions (2013-2017)	
Collision Type	**Reported Collisions**
Hit Object	44
Rear End	21
Sideswipe	7
Broadside	7
Overturned	6
Vehicle/Pedestrian	3
Head-On	3
Other	7
Total Reported Collisions at 21 intersections	*98*
Source: Statewide Integrated Traffic Records System (SWITRS) Database of Reported Collisions 2013-17	

5.2 Potential Roadway Network Improvements

5.2.1 Kenmar Road, Eel River Drive, and Highway 101 On/Off Ramps

The City of Fortuna identified potential improvements to Kenmar Road, including the intersections with the U.S. 101 ramps and Eel River Drive, as part of the *Highway 101, Fortuna Downtown and Riverwalk Area Complete Streets and Connectivity Planning Study* (Fortuna 101/Riverwalk Connectivity Study) with a study report dated November 4, 2016. The design alternatives aim to improve traffic flow and resolve existing conflicts between pedestrians, bicyclists, and motorists.

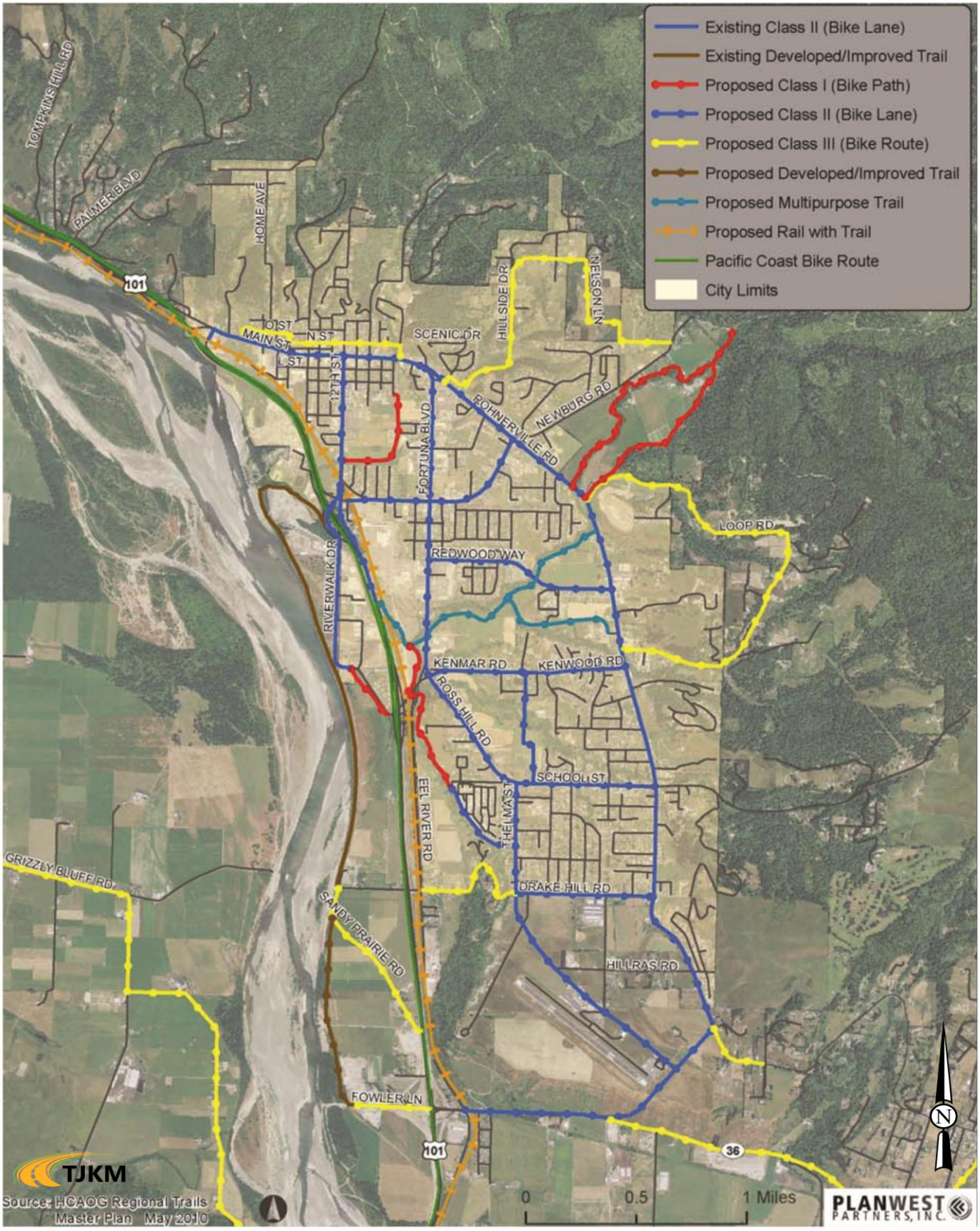
At intersections on Kenmar Road, the study identified potential intersection improvements that would install roundabouts or signals at each of the three closely-spaced intersections adjacent to the U.S. 101 interchange, consisting of the Kenmar Road intersections with the U.S. 101 Southbound and Northbound on/off ramps, and the intersection of Kenmar Road with Eel River Road. The proposed improvements, subject to funding, would reduce delay approaching the stop-signs at each intersection, applicable to motorists traveling north on Eel River Drive as they approach the Kenmar intersection. The signalization option would cost an estimated $20 million including additional turn lanes and pedestrian/bicycle improvements, while roundabouts could be installed for $6 million including pedestrian/bicycle improvements.

Installation of roundabouts was subsequently identified as the preferred improvement option (subject to funding). Roundabouts tend to reduce the prevalence of certain types of collisions and would thus be anticipated to reduce the number and severity of collisions at each of the U.S. 101 on/off ramp intersections with Kenmar Road.

5.2.2 Proposed Fortuna Bikeway Network

Proposed bikeway network routes described in the Fortuna General Plan are illustrated on **Figure 6.** As shown, several proposed bikeways are envisioned near the airport, relevant to considering options for airport access (including motor vehicle access):

- Proposed installation of Class II bicycle lanes on Drake Hill Road between Thelma Street and Rohnerville Road, and proposed conversion of Drake Hill Road to a Class III bicycle route west of Thelma Street to Eel River Road. Class III bicycle routes include shared travel lanes with motor vehicles (with a recommended lane width of 14 feet for shared motor vehicle/bicycle lanes). Therefore, conversion of the western-most segment of Drake Hill Road to a Class III bicycle route would potentially include widening the travel way on Drake Hill Road west of Thelma Street to 28 feet.
- Proposed installation of Class II bicycle lanes on two proposed future streets near the airport, one of which would connect Highway 36 with Rohnerville Road, while the other would connect with Thelma Street to the west.



SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	City of Fortuna Bicycle Facilities Figure from Fortuna General Plan SHN 017262
	September 2018 | \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\14-20180917-BicycleFacilities.doc	Figure 6

5.2.3 Highway 36 Safety Improvements

Caltrans' 2014 PSR for Highway 36 identified safety improvements, subject to approximately $7.5 million in funding, that intends to reduce the severity of vehicles running off the road by widening the roadway width to provide two 12-foot travel lanes and two 8-foot wide shoulders, including straightening some segments and reducing several roadway crests to increase stopping-sight distance. The project would begin 0.17 miles east of U.S. 101, and extend roughly 1 mile east to River Bar Road.

6.0 Alternatives Analysis

6.1 Recommended Road Section

The airport serves an average of 75 daily flight operations, thus generating an estimated volume of less than 200 daily vehicle trips (total of inbound and outbound), including airport employees. Provision of a 20 to 24 foot-wide 2-lane roadway would provide an adequate width for inbound and outbound travel, while bicycle travel could be accommodated with shared travel lanes with motor vehicles. If designated as a Class 3 bicycle route, then the recommended travel lane width would be 14 feet, increasing the travel way width to 28 feet. The recommended right-of-way width would be 40 feet with a two-way travel way of 24 to 28 feet.

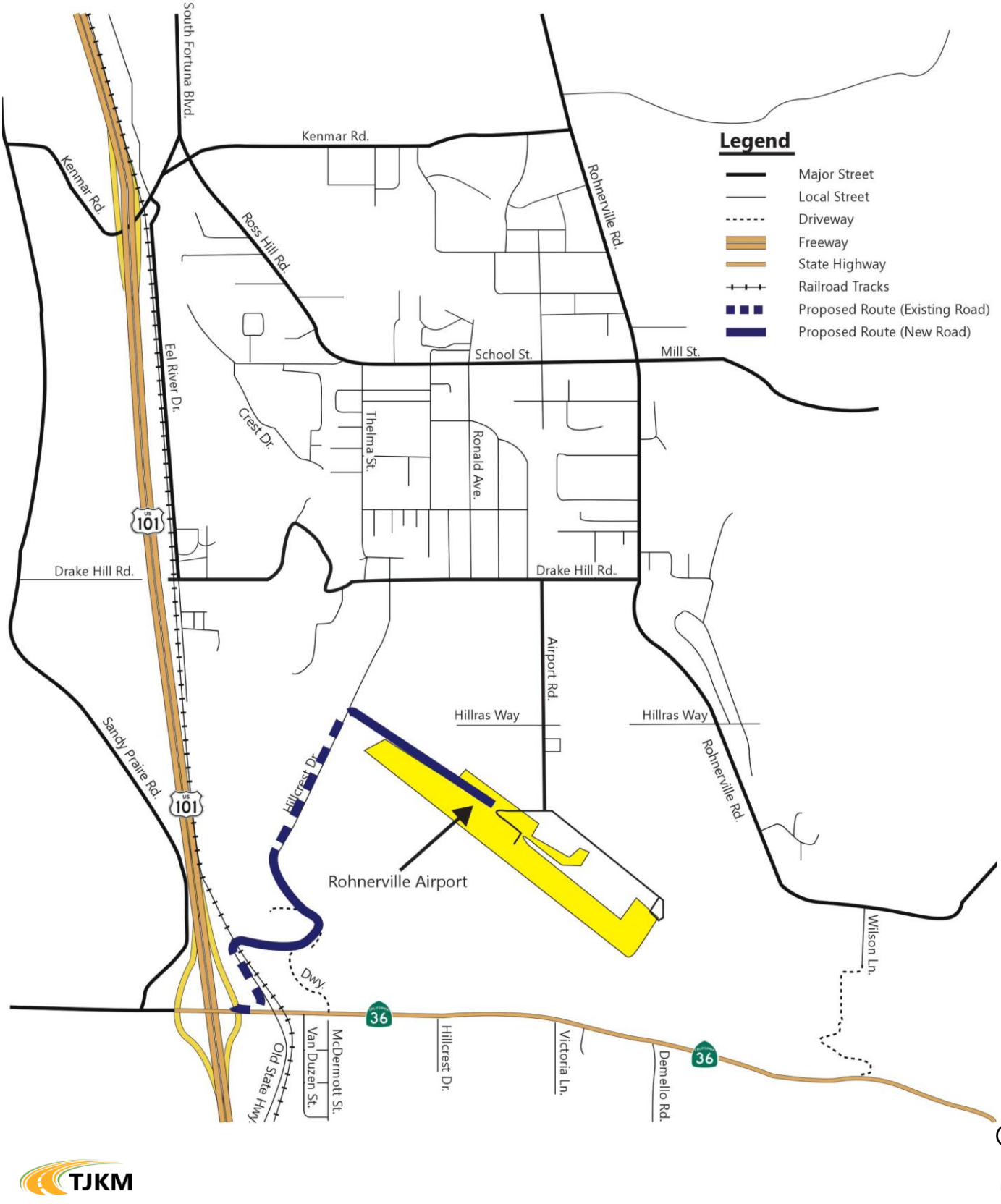
6.2 Preliminary Route Alternatives

This section describes eight preliminary alternatives identified as A1, A2, B, C, D1, D2, D3 and E as shown on **Figures 7 to 15**. Based on the existing conditions review:

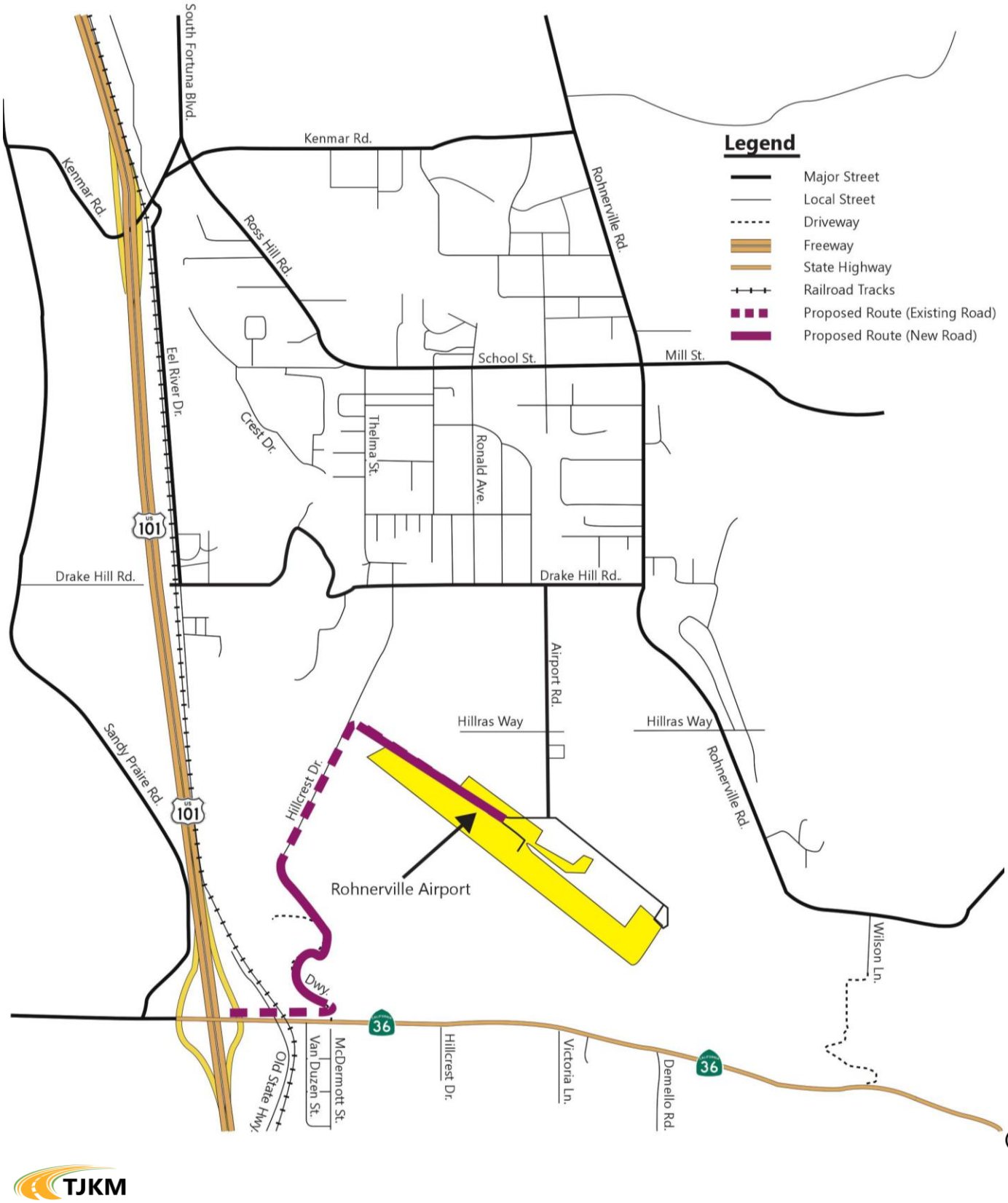
- Given narrow shoulders and limited sight distance: the provision of access via Highway 36 would not be recommended east of Old State Highway until such time as the proposed *Highway 36 Safety Improvements* are funded and implemented. Therefore, Alternatives A2, B, and C would not be recommended prior to funding of Highway 36 improvements.
- The proposed roundabouts at the Kenmar Road intersections with Eel River Drive and the U.S. 101 On/Off Ramps create an opportunity to tie the airport access improvements to the City of Fortuna 101/Riverwalk improvements (subject to funding). Alternatives D1, D2, D3 and E would access U.S. 101 via Kenmar Drive (while D3 would also include a connection with Highway 36 via Old State Highway). These options would still be feasible prior to any improvements at the Kenmar Road intersections, since the airport generates relatively low volumes (estimated at less than 200 daily vehicle trips, and less than 20 vehicle trips during the a.m. and p.m. peak hours) that would have a minimal effect on operations at the Kenmar Road intersections.

Alternatives A1 & A2: Highway 36 Connection via Hillcrest Drive

Alternatives A1 and A2 would connect Highway 36 with Hillcrest Drive, an existing dead-end local street that extends south of Drake Hill Road along the west property line adjacent to the airport. Two options are proposed for connecting with Highway 36 as shown on **Figures 7 and 8**.



SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA		Alternative A1-Old State Highway SHN 017262
	September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\3-20180917-AlternateA1.doc	Figure 7



SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA		Alternative A2- Mid-Slope Terrace SHN 017262
	September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\4-20180917-AlternateA2.doc	Figure 8

Both options would connect Hillcrest Drive with an existing private driveway via a new roadway connection on the adjacent hillside and would include a steep hillside climb estimated at approximately 18% grade, based on the Geologic Assessment Memorandum. Below the climb to Hillcrest Drive, the two options would differ in their proposed connections to Highway 36:

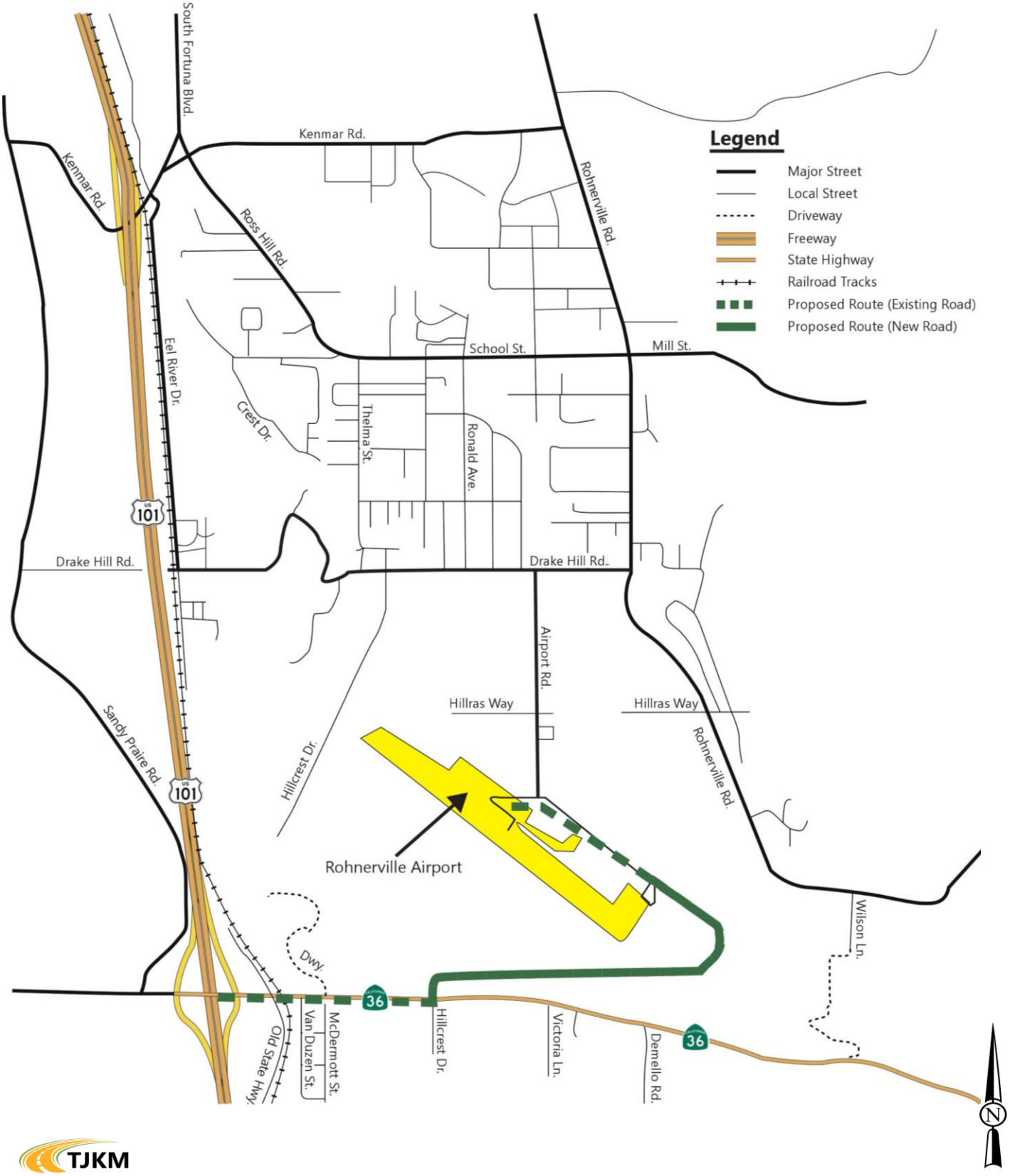
- *Alternative A1 Old State Highway* would connect with Highway 36 via the existing intersection of Old State Highway and Highway 36. The connection from the "terrace" to Old State Highway would be via an old driveway (currently unpaved) that previously connected with Old State Highway (prior to the widening of U.S. 101), and would require a new crossing of the unused railroad tracks that border Old State Highway. Given the relatively low volume of airport traffic, it is anticipated that Option A1 would not require modifications to the Highway 36/Old State Highway intersection. The intersection would likely operate at LOS A with the addition of airport traffic. This alternative could be installed independently of the proposed Highway 36 safety improvements.
- *Alternative A2 Mid-Slope Terrace* would connect with Highway 36 via an existing private driveway (currently unpaved) that intersects Highway 36 east of Old State Highway at a location roughly parallel with McDermott Street (which does not connect with Old State Highway). This connection would likely require installation of an eastbound left-turn pocket on Highway 36 approaching the intersection, thus requiring widening a section of the highway and would impact the existing residence adjacent to the driveway, on the north side of Highway 36. This option would not be recommended prior to the Highway 36 Safety Improvements that are subject to $7.5 million in funding.

Alternative B: Highway 36 via Southern Slope

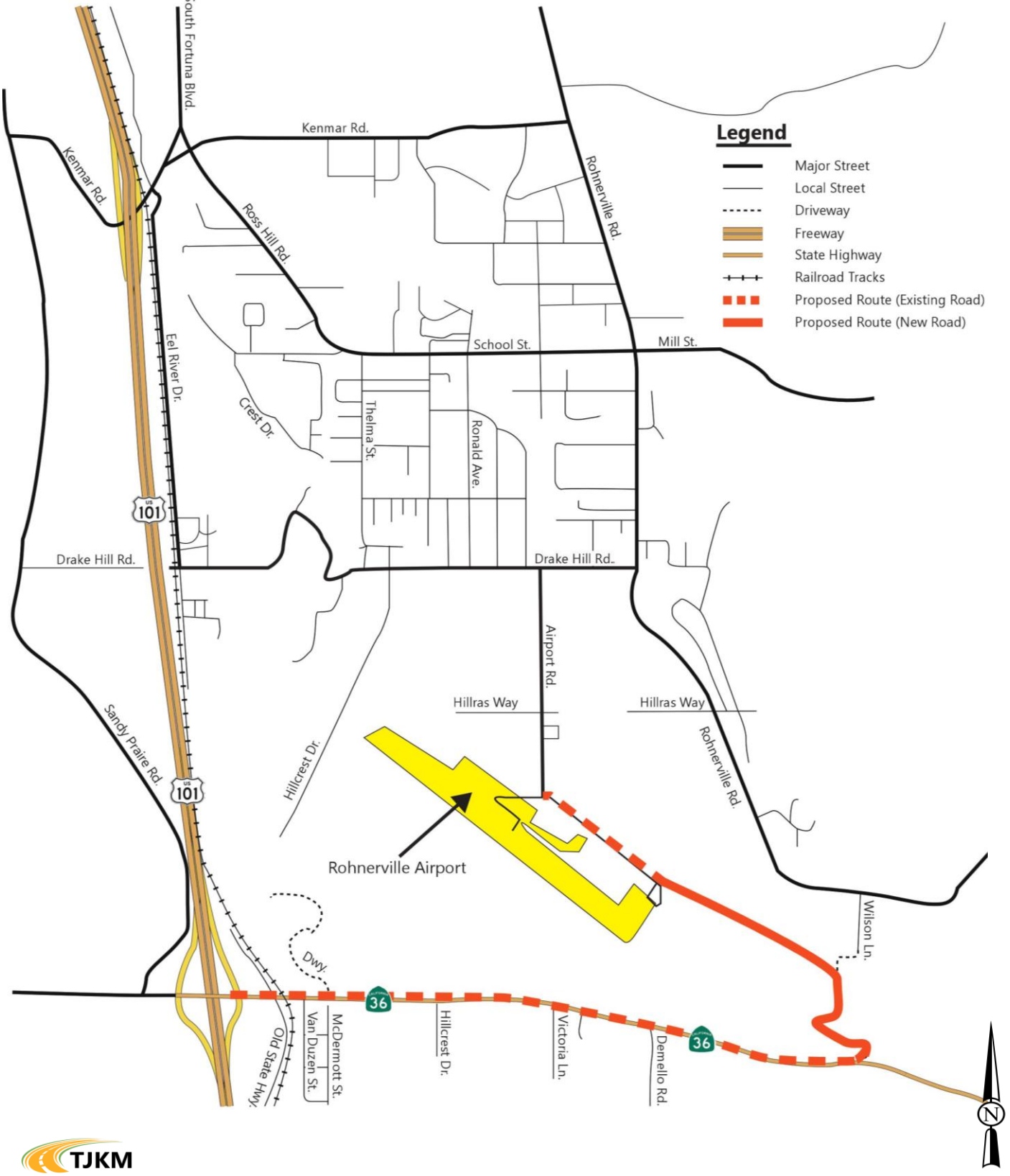
Alternative B Southern Slope would connect Highway 36 via a lengthier connection with a 7% - 10% climb along the hillside immediately south of the airport, before entering the airport from the east. **Figure 9** shows the alignment of Alternative B. This alternative would require construction of an entirely new intersection with Highway 36, including provision of an eastbound left-turn pocket approaching the intersection. This alternative would likely have substantial visual impacts as it would be visible from the valley below and would extend parallel to Highway 36 for some distance. This option would not be recommended prior to the Highway 36 Safety Improvements that are subject to $7.5 million in funding.

Alternative C: Wilson Lane

Alternative C Wilson Lane would connect Highway 36 via an existing private driveway (currently unpaved) roughly parallel with Wilson Lane (existing north/south street that connects with Rohnerville Road). Similar to Alternative A2, this alternative would require provision of an eastbound left-turn pocket approaching the intersection. This option would not be recommended prior to the Highway 36 Safety Improvements that are subject to $7.5 million in funding. **Figure 10** shows the alignment of Alternative C.



SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA		Alternative B-Southern Slope SHN 017262
	September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\5-20180917-AlternativeB.doc	Figure 9



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Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Alternative C-Wilson Lane via SR-36 SHN 017262
	September 2018 \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\6-20180917-AlternativeC.doc	Figure 10

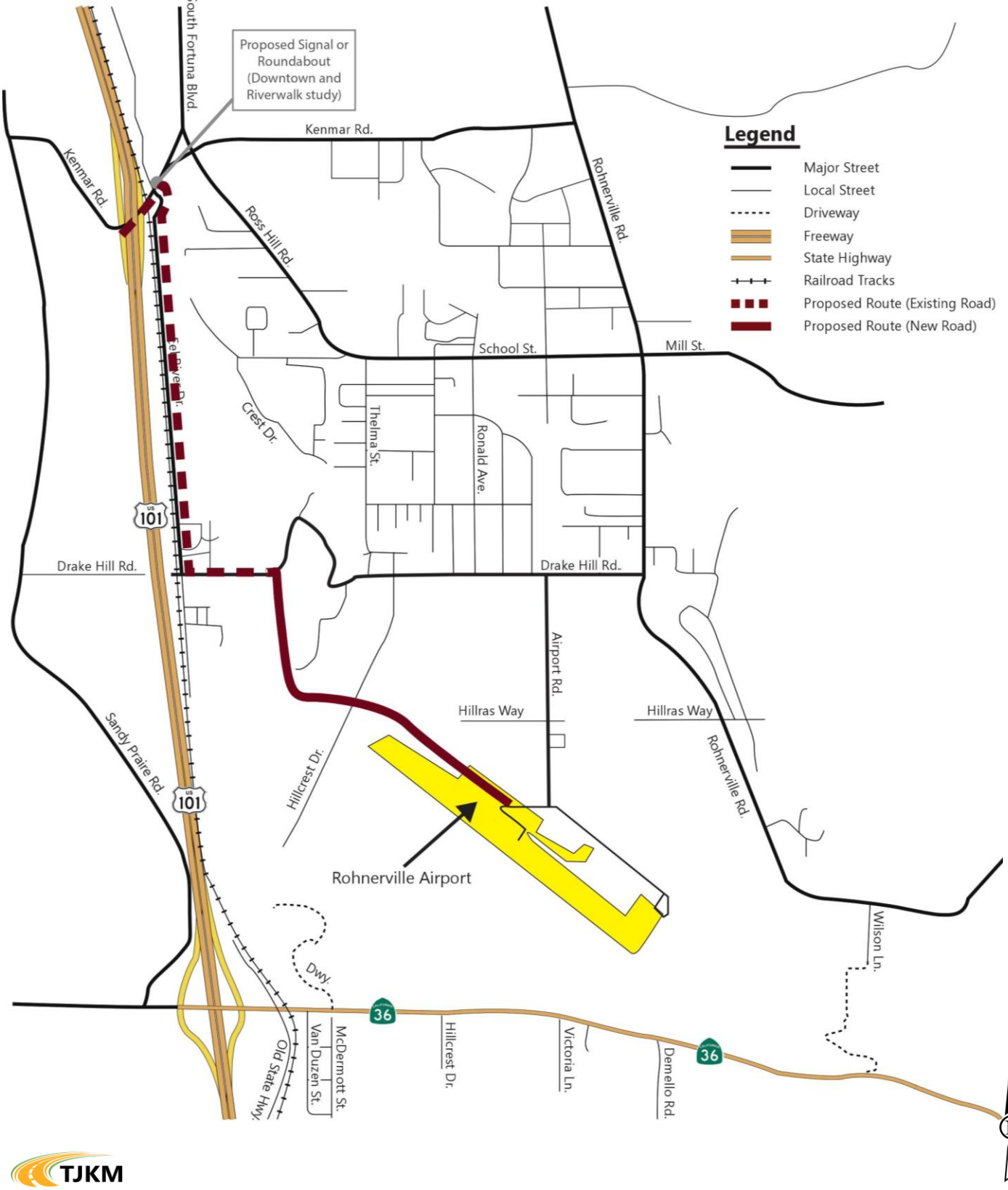
Alternatives D1-D3: Airport Access Options via Kenmar Road & Eel River Drive

Alternatives D1 to D3 would provide airport access via Kenmar Road and Eel River Drive, while Alternative D3 would also connect with Highway 36 via a new roadway connecting Eel River with Old State Highway.

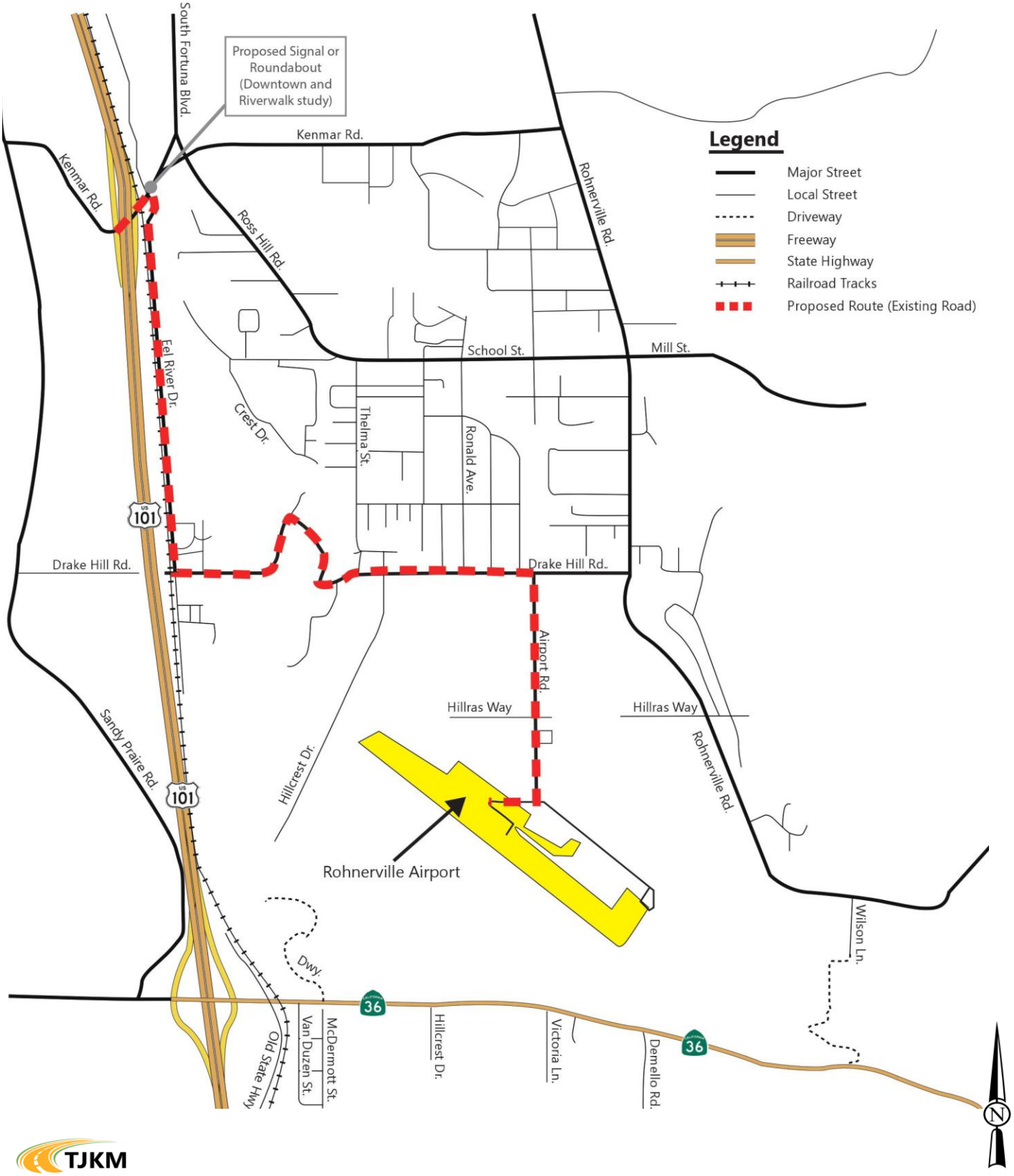
- *Alternative D1 West Slope/ Eel River Drive* would connect U.S. 101/Kenmar Road and Eel River Drive with the airport via a new roadway on the western slope, to the south from Drake Hill Road. This alternative would likely be infeasible given the steep hillside slopes–estimated to exceed 20%, based on the Geologic Assessment Memorandum. **Figure 11** shows the alignment of Alternative D1.
- *Alternative D2 Drake Hill Road/Eel River Drive* would connect U.S. 101/Kenmar Road and Eel River Drive with the airport via Drake Hill Road. As noted earlier: Drake Hill Road was the primary access route between U.S. 101 and the airport prior to the closure of the Drake Hill Road/U.S. 101 intersection. Drake Hill Road lacks a shoulder in most segments, and passes several residential homes. However, given the relatively low volume of airport traffic, this connection would be feasible and not anticipated to result in significant impacts. Additionally, conversion of Drake Hill Road to a Class 3 bicycle route (as envisioned by the Fortuna General Plan) would potentially include widening the travel way to provide 14 foot wide shared motor vehicle/bicycle lanes which could be potentially funded by securing bicycle grant funds. **Figure 12** shows the route applicable to Alternative D2.
- *Alternative D3 Drake Hill Road/Eel River Drive + Old State Highway* would include the same components as D2 (connecting U.S. 101/Kenmar Road and Eel River Drive with the airport via Drake Hill Road) and would also include a connection to Highway 36 by providing a direct connection with Old State Highway. As with A1, the use of Old State Highway is not anticipated to require modifications to the Highway 36/Old State Highway intersection based strictly on airport traffic. The intersection would likely operate at LOS A with the addition of airport traffic. However, by providing a continuous frontage road along the east side of U.S. 101 between Highway 36 and Kenmar Road: non-airport traffic would likely use Old State Highway as well (thus potentially requiring some modifications to the Highway 36/Old State Highway intersection). **Figure 13** shows the route applicable to Alternative D3.

Alternative E: Rohnerville Road

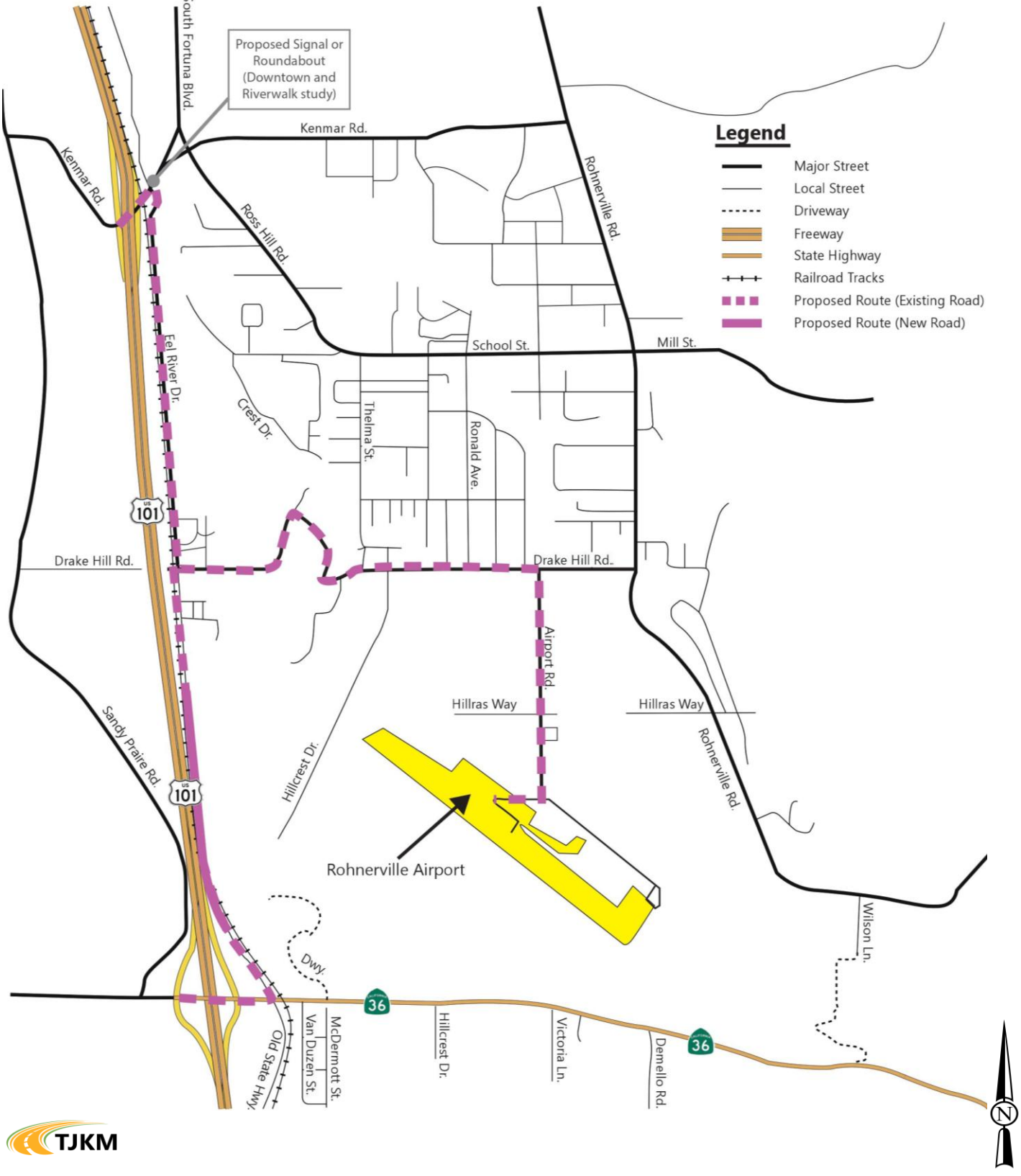
Alternative E Rohnerville Road would provide a direct roadway connection between the airport and Rohnerville Road, crossing private property to intersect Rohnerville Road at Tomoko Lane. This connection would replace the current route from School Street via Thelma Street Avenue and Airport Road. **Figure 14** shows the alignment of Alternative E.



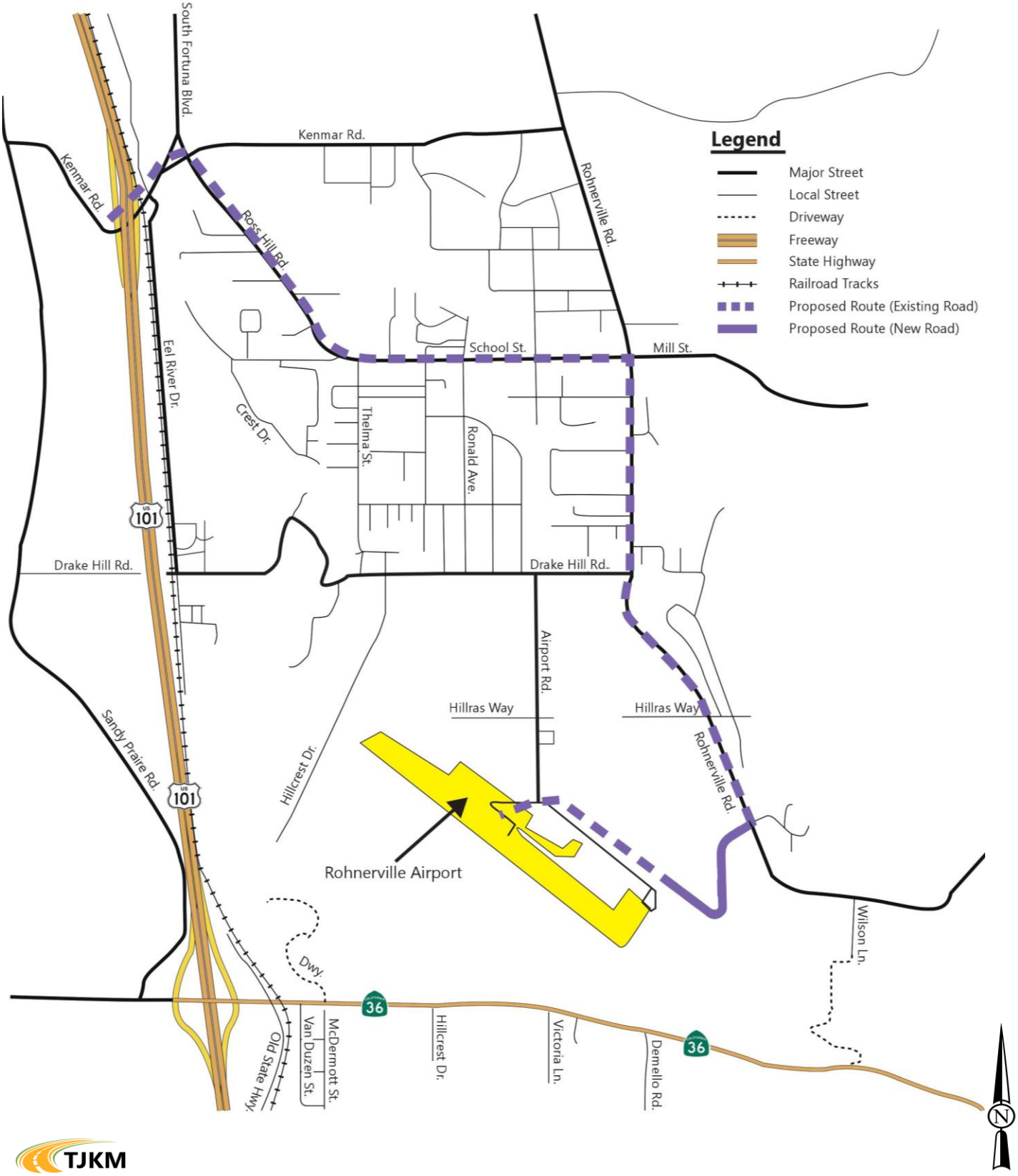
SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA		Alternative D1-West Slope/Eel River Dr. SHN 017262
	September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\7-20180917-AlternativeD1.doc	Figure 11



SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Alternative D2-Drake Hill Road/ Eel River Drive SHN 017262	
	September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\8-20180917-AlternativeD2.doc	Figure 12



Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Alternative D3-Drake Hill Rd./ Eel River Dr. + Old State Hwy. SHN 017262
September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\9-20180917-AlternativeD3.doc	Figure 13



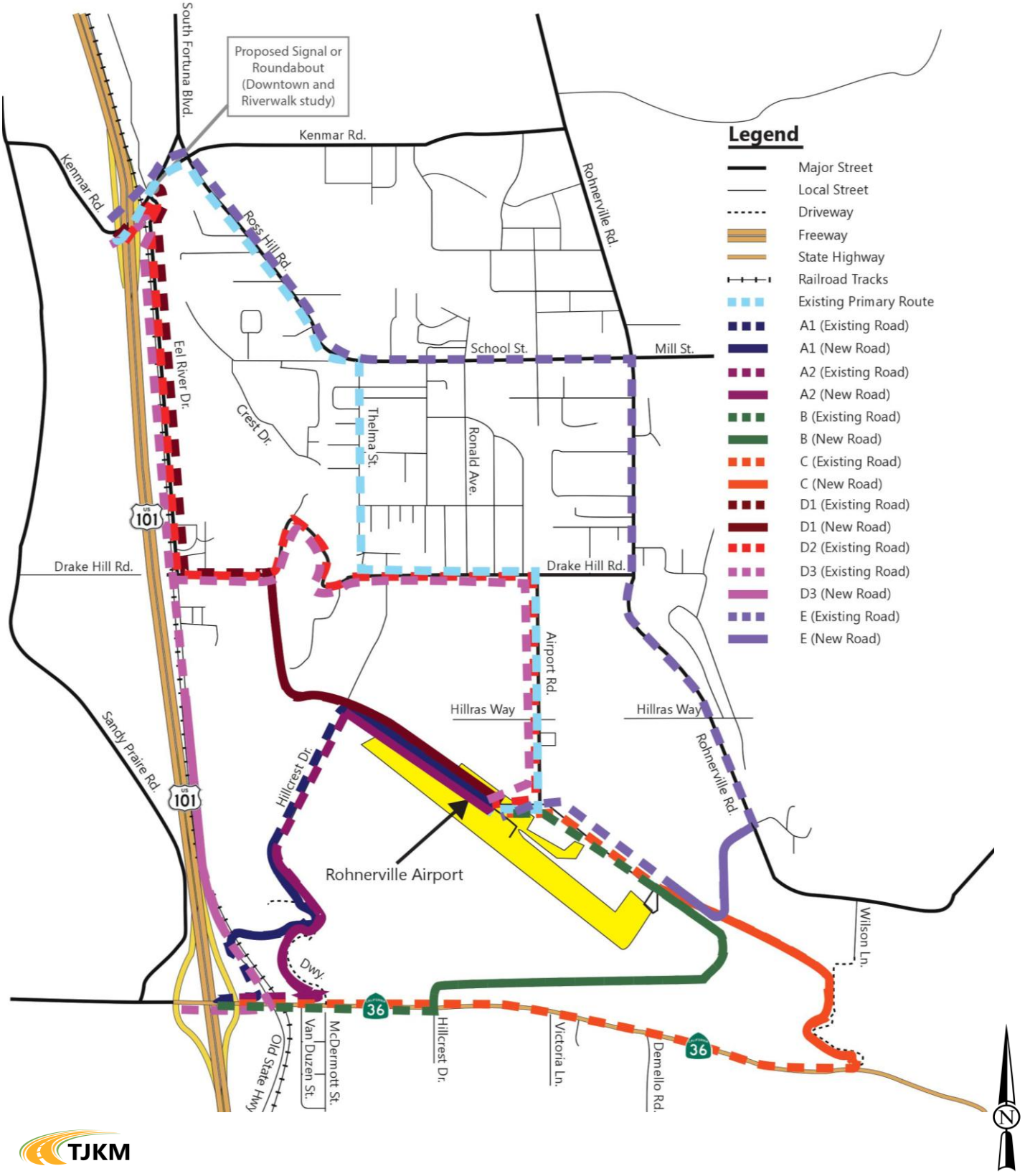
Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Alternative E-Rohnerville Rd. SHN 017262
	September 2018 \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\10-20180917-AlternativeE.doc	Figure 14

6.3 Alternatives Comparison

Figure 15 and **Table 7** compare all 8 alternatives along with the current airport access routes. Access routes to U.S. Highway 101 and State Highway 36 for each alternative are included in the table.

Table 7. Alternatives Comparison
Rohnerville Airport, Rohnerville, California

Airport Access Alternative	US 101 Access			SR 36 Access			Cost Factor
	US 101 Access Point	Distance from US 101 (miles)	US 101 Access–Net Change (miles)	SR 36 Access Point	Distance from SR 36 (miles)	SR 36 Access–Net Change (miles)	
Existing	Kenmar Road	2.53	N/A	Hydesville	3.51	N/A	N/A
A1 (Old State Hwy & SR-36)	SR-36	2.09	-0.44	Old State Highway	1.63	-1.88	High
A2 (Mid-slope Terrace & SR-36)	SR-36	1.95	-0.58	Existing Driveway	1.36	-2.15	Very High
B (South Slope & SR-36)	SR-36	2.11	-0.42	Hillcrest Drive Intersection	1.45	-2.06	Very High
C (Wilson Lane)	SR-36	2.89	+0.36	Wilson Lane Intersection	1.27	-2.24	High
D1 (West Slope & Eel River Drive)	Kenmar Road	1.99	-0.54	US 101	3.81	+0.3	Very High
D2 (Drake Hill Road & Eel River Drive)	Kenmar Road	2.63	+0.1	US 101	4.5	+0.99	Low
D3 (Drake Hill Road & Eel River Drive + Old State Highway)	Kenmar Road & SR-36	2.63	+0.1	Old State Highway	2.76	-0.75	Medium
E (Rohnerville Road)	Kenmar Road	3.48	+0.95	Hydesville	2.89	-0.62	Medium



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SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA	Comparison of Route Alternatives SHN 017262
	September 2018 \\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\11-20180917-AltRouteCompar.doc	Figure 15

Alternatives for Further Consideration

The original intent of this connectivity study was to evaluate up to three alternatives for a direct route from Rohnerville Airport to U.S. Highway 101 and State Highway 36. During a meeting with staff from HCAOG, the City of Fortuna, and Caltrans (staff from Humboldt County was unable to attend the meeting), the eight potential route alternatives were narrowed down to three alternatives for further consideration, which were evaluated for environmental constraints and cost evaluation. In addition to improving connectivity to the airport, one of the key factors in selecting the alternatives for further consideration was the ability to facilitate the development of non-airport properties in the future. The selected alternatives were A1, B/E, and D3. The environmental assessment and cost evaluation associated with these alternatives are described in the following sections. **Figure 16** shows the three alternatives for further consideration.

6.4 Environmental Conditions

A preliminary environmental constraints analysis was conducted for the three selected route alignment alternatives (A1, B/E, and D3). The environmental constraints analysis is provided in **Appendix C.** Field investigations associated with the environmental constraints analysis were limited to visible observations made from the public right-of-way, and a preliminary site walk on the airport property.

The Environmental Constraints Assessment describes the environmental setting for each of the three preferred route alignment alternatives. A brief summary is provided below.

- Route A1–No wetlands are reported from the NWI wetland mapper, nor are they reported from the Humboldt County web GIS within the vicinity of the route A1 alignment. Wetlands were not directly observed within the A1 route alignment. However, the dense cover by arroyo willow, a wetland indicator species, suggests that the slope may contain seeps and other wetlands.

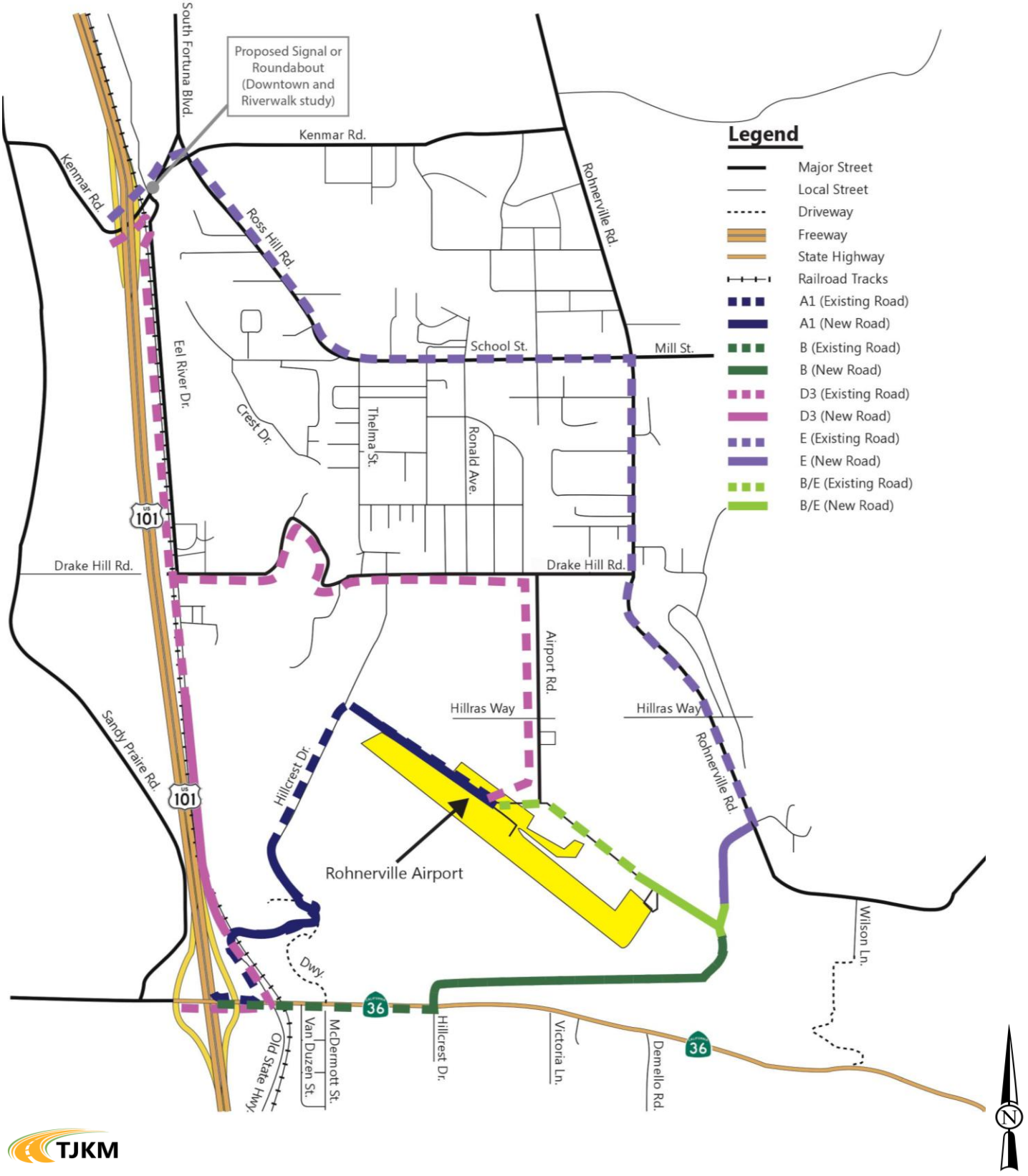
  Potential habitat exists within the A1 route alignment for 11 special status plant species and 15 special status animal species.

- Route B/E–A large potential wetland was observed within the proposed alignment. This wetland area is recorded in the NWI mapper and the Humboldt County WebGIS. Wetland conditions (saturation and hydrophytic vegetation) were observed from public ROW, although specific plant dominance and species composition could not be determined.

  Potential habitat exists within the B/E route for 11 special status plant species and 16 special status animal species.

- Route D3–No wetlands are reported from the NWI wetland mapper, nor are they reported from the Humboldt County web GIS within the vicinity of the route D3 alignment. Wetlands were not directly observed within the D3 route alignment. Areas with arroyo willow, a wetland indicator species, suggest that potential wetlands may exist within the northern portion of the proposed D3 alignment. However, there was no indication of wetland hydrology or hydric soils.

  Potential habitat exists within the D3 route alignment for eight (8) special status plant species and four (4) special status animal species.



SHN Consulting Engineers & Geologists, Inc.	Humboldt County Association of Governments (HCAOG) Rohnerville Airport Connectivity Study Fortuna, CA		Preferred Alternatives SHN 017262
	September 2018	\\eureka\projects\2017\017262-RvilleAirport\Figs\From-TJKM\12-20180917-PreferredAlts.doc	Figure 16

6.5 Opportunities and Constraints Map

Maps of the key opportunities and constraints associated with each of the three alternative routes are provided in **Figures 17A, 17B, and 17C**.

7.0 Funding and Estimate

7.1 Funding

Potential funding sources for the planning, design, and construction phases of this project include:

- The federal Better Utilizing Investments to Leverage Development (BUILD) grant program
- State Transportation Improvement Program (STIP) funding
- FEMA–Potential funding source related to enhancing CAL FIRE facilities and access at the Rohnerville Airport
- Local City funding including transportation development fees
- Small Community Air Service Development Program (SCASDP)
- Airport Improvement Program (AIP)
- State Active Transportation Program (ATP)

7.2 Estimate

Estimated opinions of probable costs were developed for the three preferred route alternatives. A summary of the cost estimate for each route alternative is provided in **Table 8.** Detailed estimates for each route alternative are provided in **Appendix D.** These estimates have been developed based on limited information and are intended to provide a rough order of magnitude associated with each potential alternative. In order to provide more accurate estimates, additional geotechnical and environmental information will need to be obtained. The accuracy of the estimate will improve as the designs of the potential routes develop. Rough order costs for route alternatives A1 and D3 do not include costs associated with modifying the existing intersection of Old State Highway and Highway 36. The existing intersection is expected to be adequate to serve airport traffic; however, increased non-airport traffic may require improvements to the intersection. Non-airport traffic impacts should be considered during future phases of this project.

OPPORTUNITIES

1. Reduces access route distance to Highway 101 by approximately 0.44 miles.

2. Reduces access route distance to Highway 36 by approximately 1.88 miles.

3. Utilizes existing Old State Highway intersection on Highway 36.

CONSTRAINTS

1. Stability of western bluff is unknown. Signs of landsliding is evident in the vacinity of the proposed route. Will likely require slope stabilization to facilitate route.

2. Will require land acquisition along much of the proposed alignment.

3. Steep road grade on western bluff along proposed route.

4. Environmental constraints: substantial cover by sensitive vegetation communities/habitat; potential habitat for 11 special status plant species and 15 special status animal species.

5. Potential wetland seeps along western bluff.

6. Tight turns (small radius) along route.

7. Significant amount of earthwork required at top of bluff.

EEL RIVER DRIVE
HWY 101
HILL CREST DRIVE
AIRPORT ROAD
ROHNERVILLE ROAD
OLD STATE HWY
HWY 36
HWY 101
HWY 36

EXPLANATION

- OPPORTUNITIES
- CONSTRAINTS
- EXISTING ROAD
- NEW ROAD
- PROJECT PARCELS
- AIRPORT FOOTPRINT

N

1" = 800'±

0 800

FEET

PHOTO SOURCE:
USGS NAIP, 2016

SHN Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Rohnerville, California

Opportunities & Constraints
A1 Alternative
SHN 017262

February 2019 | OppConstMapA1 | Figure 17A

\\eureka\projects\2017\017262-RvilleAirport\GIS\PROJ_MXD\ USER: jludtke DATE: 2/19/19, 11:37AM

OPPORTUNITIES

1. Reduces access route distance to Highway 101 by approximately 0.42 miles.

2. Reduces access route distance to Highway 36 by approximately 2.06 miles.

3. Provides direct connection between Rohnerville Road and Highway 36. Will reduce traffic volumes at the Highway 101/Kenmar Exit by directing traffic from southern Fortuna along this route.

4. Southern bluff appears more stable than the western bluff. Further geotechnical evaluation is required. Road grade is expected to be approximately 7% to 10% as the route climbs the southern bluff.

5. Could facilitate class 2 bike route identified in the Fortuna General Plan.

CONSTRAINTS

1. Will require a new intersection on Highway 36.

2. Will require land acquisition along much of the proposed alignment.

3. Significant amount of earthwork required. Extensive retaining wall installation and cut bank stabilization may be required.

4. Visual impact.

5. Significant environmental constraints: large potential wetland; substantial cover by sensitive vegetation communities/habitat; potential habitat for 11 special status plant species and 16 special status animal species.

EEL RIVER DRIVE
HWY 101
HILL CREST DRIVE
AIRPORT ROAD
ROHNERVILLE ROAD
OLD STATE HWY
HWY 36
HWY 101
HWY 36

EXPLANATION

- OPPORTUNITIES
- CONSTRAINTS
- EXISTING ROAD
- NEW ROAD
- PROJECT PARCELS
- AIRPORT FOOTPRINT

N

1" = 800'±
0 800
FEET

PHOTO SOURCE:
USGS NAIP, 2016

\\eureka\projects\2017\017262-RvilleAirport\GIS\PROJ_MXD\ USER: jludtke DATE: 2/19/19, 11:38AM

SHN Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Rohnerville, California

Opportunities & Constraints
B/E Alternative
SHN 017262

February 2019 | OppConstMapBE | Figure 17B

OPPORTUNITIES

1. Reduces access route distance to Highway 36 by approximately 0.75 miles.

2. Takes advantage of existing roadways and railroad corridor.

3. Existing roadway along Drake Hill Road climb appears to have a 50-foot ROW.

4. Could facilitate class 2 bike route identified in the Fortuna General Plan.

5. Connecting Eel River Drive and Old State Highway may reduce traffic volumes at the highway 101/Kenmar Exit by directing traffic from southern Fortuna to Old State Highway.

6. Could facilitate future commercial improvements along Eel River Drive.

7. Utilizes existing Old State Highway intersection on Highway 36.

CONSTRAINTS

1. Impact to residences along Drake Hill Road climb. Residences close to existing roadway.

2. Relatively steep grade along Drake Hill Road climb.

3. Environmental constraints: potential habitat for 8 special status plant species and 4 special status animal species.

4. Slightly increases route distance to Highway 101.

5. New road segment is within railroad corridor and will require crossing of railroad alignment.

EEL RIVER DRIVE
HWY 101
HILL CREST DRIVE
AIRPORT ROAD
ROHNERVILLE ROAD
OLD STATE HWY
HWY 36
HWY 36

EXPLANATION

- OPPORTUNITIES
- CONSTRAINTS
- EXISTING ROAD
- NEW ROAD
- PROJECT PARCELS
- AIRPORT FOOTPRINT

N

1" = 800'±

0 800

FEET

PHOTO SOURCE:
USGS NAIP, 2016

SHN Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Rohnerville, California

Opportunities & Constraints
D3 Alternative
SHN 017262

February 2019 | OppConstMapD3 | Figure 17C

\\eureka\projects\2017\017262-RvilleAirport\GIS\PROJ_MXD\ USER: jludtke DATE: 2/18/19, 3:26PM

Table 8. Preliminary Cost Opinion
Rohnerville Airport, Rohnerville, California

Route Alternative	Description	Rough Order Cost Opinion
A1	Old State Highway & Hillcrest Drive	$7,123,000
B/E	Southern Slope + Rohnerville Road Connection	$10,690,500
D3	Drake Hill Road, Eel River Drive, Old State Highway	$3,102,000

8.0 Next Steps

This planning study is the first of several steps necessary to develop a new route between Highway 36 and Rohnerville Airport. The next steps in moving the project forward may include the following:

- **Community Outreach–**The nearby community should be engaged in the process of considering the potential alternatives. A variety of methods should be considered when engaging the community. Effective means of engaging the community may include public meetings, design charrettes, on-line surveys, site walk assessments, etc.
- **Conduct Further Investigation–**Further site investigations should be considered in order to help select a preferred alternative. A thorough geotechnical investigation will likely be necessary in order to confirm the feasibility of the potential routes. A more thorough evaluation for environmental constraints should also be considered. Depending on the selected alternative, coordination with Caltrans may become a critical element to the project.
- **Select a Preferred Alternative–**Once the feasibility of the potential alternatives has been evaluated, the City will be able to select a preferred route alternative. This alternative should consider public support, geologic and environmental constraints, traffic impacts, functionality, and costs.
- **Consider Incorporating this Project Into Other Transportation Projects–**Depending on timing, it may be feasible or desirable to incorporate this project into other transportation projects that the City is currently planning to implement.
- **Develop Additional Plans/Studies–**The routes identified in this report are very preliminary. Many factors still need to be evaluated before the project can be clearly defined. Funding may be available to assist with the planning and preliminary design stages of this project.
- **Seek Design and Construction Funding–**Once the project has been clearly defined, this project should be eligible for a variety of funds to assist with the design, permitting, and construction. Some of the potential funding sources are mentioned in Section 7.1.

Geologic Assessment Memorandum

A

CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 •shninfo@shn-engr.com

REGISTERED GEOLOGIST
GARY D. SIMPSON
No. 2107
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Memorandum

Reference: 017262
Date: March 14, 2018
To: Jared O'Barr
From: Gary Simpson
Subject: Geologic Assessment, Rohnerville Airport Connectivity Study

This memorandum presents the results of our preliminary geologic assessment of potential alternative access routes to the Rohnerville Airport. Consistent with the intent of the project, our assessment has focused on access opportunities that would connect Highway 36 with the airport.

Our scope of work has included a review of available literature and photos, site reconnaissance, and preparation of this memorandum. We visited the site on January 31, 2018, with the project team, and completed a reconnaissance of the site and vicinity. Our reconnaissance was limited to public and airport lands; we did not conduct reconnaissance on private lands discussed herein. Much of the assessment described in this preliminary report is based on review of available aerial imagery.

Geologic Setting

The Rohnerville Airport is located on an uplifted alluvial plain (terrace) underlain by sediments referred to as the "Rohnerville Formation" (Ogle, 1953). The Rohnerville Formation consists of floodplain deposits (predominantly gravel with lesser amounts of sand, silt, and clay) that underlie the tilted surface at Rohnerville and extend to the north beneath Fortuna. The Rohnerville sediments are as much as 25 feet thick, and, therefore, form a relatively thin alluvial veneer that overlies the older Wildcat Group sediments that are ubiquitous throughout the lower Eel River and Van Duzen river valleys. The bedded sedimentary deposits are tilted to the north at an angle roughly coincident with the dip of the Rohnerville terrace surface.

Topographically, the Rohnerville Airport is located on a planar, north-dipping surface that projects at a low gradient toward Fortuna. Steep descending slopes border the western and southern edges of the upland, representing the margins of the Eel and Van Duzen river valleys, respectively (see attached Figures 1 and 2). Rohnerville Road and uplands lie east of the airport. Because the sedimentary units beneath the Rohnerville upland dip gently to the north, they dip into the slope south of the airport; in this orientation the beds are essentially horizontal across the slope such that individual beds are exposed for long distances (as shown on Figures 1 and 2). The inclined bedding is exposed in cross-sectional view along the steep face west of the airport. The steep slope west of the airport is marked by a series of near-vertical cliffs that are well-expressed in the LiDAR-based topography shown on Figure 1 and the oblique aerial image in Figure 2; some of these cliffs are in excess of 100 feet high.

Extensive landsliding is apparent on the steep slope west of the airport. Recent slumps are evident at a number of locations along the steep cliffs that punctuate this slope. Arcuate shaped voids on the various cliffs, and debris fans on the adjacent low gradient surfaces, reflect the potential for mass wasting during large storm events and earthquakes. Because the sedimentary bedding dips into the slope south of the airport, we infer the irregular topography of that slope to be the result of erosion of individual beds with differing erodibility, as opposed to slumping or mass wasting.

Potential Alternative Access Points

There are three basic options relative to alternative access originating on the slopes south or west of the airport. For this discussion, we assume that access up the western slope, if feasible, is an acceptable alternative due to the potential to extend the "Old State Highway" to the north from Highway 36. The three options are:

1. The Western Slope
2. The Southern Slope
3. The Mid-Slope Terrace

Western Slope. Achievable access routes are extremely limited on the steep slope west of the airport. There are, however, potential alignments that follow relatively steep "ramps" up the western slope (Figures 1 and 2). The ramp gradients appear to be on the order of 20% to 23%, which is likely prohibitively steep for the types of vehicles that need access to the airport (including CAL FIRE trucks and trailers). Although steep, the alignments would be largely "at-grade" and could be developed with minimal grading (minor cuts/fills). Significant reduction of road grade along the alignments would require additional grading. Additionally, as noted above, the numerous cliffs along the western slope would present an ongoing landslide hazard that may impact these potential alignments. Mass wasting may originate from near-vertical slopes above this potential alignment (meaning debris would land on the roadway) or from steep slopes below the alignment (which would potentially undermine the roadway). Development of these alignments would require the removal of a significant number of trees on the slope (mostly eucalyptus trees), and access would need to be developed from Old State Highway, the southern end of Eel River Drive, or Drake Hill Road. Development of these alignments would require significant geologic (landslide) mapping and geotechnical characterization in order to develop a suitable access route. We would consider any of these to be difficult alignments to construct and maintain; they are probably too steep; and they would be subject to significant mass wasting hazards.

Southern Slope. The southern slope is a hummocky, grass-covered slope that is relatively linear in map view (Figure 1). As discussed above, the alluvial beds beneath the Rohnerville terrace dip into this slope, a relatively favorable orientation from a stability standpoint. We interpret the hummocky geomorphic expression of the slope to reflect the relative resistance of the individual sedimentary beds to erosion; it appears unrelated to mass wasting (landsliding). Therefore, it is conceivable to develop a low to moderate gradient road extending up the slope at an oblique angle (see Figure 2).

There are drainage amphitheaters at both the western and eastern ends of the slope that have steep sidewalls that would preclude simple road construction. As such, the alignment up the southern slope should occur between these two areas, as shown on the attached figures; the gradient of the longest

feasible alignment is estimated at about 7%. A modified alignment incorporating switchbacks on the slope could be developed, but would require significant grading to develop an appropriate turn radius; large cuts and fills would presumably be required.

The side-hill nature of this potential alignment would require balanced cut-fill construction, where the outboard edge of the road would be supported on engineered fill generated during the grading of the road bench. A cut slope on the uphill side of the road would be of variable height, becoming progressively higher in the upper parts of the slope where it becomes steeper. Because the slope is grass-covered, no removal of trees would be required. The development of this road would be associated with significant visual impacts. Given the length of the required road construction across previously undeveloped ground, we infer that this alternative would be associated with a relatively high cost.

Access using the existing, undeveloped extension to Wilson Lane at the eastern end of the southern slope is feasible from a geotechnical standpoint, but is associated with a narrow road bed with tight curve radius, and location within a residential neighborhood. Developing a suitable road with appropriate turn radius would require significant grading.

Mid-Slope Terrace. At the western end of the southern slope, directly above the intersection of Highways 36 and 101, a broad mid-slope terrace provides an opportunity to access the airport. The terrace, visible on both the attached figures, is an alluvial bench that is actively cultivated (it is private agricultural land). An existing private road accesses the terrace from Highway 36. This is currently a narrow, unimproved road. Alternate routes from the Old State Highway and the end of Eel River Drive appear feasible to reach the mid-slope terrace from the north or west (see Figure 1 and 2).

Assuming access to the mid-slope bench could be developed from one of these options, a new road connecting the mid-slope terrace with the Rohnerville terrace above would need to be developed. An existing, overgrown road cut (with an estimated 18% gradient) is apparent on the slope above the mid-slope terrace, which could presumably be converted into a suitable access road. This inferred road leads to the southwest corner of the Rohnerville terrace; private lands and existing farm houses at the top of this grade would complicate development of access in this area. However, if access can connect to Hillcrest Drive, direct access to the airport could be developed from the west. Development of the road alignment above the mid-slope terrace would require side-hill construction resulting in a relatively high cut bank (the upper slope becomes relatively steep in this area).

From a strictly geotechnical standpoint, this is probably the simplest, most cost-effective alternative for access from Highway 36. The route incorporates existing roads and flats to reduce the overall impact, and requires the least amount of new road construction.

Let me know if you need additional information or clarification of the information presented herein.

Reference

Ogle, B. A. (1953). "Geology of the Eel River Valley Area, Humboldt County, California," *California Department of Natural Resources, Division of Mines, Bulletin 164*. 128p Sacramento, CA:CDMG.

DRAKE HILL ROAD

EEL RIVER DRIVE

HWY 101

±23%

WEST SLOPE

HILLCREST DRIVE

±20%

ROHNERVILLE AIRPORT

ROHNERVILLE ROAD

±18%

MID-SLOPE TERRACE

STEEP-SIDED DRAINAGE

OLD STATE HWY

SOUTH SLOPE

7%

HWY 36

STEEP-SIDED DRAINAGE

WILSON LANE

EXPLANATION

PROPOSED ACCESS ROADS

FEASIBLE ALTERNATIVES

MARGINALLY FEASIBLE ALTERNATIVES

0 700

FEET

N

1"=700'±

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Path: \\eureka\projects\2017\017262-RvilleAirport\GIS\PROJ_MXD\Figure1_SiteMap.mxdUser Name: psundberg

Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Rohnerville, California

Site Map

SHN 017262

March 2018 | Figure1_SiteMap | Figure 1

EXPLANATION

- *FEASIBLE ALTERNATIVES*
- *MARGINALLY FEASIBLE ALTERNATIVES*
- *CLIFFS*

BASEMAP IMAGE FROM GOOGLE EARTH; DATED 5/26/2016-VERTICAL EXAGGERATION IS 2.75X

Path: \\eureka\projects\2017\017262-RvilleAirport\GIS\FIGURES\Figure2_ObliqueView.ai

Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Rohnerville, California

Site Map-Oblique View
View to East
SHN 017262

March 2018 | Figure2_ObliqueView | Figure 2

Right of Way Maps B

SCHEDULE

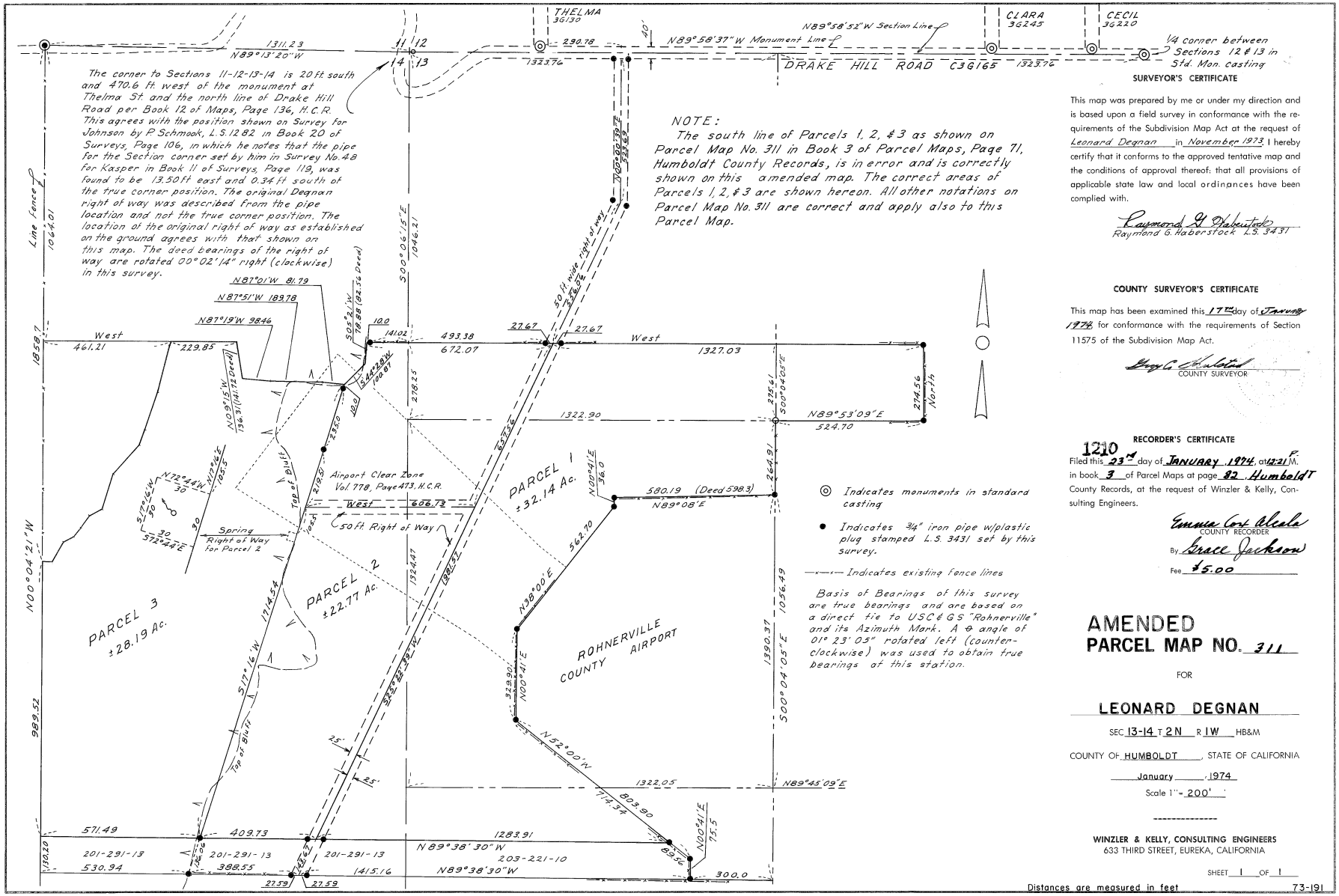
CASE	GRANTOR	GRANTEE	INSTRUMENT	DATE	RECORD	REMARKS
2218	Eugene Piola et al	State of California	Grant Deed	Dec.18,1950	Bk.156, O.R., Pg.107	and Access
2219	Mary Jane Hill	State of California	Final Order of Condemnation	Dec. 18, 1951	Bk 192, O.R. Pg 48	
2220	Christina H Hauck et vir	State of California	Grant Deed	Aug. 3,1950	Bk. 145, O.R., Pg. 624	and Access
2221	Win Fred Hauck et ux	State of California	Grant Deed	Jul. 17, 1950	Bk. 145, O.R., Pg 616	
2222	George J. Eichhorn et al	State of California	Grant Deed	Apr. 10,1950	Bk.130, O.R., Pg. 131	
2223	Henrietta A. McClung	State of California	Grant Deed	Jun. 14,1950	Bk.148, O.R., Pg.503	
2224	Bertha D. Newell	State of California	Grant Deed	Jul. 26,1950	Bk.146, O.R., Pg.475	
2225	Horace N. Bowers et ux	State of California	Grant Deed	Apr 10,1950	Bk.130 O.R., Pg.181	
2255	Glen D. Johnson et ux	State of California	Grant Deed	Sept. 19, 1951	Book 186, O.R. Page 134	
2256	George J. Eichhorn	State of California	Grant Deed	Jul. 26,1950	Bk.142, O.R. Pg.271	
155	State of California	George J Eichhorn	Directors Deed	Nov. 15,1950	Bk.156, O.R., Pg.189	
177			Relinquishment	Jan. 21, 1953	Bk. 270 O.R., Pg. 89	
6450	NWP RR CO.	STATE OF CALIFORNIA	EASEMENT	MAR. 6, 69	" 998 O.R., " 333	
6451	EARL HURD	" " "	GRANT DEED	AUG. 15, '67	" 935 O.R., " 235	
6452	MILTON L. BYRAM	" " "	GRANT DEED	AUG. 15, '67	" 935 O.R., " 232	

EQUATION OF COORDINATES:
N. 13376.49 (HUM-1-F) = 0.00 (HUM-35-A)
W. 9322.84 (HUM-1-F) = 0.00 (HUM-35-A)

1361

I-HUM-36-A

SCALE: 1" = 100'



SURVEYOR'S CERTIFICATE

This map was prepared by me or under my direction and is based upon a field survey in conformance with the requirements of the Subdivision Map Act at the request of Leonard Degnan in November 1973. I hereby certify that it conforms to the approved tentative map and the conditions of approval thereof; that all provisions of applicable state law and local ordinances have been complied with.

Raymond G. Haberstock
Raymond G. Haberstock L.S. 3431

COUNTY SURVEYOR'S CERTIFICATE

This map has been examined this 17th day of January 1974 for conformance with the requirements of Section 11575 of the Subdivision Map Act.

COUNTY SURVEYOR

RECORDER'S CERTIFICATE

1210
Filed this 23rd day of JANUARY 1974, at 12:21 P.M. in book 3 of Parcel Maps at page 82, Humboldt County Records, at the request of Winzler & Kelly, Consulting Engineers.

Emma Cort Abels
COUNTY RECORDER
By Grace Jackson
Fee $5.00

AMENDED PARCEL MAP NO. 311

FOR

LEONARD DEGNAN

SEC 13-14 T 2N R 1W HB&M

COUNTY OF HUMBOLDT, STATE OF CALIFORNIA

January, 1974

Scale 1" = 200'

WINZLER & KELLY, CONSULTING ENGINEERS
633 THIRD STREET, EUREKA, CALIFORNIA

SHEET 1 OF 1

Distances are measured in feet

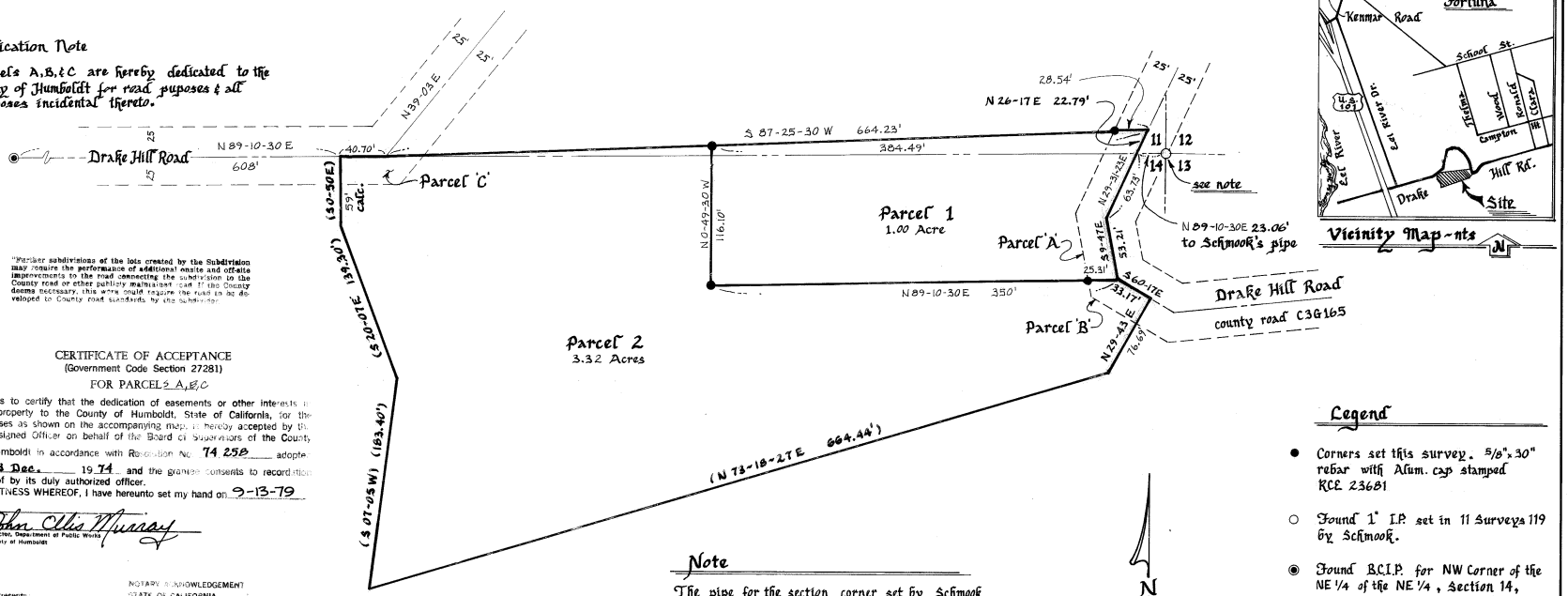
73-191

BOOK 3 OF PARCEL MAPS, PAGE 82

Dedication Note

Parcels A, B, & C are hereby dedicated to the County of Humboldt for road puposes & all purposes incidental thereto.

"Parker subdivisions of the lots created by the Subdivision may require the performance of additional onsite and off-site improvements to the road connecting the subdivision to the County road or other publicly maintained road if the County deems necessary, this area could require the road to be developed to County road standards by the subdivider."



Vicinity Map - nts

CERTIFICATE OF ACCEPTANCE

(Government Code Section 27281)

FOR PARCELS A, B, C

This is to certify that the dedication of easements or other interests in real property to the County of Humboldt, State of California, for the purposes as shown on the accompanying map, is hereby accepted by the undersigned Officer on behalf of the Board of Supervisors of the County of Humboldt in accordance with Resolution No. 74 258 adopted 3 Dec. 1974 and the grantee consents to recordation thereof by its duly authorized officer.

IN WITNESS WHEREOF, I have hereunto set my hand on 9-13-79

Deputy John Ellis Murray
Director, Department of Public Works
County of Humboldt

OWNER'S CONSENT

Know All Men by These Presents:

That the undersigned being a party having a record title interest in the real property being subdivided by this map, do hereby consent to the preparation and recordation of this map, and to the dedication of the easements for the purpose as shown thereon.

DATED this ___ day of ___, 19__

s/s ___

VICE PRESIDENT ~ BANK OF HOLETA

NOTARY ACKNOWLEDGEMENT

STATE OF CALIFORNIA

COUNTY OF Humboldt

On this 22 day of August, 1979, before me ___, a Notary Public, State of California, duly commissioned and sworn, personally appeared ___

known to me (or proved to me on the oath of ___) to be the ___ of the corporation that executed the within instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County of ___, the day and year in this certificate first above written.

___
NOTARY PUBLIC IN AND FOR THE STATE OF CALIFORNIA

My Commission Expires ___

BILLIE F. HEWES
NOTARY PUBLIC
HUMBOLDT COUNTY, CALIFORNIA
My commission expires April 30, 1980

SURVEYOR'S CERTIFICATE

This map was prepared by me or under my direction and is based upon a field survey

in conformance with the requirements of the Subdivision Map Act and local ordinance at the request of James & Sandra Hargus in August 1979.

(Signed) Allan M. Baird

R.C.E. (or L.S.) No. 23681

OWNER'S CONSENT

Know All Men by These Presents:

That the undersigned being a party having a record title interest in the real property being subdivided by this map, do hereby consent to the preparation and recordation of this map, and to the dedication of the easements for the purpose as shown thereon.

DATED this 22 day of August 1979

s/s James B. Hargus

s/s Sandra J. Hargus

COUNTY SURVEYOR'S CERTIFICATE

This map conforms with the requirements of the Subdivision Map Act and local ordinance at the request of James & Sandra Hargus in August 1979.

Dated Sept. 12, 1979

Roy C. Mulder
County Surveyor

21725

COUNTY RECORDER'S CERTIFICATE

Filed this 25th day of SEPT 1979 at 4:26 PM.

In Book 14 of PARCEL Maps page 53.

Humboldt County Records, at the request of Baird & McBride

Signed Grace Jackson
County Recorder Humboldt

FEE $5.00

NOTARY ACKNOWLEDGEMENT

STATE OF CALIFORNIA

COUNTY OF Humboldt

On this 22nd day of August 1979, before me ___, a Notary Public, State of California, duly commissioned and sworn, personally appeared James B. Hargus and Sandra J. Hargus known to me (or proved to me on the oath of ___) to be the person whose name is subscribed to the within instrument and acknowledged to me that they executed the same, IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County of Humboldt, State of California, the day and year in this certificate above written.

Linda R. Gushard
NOTARY PUBLIC IN AND FOR THE STATE OF CALIFORNIA

My Commission Expires ___

Note

The pipe for the section corner set by Schmook in Book 11 of Surveys, page 119 is 13.50 ft. East and 0.34 ft. South of true corner position. The original property was described from pipe location and not true corner position. Therefore, this map locates original property in relation to Schmook's pipe, which was found this survey.

Legend

- ● Corners set this survey. 5/8" x 30" rebar with Alum. cap stamped RCE 23681
- ○ Found 1" I.P. set in 11 Surveys 119 by Schmook.
- ◉ Found B.C.I.P. for NW Corner of the NE 1/4 of the NE 1/4, Section 14, as per 3 P.M. 71.
- ( ) Record data from deed.

N

Basis of Bearing

Book 11 Surveys, Page 119.

Parcel Map No. 1630

for

James B. & Sandra J. Hargus

In Section 14, T2N, R1E, HBM

County of Humboldt ~ State of California

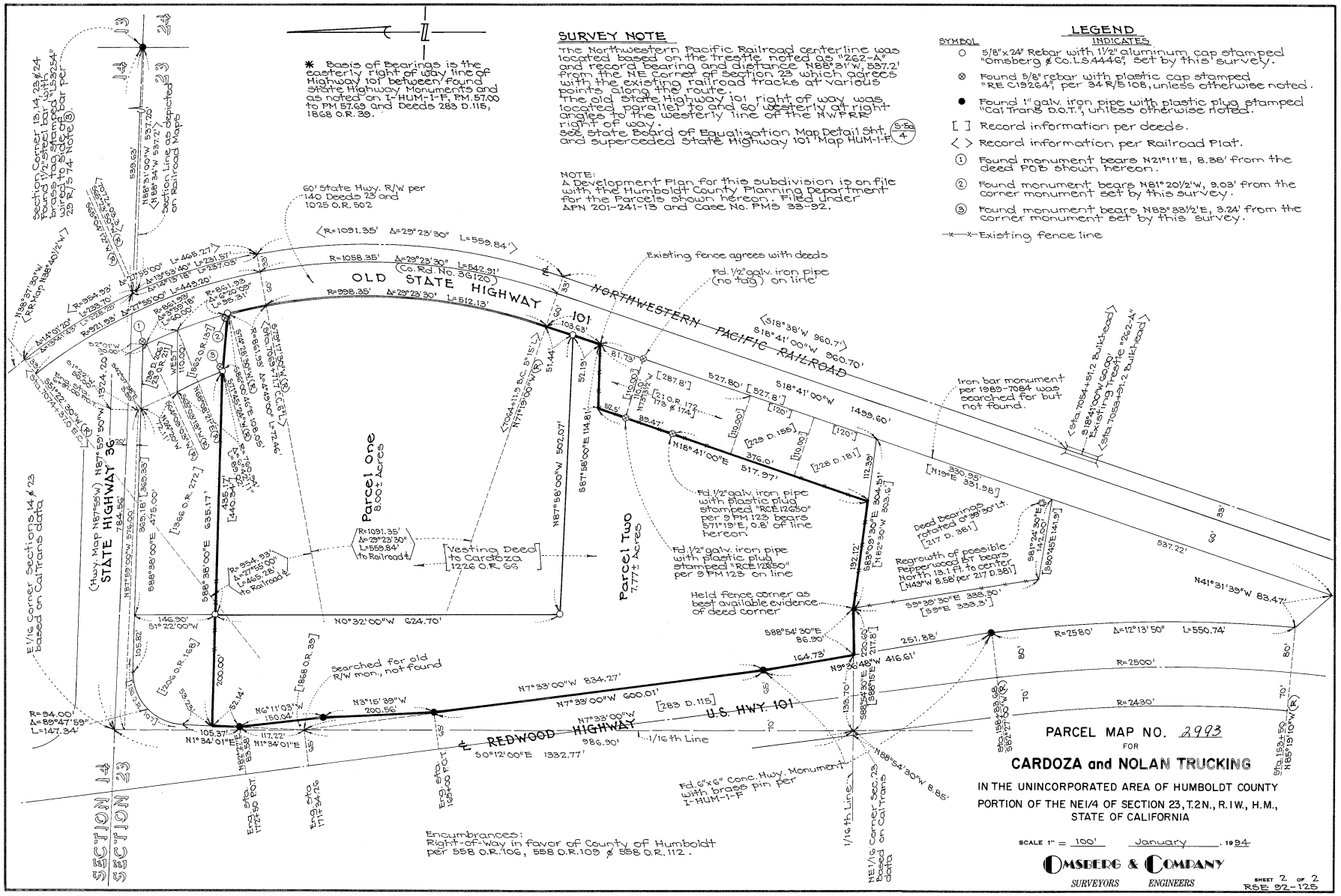
Scale: 1" = 60' Date: August 1979

Baird & McBride ~ Civil Engineers

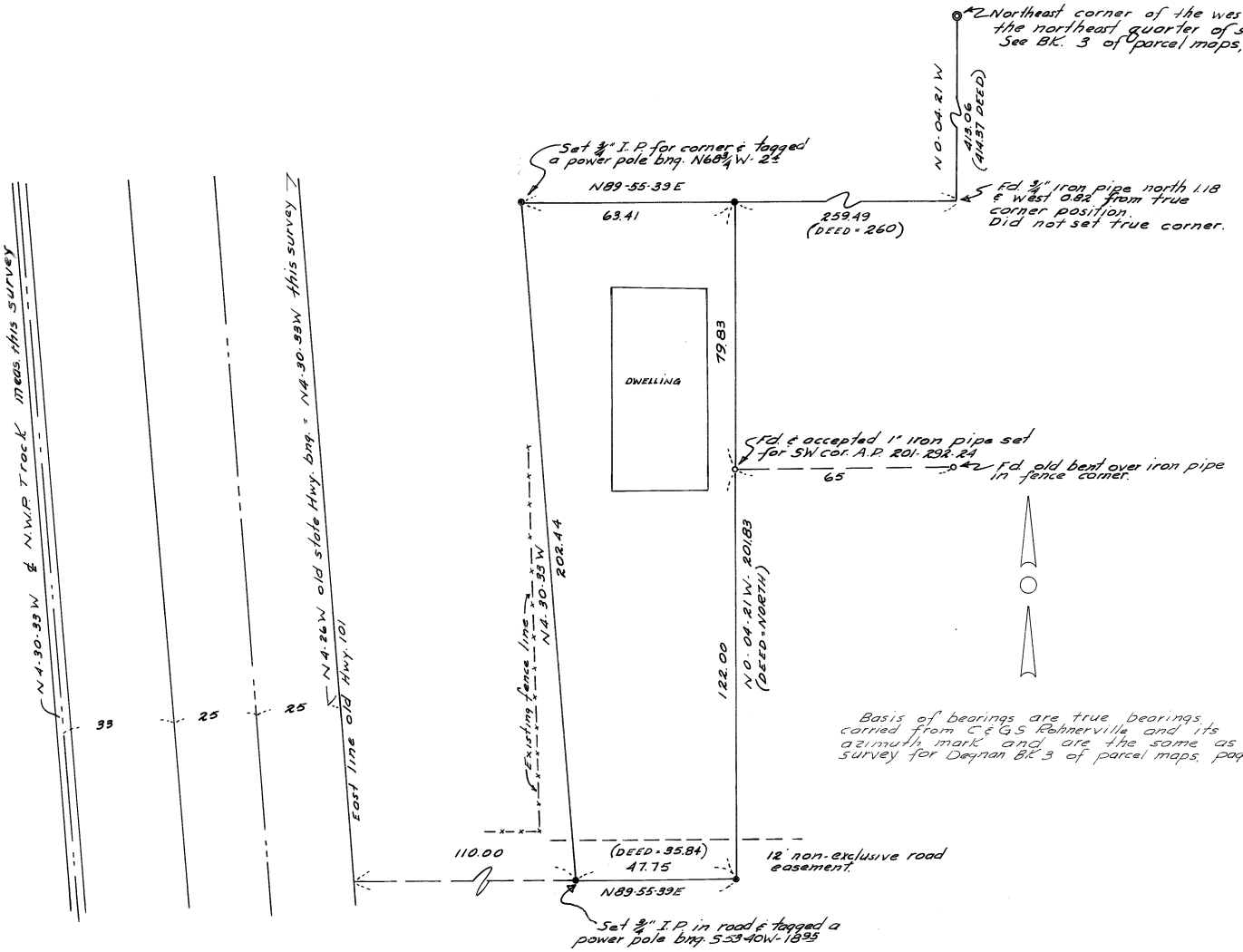
Sheet 1 of 1

79122

Book 14 of Parcel Maps, Page 53



BOOK 37 OF PARCEL MAPS, PAGE 99



SURVEYOR'S CERTIFICATE

This map correctly represents a survey made by me or under my direction in conformance with the requirements of the Land Surveyors Act at the request of Edna Ussery in September, 19 74.

Raymond D. Dalmasso
LS3431

COUNTY SURVEYOR'S CERTIFICATE

This map has been examined for conformance with the requirements of the Land Surveyor's Act this 27th day of September 19 74.

Guy C. Kuleted
COUNTY SURVEYOR
Lindleigh G. Fow
by Deputy

RECORDER'S CERTIFICATE

17258
Filed this 2ND day of OCTOBER, 1974 at 2:50 P.M. in book 30 of SURVEYS at page 84 Humboldt County Records, at the request of Winzler & Kelly, Consulting Engineers.

Emma Cox Alcala
County Recorder
By Grace Jackson
Fee $5.00

RECORD OF SURVEY

FOR

EDNA USSERY

SEC 14 T 2 N., R 1 W., HB&M

COUNTY OF HUMBOLDT, STATE OF CALIFORNIA

SEPTEMBER, 1974

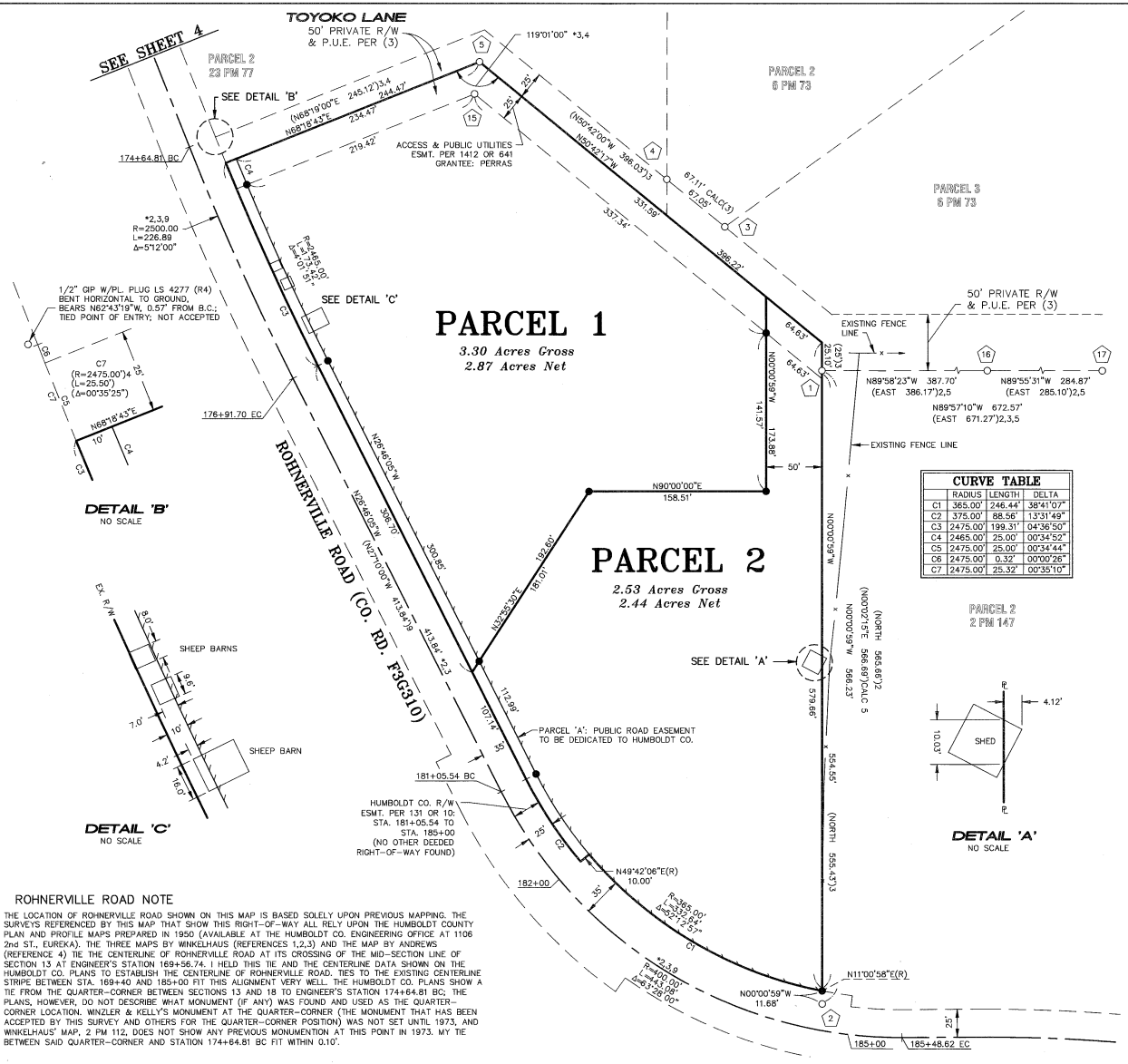
Scale 1" = 20'

WINZLER & KELLY, CONSULTING ENGINEERS
633 THIRD STREET, EUREKA, CALIFORNIA

SHEET ____ OF ____

74-163

BOOK 30 OF SURVEYS, PAGE 84



LEGEND

- ○ CORNER FOUND BY THIS SURVEY AND DESCRIBED ON SHEET 4 UNDER "CORNER NOTES", WITH REFERENCE (#), OR AS NOTED
- ● SET 1"x 30" GALVINIZED IRON PIPE WITH YELLOW PLASTIC PLUG STAMPED "LS 6339"
- ( ) RECORD DATA PER REFERENCE CITED
- * RECORD AND MEASURED DATA PER REFERENCE CITED
- (R) RADIAL BEARING
- PARCEL 'B': 1-FOOT WIDE NON-VEHICULAR ACCESS EASEMENT ADJOINING THE ROHNERVILLE ROAD R/W TO BE DEDICATED TO HUMBOLDT COUNTY BY THIS MAP

  NET AREA IS THE GROSS AREA MINUS ACCESS EASEMENTS

REFERENCES

( )1 2 PM 112
( )2 2 PM 147
( )3 6 PM 73
( )4 23 PM 77
( )5 36 R/S 72
( )6 58 R/S 100
( )7 22 MAPS 102
( )8 23 MAPS 43
( )9 HUMBOLDT CO. ENGINEERING PLANS HUM-FAS-975, SHEETS 7-8
( )10 29 R/S 74

BEARINGS ON THIS MAP ARE BASED ON THE BEARING OF N89°54'37"E ALONG THE NORTH LINE OF PARCEL 1 PER BOOK 6 OF PARCEL MAPS, PAGE 73, AND THE NORTH LINE OF PARCEL ONE PER BOOK 23 OF PARCEL MAPS, PAGE 77. (SEE SHEET 4)

THIS MAP ILLUSTRATES THE SUBDIVISION OF PARCEL 4 OF PARCEL MAP NO. 719, RECORDED IN BOOK 6 OF PARCEL MAPS, PAGE 73, AND DESCRIBED IN THAT DEED RECORDED IN BOOK 1827 OF OFFICIAL RECORDS, PAGE 135.

PARCEL MAP NO. 3293

FOR

DONALD AND KATHLIN MEYER

IN THE SW 1/4 OF SEC. 18, T.2N., R.1E., H.M., AND IN THE SE 1/4 OF SEC. 13, T.2N., R.1W., H.M., IN THE UNINCORPORATED AREA OF THE COUNTY OF HUMBOLDT · STATE OF CALIFORNIA

SEPTEMBER 2003 *1"=60'*

ALL DISTANCES ARE IN FEET AND DECIMALS THEREOF.

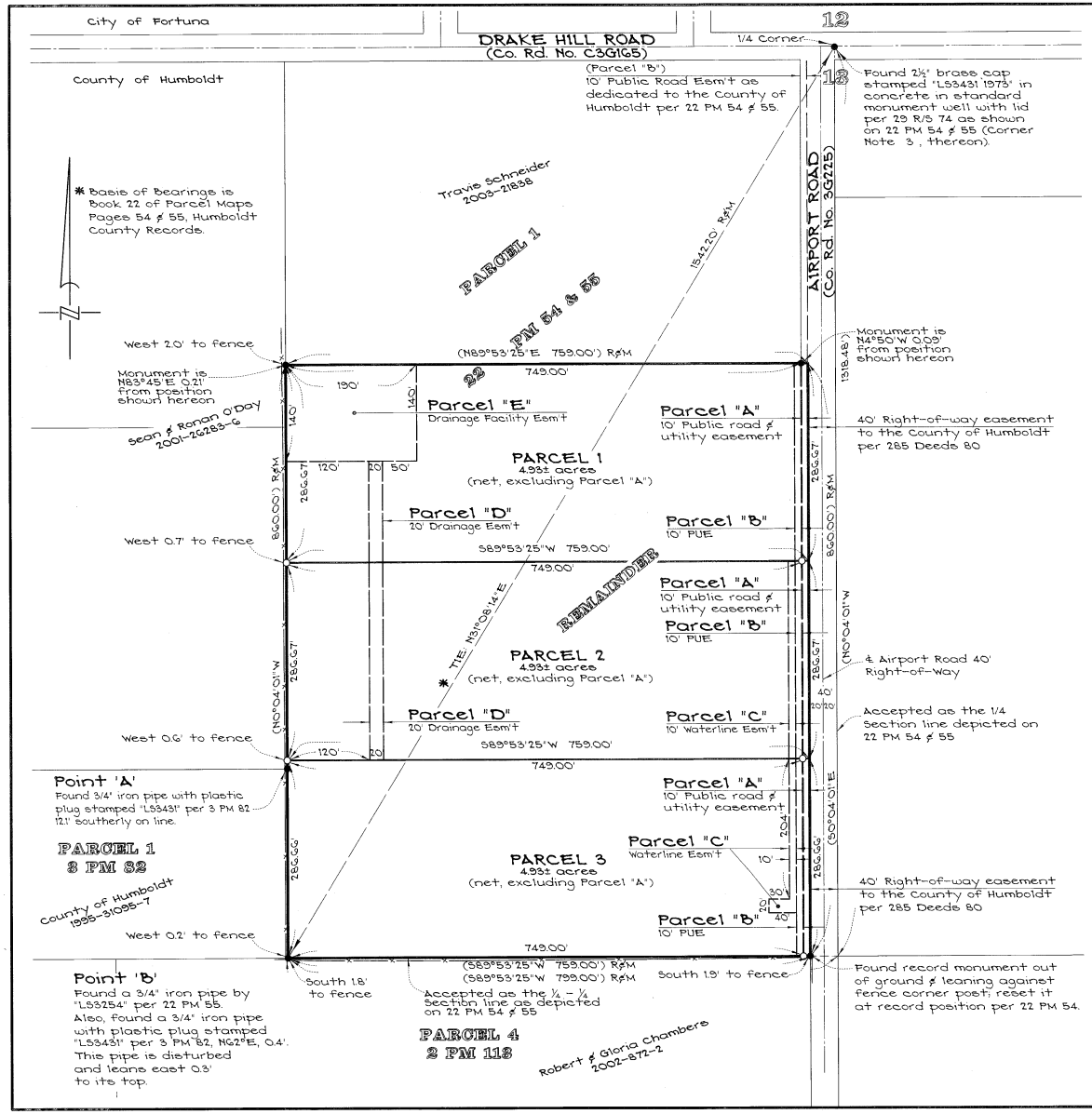
SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash
Eureka, CA 95501
(707)441-8855
FAX (707)441-8877

SHEET 3 OF 4

ROHNERVILLE ROAD NOTE

THE LOCATION OF ROHNERVILLE ROAD SHOWN ON THIS MAP IS BASED SOLELY UPON PREVIOUS MAPPING. THE SURVEYS REFERENCED BY THIS MAP THAT SHOW THIS RIGHT-OF-WAY ALL RELY UPON THE HUMBOLDT COUNTY PLAN AND PROFILE MAPS PREPARED IN 1950 (AVAILABLE AT THE HUMBOLDT CO. ENGINEERING OFFICE AT 1106 2nd ST., EUREKA). THE THREE MAPS BY WINKELHAUS (REFERENCES 1,2,3) AND THE MAP BY ANDREWS (REFERENCE 4) TIE THE CENTERLINE OF ROHNERVILLE ROAD AT ITS CROSSING OF THE MID-SECTION LINE OF SECTION 13 AT ENGINEER'S STATION 169+56.74. I HELD THIS TIE AND THE CENTERLINE DATA SHOWN ON THE HUMBOLDT CO. PLANS TO ESTABLISH THE CENTERLINE OF ROHNERVILLE ROAD. TIES TO THE EXISTING CENTERLINE STRIPE BETWEEN STA. 169+40 AND 185+00 FIT THIS ALIGNMENT VERY WELL. THE HUMBOLDT CO. PLANS SHOW A TIE FROM THE QUARTER-CORNER BETWEEN SECTIONS 13 AND 18 TO ENGINEER'S STATION 174+64.81 BC; THE PLANS, HOWEVER, DO NOT DESCRIBE WHAT MONUMENT (IF ANY) WAS FOUND AND USED AS THE QUARTER-CORNER LOCATION. WINZLER & KELLY'S MONUMENT AT THE QUARTER-CORNER (THE MONUMENT THAT HAS BEEN ACCEPTED BY THIS SURVEY AND OTHERS FOR THE QUARTER-CORNER POSITION) WAS NOT SET UNTIL 1973, AND WINKELHAUS' MAP, 2 PM 112, DOES NOT SHOW ANY PREVIOUS MONUMENTION AT THIS POINT IN 1973. MY TIE BETWEEN SAID QUARTER-CORNER AND STATION 174+64.81 BC FIT WITHIN 0.10'.

BOOK 31 OF PARCEL MAPS, PAGE 79



EASEMENT DEDICATION NOTES

Parcel "A" (AIRPORT ROAD) as shown hereon, is a 10 foot wide easement hereby dedicated to the County of Humboldt for public road and utility purposes. Public utility purposes shall mean the installation and maintenance of water and sewer lines, storm drainage pipelines, gas mains, poles, overhead and underground wires and conduits for electricity, telephone and television services; together with any and all appurtenances thereto.

Parcel "B" (10' PUE) as shown hereon, is a 10 foot wide public utility easement hereby dedicated to the County of Humboldt for Public use.

Parcel "C" (Waterline Easement) as shown hereon, is a non-exclusive easement hereby dedicated for the installation and maintenance of water lines together with any and all appurtenances thereto for the benefit of Parcels 1 & 2 created by this map.

Parcel "D" (Drainage Easement) as shown hereon, is a 20' non-exclusive easement for the installation and maintenance of surface and subsurface storm drainage pipelines and facilities, together with any and all appurtenances thereto for the benefit of Parcels 2 & 3 created by this map.

Parcel "E" (Drainage Facility Easement) as shown hereon, is a non-exclusive easement for installation, use, maintenance, repair and replacement of surface and subsurface drainage facility purposes together with any and all appurtenances thereto for the benefit of Parcels 1, 2 and 3 created by this map.

DEVELOPMENT PLAN NOTE:

A Development Plan for all the Parcels of this Subdivision, illustrating special restrictions and requirements, imposed as conditions of approval for this subdivision, is on file with the Humboldt County Planning Department under File No. APN Nos. 203-211-006 & -007, Case No. PMS-02-07.

SURVEY NOTE:

22 PM 55 shows a different position for the South ¼ corner Section 13 than the position shown on 29 R/S 74 for the same corner. After field ties to the monuments shown on 22 PM 54 and 55 were made and compared with monuments previously established per 29 R/S 74 and 3 PM 82 for departure, no significant difference was found (see Points 'A' & 'B'). Therefore, I accept the Remainder Parcel, as shown on 22 PM 54 & 55, as correctly monumenting the subject property boundary.

LEGEND

SYMBOL	INDICATES
●	Found ¾" iron pipe with brass tag stamped "LS3254" per 22 PM 54 & 55, unless otherwise noted.
O	⅝" x 24" rebar with 1½" aluminum cap stamped "Omsberg & Co. LS4446" set by this survey.
( )	Record information per 22 PM 54 & 55.
R&M	Recorded and measured.
—x—	Existing fence

This is a division of the "Remainder" as shown on 22 PM 54 & 55 and the Alan & Mary Bongio land as described in the Deed recorded December 6, 2002 under Recorder's File No. 2002-41517 and the Kevin McKenny land as described in the Deed recorded September 16, 2003 under Recorder's File No. 2003-35813, Humboldt County Records.

PARCEL MAP NO. 3333

FOR

ALAN & MARY BONGIO AND KEVIN McKENNY

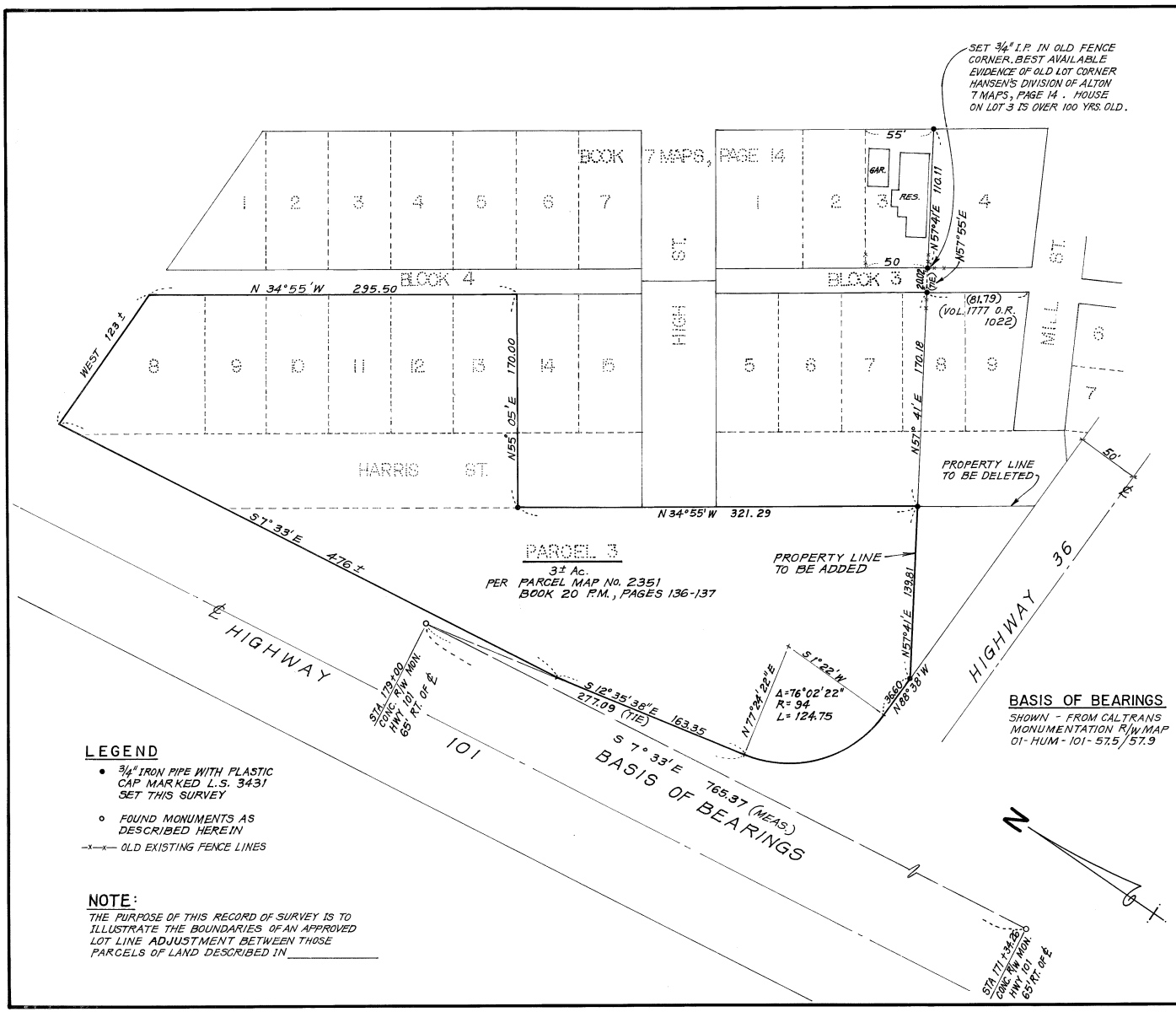
IN THE UNINCORPORATED AREA OF HUMBOLDT COUNTY
NW1/4 of SECTION 13, T.2N., R.1W., H.M.,
STATE OF CALIFORNIA

Scale: 1" = 100' February, 2004

OMSBERG & COMPANY
SURVEYORS PLANNERS ENGINEERS

SHEET 2 OF 2
02-1118-1

BOOK 31 OF PARCEL MAPS, PAGE 151



SURVEYOR'S STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE LAND SURVEYOR'S ACT AT THE REQUEST OF KIM OLESEN IN NOVEMBER 1989.

Raymond G. Haberstock

RAYMOND G. HABERSTOCK
L.S. 3431, EXP. 6-30-92

LICENSED LAND SURVEYOR — RAYMOND G. HABERSTOCK — No. 3431 — STATE OF CALIFORNIA

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE LAND SURVEYOR'S ACT THIS 2nd DAY OF July, 1990

COUNTY SURVEYOR
~~LS OR~~ R.C.E.) No. 11950
LICENSE EXPIRES 3/31/93

1990-15791-1

RECORDER'S STATEMENT

FILED THIS 5th DAY OF July, 1990 AT 12:08 P.M. IN BOOK 51 OF SURVEYS, AT PAGE 11, HUMBOLDT COUNTY RECORDS, AT THE REQUEST OF RAYMOND G. HABERSTOCK.

STEPHEN A. STRAWN
COUNTY RECORDER
FEE $ 6.00
By:

BASIS OF BEARINGS

SHOWN - FROM CALTRANS MONUMENTATION R/W MAP 01-HUM-101-57.5/57.9

LEGEND

- • 3/4" IRON PIPE WITH PLASTIC CAP MARKED L.S. 3431 SET THIS SURVEY
- ○ FOUND MONUMENTS AS DESCRIBED HEREIN
- —x—x— OLD EXISTING FENCE LINES

NOTE:

THE PURPOSE OF THIS RECORD OF SURVEY IS TO ILLUSTRATE THE BOUNDARIES OF AN APPROVED LOT LINE ADJUSTMENT BETWEEN THOSE PARCELS OF LAND DESCRIBED IN _____

RECORD OF SURVEY

for

KIM OLESEN

in

SECTION 14, T.2 N., R.1 W., H.M.
and
HANSEN'S DIVISION OF ALTON
COUNTY of HUMBOLDT STATE of CALIFORNIA

by

HABERSTOCK SURVEYING
FORTUNA, CALIFORNIA

SCALE: 1"=50' NOVEMBER 1989

SHEET 1 of 1

Book 51 of Surveys, Page 11

Environmental Constraints Analysis

C

Environmental Constraints Analysis
Rohnerville Airport Connectivity Study

Humboldt County Association of Governments
611 "I" Street, Suite B
Eureka, California

Prepared for:

Humboldt County Association of Governments

September 2018
017262

Reference: 017262

Environmental Constraints Analysis
Rohnerville Airport Connectivity Study

Prepared for:
Humboldt County Association of Governments (HCAOG)

Prepared by:

812 W. Wabash Ave.
Eureka, CA 95501-2138
707-441-8855

September 2018

QA/QC:JLS___

Table of Contents

List of Illustrations

Abbreviations and Acronyms

BIOS	Biogeographic Information and Observation System
C	candidate
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CE	categorical exclusion
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRAM	California rapid assessment method
CT	candidate threatened
CWA	Clean Water Act
D	delisted
DPS	distinct population segment
E	endangered
EIR	environmental impact report
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FESA	Federal Endangered Species Act
FP	fully protected
FP	fully protected
G#S#	vegetation ranking globally and statewide
GIS	geographic information system
IPaC	Information for Planning and Conservation
MBTA	Migratory Bird Treaty Act
MND	mitigated negative declaration
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NR	no reference
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PCE	programmatic categorical exclusion
PT	proposed threatened
ROW	right-of-way
RWQCB	North Coast Regional Water Quality Control Board
SSC	species of special concern
SWPPP	stormwater pollution prevention plan
T	threatened
USACE	US Army Corp of Engineers
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
VegCAMP	Vegetation Classification and Mapping Program
WL	watch list

Introduction

Project Summary

The Rohnerville Airport connectivity study was undertaken to assess opportunities to improve motor vehicle access to and from the Rohnerville Airport, primarily from US Highway 101 and State Highway 36. The connectivity study is intended to identify potential route alternatives and potential constraints associated with each. The results of the study will provide the foundation and direction for the design of a future access route, including the determination of the least impactful most cost effective route.

Purpose of the Report

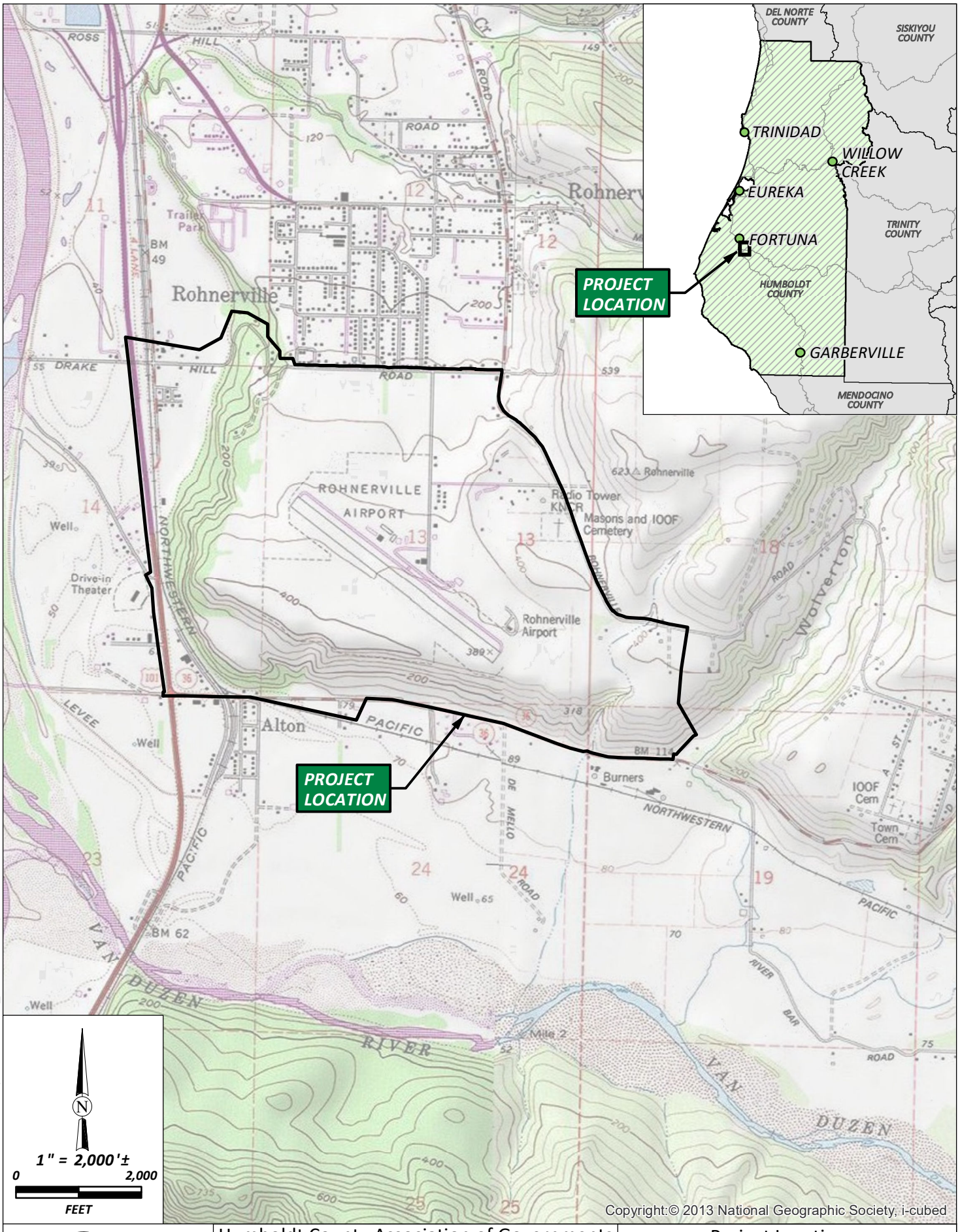
This environmental constraints analysis is intended to document environmental constraints within the study area, specifically within the area of proposed routes and new road construction. Two reconnaissance-level site investigations were conducted within the preferred route alternatives; the first on April 19, 2018, and a second on August 9, 2018. Site investigations prioritized areas with potential new road construction. Site investigations were conducted to identify the potential presence of biological resources listed under the Federal Endangered Species Act (FESA); wetlands and waters of the US as regulated by the US Army Corps of Engineers (USACE); species listed as endangered or threatened under the California Endangered Species Act (CESA); species identified as species of special concern (SSC) by the California Department of Fish and Wildlife (CDFW); special-status plant species having a rare plant ranking as determined by the California Native Plant Society (CNPS) rare plant inventory; and sensitive habitats as listed by the CDFW. No permit or environmental compliance document was collected, initiated, or completed for this effort; no regulatory agency was contacted for additional information. Protocol level surveys were not conducted for this report, and no comprehensive seasonally appropriate survey or wetland delineation was conducted for this report.

Project Location

This environmental constraints analysis has been conducted within the vicinity of the Rohnerville Airport just south of the southern boundary of the City of Fortuna, Humboldt County. Fortuna is approximately 14 miles south of Eureka and can be accessed from Highway 101 (see Figure 1 for project location). The study area includes several roadways, driveways, and bare land identified as potential access routes within a large area surrounding the airport approximately 1 mile by 1.3 miles in size, with varied topography (see Figure 2). The three potential route alignments outlined in Figure 2 were analyzed to evaluate the likelihood of biological resources, sensitive habitat, and other potential project constraints.

Existing Conditions

The study areas are located along three proposed alignments surrounding the Rohnerville Airport. Three route alternatives (A1, D3, B/E) are proposed based on the results of the geotechnical report (SHN, 2018) and the traffic report (TJKM, 2018), as well as collaboration with the City of Fortuna and Humboldt County Association of Governments (see Figure 2). The Rohnerville Airport is situated within a mosaic of rural residential development and agricultural fields on the southern edge of Fortuna, on top of an uplifted alluvial plain with steep slopes to the south and west. Highway 36 is at the base of the uplifted alluvial plain and is separated from the airport by steep slopes and cliffs.



\\Eureka\Projects\2017\017262-RvilleAirport\GIS\PROJ_MXD\ USER: jsousa DATE: 9/17/18, 1:16PM

SHN Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Rohnerville, California

Project Location

SHN 017262

September 2018 | ECA_Fig1_ProjectLocation | Figure 1

EXPLANATION

ROUTE ALTERNATIVE, CONDITION

- A1, EXISTING
- A1, PROPOSED
- B&E, EXISTING
- B&E, PROPOSED
- D3, EXISTING
- D3, PROPOSED
- FEMA ZONE BOUNDARIES
- HIST. QUATERNARY FAULT
- WETLANDS (FWS, 2018)
- HIST. LANDSLIDE (CGS)
- POTENTIAL LIQUEFACTION
- GILIA CAPITATA SSP. PACIFICA (CNDDB, SEPT. 2018)
- PHOTO LOCATION & DIRECTION

VEGETATION (SHN, 2018)

- SIDALCEA MALVIFLORA SSP. PATULA
- COASTAL BLUFF GRASSLAND
- CAL. BAY FOREST
- POTENTIAL WETLANDS
- DEVELOPED

N

1" = 500'±

0 500

FEET

PHOTO SOURCE: USGS NAIP, 2016

ON THE GROUND FIELD VERIFIED

NOT SURVEYED (NO ACCESS)

NOT SURVEYED (NO ACCESS)

NOT SURVEYED (NO ACCESS)

FEMA ZONE X
AREA OF MINIMAL FLOOD HAZARD

LITTLE SALMON FAULT ZONE (GOOSE LAKE FAULT)

NOT SURVEYED (NO ACCESS)

NOT SURVEYED (NO ACCESS)

POTENTIAL WETLAND SEEPS

FEMA ZONE AE
1% ANNUAL CHANCE FLOOD HAZARD

FEMA ZONE X
0.2% ANNUAL CHANCE FLOOD HAZARD

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 19

\\Eureka\Projects\2017\017262-RvilleAirport\GIS\PROJ_MXD\ USER:jsousa DATE:2/15/2019

Consulting Engineers & Geologists, Inc.

Humboldt County Association of Governments
Rohnerville Airport Connectivity Study
Fortuna, California

Environmental Constraints Map

SHN 017262

February 2019 | ECA_Fig2_EnviroConstraintsRev2 | Figure 2

The majority of Routes D3 and B/E, as well as the existing primary route, all pass through the City of Fortuna, which is characterized by residential and commercial development with few natural features remaining. Few changes are proposed for the developed roadways through Fortuna if these routes were selected.

All three proposed route alternatives pass through rural residential and agricultural fields to reach the airport, and routes A1 and B/E climb up the steep slopes to connect the airport to Highway 36. Existing rural roadways may need to be improved to provide access to the Rohnerville airport. Rural roadways surrounding the Rohnerville Airport typically consist of a grassy right-of-way (ROW) with dense shrub cover behind the maintained shoulder along portions of the roadways. Areas along the existing roadways are dominated primarily by non-native vegetation; however, roadside habitat is known to support several special status species and sensitive habitats. Existing roadways proposed as a portion of potential route alternatives include: Eel River Drive, Drake Hill Road, Airport Road, Hillcrest Drive, Old State Highway, Rohnerville Road, and Highway 36 (see Figure1 and Appendix 2, photos 1-3, 10, 13, and 14).

Rural residential development within the area typically consists of a single residential house with several outbuildings on one to five acres. Habitat quality varies, but is typically lower quality due to human use and development. These lands are often dominated by non-native grasses. Residential development is concentrated along Airport Road, Hillras Way, and Rohnerville Road to the north and east of Rohnerville Airport.

Agricultural fields surrounding the Rohnerville Airport are dominated by non-native pasture grasses and are used for grazing (see Appendix 2, photos 11-14). Routes A1 and B/E propose new road construction through agricultural lands at some point along the proposed routes (Figure 2). The agricultural lands surrounding the airport are generally gently sloping to the north, and have been used for grazing for more than 100 years, with little change observable in aerial imagery from the past 20 years (Google Earth). Dominant plant species within agricultural fields include: sweet vernal grass (*Anthoxanthum odoratum*), tall fescue (*Festuca arundinacea*), large quaking grass (*Briza maxima*), velvet grass (*Holcus lanatus*), creeping bentgrass (*Agrostis stolonifera*), and wild oat (*Avena barbata*).

The bluff face to the south and west of the airport consists of many habitat types and vegetation communities. Routes A1, D3, and B/E all propose new road construction along the bluff face or along the base of the bluff at some point along the proposed routes (Figure 2). The south facing bluff slope to the south of the airport (the location of proposed new road construction for Route B/E) is dominated by grazed grassland with scattered shrub cover (see Appendix 2, photos 15, and 16). Several ravines cut into the bluff face support some tree cover and additional shrub cover. The west facing slope of the bluff is dominated by shrub and tree cover. The dominant species along this portion of the bluff face include: Eucalyptus (*Eucalyptus globulus*), arroyo willow (*Salix lasiolepis*), poison oak (*Toxicodendron diversilobum*), California bay tree (*Umbellularia californica*), California blackberry (*Rubus ursinus*), and coyote brush (*Baccharis pilularis* ssp. *consanguinea*).

Sensitive vegetation communities and habitat for special status species potentially occurs along existing roadways as well as within the agricultural fields and along the bluff face proposed as potential route alternatives. These areas are discussed in further detail below.

Methods

Environmental Scoping Methods

The initial environmental scoping consisted of a review of existing environmental literature and data results from database queries of potential on-site sensitive species which were evaluated using the Fortuna and eight surrounding United States Geological Survey (USGS) 7.5 Quadrangles (see Tables 1-1 and 1-2, Appendix 1). The database queries include the California Natural Diversity Database (CNDDB) including the Biogeographic Information and Observation System (BIOS) [CDFW, 2018b]; the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants [CNPS, 2018]; the United States Fish and Wildlife Information for Planning and Conservation (IPaC)and Critical Habitat Portal [USFWS, 2018b], and VegCamp and a Manual of California Vegetation (Sawyer, 2009) for information on natural communities that may occur in the area.

Additional existing data was reviewed when available, such as soil and ecological maps and descriptions generated by the Natural Resources Conservation Service (NRCS) and wetland mapping from US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) [USFWS, 2018c]. NWI maps are compiled using a variety of remote sensing data sources, including aerial photographs, infrared photography, and soils data. NWI maps do not necessarily represent an accurate extent of jurisdictional wetlands in the study area. Additionally, the Humboldt County Web Geographic Information System (GIS) was reviewed for soils and wetland information as well as for the occurrence of prime agricultural land and sensitive vegetation communities/ habitat areas identified within the study area. Finally, the Calflora database and Consortium of California herbaria was consulted in conjunction with the Jepson Herbarium database for specific species cross referencing for potential rare plants in the project vicinity.

Environmental Reconnaissance Survey Methods

On April 19 and August 9, 2018, SHN staff performed reconnaissance level investigations of environmental and biological resources within the proposed alternative routes. Survey efforts were concentrated on the most feasible route alternatives that were identified in the geotechnical and traffic reports. The surveys were meant to identify the potential for environmental impacts, and to determine which proposed alternative routes have more or fewer potential environmental impacts. The field reconnaissance effort focused on identifying the potential presence of wetland, riparian, and special-status plant species (listed as rare, threatened, endangered, or candidate for rare, threatened, or endangered species under the state or federal Endangered Species Act, CNPS rare plant ranking, or of local importance), or special status habitats present within the proposed alternative routes. Aerial photography maps, topographic maps, NWI maps, Humboldt web GIS and IPaC were consulted for the area containing each proposed route alternative. CNDDB, CNPS Rare Plant inventory were consulted using the Fortuna and eight surrounding 7.5-minute quadrangles prior to and during the survey to determine potential sensitive species or habitat occurrence.

Field work was conducted by walking and driving each of the proposed routes (limited to portions where access permission had been obtained), and visually documenting findings through photographs, notes, and on aerial photography maps. Each location with a potential wetland, sensitive vegetation community(s), or area(s) potentially containing special status species and/or habitats, was noted. These areas would then be recommended for further investigation and mapping or protocol level surveys in order to determine extent of these areas and to fulfill potential permit requirements.

It is noted that many of the proposed route alternatives have portions that pass through private property and were inaccessible for surveying. These areas were reviewed using the aforementioned databases and queries, and were viewed from areas where access was granted; however, no on the ground walk through was conducted.

Results

Potential Target Species

A list of potential target species for the study area was compiled from the database queries and is presented in Table 1-1 and 1-2, Appendix 1. These tables include all plant and animal species reported by the CNDDB, CNPS, and IPaC. There is no recorded occurrence of any botanical species identified by the USFWS as threatened, endangered, or candidate species proposed for listing as either threatened or endangered under the FESA or associated critical habitat within the project area or area of potential effects (USFWS, 2018a). The USFWS lists are often general in nature and do not indicate presence, merely the need for further review.

All species reported from CNDDB, CNPS, and IPaC within the Fortuna and eight surrounding 7.5-minute quadrangles were reviewed for the potential to occur within each of the three preferred route alternatives and are recorded in Tables 1-1 and 1-2 in Appendix 1.

Each species was evaluated for its potential to occur in each of the three preferred route alternatives according to the following criteria:

- **None**. Species listed as having "none" are those species for which:
    - there is no suitable habitat present in the study area (that is, habitats in the study area are unsuitable for the species requirements [for example, elevation, hydrology, plant community, disturbance regime, etc.]).
- **Low**. Species listed as having a "low" potential to occur in the study area are those species for which:
    - there is no known record of occurrence in the vicinity, and
    - there is marginal or very limited suitable habitat present within the study area.
- **Moderate**. Species listed as having a "moderate" potential to occur in the study area are those species for which:
    - there are known records of occurrence in the vicinity, and
    - there is suitable habitat present in the study area.
- **High**. Species listed as having a "high" potential to occur in the study area are those species for which:
    - there are known records of occurrence in the vicinity (there are many records and/or records in close proximity), and
    - there is highly suitable habitat present in the study area.
- **Present**. Species listed as "present" in the study area are those species for which:
    - the species was observed in the study area.

Preferred Route Alternatives Results

Route A1

Route A1 would connect the airport to Highway 36 by climbing the southwestern slope of the bluff. This would require new road construction and improvement of existing driveways and private roadways (see Figure 2). The proposed route passes through several vegetation communities, agricultural fields, potential wetlands, and potential special status species habitat. Primary vegetation communities include arroyo willow thickets (*Salix lasiolepis* shrubland alliance), California bay forest (*Umbellularia californica* Forest Alliance), poison oak scrub (*Toxicodendron diversilobum* shrubland Alliance), and bluff grassland (non-native grass species dominant). See Appendix 2, Photos 1-4 for proposed Route A1 photos.

Arroyo willow thickets have a rarity ranking of G4S4, meaning that this vegetation community is relatively stable globally and statewide, and does not require review under the California Environmental Quality Act (CEQA). California bay forest has a rarity ranking of G4S3, meaning that this vegetation community is relatively secure globally, but is less common within the state and will require review under CEQA. Poison oak scrub has a rarity ranking of G4S4, meaning that this vegetation community is relatively stable globally and statewide and does not require review under CEQA. Additional vegetation communities may exist within the proposed route A1 alignment; however, access to the majority of the route was not permitted as it passes through private property. Additional surveying and mapping is needed to determine potential sensitive vegetation communities occurring within the proposed Route A1 alignment. See photos 2 and 3 for bluff slope vegetation communities and photo 4 for bluff grassland. See Figure 2 for a map of special status Vegetation Community composition along proposed Route A1 alignment.

No wetland is reported from the NWI wetland mapper (see Appendix 3), and no wetland is reported from the Humboldt County web GIS within the vicinity of the proposed Route A1 alignment. No wetland was directly observed within the Route A1 alternative; however, the dense cover by arroyo willow, a wetland indicator species, suggests that the slope may contain seeps and other wetlands (see photo 3). Access to the majority of the route was not permitted as it passes through private property. Additional surveying and mapping is needed to determine potential wetlands occurring within the proposed Route A1 alignment.

Potential habitat exists within the proposed Route A1 alignment for 11 special status plant species and 15 special status animal species (see Tables 1 and 2 in Appendix 1). The majority of these species require a mosaic of open sloping grassland and shrub habitat. Others require some tree cover which is present within portions of the proposed Route A1 alignment. Special status plant species most likely to occur within this alignment include pacific gilia (*Gilia capitata* ssp. *pacifica*), Tracy's tarplant (*Hemizonia congesta* ssp. *tracyi*), maple-leaved checkerbloom (*Sidalcea malachroides*), and Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*). Special status animal species most likely to occur within this alignment include osprey (*Pandion haliaetus*), bank swallow (*Riparia riparia*), black capped chickadee (*Poecile atricapilus*), and North American porcupine (*Erethizon dorsatum*).

Route D3

Route D3 would connect the airport to Highway 36 by skirting the western base of the bluff requiring the construction of approximately 2,000 feet of roadway and improvement of existing roadways (see Figure 2). The majority of Route D3 is proposed using existing roadways and, therefore, has reduced impacts compared to other proposed routes. New road construction required for the proposed route passes through several vegetation communities, disturbed and previously developed areas, and potential habitat for some special status species. Primary vegetation communities include arroyo willow thickets, California

bay forest, poison oak scrub, Eucalyptus groves (*Eucalyptus* (*globulus, camaldulensis*; Semi-Natural Woodland Stands) and non-native species dominated areas associated with historical and existing road and railroad development. See Appendix 2, Photos 5-10 for proposed Route D3 photos, and Figure 2 for a map of special status Vegetation Community composition along the route.

Arroyo willow thickets have a rarity ranking of G4S4, meaning that this vegetation community is relatively stable globally and statewide, and does not require review under CEQA (Appendix 2, photos 8 and 9). California bay forest has a rarity ranking of G4S3, meaning that this vegetation community is relatively secure globally, but is less common within the state and will require review under CEQA (Appendix 2, photos 5 and 6). Poison oak scrub has a rarity ranking of G4S4, meaning that this vegetation community is relatively stable globally and statewide and does not require review under CEQA (Appendix 2, photos 7 and 9). Eucalyptus groves and other non-native species dominated areas (Appendix 2, photos 5-7) should be targeted for removal as potential mitigation areas that can be restored with native vegetation. The entire area proposed for new road construction for Route D3 was traversed and no additional vegetation communities are expected to occur within the proposed alignment.

No wetland is reported from the NWI wetland mapper (see Appendix 3), and no wetland is reported from the Humboldt County web GIS within the vicinity of the proposed route D3 alignment. No wetland was directly observed within the D3 Route alternative. Areas with arroyo willow, a wetland indicator species, suggest that potential wetlands may exist within the northern portion of the proposed alignment for Route D3. However, closer inspection revealed that although wetland indicator species were dominant, there was no indication of wetland hydrology or hydric soils. A wetland delineation assessing all three wetland parameters of vegetation, hydrology, and soils is needed to confirm the presence or absence of wetlands within the proposed Route D3 alignment.

Potential habitat exists within the proposed Route D3 alignment for eight special status plant species and four (4) special status animal species (see Tables1-1 and 1-2 in Appendix 1). The majority of these species requires a mosaic of open sloping grassland and shrub habitat. Others require some tree cover, which is present within portions of the proposed Route D3 alignment. Special status plant species most likely to occur within this alignment include pacific gilia (*Gilia capitata* ssp. *pacifica*) and Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*). Special status animal species most likely to occur within this alignment include black capped chickadee (*Poecile atricapilus*) and potentially North American porcupine (*Erethizon dorsatum*).

Route B/E

Route B/E connects the airport to Rohnerville Road by a more direct route east of the airport, requiring 1,400 feet of new road across agricultural land, and uses existing roads through Fortuna to US 101. Route B/E also proposes a direct route to Highway 36 across the southern bluff face, requiring approximately 1 mile of new road construction. Route B/E would require the construction of 6,900 feet of new road across agricultural land, a large intact wetland, coastal bluff grassland, and potential habitat for special status species. The remainder of the route uses well developed existing roads in Fortuna with minimal need for improvements and, therefore, presents very little potential for impacts to biological resources. Primary vegetation cover within the proposed new road portion of Route B/E between the airport and Rohnerville Road is provided by pasture grasses and other non-native species throughout the agricultural fields. An NWI- and County GIS-mapped potential wetland area is dominated by wetland indicator species (Figure 2). The portion of Route B/E crossing the southern bluff slope contains high-quality habitat for several special status species. In addition, potential wetlands were observed at the base of the bluff slope along Highway 36. The majority of the proposed new road portion of Route B/ E was not surveyed due to its location across

private property. The proposed alignment was reviewed from adjacent public ROW, aerial imagery, and the aforementioned environmental databases. See Appendix 2, Photos 11-16 for proposed Route B/E photos and Figure 2 for a map of special status vegetation community composition along the proposed Route B/E alignment.

No distinct vegetation communities were observed within the portion of new road proposed between the airport and Rohnerville Road. The majority of the area is dominated by non-native pasture grasses and forbs, and it has been actively grazed and used for hay production with little change over the past 20 years according to aerial imagery (Google Earth, 2016; see Appendix 2, photos 11-14). It is likely that distinct vegetation communities exist within the wetland area; however this area was contained within private property and access was not granted for vegetation community mapping or surveying. The south bluff slope contains several distinct vegetation communities (see Appendix 2, photos 15 and 16). The majority of the area is dominated by grazed bluff grassland, which is primarily a wide range of herbaceous species. These areas provide excellent habitat for a number of special status species. Other vegetation communities occurring within the proposed alignment include arroyo willow thickets, poison oak scrub, coyote brush scrub (*Baccharis pilularis* Shrubland Alliance), and coastal brambles (*Rubus* [*parviflorus, spectabilis, ursinus*] shrubland alliance).

Arroyo willow thickets have a rarity ranking of G4S4, meaning that this vegetation community is relatively stable globally and statewide, and does not require review under CEQA. Poison oak scrub has a rarity ranking of G4S4, meaning that this vegetation community is relatively stable globally and statewide and does not require review under CEQA. Coyote brush scrub has a rarity ranking of G5S5, meaning that this vegetation community is stable and increasing globally and statewide, and does not require review under CEQA. Coastal brambles have a rarity ranking of G4S3, meaning that this vegetation community is relatively secure globally, but is less common within the state and will require review under CEQA (Appendix 2, photos 5 and 6). Additional vegetation communities may exist within the proposed route B/E alignment; however, access to the majority of the route was not permitted as it passes through private property. Vegetation communities were not mapped within the southern bluff slope portion of the B/E alignment due to a lack of access and traffic conditions along Highway 36. Additional surveying and mapping is needed to determine potential sensitive vegetation communities occurring within the proposed Route B/E alignment. See photos 2 and 3 in Appendix 2 for bluff slope vegetation communities and photo 4 for bluff grassland.

A large potential wetland was observed within the proposed alignment for the new road construction portion of Route B/E (see Appendix 2, photo 12; and Figure 2). This wetland area is recorded in the NWI mapper and the Humboldt County WebGIS (see Appendix 3). Wetland conditions (saturation and hydrophytic vegetation) were observed from public ROW, although specific plant dominance and species composition could not be determined. The wetland drains to the north into a stream channel that appears to meet the definition of an ordinary high water mark (OHWM), which would make this a jurisdictional water of the U.S. Additional wetland conditions were observed along Highway 36 within a drainage ditch that catches water from the bluff slope above the highway. A wetland delineation assessing all three wetland parameters (vegetation, hydrology, and soils), as well as an OHWM delineation assessing the width and nature of the stream channel is needed to confirm the extent of the wetland and jurisdictional waters within the proposed Route B/E alignment.

Potential habitat exists within the proposed Route B/E alignment for 11 special status plant species and 16 special status animal species (see Tables 1-1 and 1-2 in Appendix 1). The majority of these species requires a mosaic of open sloping grassland and shrub habitat, while others require open wetland conditions. Special status plant species most likely to occur within this alignment include pacific gilia (*Gilia capitata* ssp.

pacifica), Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*), Tracy's tarplant (*Hemizonia congesta* ssp. *tracyi*), harlequin lotus (*Hosakia gracilis*), and maple-leaved checkerbloom (*Sidalcea malachroides*). Siskiyou checkerbloom was observed along Highway 36; it could occur within the proposed Route B/E alignment. (See Appendix 2, photo 17, and Figure 2 for location of Siskiyou checkerbloom observation.) Special status animal species most likely to occur within this alignment include the northern red-legged frog (*Rana aurora*), and several special status bird species, which have potential forage or hunt within this area.

Table 1. Comparison of Environmental Constraints By Proposed Route, Routes A1, D3, and B/E

Proposed Route	Number of Sensitive Vegetation Communities	Wetlands	Number of Special Status Plant Species	Number of Special Status Animal Species
A1	**2**: California Bay Forest, Coastal bluff grassland	**Yes**, not NWI[1] mapped	**11** species (4 high[2] potential, 7 mod.[3] potential)	**15** species (4 high[2] potential, 11 mod.[3] potential)
D3	**1**: California Bay Forest	**Unlikely**	**8** species (2 high[2] potential, 6 mod.[3] potential)	**4** species (1 high[2] potential, 3 mod.[3] potential)
B/E	**2**: Coastal brambles, coastal bluff grassland (possibly more within wetland)	**Yes**, NWI mapped, and unmapped	**11** species (5 high[2] potential, 6 mod.[3] potential)	**16** species (6 high[2] potential, 10 mod.[3] potential)

1. NWI: National Wetland Inventory
2. **High**. Species listed as having a "high" potential to occur in the study area are those species for which: there are known records of occurrence in the vicinity (there are many records and/or records in close proximity), and there is highly suitable habitat present in the study area.
3. **Mod.** Species listed as having a "moderate" potential to occur in the study area are those species for which: there are known records of occurrence in the vicinity, and there is suitable habitat present in the study area.

Environmental Permits and Processes

California Environmental Quality Act

Review under CEQA is required whenever a state or local government entity initiates a project, funds a project, or issues a permit decision. The CEQA document is prepared or overseen by a designated lead agency. An initial study determines the appropriate level of environmental review. For a project such as this one that is limited to relatively small portions of an urban fringe area, but including sensitive habitat areas, wetlands, and habitat for special status species, there is a possibility that an environmental impact report (EIR) would be required. However, if all identified impacts can be avoided or adequately mitigated, a mitigated negative declaration (MND) may be adequate. The Humboldt County Association of Governments would most likely be the CEQA lead agency for the project. Other potential candidates for CEQA lead agency include the City of Fortuna, County of Humboldt, Caltrans or other non-federal agencies with permitting authority over the project.

National Environmental Policy Act

Compliance with the National Environmental Policy Act (NEPA) is required whenever there is federal involvement in the project. If the ultimate project includes federal funding, it would trigger NEPA analysis. In addition, federal involvement may also include approval or issuance of permits. If the project does not qualify for a categorical exclusion (CE) or programmatic categorical exclusion (PCE), additional environmental documentation under NEPA may be necessary prior to approval or funding by a federal agency. The California Department of Transportation (Caltrans) would most likely be the NEPA lead agency for the project.

Additional CEQA/NEPA Considerations

From a CEQA/NEPA perspective, project segmentation or "piece-mealing" may occur when the project as described and analyzed in a single CEQA or NEPA process does not encompass the entire project. Segmentation can occur when portions of a project that are dependent on other portions of the project to make them functional are evaluated in separate documents.

If a project has reasonably foreseeable additional components, they must be analyzed concurrently as part of a single project. The flaw of segmentation is that it can divide larger projects into smaller components, which, when viewed independently, may not lead to the identification of the full range and intensity of impacts resulting from the entire project when viewed as a whole. Linear infrastructure network projects (for example, transmission lines, pipe networks, roads, trails) may present a special challenge when considering whether a project is in danger of being segmented, because there may be no clear cut method of determining where an individual project starts and ends, and whether it should be analyzed as part of a larger project or as an individual action simply occurring on a larger network. Following court decisions, the standard for determining whether a road project is an individual action warranting individual CEQA/NEPA analysis is if it is: of substantial length, is between logical termini (such as, population centers or major crossroads, etc.), and has independent utility.

Special Studies for CEQA/NEPA

CEQA and NEPA require special studies for key resources that may be impacted by the project. Preparation of CEQA/NEPA documents would trigger a need for various special studies within the chosen route alternative.

Biological studies would include additional investigation of areas where access permission has not been obtained. Protocol level surveys for special-status plants and animals would likely be required, as well as wetland delineation. Other special studies could be required to address aesthetics, agricultural resources, air quality, cultural resources, drainage, geology and soils, greenhouse gas emissions, hazardous materials, noise, and/or traffic. At this time, it is unknown which of these studies would be required.

Permits

U.S. Army Corps of Engineers Section 404 Permit

The U.S. Army Corps of Engineers (USACE) regulates discharges of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act (CWA). Depending on the route chosen, the project may result in unavoidable fill of some jurisdictional wetlands or waters of the U.S. during project implementation. There are also potential stream crossings (E portion of Route B/E), although the project will likely be designed to avoid or minimize impacts to wetlands or waters of the U.S. However, if filling of wetlands or waters of the U.S. is unavoidable, the project will require a USACE Section 404 Permit. The project may qualify for a streamlined USACE Nationwide Permit. Prior to authorizing wetland fill under Section 404, wetland delineation must be submitted and verified by the USACE. Impacts that cause a loss of jurisdictional wetland will require an approved wetland mitigation and monitoring plan (MMP), accompanied by an adaptive management plan and long-term maintenance plan.

Formal wetland delineation is recommended during the planning phase of any alternative access route that crosses a potential wetland identified in this report, and for those areas where ditches (potential waters of the U.S.) occur adjacent to the roads, in order to verify potential wetlands or other waters of the U.S. and to

request a jurisdictional determination. Wherever ground disturbing work would occur below the OHWM of a stream crossing, wetland delineation and a 404 permit would also be required. Potential wetlands and waters of the U.S. are shown on Figure 2, and include wetlands within the proposed new road construction of Route A1 and Route B/E, including a small stream and the large wetland between the airport and Rohnerville Road.

Regional Water Quality Control Board Section 401 Water Quality Certification and National Pollutant Discharge Elimination System Requirements

Pursuant to section 401 of the federal CWA, projects that require a USACE permit for discharge of dredge or fill material must obtain water quality certification to confirm compliance with state water quality requirements. If the project results in unavoidable fill of wetlands or other waters of the U.S., Section 401 Certification from the North Coast Regional Water Quality Control Board (RWQCB) will be required. The RWQCB may encourage a California rapid assessment method (CRAM) evaluation of impacted habitats and mitigation for compensation of impacts.

The CWA requires that any discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge complies with a National Pollutant Discharge Elimination System (NPDES) permit. These regulations require that discharges of stormwater from construction projects that cause one or more acres of soil disturbance must be in compliance with an NPDES permit. If the project disturbs more than one acre of soil, it must comply with the construction general stormwater permit issued by the State Water Resource Control Board. The construction general permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP). Additionally, the RWQCB may take jurisdiction on a variety of drainage ditches and swales identified within the three proposed route alternatives and a formal delineation of the features will be required within the chosen route alternative.

California Department of Fish and Wildlife Section 1602 Lake and Streambed Alteration Agreement

Under Fish and Game Code Section 1602 (Streambed Alteration), the CDFW has jurisdiction over proposed activities that may substantially modify a river, stream, or lake. Proposed Route B/E includes a section of a small unnamed stream, and depending on the route chosen and the final design, direct or indirect impacts could occur at this location. CDFW jurisdiction extends at least to the top of bank and may sometimes include adjacent riparian zones. As a result, a 1600 Lake and Streambed Alteration Agreement, including special conditions to avoid or minimize impacts, is anticipated for Route B/E.

Federal Endangered Species Act Compliance (Protocol Level Surveys and Biological Assessments)

Based on available knowledge at this time, the project is not expected to result in any adverse impacts to federally threatened or endangered species or habitats, and the need for formal Section 7 Endangered Species Act (ESA) consultation is not anticipated. However, when a USACE permit is required for impacts to jurisdictional wetlands or other waters and the project has the potential to cause adverse impacts to federally-listed threatened or endangered species, the USACE must initiate consultation with the USFWS and/or the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the ESA. Although unlikely for the proposed project (because no impact to threatened or endangered species is currently anticipated), if future studies determine that a listed species is present or if a species is added to the list and is present in the area, and if adverse effects are possible, informal or formal consultation, including preparation of a

biological assessment, may be required. If project activities require dewatering of any portion of a stream, or if there is a possibility of sediment input to a stream or any other potential instream impact, Section 7 consultation including preparation of a biological assessment may be necessary.

There is no documentation of listed species in the project study area. However, if they are found to occur near the chosen route alternative, a variety of requirements ranging from pre-construction protocol surveys to seasonal noise and visual buffers during construction would be triggered, depending on distance to the nest or occurrence.

California Endangered Species Act Compliance (Protocol Level Surveys and Biological Assessments)
The California Endangered Species Act (CESA) requires consultation with CDFW when preparing CEQA documents to ensure that the lead agency actions do not jeopardize the existence of special status species. A number of state listed or state sensitive species could potentially occur close to or within the proposed route alternatives including bank swallow and northern red-legged frog, among others. However, no site-specific surveys are available at this time.

By incorporating the development of reasonable avoidance or mitigation measures in the CEQA document (such as, seasonal work windows and buffer zones around bird and bat habitats, native migratory bird nests during the nesting season, and pre-construction surveys for other species) impacts can likely be reduced to less than significant. However, a thorough review is recommended, especially where wetland, stream, drainage ditches, or bluff slope impacts may occur.

Migratory Bird Treaty Act (Nesting Bird Surveys)
The Migratory Bird Treaty Act (MBTA) protects all native species of birds. USFWS has statutory authority to enforce the MBTA. To avoid impacts to nesting birds it is recommended that to the extent practical, construction activity occur outside the nesting season. In Humboldt County the nesting season is approximately March 15 to August 15. This will be most crucial near shrubby areas, riparian areas, and large trees. If it is not possible to avoid the nesting season, avian surveys should occur within seven days prior to disturbance, and if active nests are identified, then the biologist shall establish appropriate buffers. For common species typical of urban sites, these are often very small, although buffers for raptors or special-status birds can be much larger (100 to 500 feet). Additional protections for birds or requirements for avoidance are found in the Fish and Game Code and are often a part of CEQA compliance and mitigation measures.

California Department of Transportation
Encroachment permits and/or other agreements may be required for use of or alterations to any area within a Caltrans ROW.

City of Fortuna
If the roadway improvements are made by a lead agency other than City of Fortuna, encroachment permits and/or other agreements may be required for use of or alterations to any area within a City of Fortuna ROW. If the roadway improvements are made by the City within city limits, no City permit would be required.

County of Humboldt
If the roadway improvements are made by a lead agency other than County of Humboldt within County jurisdiction, a General Plan conformance review would likely be required, along with Planning Commission recommendation of the new ROW prior to its acquisition. A special permit would also be required if work is

proposed within a streamside management area. Encroachment permits may be required if any work encroaches into County ROW. Also, a Humboldt County grading permit will be needed for grading work in the County ROW, which exceeds the thresholds identified in the County Grading Ordinance.

Permit Summary

In summary, a variety of permits and related environmental review would be necessary. In general, agencies are more supportive of projects when they are a part of the early planning and collaboration process. Currently, each route alternative will require permitting; however, permitting requirements vary between the three routes. All three routes will most likely need grading permits, seasonally appropriate biological surveys, and special studies required for CEQA and NEPA.

Routes A1 and B/E will potentially impact wetlands and will need additional permitting, including a USACE 404 permit, RWQCB 401 certification, CDFW 1602 agreement. These routes may need Section 7 consultation with USFWS and/or NMFS for impacts to federally listed species.

Route D3 will not likely result in impacts to wetlands or waters of the US, and, therefore, will have fewer permitting needs.

Conclusions

Three proposed access route alternatives for the Rohnerville airport were reviewed for potential environmental constraints and permitting needs. Following reconnaissance level surveys and environmental database review, each of the three preferred route alternatives was compared to better inform project design. The project area is shown on Figures 1 and 2. Appendix 2 contains representative photographs of the different habitats or constraints observed during the field reconnaissance effort.

Of the three proposed routes, Route B/E has the most environmental constraints, followed closely by Route A1; with Route D3 having the least environmental constraints (see Table 1). Route B/E has substantial cover by sensitive vegetation communities/habitat, has several wetlands present within the proposed alignment (mapped and unmapped), and has habitat present for the highest number of special status species (27 total). In addition, Route B/E proposes the most new road construction, which will most likely lead to more environmental impacts than routes proposing minimal new road construction. Route A1 also has substantial cover by sensitive vegetation communities/habitat (see Figure 2), has wetlands present (extent unknown) within the proposed route alignment, and has potential habitat for a high number of special status species (26 total). Route D3 has minimal cover by one sensitive vegetation community (see Figure 2), is unlikely to have wetlands present within the proposed alignment, and has potential habitat for 12 special status species.

Any of the chosen route alignments will require a formal wetland delineation following USACE protocol to identify impacts to wetland habitat or other waters of the U.S., particularly in the areas identified as potential wetland, ditch, and stream crossings. Wetlands identified in Figure 2 and shown in photos 3, 11, and 12 in Appendix 2 include a small stream with evident flow paths connected by culverts, drainages, swales, and seasonal hillside seeps containing hydrophytic vegetation.

Potential biological surveys required for implementing this proposed project include, at a minimum, a protocol level intensive botanical site inventory of vascular plant species, with emphasis on species identified in the database queries. This survey will need to be conducted at the appropriate season(s) to

locate flowering individuals of listed species. A few state special concern wildlife species have been reported within the general project vicinity, and others could occur. Routes A1, D3, and B/E contain large trees and shrubs, and other viable habitat for migratory nesting birds. Therefore the chosen route alignment may need to be further assessed with CEQA special studies in order to identify and offset adverse impacts to the potential fauna along these routes. Additional non-biological studies may be required by CEQA/NEPA.

References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds). (2012). *The Jepson Manual: Vascular Plants of California, Second Edition*. Berkeley, CA:University of California Press, Berkeley.

Calflora. (NR). "Calflora" database. Berkeley, CA:Calflora. Accessed April and July 2018 at: http://calflora.org/

California Department of Fish and Wildlife. (2010). Vegetation Classification and Mapping Program (VegCAMP), "Natural Communities List." Sacramento, CA:CDFW. Accessed July 2018at: http://www.dfg.ca.gov/biogeodata/vegcamp/natural_communities.asp.

---. (2018a). "California Natural Diversity Database (CNDDB)." Accessed April and July 2018 at: http://www.dfg.ca.gov/biogeodata/cnddb/. Sacramento, CA:CDFW.

---. (2018b). "Biogeographic Information and Observation System (BIOS), Version 5.66.18." Sacramento, CA:CDFW. Accessed April and July 2018 at: http://bios.dfg.ca.gov/.

---. (2018c). "Special Vascular Plants, Bryophytes, and Lichens List." Sacramento, CA:CDFW.

---. (2018d). "Special Animals List." Sacramento, CA:CDFW.

---. (NR). Section 1602 – Lake and Streambed Alteration Agreement–The California Biologist's Handbook Accessed at: http://biologistshandbook.com/permits/section-1602-lake-and-streambed-alteration-agreement/

California Native Plant Society. (2018)."CNPS Rare Plant Program, Inventory of Rare and Endangered Plants (online edition, v8-02)."Sacramento, CA:CNPS. Accessed April and July 2018 at: http://www.rareplants.cnps.org.

Consortium of California Herbaria. (NR). "Consortium of California Herbaria" database. Berkeley, CA:CCH. Accessed April and July 2018 at: http://ucjeps.berkeley.edu/consortium/.

County of Humboldt. (2018). Web GIS 2.0. Accessed April and July 2018 at: https://humboldtgov.org/1357/Web-GIS

---. (NR). "Title III, Land Use and Development, Division 3, Building Regulations, Section 331-12, Grading, Excavation, Erosion, and Sedimentation Control." Eureka, CA:County of Humboldt.

GHD. (May 2016). *Environmental Constraints Analysis, Fortuna Highway 101/Riverwalk Area Connectivity Project.* Eureka, CA:GHD.

Google Earth. (9/2/1998, 5/26/2016). 40.55332°, -124.13324°. Accessed April & July 2018. NR:Google Earth.

National Geographic Society. (2013). Topographic Map of Rohnerville Airport, CA. Accessed at: http://maps.nationalgeographic.com/maps

Natural Resource Conservation Service. (April 2018). NRCS Web Soil Survey. Accessed April 2018 at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Sawyer, J.O., T. Keeler-Wolf, and J Evans. (2009). *A Manual of California Vegetation, Second Edition*. Sacramento, CA:CNPS Press.

SHN. (March 2018). *Geologic Assessment, Rohnerville Airport Connectivity Study.* Eureka, CA:SHN.

State Water Resources Control Board. (2012). "Clean Water Act Section 303(d): Impaired Waters and Total Maximum Daily Loads (TMDLs)." Sacramento, CA:SWRCB.

TJKM. (June 2018). *Existing Conditions/Opportunities and Preliminary Route Alternatives, Rohnerville Airport Connectivity Study.* Pleasanton, CA:TJKM

U.S. Department of Agriculture. (NR). NAIP Coverage, accessed at: https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/APFO/status-maps/pdfs/naipcov_2017.pdf

U.S. Fish and Wildlife Service. (2018a). Information, Planning and Conservation System (IPAC), Trust Resources List." Washington D.C.:USFWS. Accessed April and July 2018 at: https://ecos.fws.gov/ipac/location/index.

---. (2018b). "Critical Habitat Portal." Washington D.C.:USFWS. Accessed April and July 2018 at: http://ecos.fws.gov/crithab/.

---. (2018c). National Wetland Inventory. Washington D.C.:USFWS. Accessed May 2018 at: http://fws.gov/wetlands/data/mapper.html.

U.S. Geological Survey. (NR). 7.5-Minute Fortuna Quadrangle and 8 surrounding quadrangles. NR:USGS.

Species Lists 1

Table A-1
Regionally Occurring Special Status Plant Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study, 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	Family	Fed-List	Cal-List	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Abronia umbellata var. *breviflora*	pink sand-verbena	Nyctagin-aceae	None	None	G4G5-T2	S1	1B.1	June-Oct.	Coastal dunes and coastal strand.	Foredunes and interdunes with sparse cover. Usually the plant closest to the ocean. 0-10 m[(3)].	Route A1: **None** Route D3: **None** Route B/E: **None**
Angelica lucida	sea-watch	Apiaceae	None	None	G5	S3	4.2	May-Sept.	Coastal strand	Coastal bluff scrub, dunes, coastal scrub, coastal salt marshes. 0-150 m	Route A1: **None** Route D3: **None** Route B/E: **None**
Anomobrym julaceum	slender silver moss	Bryaceae	None	None	G5?	S2	4.2	Moss	Broadleaf upland forest, Lower montane and N. Coast conifer forest.	Damp rock and soil on outcrops, usually on roadcuts. 100-1,000 m.	Route A1: **Low** Route D3: **None** Route B/E: **Low**
Astragalus pycnostachyus var. *pycnostachyus*	coastal marsh milk-vetch	Fabaceae	None	None	G2T2	S2	1B.2	April-Oct.	Coastal dunes, marshes & swamps, coastal scrub.	Mesic sites in dunes or along streams or coastal salt marshes. 0-155 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Astragalus rattanii var. *rattanii*	Rattan's milk-vetch	Fabaceae	None	None	G4T4	S4	4.3	April-July	Chaparral, cismontane woodland, lower montane conifer forest	Open grassy hillsides, gravelly flats in valleys, and gravel bars of stream beds 30-825 m.	Route A1: **Mod.** Route D3: **None** Route B/E: **Mod.**
Cardamine angulata	seaside bittercress	Brassic-aceae	None	None	G5	S1	2B.1	Jan.-July	Lower montane, conife forest, N. coast conifer forest, wetland	Wet areas, streambanks. 90-155 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Carex leptalea	bristle-stalked sedge	Cyperaceae	None	None	G5	S1	2B.2	March-July	Bogs and fens, meadows and seeps, marshes and swamps.	Mostly known from bogs and wet meadows. 3-1,395 m.	Route A1: **None** Route D3: **None** Route B/E: **Low**
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	None	None	G5	S3	2B.2	April-August	Marsh & swamp (brackish or freshwater).	0-200 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Castilleja ambigua var. *humboldtiensis*	Humboldt Bay owl's-clover	Orobanch-aceae	None	None	G4T2	S2	1B.2	April-August	Marshes and swamps.	Coastal saltmarsh with Spartina, Distichlis, Salicornia, Jaumea. 0-20 m.	Route A1: **None** Route D3: **None** Route B/E: **None**

Table A-1
Regionally Occurring Special Status Plant Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study, 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	Family	Fed-List	Cal-List	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Castilleja litoralis	Oregon coast paintbrush	Orobanch-aceae	None	None	G3	S3	2B.2	June	Coastal bluff scrub, coastal dunes, coastal scrub.	Sandy sites. 5-255 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Chloropyron maritimum ssp. *palustre*	Point Reyes salty bird's-beak	Orobanch-aceae	None	None	G4?T2	S2	1B.2	June-Oct.	Coastal salt marsh.	Usually in coastal salt marsh with Salicornia, Distichlis, Jaumea, Spartina etc. 0-10 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Chrysosplenium glechomifolium	Pacific golden saxifrage	Saxifrag-aceae	None	None	G5	S3	4.3	Feb.-June	North Coast coniferous forest, riparian forest.	Streambanks, sometimes seeps, sometimes roadsides. 10-220 m.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Low**
Clarkia amoena ssp. Whitneyi	Whitney's farewell-to-spring	Onagr-aceae	None	None	G5T1	S1	1B.1	June-Aug.	Coastal bluff scrub, Coastal scrub	5-125 m.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Mod.**
Collomia tracyi	Tracy's collomia	Polemoni-aceae	None	None	G4	S4	4.3	June-July	Broadleaf upland forest, Lower montane coniferous forest.	Rocky, sometimes serpentinite. 300-2,100 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Erysimum menziesii	Menzies' wallflower	Brassic-aceae	E	E	G1	S1	1B.1	March-Sept.	Coastal dunes.	Localized on dunes and coastal strand. 0-35 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Erythronium oregonum	giant fawn lily	Liliaceae	None	None	G4G5	S2	2B.2	March.-June	Cismontane woodland, Meadows and seeps.	Sometimes serpentinite, rocky, openings. 100-1,150 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Erythronium revolutum	coast fawn lily	Liliaceae	None	None	G4G5	S3	2B.2	March-July	Bogs and fens, Broadleaf upland forest, N. Coast conifer forest.	Mesic streambanks. 0-1,600 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Fissidens pauperculus	minute pocket moss	Fissident-aceae	None	None	G3?	S2	1B.2	Lichen	North coast coniferous forest, Redwood.	Moss growing on damp soi along the coast. In dry streambeds and on stream banks. 10-1,024 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Gilia capitata ssp. *pacifica*	Pacific gilia	Polemoni-aceae	None	None	G5T3	S2	1B.2	April-August	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland.	5-1,665 m.	Route A1: **High** Route D3: **High** Route B/E: **High**

Table A-1
Regionally Occurring Special Status Plant Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study, 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	Family	Fed-List	Cal-List	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Gilia millefoliata	dark-eyed gilia	Polemoni-aceae	None	None	G2	S2	1B.2	April-July	Coastal dunes.	1-60 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Glehnia littoralis ssp. *leiocarpa*	American glehnia	Apiaceae	None	None	G5T5	S3	4.2	May-August	Coastal Dunes	0-20 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Hemizonia congesta ssp. *tracyi*	Tracy's tarplant	Asteraceae	None	None	G5T4	S4	4.3	May-Oct.	Coastal prairie, N. coas and lower montane conifer forests.	Openings; sometimes on serpentine. 120-1,200 m.	Route A1: **High** Route D3: **Mod.** Route B/E: **High**
Hesperevax sparsiflora var. *brevifolia*	short-leaved evax	Asteraceae	None	None	G4T3	S2	1B.2	March-June	Coastal bluff scrub, coastal dunes, coastal prairie.	Sandy bluffs and flats. 0-215 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Hesperolinon adenophyllum	glandular western flax	Linaceae	None	None	G2G3	S2S3	1B.2	May-Aug.	Chaparral, cismontane woodland, valley and foothill grassland.	Serpentine soils; generally found in sepentine chaparral. 425-1,345 m.	Route A1: **Mod.** Route D3: **Mod.** Route B/E: **Mod.**
Hosackia gracilis	harlequin lotus	Fabaceae	None	None	G4	S3	4.2	March-July	Broadleaf upland forest, coast bluff scrub, coast prairie, coast scrub, meadow, seep, marsh & swamp, closed cone & N. coast conifer forests, valley & foothill grassland.	Wetlands and roadsides. 0 700 m.	Route A1: **Mod.** Route D3: **Low** Route B/E: **High**
Lathyrus glandulosus	sticky pea	Fabaceae	None	None	G3	S3	4.3	April-June	Cismontane woodland.	Oak woodlands upland from coastal redwood forests, and along roadsides. 300-800 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Layia carnosa	beach layia	Asteraceae	E	E	G2	S2	1B.1	March-July	Coastal dunes, coastal scrub.	Sparsely vegetated, semi-stabilized dunes, usually behind foredunes. 0-30 -m	Route A1: **None** Route D3: **None** Route B/E: **None**
Lilium kelloggii	Kellogg's lily	Liliaceae	None	None	G3	S3	4.3	May-August	Lower montane & N. coast coniferous forest	Openings and roadsides. 3-1,300 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**

Table A-1
Regionally Occurring Special Status Plant Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study, 5/11/2018
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Scientific Name	Common Name	Family	Fed-List	Cal-List	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Lilium occidentale	western lily	Liliaceae	E	E	G1	S1	1B.1	June-July	Coastal scrub, freshwater marsh, bog & fens, coastal bluff scrub, coast prairie, N. coast conifer forest, marshes and swamps.	Well-drained, old beach washes overlain with wind blown alluvium and organi topsoil; usually near margins of Sitka spruce. 3-110 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Lilium rubescens	redwood lily	Liliaceae	None	None	G3	S3	4.2	April-August	Broadleaf upland forest, Chaparral, uppe and lower montane an N. coast conifer forests	Sometimes serpentinite, sometimes roadsides. 30-1,910 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Listera cordata	heart-leaved twayblade	Orchid-aceae	None	None	G5	S4	4.2	Feb.-July	Lower montane conifer forest, north coast conifer forest.	Bogs and fens, 5-1,370 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Lycopodium clavatum	running-pine	Lycopodi-aceae	None	None	G5	S3	4.1	June-Sept.	Lower montane conifer forest, north coast conifer forest, marsh &swamp.	Forest understory, edges, openings, roadsides; mesic sites w/ partial shade & light. 45-1,225 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Mitellastra caulescens	leafy-stemmed mitrewort	Saxifrag-aceae	None	None	G5	S4	4.2	March-Oct.	Broadleaf upland forest, lower montane conifer forest, meadow & seep, N. coast conife forest.	Mesic sites. 5-1,700 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Montia howellii	Howell's montia	Montiaceae	None	None	G3G4	S2	1B.1	March-June	Meadows and seeps, North Coast coniferous forest, Vernal pools.	Vernally mesic sites, sometimes roadsides. 0-835 m.	Route A1: **Low** Route D3: **Mod.** Route B/E: **Mod.**
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	None	None	G2	S1	1B.1	May-Oct.	Coastal bluff scrub, coastal dunes, coastal prairie, low montane conifer forest.	Sandy substrates; usually mesic sites. 3-800 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Packera bolanderi var. bolanderi	seacoast ragwort	Asteraceae	None	None	G4T4	S2S3	2B.2	Jan.-August	Coastal scrub, north coast conifer forest.	Often along roadsides. 30-915 m.	Route A1: **Mod.** Route D3: **Mod.** Route B/E: **Mod.**

Table A-1
Regionally Occurring Special Status Plant Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study, 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	Family	Fed-List	Cal-List	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Piperia candida	white-flowered rein orchid	Orchid-aceae	None	None	G3	S3	1B.2	May-Sept.	N. Coast and lower montane conifer forest broadleaf upland forest.	Sometimes serpentine. Forest duff, mossy banks, rock outcrops, muskeg. 45-1,615 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Pityopus californicus	California pinefoot	Ericaceae	None	None	G4G5	S4	4.2	March-August	Broadleaf upland forest, upper montane and, N. coast conifer forest, low montane conifer forest.	Deep shade w/ few understory species, often under layer of duff, in rock to clay loam soil. 15-2,225 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Pleuropogon refractus	nodding semaphore grass	Poaceae	None	None	G4	S4	4.2	March-August	Meadow & seep, low montane conifer forest N. coast conifer forest, riparian forest.	Mesic sites along streams, grassy flats in shaded redwood groves. 0-1,600 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Polemonium carneum	Oregon polemonium	Polemoni-aceae	None	None	G3G4	S2	2B.2	April-Sept.	Coastal prairie, coastal scrub, lower montane coniferous forest.	0-1,830 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Puccinellia pumila	dwarf alkali grass	Poaceae	None	None	G4?	SH	2B.2	July	Marshes and swamps.	Mineral spring meadows and coastal salt marshes. 1-10 m.	Route A1: **None** Route D3: **None** Route B/E: **None**
Ribes laxiflorum	trailing black currant	Grossulari-aceae	None	None	G5	S4	4.3	March-July	North Coast coniferous forest.	Sometimes roadsides. 5-1,395 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Ribes roezlii var. *amictum*	hoary gooseberry	Grossulari-aceae	None	None	G5T4	S4	4.3	March-April	Broadleaf forest, cismontane woodland, upper & lower montane conifer forest	120-2,300 m.	Route A1: **Mod.** Route D3: **Mod.** Route B/E: **Low**
Sidalcea malachroides	maple-leaved checkerbloom	Malvaceae	None	None	G3	S3	4.2	March-August	Broadleaf upland forest, coast prairie, coast scrub, N. coast conifer forest, riparian.	Woodlands and clearings near coast; often in disturbed areas. 0-730 m.	Route A1: **High** Route D3: **Mod.** Route B/E: **High**
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Malvaceae	None	None	G5T2	S2	1B.2	March-August	Coastal bluff scrub, coastal prairie, north coast coniferous forest	Open coastal forest; roadcuts. 5-1,255 m.	Route A1: **High** Route D3: **High** Route B/E: **High**

Table A-1
Regionally Occurring Special Status Plant Species Scoping List CNDDB, CNPS, IPaC
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Scientific Name	Common Name	Family	Fed-List	Cal-List	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Sidalcea oregana ssp. eximia	coast checkerbloom	Malvaceae	None	None	G5T1	S1	1B.2	June-August	N. coast and lower montane conifer forests, Meadows and seeps,	5-1,340 m.	Route A1: **Low** Route D3: **Low** Route B/E: **Mod.**
Sisyrinchium hitchcockii	Hitchcock's blue-eyed grass	Iridaceae	None	None	G2	S1	1B.1	June	Cismontane woodland, valley and foothill grassland.	Openings in woodland or i grassland. 305 m in California.	Route A1: **None** Route D3: **None** Route B/E: **Low**
Spergularia Canadensis var. occidentalis	western sand-spurrey	aryophyll-aceae	None	None	G5T4	S1	2B.1	June-Aug.	Marshes and swamps (coastal salt marshes).	0-3 m.	Route A1: **None** Route D3: **None** Route E: **None**
Tiarella trifoliata var. *trifoliata*	trifoliate laceflower	Saxifrag-aceae	None	None	G5T5	S2S3	3.2	June-August	Lower montane coniferous forest, nort coast coniferous forest	Forest edge; moist shady banks. 170-1,500 m.	Route A1: **Low** Route D3: **Low** Route B/E: **None**
Usnea longissima	Methuselah's beard lichen	Parmeli-aceae	None	None	G4	S4	4.2	lichen	North coast coniferous forest, broadleaf upland forest.	In the "redwood zone" on tree branches of a variety of trees, including big leaf maple, oaks, ash, Douglas-fir, & bay. 45-1,465 m.	Route A1: **Low** Route D3: **None** Route B/E: **None**

1. Species indicator status as assigned by Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and California Department of Fish and Wildlife (CDFW)
   - C: candidate
   - CT: candidate threatened
   - D: delisted
   - DPS: distinct population segment
   - E: endangered
   - ESU: evolutionarily significant unit
   - FP: fully protected
   - PT: proposed threatened
   - SSC: species of special concern
   - T: threatened
   - WL: watch list
   - FP: fully protected

2. Species Heritage rank as assigned by California Department of Fish and Wildlife (CDFW)

G1/S1: critically imperiled
G2/S2: imperiled
G3/S3: vulnerable
G4/S4: apparently secure
G5/S5: secure

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Amphibians									
Ascaphus truei	Pacific tailed frog	None	None, SSC	G4	S3S4	Aquatic, Klamath/ N. coast flowing waters, Lower montane conifer, N. coast conifer, Redwood, and Riparian forests	Occurs in montane hardwood-conifer, redwood, Douglas-fir & ponderosa pine habitats.	Restricted to perennial montane streams. Tadpoles require water below 15 degrees C.	Route A1: **None** Route D3: **None** Route B/E: **None**
Rana aurora	northern red-legged frog	None	None, SSC	G4	S3	Klamath/N. coast flowing waters, riparian forest, riparian woodland	Humid forests, woodlands, grasslands, & streamsides in NW California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.	Route A1: **Mod.** Route D3: **Low** Route B/E: **High**
Rana boylii	foothill yellow-legged frog	None	None, SSC	G3	S3	Aquatic, Chaparral, Cismontane woodland, coast scrub, Klamath/N. coast flowing waters, lower montane conifer forest, meadow & seep, riparian forest and woodland	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats.	Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Rhyacotriton variegatus	southern torrent salamander	None	None, SSC	G3G4	S2S3	Lower montane conifer forest, old-growth, redwood forest, riparian forest.	Coastal redwood, Douglas-fir, mixed conifer, montane riparian and montane hardwood-conifer habitats. Old growth forest.	Cold, well-shaded, permanent streams and seepages, or within splash zone or on moss-covered rock within trickling water.	Route A1: **None** Route D3: **None** Route B/E: **Low**
Birds									
Accipiter cooperii	Cooper's hawk	None	None	G5	WL	Cismontane woodland Riparian forest Riparian woodland Upper montane conifer forest.	Woodland, chiefly of open, interrupted or marginal type.	Nest sites mainly in riparian deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Mod.**
Accipiter gentilis	northern goshawk	None	None, SSC	G5	S3	North coast conifer forest, Subalpine conifer forest, Upper montane conifer forest	Within, and in vicinity of, coniferous forest. Uses old nests, and maintains alternate sites.	Usually nests on north slopes, near water. Red fir, lodgepole pine, Jeffrey pine, and aspens are typical nest trees.	Route A1: **Low** Route D3: **None** Route B/E: **None**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Accipiter striatus	sharp-shinned hawk	None	None	G5	WL, S4	Cismontane woodland, lower montane conifer forest, riparian forest, riparian woodland	Ponderosa pine, black oak, riparian deciduous, mixed conifer & Jeffrey pine habitat. Prefers riparian.	North-facing slopes, with plucking perches are critical requirements. Nests usually within 275 ft of water.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Agelaius tricolor	tricolor blackbird	None	CE	G2G3	S1S2	Freshwater marsh, Marsh & swamp, Swamp, Wetland	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Route A1: **None** Route D3: **None** Route B/E: **None**
Ammodramus savannarum	grasshopper sparrow	None	None	G5	S3	Valley & foothill grassland	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes.	Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	Route A1: **None** Route D3: **None** Route B/E: **Low**
Aquila chrysaetos	golden eagle	None	None	G5	FP, WL, S3	Broadleaf upland forest, cismontane woodland, coastal prairie, upper & lower montane conifer forest, valley & foothill grassland	Rolling foothills, mountain areas, sage-juniper flats, & desert.	Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Route A1: **Low** Route D3: **None** Route B/E: **Low**
Ardea alba	great egret	None	None	G5	S4	Brackish marsh, estuary, freshwater marsh, marsh & swamp, riparian forest, wetland	Colonial nester in large trees.	Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	Route A1: **None** Route D3: **None** Route B/E: **High**
Ardea herodias	great blue heron	None	None	G5	S4	Brackish marsh, Estuary, Freshwater marsh, Marsh & swamp, Riparian forest, Wetland.	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.	Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	Route A1: **None** Route D3: **None** Route B/E: **High.**
Brachyramphus marmoratus	marbled murrelet	T	E	G3G4	S1	Lower montane conifer forest, Oldgrowth Redwood	Feeds near-shore; nests inland along coast from Eureka to Oregon border.	Nests in old-growth redwood-dominated forests, up to 6 mi. inland, often in Douglas-fir.	Route A1: **None** Route D3: **None** Route B/E: **None**

Table 1-2
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Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Charadrius alexandrinus nivosus	western snowy plover	T	None, SSC	G3T3	S2S3	Great Basin standing waters, Sand shore, Wetland	Sandy beaches, salt pond levees & shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting.	Route A1: **None** Route D3: **None** Route B/E: **None**
Charadrius montanus	mountain plover	None	None, SSC	G3	S2S3	Chenopod scrub Valley & foothill grassland	Short grasslands, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms.	Short vegetation, bare ground & flat topography. Prefers grazed areas & areas with burrowing rodents.	Route A1: **None** Route D3: **None** Route B/E: **None**
Coccyzus americanus occidentalis	western yellow-billed cuckoo	T	E	G5T2T3	S1	Riparian forest.	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Route A1: **None** Route D3: **None** Route B/E: **None**
Contopus cooperi	olive-sided flycatcher	None	None, SSC	G4	S4	Lower montane conifer forest, redwood and upper montane conifer forests.	Nesting habitats are mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir & lodgepole pine.	Most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	Route A1: **None** Route D3: **None** Route B/E: **None**
Coturnicops noveboracensis	yellow rail	None	None, SSC	G4	S1S2	Freshwater marsh, meadow & seep.	Summer resident in eastern Sierra Nevada in Mono Co.	Freshwater marshlands.	Route A1: **None** Route D3: **None** Route B/E: **None**
Egretta thula	snowy egret	None	None	G5	S4	Marsh & swamp, meadow & seep, riparian forest, riparian woodland, wetland	Colonial nester, with nest sites situated in protected beds of dense tules.	Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	Route A1: **None** Route D3: **None** Route B/E: **None**
Empidonax traillii	willow flycatcher	None	E	G5T3T4	S1S2	Meadow & seep Riparian woodland	Mountain meadows and riparian habitats in the Sierra Nevada and Cascades	Nests near the edges of vegetation clumps and near streams.	Route A1: **None** Route D3: **None** Route B/E: **None**
Falco peregrinus anatum	American peregrine falcon	D	D	G4T4	FP	Feed exclusively on smaller bird species. Wide variety of habitats across the globe.	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures.	Nest consists of a scrape or a depression or ledge in an open site.	Route A1: **Mod.** Route D3: **None** Route B/E: **Mod.**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Haliaeetus leucocephalus	Bald eagle	D	E	G5	S3	Lower montane coniferous forest Oldgrowth.	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water.	Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Route A1: **Mod.** Route D3: **None** Route B/E: **None**
Nycticorax nycticorax	black-crowned night heron	None	None	G5	S4	Marsh & swamp, riparian forest, riparian woodland, wetland	Colonial nester, usually in trees, occasionally in tule patches.	Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	Route A1: **None** Route D3: **None** Route B/E: **None**
Pandion haliaetus	osprey	None	None, WL	G5	S4	Riparian forest	Ocean shore, bays, fresh-water lakes, and larger streams.	Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	Route A1: **High** Route D3: **None** Route B/E: **Mod.**
Pelecanus occidentalis californicus	California brown pelican	DL	DL, FP	G4T3	S3	Estuaries and coastal marine habitat.	Colonial nester on coastal islands just outside the surf line.	Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally.	Route A1: **None** Route D3: **None** Route B/E: **None**
Phalacrocorax auritus	double-crested cormorant	None	None	G5	S4	Riparian forest, Riparian scrub, Riparian woodland	Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state.	Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	Route A1: **None** Route D3: **None** Route B/E: **None**
Poecile atricapillus	black-capped chickadee	None	None, WL	G5	S3	Riparian woodland	Inhabits riparian woodlands in Del Norte and northern Humboldt counties.	Mainly found in deciduous tree-types, especially willows and alders, along large or small watercourses.	Route A1: **High** Route D3: **High** Route B/E: **High**
Riparia riparia	bank swallow	None	T	G5	S2	Riparian scrub, Riparian woodland	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Route A1: **High** Route D3: **None** Route B/E: **High**
Selasphorus rufus	rufous hummingbird	None	None	G5	S1S2	North coast coniferous forest, Oldgrowth	Breeds in Transition life zone of northwest coastal area from Oregon border to southern Sonoma County.	Nests in berry tangles, shrubs, and conifers. Favors habitats rich in nectar-producing flowers.	Route A1: **Mod.** Route D3: **Mod.** Route B/E: **Mod.**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Selasphorus sasin	Allen's hummingbird	None	None	G5	S4	Chaparral, mixed evergreen forest, woodlands, urban interface.	Thickets, mixed forests, planted stands, montane woodlands, open areas, and shrubs.	Nests on twigs or forks of trees and shrubs, sometimes in vines, occasionally in buildings.	Route A1: **Mod.** Route D3: **Mod.** Route B/E: **High**
Setophaga petechia	yellow warbler	None	None	G5	S3S4	Riparian forest, Riparian scrub, Riparian woodland	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada.	Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Route A1: **Low** Route D3: **Low** Route B/E: **Mod.**
Strix occidentalis caurina	northern spotted owl	T	SSC	G3T3	S2S3	North coast conifer forest, Oldgrowth Redwood	Old-growth forests or mixed stands of old-growth & mature trees. Occasional in younger forests w/ patches of big trees.	High, multistory canopy dominated by big trees, many trees w/cavities or broken tops, woody debris & space under canopy.	Route A1: **None** Route D3: **None** Route B/E: **None**
Fish									
Acipenser medirostris	green sturgeon	T	None, SSC	G3	S1S2	Aquatic, Klamath/N. coast flowing waters, Sacramento/ San Joaquin flowing waters	The most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, & Trinity Rivers.	Spawns at temps between 8-14 C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	Route A1: **None** Route D3: **None** Route B/E: **None**
Entosphenus tridentatus	Pacific lamprey	None	None, SSC	G4	S4	Aquatic, Klamath/N. coast flowing waters, Sacramento/ San Joaquin flowing waters, South coast flowing waters	Found in Pacific Coast streams north of San Luis Obispo Co., however regular runs in Santa Clara River. Size of runs is declining.	Swift-current gravel-bottomed areas for spawning with water temps between 12-18 C. Ammocoetes need soft sand or mud.	Route A1: **None** Route D3: **None** Route B/E: **None**
Eucyclogobius newberryi	tidewater goby	E	None, SSC	G3	S3	Aquatic, Klamath/North coast flowing waters, Sacramento/ San Joaquin flowing waters, South coast flowing waters	Brackish water habitats along the Calif coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels.	Route A1: **None** Route D3: **None** Route B/E: **None**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Oncorhynchus clarkii clarkii	coast cutthroat trout	None	None	G4T4	S3	Aquatic, Klamath/North coast flowing waters	Small coastal streams from the Eel River to the Oregon border.	Small, low gradient coastal streams and estuaries. Needs shaded streams with water temperatures <18C, and small gravel for spawning.	Route A1: **None** Route D3: **None** Route B/E: **None**
Oncorhynchus kisutch pop. 2	coho salmon - southern OR. / northern CA. ESU	T	T	G4T2Q	S2?	Aquatic, Klamath/North coast flowing waters, Sacramento/San Joaquin flowing waters	Federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California.	State listing refers to populations between the Oregon border and Punta Gorda, California.	Route A1: **None** Route D3: **None** Route B/E: **None**
Oncorhynchus kisutch pop. 4	coho salmon – central CA. coast ESU	E	E	G4	S2?	Aquatic	Federal listing = pops between Punta Gorda & San Lorenzo River. State listing = pops south of Punta Gorda.	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water & sufficient dissolved oxygen.	Route A1: **None** Route D3: **None** Route B/E: **None**
Oncorhynchus mykiss irideus pop. 1	steelhead – Klamath Mountains Province DPS	None	None	G5T3Q	S2	Aquatic Klamath/North coast flowing waters	Streams between Elk River, Oregon and the Klamath & Trinity rivers in California, inclusive.	Minimum water depth for upstream migration is 18 cm. Water velocities > 3-4 m/sec may impede upstream progress.	Route A1: **None** Route D3: **None** Route B/E: **None**
Oncorhynchus mykiss irideus pop. 16	steelhead – N. California DPS	T	None	G5T2-T3Q	S2S3	Aquatic Sacramento/San Joaquin flowing waters	Coastal basins from Redwood Creek south to the Gualala River, inclusive. Does not include summer-run steelhead.	Cool, swift, shallow water & clean loose gravel for spawning	Route A1: **None** Route D3: **None** Route B/E: **None**
Oncorhynchus mykiss irideus pop. 36	summer-run steelhead trout	None	None	G5T4Q	S2	Aquatic, Klamath/North coast flowing waters, Sacramento/San Joaquin flowing waters	No. Calif coastal streams south to Middle Fork Eel River. Within range of Klamath Mtns province DPS & No. Calif DPS.	Cool, swift, shallow water & clean loose gravel for spawning, & suitably large pools in which to spend the summer.	Route A1: **None** Route D3: **None** Route B/E: **None**
Oncorhynchus tshawytscha pop. 17	Chinook salmon (California coast ESU)	T	None	G5	S1	Aquatic Sacramento/San Joaquin flowing waters	Federal listing refers to wild spawned, coastal, spring & fall runs between Redwood Cr, Humboldt Co & Russian R., Sonoma Co	Major limiting factor for juvenile chinook salmon is temperature, which strongly effects growth & survival.	Route A1: **None** Route D3: **None** Route B/E: **None**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Spirinchus thaleichthys	longfin smelt	C	T, SSC	G5	S1	Aquatic | Estuary	Euryhaline, nektonic & anadromous. Open waters of estuaries, mostly mid to bottom of water column.	Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	Route A1: **None** Route D3: **None** Route B/E: **None**
Thaleichthys pacificus	Eulachon	T	None	G5	S3	Aquatic Klamath/North coast flowing waters	Found in Klamath River, Mad River, Redwood Creek & in small numbers in Smith River & Humboldt Bay tributaries.	Spawn in lower reaches of coastal rivers w/ moderate water velocities & bottom of pea-sized gravel, sand & woody debris	Route A1: **None** Route D3: **None** Route B/E: **None**
Insects									
Bombus caliginosus	obscure bumble bee	None	None	G4?	S1S2	Nests underground or above ground in abandoned bird nests	Open grassy coastal plains and coast range meadows from Santa Barbara county to Washington state.	Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.	Route A1: **Mod.** Route D3: **None** Route B/E: **Mod.**
Bombus occidentalis	western bumble bee	None	None	G2G3	S1	Pollinates a wide variety of flowers. Will gnaw through flowers to obtain nectar their tongues are too short to reach.	Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.	Nest in cavities or abandoned burrows.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Mod.**
Mammals									
Antrozous pallidus	pallid bat	None	None	G5	S3	Chaparral, Coastal scrub, riparian woodland, upper montane conifer forest, valley & foothill grassland	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Aplodontia rufa humboldtiana	Humboldt mountain beaver	None	None	G5TNR	SNR	Coastal scrub, Redwood, Riparian forest	Coast Range in southwestern Del Norte County and northwestern Humboldt County.	Variety of coastal habitats, including coastal scrub, riparian forests, typically with open canopy and thickly vegetated understory.	Route A1: **None** Route D3: **None** Route B/E: **None**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Arborimus pomo	Sonoma tree vole	None	None, SSC	G3	S3	North coast conifer forest, old-growth, redwood forest	N. coast fog belt from Oregon border to Sonoma Co. In Douglas-fir, redwood & montane hardwood-conifer forests.	Feeds almost exclusively on Douglas-fir needles. Will occasionally take needles of grand fir, hemlock or spruce.	Route A1: **Low** Route D3: **None** Route B/E: **None**
Corynorhinus townsendii	Townsend's big-eared bat	None	None, SSC	G3G4	S2	Broadleaf upland forest, chaparral, low montane conifer forest, meadow & seep, riparian forest and woodland, montane conifer forest, valley & foothill grassland	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Route A1: **Low** Route D3: **Low** Route B/E: **Low**
Erethizon dorsatum	North American porcupine	None	None	G5	S3	Broadleaf upland forest, cismontane woodland, closed-cone conifer forest, lower & upper montane conifer forest N. coast conifer forest.	Forested habitat in the Sierra Nevada, Cascade, and Coast ranges, scattered observ. from forested areas in the Transverse Ranges	Wide variety of coniferous and mixed woodland habitat.	Route A1: **High** Route D3: **Mod.** Route B/E: **Mod.**
Lasionycteris noctivagans	silver-haired bat	None	None	G5	S3S4	Lower montane conifer forest, oldgrowth, riparian forest.	Primarily a coastal and montane forest dweller, feeding over streams, ponds & open brushy areas.	Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. Needs drinking water.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Mod.**
Lasiurus cinereus	hoary bat	None	None	G5	S4	Broadleaved upland forest, cismontane woodland, lower montane conifer forest, N. coast coniferous forest	Prefers open habitats or habitat mosaics, w/ access to trees for cover & open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Low**
Martes caurina humboldtensis	Humboldt marten	None	CE, SSC	G5T1	S1	North coast conifer forest, old-growth, Redwood forest	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County.	Associated with late-successional coniferous forests, prefer forests with low, overhead cover.	Route A1: **Low** Route D3: **None** Route B/E: **None**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence
Myotis yumanensis	Yuma myotis	None	None	G5	S4	Lower montane coniferous forest, Riparian forest, Riparian woodland, Upper montane coniferous forest.	Optimal habitats are open forests and woodlands with sources of water over which to feed.	Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	Route A1: **Mod.** Route D3: **Low** Route B/E: **Mod.**
Pekania pennanti	fisher (west coast DPS)	PT	CT, SSC	G5T2-T3Q	S2S3	North coast conifer forest, old-growth, riparian forest	Intermediate to large-tree stages of conifer forests & deciduous-riparian areas w/ high % canopy closure.	Uses cavities, snags, logs & rocky areas for cover & denning. Needs large areas of mature, dense forest.	Route A1: **None** Route D3: **None** Route B/E: **None**
Reptiles									
Emys marmorata	western pond turtle	None	None, SSC	G3G4	S3	Aquatic, Artificial flowing waters, Klamath/N. coast flowing waters, Klamath/N. coast standing waters, Marsh & swamp, Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches, usually with aquatic vegetation, below 6000 ft.	Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	Route A1: **None** Route D3: **None** Route B/E: **None**
Mollusks									
Anodonta californiensis	California floater	None	None	G3Q	S2	Aquatic	Freshwater lakes and slow-moving streams and rivers. Taxonomy under review.	Generally in shallow water.	Route A1: **None** Route D3: **None** Route B/E: **None**
Gonidea angulata	western ridged mussel	None	None	G3	S1S2	Aquatic	Primarily creeks & rivers & less often lakes. Originally in most of state, now extirpated from Central & So. CA.	Inhabits cold creeks and streams from high to low elevations. A filter feeder that requires host fish to complete life cycle.	Route A1: **None** Route D3: **None** Route B/E: **None**
Margaritifera falcata	western pearlshell	None	None	G4G5	S1S2	Aquatic	Aquatic	Prefers lower velocity waters.	Route A1: **None** Route D3: **None** Route B/E: **None**

Table 1-2
Regionally Occurring Special Status Animal Species Scoping List CNDDB, CNPS, IPaC
Rohnerville Airport Connectivity Study 5/11/2018
Fortuna and Surrounding 7.5 min Quadrangles

Scientific Name	Common Name	FedList	CalList	GRank	SRank	Habitats	General Habitat	Micro-Habitat	Potential of Occurrence

1. Species indicator status as assigned by Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and California Department of Fish and Wildlife (CDFW)

C: candidate	FP: fully protected
CT: candidate threatened	PT: proposed threatened
D: delisted	SSC: species of special concern
DPS: distinct population segment	T: threatened
E: endangered	WL: watch list
ESU: evolutionarily significant unit	FP: fully protected

2. Species Heritage rank as assigned by California Department of Fish and Wildlife (CDFW)

G1/S1: critically imperiled

G2/S2: imperiled

G3/S3: vulnerable

G4/S4: apparently secure

G5/S5: secure

Table 1-3 Botanical Species Observed 4/19 and 8/9/2018 Rohnerville Airport Access, Fortuna, CA			
Scientific Name	**Common Name**	**Family**	**Native?**
Trees			
Pinus radicata	Monterrey pine	Pinaceae	N
Prunus avium	sweet cherry	Rosaceae	N
Prunus cerasifera	wild plum	Rosaceae	N
Pseudotsuga menziesii	Douglas fir	Pinaceae	Y
Salix lasiolepis	arroyo willow	Salicaceae	Y
Shrubs			
Baccharis pilularis ssp. *consanguinea*	coyote brush	Asteraceae	Y
Cotoneaster lacteus	milk flower cotoneaster	Rosaceae	N
Cytisus scoparius	Scotch broom	Fabaceae	N
Frangula purshiana	cascara	Rhamnaceae	Y
Mimulus aurantiacus var. *aurantiacus*	sticky monkey flower	Phrymaceae	Y
Morella californica	California wax myrtle	Myricaceae	Y
Oemleria cerasiformis	osoberry	Rosaceae	Y
Rosa rubiginosa	sweetbriar	Rosaceae	N
Rubus armeniacus	Himalayan blackberry	Rosaceae	N
Rubus parviflorus	thimbleberry	Rosaceae	Y
Rubus ursinus	California blackberry	Rosaceae	Y
Symphoricarpos albus var. *laevigatus*	snowberry	Caprifoliaceae	Y
Ferns and Allies			
Equisetum arvense	horsetail	Equisetaceae	Y
Pteridium aquilinum var. *pubescens*	bracken fern	Dennstaedtiaceae	Y
Sedges and Rushes			
Juncus patens	spreading rush	Juncaceae	Y
Grasses			
Agrostis stolonifera	creeping bentgrass	Poaceae	N
Anthoxanthum odoratum	sweet vernal grass	Poaceae	N
Avens barbata	wild oat	Poaceae	N
Briza maxima	large quaking grass	Poaceae	N
Bromus diandrus	ripgut brome	Poaceae	N
Festuca arundunacea	tall fescue	Poaceae	N
Festuca myuros	rattail six weeks grass	Poaceae	N
Holcus lanatus	velvet grass	Poaceae	N
Hordeum brachyantherum ssp. *brachyantherum*	meadow barley	Poaceae	Y
Phalaris arundinacea	canary reed grass	Poaceae	N
Poa annua	annual grass	Poaceae	N

Table 1-3 Botanical Species Observed 4/19 and 8/9/2018 Rohnerville Airport Access, Fortuna, CA			
Scientific Name	**Common Name**	**Family**	**Native?**
Herbs			
Brassica nigra	black mustard	Brassicaceae	N
Carduus pycnocephalus	Italian thistle	Asteraceae	N
Cerastium glomeratum	mouse ear chickweed	Caryophyllaceae	N
Chamerion angustifolium	fireweed	Onagraceae	Y
Claytonia parviflora ssp. *parviflora*	miner's lettuce	Montiaceae	Y
Conium maculatum	poison hemlock	Apiaceae	N
Dipsacus fullonum	teasel	Dipsacaceae	N
Erodium moschatum	whitestem filaree	Geraniaceae	N
Eschscholzia califonica	California poppy	Papaveraceae	Y
Galium aparine	cleaver plant	Rubiaceae	Y
Geranium dissectum	cutleaf geranium	Geraniaceae	N
Heracluem maxima	cow parsnip	Apiaceae	Y
Lamium purpureum	henbit	Lamiaceae	N
Leucanthemum vulgare	oxeye daisy	Asteraceae	N
Lupinus rivularis	riverbank lupine	Fabaceae	Y
Marah oregana	coast man-root	Cucurbitaceae	Y
Medicago polymorpha	bur clover	Fabaceae	N
Mentha pulegium	pennyroyal	Lamiaceae	N
Oenanthe sarmentosa	water parsley	Apiaceae	Y
Pectiantia ovalis	coastal mitrewort	Saxifragaceae	Y
Plantago lanceolata	English plantain	Plantaginaceae	N
Pseudognaphalium luteoalbum	Jersey cudweed	Asteraceae	N
Raphanus sativa	wild radish	Onagraceae	N
Rumex crispus	curly dock	Polygonaceae	N
Scrophularia californica	beeplant	Scrophulariaceae	Y
Sidalcea malviflora* ssp. *patula	**Siskiyou checkerbloom,**	**Malvaceae**	**Y 1B.2**
Silybum marianum	blessed milk thistle	Asteraceae	N
Sonchus asper	prickly sow thistle	Asteraceae	N
Stachys ajugoides	bugle hedgenettle	Lamiaceae	Y
Symphyotrichum chilense	pacific aster	Asteraceae	Y
Trifolium subterraneum	subterranean clover	Fabaceae	N
Veronica arvensis	speedwell	Plantaginaceae	Y
Vicia hirsuta	tiny vetch	Fabaceae	N
Vines			
Hedera helix	English ivy	Araliaceae	N
Toxicodendron diversilobum	poison oak	Anacardiaceae	Y
66 Species			**44% Native**

Site Photographs 2

Photo 1: Looking southeast along an unused roadway within a portion of proposed Route D3. Note vegetated bluff slope in background the proposed location of Route A-1. Also note non-native vegetation along pavement. Photo taken April 19, 2018.

Photo 2: Looking north at Route A-1 bluff slope alignment from proposed Route D-3 alignment. Note California bay trees in background and Eucalyptus in the far background. Photo taken April 19, 2018.

Photo 3: Looking northwest toward proposed Route A-1 alignment. Note vegetated bluff slope with a dominance of willows (lighter green), and California bay tree (darker green). Poison oak brambles are tinted orange. Photo taken April 19, 2018.

Photo 4: Looking west from the top the bluff toward a portion of the Route A-1 alignment. Note bluff grassland similar to that which occurs within the Route A-1 alignment. Photo taken April 19, 2018.

Photo 5: Looking south within proposed Route D-3 alignment. Note railroad tracks, gravel, and poison oak dominance on slope and along tracks. Also note California bay tree stand (center) and eucalyptus. Photo taken August 9, 2018.

Photo 6: Looking north within proposed Route D-3 alignment. Note railroad tracks, gravel, and poison oak dominance. Also note California bay trees and eucalyptus on slope. Photo taken August 9, 2018.

Photo 7: Looking east toward bluff slope above proposed Route D-3. Note poison oak thicket and eucalyptus trees. Photo taken August 9, 2018.

Photo 8: Looking north within proposed Route D-3 alignment. Note well drained soils and eucalyptus trees. Arroyo willow thicket is in far background. Photo taken August 9, 2018.

Photo 9: Looking southeast toward bluff face at northern end of proposed Route D-3. Note arroyo willow thicket, non-native grasses, and poison oak. Photo taken August 9, 2018.

Photo 10: Looking south from northern end of proposed Route D-3 new road construction. Note paved roadway and non-native brambles along the edge of pavement. Photo taken August 9, 2018.

Photo 11: Looking north across agricultural lands within the vicinity of proposed Route B/E. A stream crosses the field in the center of the photo surrounded by tall grass. A defined channel exists, but is not visible within this photo. Photo taken August 9, 2018.

Photo 12: Looking east toward the proposed Route B/E alignment from airport. Note stream in center of photo with surrounding wetland. Agricultural field has been recently hayed. Photo taken August 9, 2018.

Photo 13: Looking North within existing ROW to airport Cal-fire base. This roadway would be improved for proposed Route B/E. Note non-native mowed grassland in ROW. Photo taken August 9, 2018.

Photo 14: Looking southwest toward proposed Route B/E alignment at the intersection with Rohnerville Road. Note upland pasture at this location. Photo taken August 9, 2018.

Photo 15: Looking north toward south bluff face along Highway 36. The proposed Route B/E alignment would gradually climb this slope. Note grassland and scattered shrub habitat. Photo taken April 19, 2018.

Photo 16: Looking east along south bluff face along Highway 36. Proposed Route B/E alignment would climb from approximately this point going east along the bluff face. Note shrubby habitat along Highway 36 in the left hand corner of the photo. Potential wetlands occur within the shrubby habitat. Photo taken April 19, 2018.

Photo 17: Siskiyou checkerbloom along Highway 36. Additional populations may occur in un-surveyed areas along the proposed route B/E alignment. Photo taken April 19, 2018.

NWI Map, Rohnerville Airport 3

U.S. Fish and Wildlife Service
National Wetlands Inventory

Rohnerville NWI Map

August 9, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Rohnerville North End

August 9, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

U.S. Fish and Wildlife Service
National Wetlands Inventory

Rohnerville South End

August 9, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Eureka, CA | Arcata, CA | Redding, CA | Willits, CA | Coos Bay, OR | Klamath Falls, OR

www.shn-engr.com

Cost Estimates D

Rohnerville Airport Connectivity
Preliminary Estimate*
County of Humboldt
9/11/2018

Alternative No.	Unit of Measure	Item	Draft Estimated Cost*
A1	LS	Old State Highway & Hillcrest Drive	$ 7,123,000
B	LS	Southern Slope	$ 9,294,700
D3 (Phase 1)	LS	Drake Hill Road & Eel River Drive	$ 960,400
D3 (Phase 2)	LS	Old State Highway extension to Drake Hill Road	$ 2,141,600
E	LS	Rohnerville Road	$ 1,395,500

Assumptions:
The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

A thorough geotechnical evaluation will need to be conducted to confirm the feasibility of each alternative This estimate does not consider potential geologic issues such as slope stability.

This estimate does not include costs associated with environmental mitigation

Costs of ROW engineering and acquisition are not included in this estimate

Excavation and retaining wall quantities have not been thoroughly evaluated at this stage

This estimate is based on 2018 costs. Costs should be increase as appropriate to anticipate actual construction costs in the future

CONSTRUCTION COST ESTIMATE: Preliminary Estimate

Jurisdiction:	County of Humboldt	Date:	9/10/2018
Project:	Rohnerville Airport Connectivity	Project No.:	074-028
Alternative:	A1 - Old State Highway	Prepared:	AV

ITEM		UNIT	UNIT COST	QUANTITY	TOTAL
Traffic Control		LS	$147,474.75	1	$147,474.75
Mobilization		LS	$73,737.38	1	$73,737.38
Utility Relocations		LS	$294,949.50	1	$294,949.50
Drainage Improvements		LS	$589,899.00	1	$589,899.00
Construction Inspection		LS	$442,424.25	1	$442,424.25
PS&E		LS	$442,424.25	1	$442,424.25
Environmental Studies & Permitting		LS	$147,474.75	1	$147,474.75
Segment 1					
Striping	Detail 21	LF	$3.00	1075	$3,225.00
Segment 2					
Striping	Detail 21	LF	$3.00	1695	$5,085.00
Civil	Asphalt Concrete (4")	CF	$13.00	13560	$176,280.00
	Class II Aggregate Base	CY	$70.00	1505	$105,350.00
	Curb & Gutter w/ASB	LF	$35.00	1695	$59,325.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	27120	$122,040.00
Retaining Walls	MSE (Includes Infill)	SF	$50.00	10158	$507,900.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 3					
Striping	Detail 21	LF	$3.00	1080	$3,240.00
Civil	Asphalt Concrete (4")	CF	$13.00	8640	$112,320.00
	Class II Aggregate Base	CY	$70.00	960	$67,200.00
	Curb & Gutter w/ASB	LF	$35.00	1080	$37,800.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	17280	$77,760.00
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 4					
Striping	Detail 21	LF	$3.00	1220	$3,660.00
Civil	Asphalt Concrete (4")	CF	$13.00	9760	$126,880.00
	Class II Aggregate Base	CY	$70.00	1080	$75,600.00
	Curb & Gutter w/ASB	LF	$35.00	1220	$42,700.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	19520	$87,840.00
Retaining Walls	MSE (Includes Infill)	SF	$50.00	7314	$365,700.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 5					
Striping	Detail 21	LF	$3.00	1920	$5,760.00
Civil	Asphalt Concrete (4")	CF	$13.00	7680	$99,840.00
	Class II Aggregate Base	CY	$70.00	1705	$119,350.00
	Curb & Gutter w/ASB	LF	$35.00	1920	$67,200.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	15360	$69,120.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 6					
Striping	Detail 21	LF	$3.00	2180	$6,540.00
Civil	Asphalt Concrete (4")	CF	$13.00	17440	$226,720.00
	Class II Aggretage Base	CY	$70.00	1940	$135,800.00
	Curb & Gutter w/ASB	LF	$35.00	2180	$76,300.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	34880	$156,960.00
Erosion Control		LS	$1,200.00	1	$1,200.00

*Prices and quantities are planning level estimates. Cost may vary based on market conditions at the time of construction.

SUBTOTAL:	$5,087,878.88
CONTINGENCY:	40%
TOTAL ESTIMATE (ROUNDED):	$7,123,000.00

CONSTRUCTION COST ESTIMATE: Preliminary Estimate

Jurisdiction:	County of Humboldt	Date:	2/15/2019
Project:	Rohnerville Airport Connectivity	Project No.:	074-028
Alternative:	B - Southern Slope	Prepared:	TJKM

ITEM		UNIT	UNIT COST	QUANTITY	TOTAL
Traffic Control		LS	$198,182.75	1	$198,182.75
Mobilization		LS	$99,091.38	1	$99,091.38
Utility Relocations		LS	$396,365.50	1	$396,365.50
Drainage Improvements		LS	$792,731.00	1	$792,731.00
Construction Inspection		LS	$594,548.25	1	$594,548.25
PS&E		LS	$594,548.25	1	$594,548.25
Segment 1					
Striping	Detail 10	LF	$2.00	100	$200.00
	Detail 39 (Bike lane stripe)	LF	$2.50	200	$500.00
	Detail 21	LF	$3.00	100	$300.00
Civil	Asphalt Concrete (4")	CF	$13.00	1470	$19,110.00
	Class 2 Aggregate Base	CY	$70.00	170	$11,900.00
	Curb & Gutter w/ASB	LF	$35.00	100	$3,500.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	2930	$13,185.00
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 2					
Striping	Detail 21	LF	$3.00	300	$900.00
Civil	Asphalt Concrete (4")	CF	$13.00	1200	$15,600.00
	Asphalt Base	CY	$70.00	130	$9,100.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	2400	$10,800.00
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 2E					
Striping	Detail 21	LF	$3.00	300	$900.00
Civil	Asphalt Concrete (4")	CF	$13.00	1200	$15,600.00
	Asphalt Base	CY	$70.00	130	$9,100.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	2400	$10,800.00
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 2S					
New Traffic Signal		EA	$250,000.00	1	$250,000.00
Striping	12" White Stop Bar	LF	$4.00	35	$140.00
Marking	Arrows	EA	$500.00	2	$1,000.00
Removal	Striping Removal	LF	$2.50	40	$100.00
Segment 3					
Striping	Detail 21	LF	$3.00	5400	$16,200.00
	Detail 39 (Bike lane stripe)	LF	$2.50	10800	$27,000.00
Civil	Asphalt Concrete (4")	CF	$13.00	61140	$794,820.00
	Asphalt Base	CY	$70.00	7600	$532,000.00
	Curb & Gutter w/ASB	LF	$35.00	5400	$189,000.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	122400	$550,800.00
Retaining Walls	MSE (including backfill)	SF	$50.00	24000	$1,200,000.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 4					
Striping	Detail 21	LF	$3.00	1750	$5,250.00
Civil	Asphalt Concrete (4")	CF	$13.00	7000	$91,000.00
	Asphalt Base	CY	$70.00	780	$54,600.00
	Curb & Gutter w/ASB	LF	$35.00	1750	$61,250.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	14000	$63,000.00
Erosion Control		LS	$1,200.00	1	$1,200.00

*Prices and quantities are planning level estimates. Cost may vary based on market conditions at the time of construction.

SUBTOTAL:	$6,639,122.13
CONTINGENCY:	40%
TOTAL ESTIMATE (ROUNDED):	$9,294,700.00

CONSTRUCTION COST ESTIMATE: Preliminary Estimate

Jurisdiction:	County of Humboldt	Date:	9/10/2018
Project:	Rohnerville Airport Connectivity	Project No.:	074-028
Alternative:	D3 (Phase 1) - Drake Hill Road & Eel River Drive	Prepared:	AV

ITEM		UNIT	UNIT COST	QUANTITY	TOTAL
Traffic Control		LS	$19,884.25	1	$19,884.25
Mobilization		LS	$9,942.13	1	$9,942.13
Utility Relocations		LS	$39,768.50	1	$39,768.50
Drainage Improvements		LS	$79,537.00	1	$79,537.00
Construction Inspection		LS	$59,652.75	1	$59,652.75
PS&E		LS	$59,652.75	1	$59,652.75
Environmental Studies & Permitting		LS	$19,884.25	1	$19,884.25
Segment 1a					
Civil	Asphalt Concrete (4")	CF	$13.00	6230	$80,990.00
	Class II Aggregate Base	CY	$70.00	690	$48,300.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	12460	$56,070.00
Retaining Walls					$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 1b					
Marking	Sharrow	EA	$500.00	15	$7,500.00
Signage	Bike Sign and Post	EA	$250.00	5	$1,250.00
Civil	Asphalt Concrete (4")	CF	$13.00	6760	$87,880.00
	Class II Aggregate Base	CY	$70.00	750	$52,500.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	13510	$60,795.00
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00

*Prices and quantities are planning level estimates. Cost may vary based on market conditions at the time of construction.

SUBTOTAL:	$686,006.63
CONTINGENCY:	40%
TOTAL ESTIMATE (ROUNDED):	$960,400.00

CONSTRUCTION COST ESTIMATE: Preliminary Estimate

Jurisdiction:	County of Humboldt	Date:	9/10/2018
Project:	Rohnerville Airport Connectivity	Project No.:	074-028
Alternative:	D3 (Phase 2) - Old State Highway	Prepared:	AV

ITEM		UNIT	UNIT COST	QUANTITY	TOTAL
Traffic Control		LS	$38,898.63	1	$38,898.63
Mobilization		LS	$22,251.69	1	$22,251.69
Utility Relocations		LS	$89,006.75	1	$89,006.75
Drainage Improvements		LS	$178,013.50	1	$178,013.50
Construction Inspection		LS	$133,510.13	1	$133,510.13
PS&E		LS	$133,510.13	1	$133,510.13
Environmental Studies & Permitting		LS	$44,503.38	1	$44,503.38
Segment 2a					
Civil	Asphalt Concrete (4")	CF	$13.00	1960	$25,480.00
	Class II Aggregate Base	CY	$70.00	220	$15,400.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	3925	$17,662.50
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 2b					
Striping	Detail 21	LF	$3.00	2595	$7,785.00
Civil	Asphalt Concrete (4")	CF	$13.00	20760	$269,880.00
	Class II Aggregate Base	CY	$70.00	2310	$161,700.00
	Curb & Gutter w/ASB	LF	$35.00	2595	$90,825.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	41520	$186,840.00
Retaining Walls		CY	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 2c					
Striping	Detail 21	LF	$3.00	405	$1,215.00
Civil	Asphalt Concrete (4")	CF	$13.00	3240	$42,120.00
	Class II Aggregate Base	CY	$70.00	300	$21,000.00
	Curb & Gutter w/ASB	LF	$35.00	405	$14,175.00
Removal	Roadway Excavation Type A (8")	CF	$4.50	6480	$29,160.00
Retaining Walls		SF	$0.00	0	$0.00
Erosion Control		LS	$1,200.00	1	$1,200.00
Segment 2d					
Striping	Detail 21	LF	$3.00	1075	$3,225.00

*Prices and quantities are planning level estimates. Cost may vary based on market conditions at the time of construction.

SUBTOTAL:	$1,529,761.69
CONTINGENCY:	40%
TOTAL ESTIMATE (ROUNDED):	$2,141,600.00

CONSTRUCTION COST ESTIMATE:	Preliminary Estimate		
Jurisdiction:	County of Humboldt	Date:	9/10/2018
Project:	Rohnerville Airport Connectivity	Project No.:	074-028
Alternative:	E - Rohnerville Road	Prepared:	AV

ITEM			UNIT	UNIT COST	QUANTITY	TOTAL
Traffic Control			LS	$29,756.88	1	$29,756.88
Mobilization			LS	$14,878.44	1	$14,878.44
Utility Relocations			LS	$59,513.75	1	$59,513.75
Drainage Improvements			LS	$119,027.50	1	$119,027.50
Construction Inspection			LS	$89,270.63	1	$89,270.63
PS&E			LS	$89,270.63	1	$89,270.63
Segment E1						
Striping	Detail 21		LF	$3.00	1500	$4,500.00
	Detail 39	(Bike lane stripe)	LF	$2.50	3000	$7,500.00
Civil	Asphalt Concrete (4")		CF	$13.00	17000	$221,000.00
	Asphalt Base		CY	$70.00	2111	$147,770.00
	Curb & Gutter w/ASB		LF	$35.00	1500	$52,500.00
Removal	Roadway Excavation Type A (8")		CF	$4.50	34000	$153,000.00
Retaining Walls			SF	$0.00	0	$0.00
Erosion Control			LS	$1,200.00	1	$1,200.00
Segment E1a						
Striping	12" White Stop Bar		LF	$4.00	25	$100.00
Marking	"Stop" Pavement Marking		EA	$500.00	2	$1,000.00
Signage	R1-1 Sign and Post		EA	$250.00	2	$500.00
Removal	Striping Removal		LF	$2.50	35	$87.50
Segment E1b						
Civil	Asphalt Concrete (4")		CF	$13.00	160	$2,080.00
	Asphalt Base			$70.00	18	$1,260.00
Removal	Roadway Excavation Type A (8")		CF	$4.50	320	$1,440.00
Retaining Walls						$0.00
Erosion Control			LS	$1,200.00	1	$1,200.00

*Prices and quantities are planning level estimates. Cost may vary based on market conditions at the time of construction.

SUBTOTAL:	$996,855.31
CONTINGENCY:	40%
TOTAL ESTIMATE (ROUNDED):	$1,395,500.00

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