YUMA REGION INVESTING IN MANUFACTURING COMMUNITIES PARTNERSHIP (IMCP) PROJECT: SUMMARY REPORT

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Chapter 1: Introduction

This document summarizes a strategic planning process completed for Yuma County (the Yuma Region) for the Investing in Manufacturing Communities Partnership (IMCP) program. The report provides a strategic plan for expanding the Yuma Region's manufacturing economy based on opportunities identified during an extensive research, analysis and stakeholder outreach process. The analytical components of the report are followed by a series of strategic recommendations.

The bulk of the report documents a range of analytical steps examining industry competitiveness within the Yuma Region, with a focus on manufacturing industries. The analytical work includes the following topics:

- An industry-competitiveness assessment for the Yuma Region, which combines three separate analyses: 1) an analysis based on employment data by industry, evaluating all industry sectors in the County, 2) a trade-flow analysis examining local production and consumption patterns for a wide range of commodities and services, and 3) a manufacturing-focused analysis.
- An assessment of manufacturing facility requirements that applies site-selection measures to Yuma Region industries.
- Assessment of manufacturing-industry employment and target-industry interrelationships within the Yuma IMCP region, including data for Pima and Santa Cruz counties in Arizona, Imperial County, California, and Sonora and Baja California, Mexico.
- Review of employment patterns of Yuma sub-regions, as one way of assessing their competitive position within the County.
- Assessment of inter-industry relationships, from Bureau of Economic Analysis (BEA) Input-Output data, as one way of indicating which industry sectors contribute the most to the output of Yuma Region principal manufacturing sectors, and hence are theoretically most desirable to have in the local economy.
- A summary of Yuma Region manufacturing industries' competitive position based on the factors discussed in the report.

The report also includes an assessment of infrastructure elements important to the development of manufacturing activity. Transportation, utilities, and broadband services are assessed for a series of 10 analysis areas located throughout Yuma County. The assessment calls attention to strengths and weaknesses in broadband service in the Yuma Region in comparison to the state of Arizona and the nation as a whole.

Strategic partners, regulatory barriers, federal incentives and other economic development resources are also inventoried in the report. The final section of the report is the strategic/marketing plan, which is intended to provide a foundation for implementing a manufacturing focused development strategy for the County.

Note that the data reported in various sections of this report include estimates of employment by industry in some sectors for which "official" (government sourced) estimates are not available (in government data/reports, figures are deliberately suppressed to avoid disclosing information that could be traced back to one or a few firms). Readers of this report should assume that this applies to most

sectors where the number of employees is relatively small, and consequently the estimates may diverge, in some cases considerably, from what is known to be the actual figures. This is an unavoidable consequence of using data from providers who employ automated techniques to generate such estimates.

Chapter 2: Executive Summary

This document provides a comprehensive view of manufacturing in the Yuma Region, using a number of measures as described in the Introduction section, above, and relating conditions in the Yuma Region with manufacturing activity in the surrounding region. The primary intent of this assessment is to elaborate on the competitiveness of the Yuma Region's manufacturing sectors from a number of technical points of view, including:

- How the industry compares to all sectors of the economy in traditional industry competitive screening.
- Whether the industry has an existing related-industry base in the Yuma Region, Northern Mexico, Pima County, Imperial County, and Arizona overall.
- The extent to which the industry exhibits inter-industry interactions with manufacturing sectors, in Input-Output data measures.

The assessment also incorporates qualitative observations on the manufacturing sectors, including:

- The potential link industries have to the competitive advantages that have been identified by Stakeholders within the greater Yuma Region;
- The potential industry linkages to Biotech or Renewable Energy, clusters of interest in the Yuma Region and surrounding regions;
- The potential military-facility interaction to the industries within the Yuma Region.

From a list of 29 Yuma Region industries (existing or identified as potentially desirable) evaluated in this way, a "short list" of eleven industries that scored highest in the evaluation emerged, and these are shown on the table below. The table includes some manufacturing industries that do not currently exist or are minimally present in the Yuma Region, and which were suggested by Stakeholders in an initial meeting for this project.

This report also addresses the presence of non-manufacturing industries in the Yuma Region that have a role in supporting manufacturing activity. The primary means of doing this was the traditional industry competitive screening process, which looked at all sectors in the Yuma Region, and the review of inter-industry interactions with manufacturing sectors, using the Input-Output data measures. The assessment indicated that the Yuma Region has competitively strong industries in many of the most interactive sectors, and few identifiable deficiencies, which included: Management of companies and enterprises; Insurance carriers and related activities; Legal services; and Air transportation.

The interpretation of the results summarized in the table below and described throughout the report, that is, in evaluating the relative strength or other measure of desirability of an industry, depends largely on the strategic positioning of the manufacturing sector overall and in combination with other goals, initiatives, and other sectors.

Yuma manufacturing industries competitive-factor summary "Short List"

					Strong exist. related-industry base in:									
NAICS code	Manufacturing industry description	2013 Jobs	Yuma's advantages mentioned by Stakeholders (1)	TNDG Compet-itive screening	Yuma	No. Mexico	Pima Cnty/ IFS	Imperial Cnty	Ariz.	Strong contri-butor to other Yuma manuf. (2)	Support from non-manuf. sectors (3)	Minimal locational require-ments (4)	Potential link to Biotech or Renewable Energy	Potential military facility link
311991	Perishable Prepared Food Manufacturing	164	Ample, competitive labor; ag. link	X	X	X	X	X	X		X		X	
335911	Storage Battery Manufacturing	153	Climate (solar)		X	X	X	X	X				X	X
311511	Fluid Milk Manufacturing	152	Ag. link		X	X	X	X	X			X		
336411	Aircraft Manufacturing	70	Military link, climate, ret. military, strong logistics		X	X	X	X	X					X
332312	Fabricated Structural Metal Manufacturing	52	Util. rates, logistics		X	X	X	X	X	X			X	
332116	Metal Stamping	41			X	X	X	X	X	X				
336212	Truck Trailer Manufacturing	33	Util. rates, logistics	X	X	X	X	X	X		X	X		
339950	Sign Manufacturing	31			X	X	X	X	X			X		
321991	Manufactured homes/RVs		Labor	(n/a)	X	X	X	X	X			X		
336---	Unmanned vehicle manufacturing		Climate, military	(n/a)	X	X	X	X	X					X
332710	CNC machining		Retired mil.	(n/a)	X	X	X	X	X	X				X

1. Applied here to industries by a combination of Stakeholders' and TNDG's observations.
2. Potential contribution to output of other Yuma Region major industries, based on broader industry group (3-digit level; see Table 10).
3. Non-manufacturing sectors with a strong presence in the Yuma Region provide higher levels of support for these industries than for others. See Table 10.
4. See Table 7.

The marketing framework section of the report reflects the detailed assessment (provided in the remainder of this document) of opportunities and challenges relative to expanding manufacturing activities in the Yuma Region. These opportunities and challenges are briefly highlighted as follows:

Strengths/Opportunities	Weaknesses/Challenges
• Unique economic "drivers" (agriculture, military) with potential connections to manufacturing and innovations • Strategic "dual border" (U.S.-Mexico, Arizona-California) location; excellent port of entry infrastructure • Focal point of renewable energy development • Developable land appropriate for manufacturing facilities • Development-friendly local governments; responsive public/private "partners" with history of collaborating to address economic development issues • Expanding capacity for training of technical workforce • Location within a larger, dynamic region (and with expanding levels of intraregional cooperation)	• Limited base of manufacturing activity • Difficulty in recruiting technical workforce • Inadequate infrastructure assets in areas planned for industrial development • Limited access to venture capital from local sources • Limited track record in commercialization of technology (i.e., large military presence in the Yuma Region has not been significantly leveraged for manufacturing activities) • Bi-national (U.S.-Mexico) manufacturing supply chain tends to favor south-of-the-border locations for actual production

The marketing and implementation plan is organized in terms of three major themes and twelve program recommendations. In some cases the program recommendations represent continuation of existing programs, with the intent that these efforts be refocused to support the manufacturing-specific emphasis of the IMCP strategy.

As noted below, an overarching theme of the implementation plan is regional collaboration, with a particular emphasis on leveraging the forthcoming implementation of the Innovation Frontier Southwest (IFS) initiative. IFS is a public-private partnership composed of public and private sector entities, educational and workforce providers, economic development organizations, state agencies, and non-profit service providers. IFS consists of the following entities: City of Tucson, Pima County, Tech Parks Arizona, Pima Community College, Pima County One-Stop, City of Sierra Vista, Greater Yuma Economic Development Corporation, Yuma Private Industry Council, New Mexico State University and the New Mexico MEP. The IFS region spans the US-Mexico border from Yuma/San Luis, Arizona to Las Cruces/Santa Teresa, New Mexico. The region is anchored by the Tucson/Nogales metropolitan area. The IFS recently (April 2014) submitted an application for IMCP designation. Although the application was unsuccessful, it is anticipated that the consortium organized for the application process will continue to collaborate on regional-scale economic development initiatives.

The IMCP process has identified a number of manufacturing sectors that are potentially viable targets for the Yuma Region based on connections to existing local strengths (see "short list" above). However, due to the relatively small size of the Yuma Region's existing manufacturing base (in which only a

handful of individual sectors have sizeable numbers of existing employees), major expansion of the Yuma Region's manufacturing economy is probably best accomplished by positioning the Yuma Region as part of a large, dynamic region. In this context, the Yuma Region will be more readily recognized (by prospect firms) as a component of a large supply chain rather than appearing to be a smaller community in an isolated location. The IFS consortium provides an excellent framework for continued regional collaboration on manufacturing development. Ongoing participation in IFS initiatives provides an opportunity for the Yuma Region to leverage finite local resources with the marketing investment and name recognition of the larger communities in the IFS region.

The twelve major recommendations are outlined below.

Major Theme: Expanding the Yuma Region's Capacity and Attractiveness for Manufacturing Activities

Recommendation 1: Designate **Manufacturing Investment Zones** in strategic areas of the Yuma Region; concentrate available resources on enhancing the "project readiness" of these areas.

Recommendation 2: Establish **Manufacturing Red Team** composed of officials from the local municipalities, Yuma County, and GYEDC. The Red Team should focus on maintaining a manufacturing-friendly regulatory environment and streamlining development/permitting processes for manufacturing projects.

Recommendation 3: Establish a **Manufacturing Skills Taskforce** (including representatives of JTED, AWC, YPIC, etc.) to ensure that the Yuma Region's educational and workforce training systems are responsive to the needs of existing and prospective manufacturing employers.

Establish a Manufacturing Skills Taskforce to ensure that the Yuma Region's educational and workforce training systems are of existing and prospective manufacturing employers.

Major Theme: Manufacturing-focused Business Development

Recommendation 4: Continue to foster a **culture of industry clustering** (i.e., supply chain networking) among Yuma Region manufacturing firms and related support businesses.

Recommendation 5: Expand **outreach to existing Yuma Region manufacturing firms** to define the "business case" for needed manufacturing support activities (i.e., supply chain firms); determine specific support needs to facilitate businesses expansions or start-ups related to the identified business opportunities.

Recommendation 6: **Target high-priority manufacturing industries** (as identified and refined through the efforts connected with this project) as part of GYEDC's marketing and business attraction programs.

Recommendation 7: Position the Yuma Region as a key player in regional marketing and cluster-development efforts of the **Innovation Frontier Southwest (IFS) initiative**; actively and directly participate in IFS implementation to expand the reach of the Yuma Region's marketing and business recruitment efforts.

Recommendation 8: Expand cross-border collaboration focused on **development of bi-national manufacturing supply chains**; optimize the Yuma Region's capture of this activity (which may include non-manufacturing components of the supply chain) based on the Yuma Region's strategic "dual border" (U.S./Mexico and Arizona/California) location.

Recommendation 9: Continue to serve as a **clearinghouse for financial incentives and business capital** programs; expand access to business capital through coordination with IFS initiatives (see also Recommendation 12) and other entities identified in this report.

Major Theme: Organizational Support / Securing Resources for IMCP Implementation

Recommendation 10: Establish **IMCP Implementation Taskforce** to coordinate ongoing implementation of this strategic plan.

Recommendation 11: Aggressively pursue **federal and state funding** to address critical infrastructure gaps affecting the immediate availability of developable property within the Manufacturing Investment Zones; establish a **Manufacturing Infrastructure Committee** to recommend to the proper local agency a prioritization of infrastructure projects and funding applications.

Recommendation 12: Pursue **strategic partnerships to expand access to angel funding and venture capital** for entrepreneurial start-ups and technological innovation in the Yuma Region; promote availability of these resources through a local clearinghouse function (see Recommendation 9).

As indicated on the chart on the next page, implementation of the IMCP strategic plan will involve direct collaboration of several partner organizations including, but not limited to, the following key entities, plus the cooperative participation of external entities such as Copresan and other Mexican organizations and jurisdictions, and the Innovation Frontier Southwest (IFS) Consortium:

- Yuma County
- Cities (Yuma, Somerton and San Luis)
- Greater Yuma Economic Development Corporation (GYEDC)
- Western Arizona Economic Development District (WAEDD)

Implementation Partners

	County	GYEDC	WAEDD	Cities	Other Local Entities	External Entities
Expanding the Yuma Region's Capacity/Attractiveness for Manufacturing Activities						
Site/facility/infrastructure readiness	X	X	X	X	X	
Regulatory environment	X	X		X		
Manufacturing workforce		X			X	
Manufacturing-focused Business Development						
Manufacturing "cluster" networks	X	X	X	X		X
Business expansion	X	X		X		
Marketing/business attraction	X	X	X	X		
Regional manufacturing supply chain (IFS region)	X	X		X		X
Bi-national marketing and supply chain development	X	X		X	X	X
Capital Access	X	X		X		X
Organizational Support/Resources of IMCP Implementation						
IMCP Implementation Taskforce	X	X	X	X		
Federal and state funding resources	X		X	X		X
Angel funding and venture capital		X	X			X

Chapter 3: Industry-Competitiveness Assessment

This section reports the findings of the TNDG Team's quantitative assessment of the competitiveness of the Yuma Region with respect to the industries discussed below. The analysis included typical assessment procedures to identify especially competitive industries (compatible with a target-industry study), with additional detail applied to most manufacturing industries represented in the Yuma Region. Specifically, there are three separate analyses reported, which are in some ways independent but are potentially complementary: 1) an analysis based on employment data by industry, evaluating all industry sectors in the County with the same set of criteria, 2) a trade-flow analysis examining local production and consumption patterns for a wide range of commodities and services, and 3) a manufacturing-focused analysis that reviews conditions for any manufacturing industry with 20 or more existing employees in Yuma County, based on 2013 employment estimates. (In order to avoid redundancies, this component of the analysis does not address manufacturing industries identified in the first two assessments).

Competitively Strong Industries Based on Employment Data

Utilizing detailed employment-by-industry data from Economic Modeling Specialists Incorporated (EMSI), the TNDG Team employed multiple data analysis techniques and screening mechanisms to identify local industries with existing competitive advantages and those industries that appear to offer exceptional opportunities for growth and development. The first data analysis calculated location quotients for existing Yuma Region industries. A location quotient (LQ) compares the relative proportion of a given industry in the local economy to the proportion of total employment in that industry for a reference area, in this case the United States. If the proportions are equal, then the location quotient equals 1.0. For example, in Yuma County the Masonry Contractors industrial sector has a location quotient almost exactly equal to 1.0. This means that the proportion of Masonry Contractor employment in Yuma County is the same as the national average.

If a location quotient is above about 1.0, we assume that the local area possesses some sort of competitive advantage in that industry. For example, the Crop Harvesting Industry for Yuma County has a location quotient greater than 54, meaning that as a percentage of the total workforce, more than 50 times as many jobs for that industry are located in Yuma County compared to the national average. These competitive advantages could be a result of natural resource availability, locational characteristics, or any combination of labor force, supply chain or other market conditions.

A location quotient less than 1.0 indicates that a given industry is under-represented in the Yuma County economy. This could represent an underserved market, or could simply be a reflection of local market conditions. For example, one would not expect the shipbuilding industry to be located in Yuma County, though local agricultural production could demand shipping services to export their commodities to international markets. More often, a location quotient in the range of 0.5 to 0.9 represents industries that may offer industrial targets of opportunity for local economic development. (While an LQ of less than 0.5 also represents potential market opportunities, there may not be enough local market demand and industry resources available to justify targeting those industries for recruitment or development.)

The second analytical technique employed is a Dynamic Shift Share Analysis. This methodology separates employment change in a given industry into three causal areas: National Effect, Industry Effect, and Competitive Effect. The National Effect identifies the component of employment change

assumed to be caused by overall national economic trends. For example, if total employment in the US grew by 10% from 2009-2012, and a given industry in Yuma County grew by 18%, we would assume that 10% of that growth is due to overall economic growth. Because industries do not usually exactly follow national economic trends, we also consider the Industry Effect that assigns a portion of local employment change in a particular industry to that industry's national trends. For example, because of an aging population total employment in the healthcare services industry has risen faster than national average employment growth, which would mean that a portion of healthcare sector growth in the Yuma Region would be a reflection of this broader industry trend at the national level. The Industry Effect could also be negative for declining industries such as telecommunications equipment manufacturing, which has largely moved off-shore.[1]

The sum of the National Effect and Industry Effect is called the Expected Change. For example, employment in Commercial and Industrial Machinery and Equipment Manufacturing industry in Yuma County grew by 70 jobs over the study period. Of the growth, 11 of the new jobs reflect overall economic trends (National Effect) and an additional 5 jobs indicate overall relative job growth in that industry across the nation (Industry Effect). The sum of these two effects, 16, is the Expected Change for employment growth in that industry in Yuma County. As noted, the actual growth in that industry in Yuma County was 70 jobs and the difference in actual job growth and the Expected Change is called the Competitive Effect, or 54 jobs (70-16=54). This means that the Yuma County economy demonstrated a competitive advantage in this sector of the economy – the industry grew faster than can be explained by broader economic and industry trends.

The Team calculated location quotients and conducted shift share analyses for several hundred industry sectors in Yuma County. To reduce the number of industries for consideration as targets the Team engaged in a multi-level screening process based on the 100 "best" industries by location quotient (counted separately for higher LQs (1.5 and above) or low LQs (0.6 to 0.9)), Expected Change, and Competitive Effect. To make it through the initial screening, a given industry had to be among the "best" for at least two of these measures. We then added two additional criteria: overall national growth for any given industry (to avoid targeting declining industries) and projected national growth for each industry being at least 10% over the next seven years. Government sector jobs, at any level, were excluded. The resulting initial list of potential industries using these screening processes comprises 44 sectors including agriculture, manufacturing, retail trade, and services, shown on Table 1 (below). Note that the evaluation values vary considerably among these sectors, and they are listed in NAICS-code order with no attempt to rank them by any one or combination of analysis-variable values.

[1] The data used for location quotient and shift share analyses rely on industry and/or occupational employment estimates. A noted weakness of either methodology is that there are no direct modeling inputs to adjust for regional differences in labor productivity. While these differences do exist, in practice they have little consequence in the identification of competitive industries for economic development purposes. Sectors targeted for industrial recruitment or expansion typically represent potential marginal increases in new jobs that far exceed the marginal effects of productivity variance. One way of looking at this is to consider that if a local business is experiencing substantial and rapid (positive) changes in productivity, that industry should still be generating net new employment due to increasing market share.

Table 1. Competitively Strong Industries in the Yuma Region Meeting Two or More Screening Criteria

NAICS	Description	LQ region 2013	Expected Change	Actual Change	Comp Effect	Nat'l Job Δ 01-13	Nat'l Job Δ 13-20
115112	Soil Preparation, Planting, Cultivating	6.4	63	73	10	43.1%	25.1%
115113	Crop Harvesting, Primarily by Machine	54.8	346	(1,610)	(1,956)	16.7%	19.9%
115114	Postharvest Crop Activities (except Cotton)	44.2	671	(215)	(886)	31.2%	17.1%
115116	Farm Management Services	24.3	213	(358)	(571)	29.6%	25.4%
221310	Water Supply and Irrigation Systems	6.2	16	23	7	14.5%	20.4%
311991	Perishable Prepared Food Manufacturing	9.1	12	145	133	60.9%	21.7%
336212	Truck Trailer Manufacturing	2.1	-	33	33	9.6%	28.7%
424480	Fresh Fruit and Vegetable Merchant Wholesalers	2.2	111	(449)	(560)	20.4%	23.4%
442299	All Other Home Furnishings Stores	0.7	1	38	37	3.5%	23.6%
443112	Radio, Television, and Other Electronics Stores	1.0	16	71	55	21.9%	29.1%
446110	Pharmacies and Drug Stores	0.7	5	102	97	3.3%	11.2%
448150	Clothing Accessories Stores	0.8	20	3	(17)	64.1%	38.0%
452910	Warehouse Clubs and Supercenters	2.5	107	1,384	1,277	76.3%	29.6%
484230	Specialized Freight (except Used Goods) Trucking, Long-Distance	1.4	3	63	60	14.6%	24.7%
485991	Special Needs Transportation	1.4	23	16	(7)	69.9%	26.2%
488210	Support Activities for Rail Transportation	3.6	-	49	49	46.6%	20.9%
493120	Refrigerated Warehousing and Storage	7.0	24	105	81	30.1%	21.4%
522390	Activities Related to Credit Intermediation	0.8	1	50	49	26.4%	11.6%
523920	Portfolio Management	0.4	37	157	120	159.1%	48.9%
523930	Investment Advice	0.3	94	130	36	130.1%	49.4%
541330	Engineering Services	0.5	14	99	85	11.3%	19.8%
541380	Testing Laboratories	13.8	2	1,025	1,023	13.1%	24.3%
541511	Custom Computer Programming Services	0.8	1	352	351	25.7%	31.2%
541611	Administrative / General Management Consulting Services	0.5	44	122	78	65.9%	31.1%
541613	Marketing Consulting Services	0.5	14	79	65	106.1%	41.3%
561422	Telemarketing Bureaus	7.7	103	1,240	1,137	29.7%	31.9%
611110	Elementary /Secondary Schools (Private)	0.9	33	278	245	23.3%	15.2%
611610	Fine Arts Schools (Private)	0.7	27	40	13	77.7%	23.4%
621111	Offices of Physicians (except Mental Health)	1.0	193	489	296	25.4%	21.0%
621210	Offices of Dentists	0.8	35	162	127	21.8%	19.6%
621340	Physical, Occupational, Speech Therapists	0.8	74	73	(1)	83.1%	35.6%
621399	Offices of Other Misc. Health Practitioners	0.6	25	60	35	69.8%	30.9%
621420	Outpatient Mental Health and Substance Abuse Centers	4.5	74	262	188	45.7%	26.7%
621491	HMO Medical Centers	4.4	-	250	250	96.4%	46.6%
621492	Kidney Dialysis Centers	2.13	-	102	102	63.5%	42.0%
621610	Home Health Care Services	0.3	71	148	77	102.3%	46.8%
622110	General Medical and Surgical Hospitals (Private)	1.0	274	371	97	16.9%	13.1%
622310	Specialty Hospitals (Private)	1.4	-	135	135	59.9%	42.6%
623110	Nursing Care Facilities	0.8	29	207	178	7.8%	13.8%
624120	Services for the Elderly and Persons with Disabilities	0.5	13	324	311	269.8%	42.9%
713110	Amusement and Theme Parks	0.6	3	32	29	17.3%	24.3%
713910	Golf Courses and Country Clubs	0.9	12	115	103	25.7%	17.2%
722110	Full-Service Restaurants	0.8	372	477	105	25.6%	15.9%
722310	Food Service Contractors	0.7	168	(174)	(342)	43.8%	23.1%

Source: EMSI, Authors' calculations

	Manufacturing industry

Using this data-driven analytical approach, competitively strong industries appear in the 13 major (2-digit) sectoral categories shown below, including Manufacturing, which is represented, based on the analysis described above, by only two industries (highlighted in the table above):

Agriculture (4 industries)
Utilities (1)
Manufacturing (2)
Wholesale trade (1)
Retail trade (5)
Transportation and warehousing (4)
Finance and insurance (3)
Professional, Scientific, and Technical Services (5)
Administrative and Support and Waste Management and Remediation Services (1)
Educational services (2)
Health services (12)
Arts, Entertainment, and Recreation (2)
Accommodation and Food Services (2)

One finding readily apparent from this analysis is that the results should not be considered universally "strategic." That is, some of the above industries might be suitable targets for expansion while others are most appropriately left to typical market forces. For example, the Yuma Region has a strong medical-services sector due to its function as a central city for its region, its location on the border, and its sizable influx of seasonal visitors. Maximizing the potential for medical services delivery might be a general economic development strategy for the region; but strategies are unlikely to focus on specific, detailed medical-service industries unless there is a compelling public-sector participation role.

Within the context of this study, with its focus on manufacturing, the preceding employment-based analysis identifies only two manufacturing industries out of the 44 on the screened list. Manufacturing industries will be addressed in detail in subsequent sections, but the two competitively strong industries should be noted: Perishable Prepared Food Manufacturing, an established industry in the Yuma Region, and Truck Trailer Manufacturing, a relatively new industry for the region.

Commodities-based analysis

The second stage of our quantitative assessment addresses potential targets for economic development based on an examination of regional trade flows for more than 400 commodities and services consumed and/or produced in Yuma County. These data are based on the IMPLAN economic input-output model for 2012, the most recent data available. Using data from the US Census Bureau, the Bureau of Economic Analysis, the US Department of Transportation, and other sources, the IMPLAN model describes transactions among and between industries, institutions (government), and households. Trade imbalances can highlight existing competitive advantages (for example the region has net exports in some commodities) and potential for local industry development (net imports). Information provided by this analysis can be combined with the analysis of competitive industries above to further screen the list of potential industries that could be incorporated into an economic development strategy, and/or possibly indicate the type of development activity best suited to the local market. For example, having net imports of $8 million for Chocolate Confectioneries from Purchased Chocolate would not be enough market opportunity to recruit a Hershey's manufacturing facility, but it could represent a potential business opportunity for a local entrepreneur.

The commodities data are summarized on the following numbered tables, each with a companion table that focuses on commodities' potential ties to Yuma Region manufacturing:

Table 2: Commodities and services with substantial net exports from Yuma County

Table 3: Commodities and services that represent net imports (local demand is higher than local production), and no local production

Table 4: Imported commodities and services, with some local production.

Table 2 below reports those commodities and services with substantial net exports from Yuma County. While the sector numbering scheme is different from our employment analysis, making direct industry-by-industry comparisons of these two analytic approaches invalid, the same overall pattern of local industry strengths and challenges emerges. For retail services, a net export means that, on average, local retailers are attracting out-of-area shoppers bringing in new sales and tax revenue for Yuma County and its municipalities.

TABLE 2. EXPORT COMMODITIES AND SERVICES FROM YUMA COUNTY

Description	Exports
Vegetables and melons	$ 567,143,229
Agriculture and forestry support services	$ 198,901,960
All other crop farming products	$ 125,941,315
Scenic and sightseeing transportation services and support activities for transportation	$ 107,465,103
Commercial and industrial machinery and equipment rental and leasing services	$ 106,577,675
Fluid milk and butter	$ 103,018,362
Artificial and synthetic fibers and filaments	$ 95,981,358
All other manufactured food products	$ 68,864,797
Fiber filaments, yarn, and thread	$ 58,860,999
Business support services	$ 51,995,183
Wild game products, pelts, and furs	$ 37,319,226
Retail Services - General merchandise	$ 33,728,972
All other basic inorganic chemicals	$ 30,261,300
Forest, timber, and forest nursery products	$ 29,749,161
Water, sewage treatment, and other utility services	$ 19,524,951
Retail Services - Gasoline stations	$ 18,826,578
Other accommodation services	$ 17,580,450
Retail Services - Motor vehicle and parts	$ 17,517,760
Ready-mix concrete	$ 14,179,726
Architectural, engineering, and related services	$ 13,497,349
Facilities support services	$ 13,157,654
Cattle from ranches and farms	$ 12,048,900
Crowned and stamped metals	$ 11,645,004
Commercial and industrial machinery and equipment repairs and maintenance	$ 11,269,532
Cotton	$ 9,930,798
Rail transportation services	$ 9,510,893
Waste management and remediation services	$ 8,699,627
Fruit	$ 8,677,374
Engineered wood members and trusses	$ 7,919,273

Source: IMPLAN, Authors' calculations

Not surprisingly, net exports are strong in agricultural output (both in number of commodity categories and especially in dollar volume) and in retail goods. Although translation of commodities to industry categories is inherently problematic, ten of the above categories appear to have a direct relationship to manufacturing (and are listed in the same order as the preceding table, by value of exports). The right-hand column shows potential connections of sectors to the Yuma Region manufacturing-related Leading Industries (leading industries designated by GYEDC).

Commodity	Possible tie to Yuma Region Leading Manuf.-related Industries
Fluid milk and butter	Food/agribusiness
Artificial and synthetic fibers and filaments	
All other manufactured food products	Food/agribusiness
Fiber filaments, yarn, and thread	
Wild game products, pelts, and furs	Food/agribusiness
All other basic inorganic chemicals	Food/agribusiness
Forest, timber, and forest nursery products	Food/agribusiness
Ready-mix concrete	
Crowned and stamped metals	Industrial manufacturing
Engineered wood members and trusses	

For commodities and services that represent net imports (local demand is higher than local production), we separate the findings by those that have no local production and those with at least some local production (Table 3, below). These lists have been screened to not include industries with minimal economic development potential. For example, local labor force, geographic, and institutional characteristics mean that Yuma County is not likely to attract large pharmaceutical manufacturers to the area. Similarly, the region is unlikely to host a major petrochemical refinery, ship building facility, or farm equipment assembly plant. We have also redacted food manufacturing that requires agricultural products not grown in the county, with the exception of beer.

TABLE 3. IMPORTED COMMODITIES/SERVICE WITH NO LOCAL PRODUCTION (REDACTED LIST)

Description	Imports
Funds, trusts, and other financial services	$ 85,172,149
Men's and boys' cut and sewn apparel	$ 21,129,482
Leasing of nonfinancial intangible assets	$ 21,099,362
Beer, ale, malt liquor and nonalcoholic beer	$ 19,335,289
Other engine equipment	$ 18,366,727
Distilled liquors except brandies	$ 10,237,124
Other fabricated metals	$ 8,556,874
Chocolate confectioneries from purchased chocolate	$ 8,005,487
Plastics pipes and pipe fittings	$ 5,878,728
Non-chocolate confectioneries	$ 5,697,877
All Other Transportation Equipment	$ 5,372,765
Motors and Generators	$ 5,141,097

Source: IMPLAN, Authors' calculations

Most of the commodity categories on this table are potentially associated with manufacturing, as listed in the table below, although the dollar amounts in several cases are relatively small. The right-hand column shows potential connections of sectors to Yuma Region manufacturing-related Leading Industries.

Commodity	Possible tie to Yuma Region Leading Manufacturing-related Industries
Men's and boys' cut and sewn apparel	
Beer, ale, malt liquor and nonalcoholic beer	Food/agribusiness
Other engine equipment	
Distilled liquors except brandies	Food/agribusiness
Other fabricated metals	Industrial manufacturing
Chocolate confectioneries from purchased chocolate	Food/agribusiness
Plastics pipes and pipe fittings	
Non-chocolate confectioneries	Food/agribusiness
All Other Transportation Equipment	
Motors and Generators	Industrial manufacturing

Imported commodities and services in which some local production is also occurring are shown on Table 4.

Table 4. Imported Commodities and Services with Local Production (redacted list)

Description	Net Commodity Supply*	Imports
Real estate buying and selling, leasing, managing, and related services	$ 98,880,670	$ 427,195,918
Wholesale trade distribution services	$ 261,470,858	$ 249,451,053
Scientific research and development services	$ 5,205,907	$ 166,482,901
Private junior colleges, colleges, universities, and professional schools	$ 51,102,224	$ 98,507,900
Legal services	$ 22,024,883	$ 97,225,527
Offices of physicians, dentists, and other health practitioners	$ 233,199,847	$ 96,566,481
Custom computer programming services	$ 41,695,758	$ 91,821,623
Private hospital services	$ 382,108,545	$ 84,422,951
Management of companies and enterprises	$ 13,855,513	$ 81,558,679
Search, detection, and navigation instruments	$ 9,902,287	$ 74,821,806
Computer systems design services	$ 7,715,337	$ 68,311,531
Data processing- hosting- ISP- web search portals	$ 12,103,715	$ 57,618,246
Fertilizer	$ 52,338,054	$ 54,590,845
Electronic computers	$ 6,776,121	$ 50,784,131
Accounting, tax preparation, bookkeeping, and payroll services	$ 19,498,399	$ 47,937,063
Pesticides and other agricultural chemicals	$ 41,458,680	$ 41,602,130
Nursing and residential care services	$ 75,055,672	$ 38,448,155
Advertising and related services	$ 52,942,610	$ 38,320,922
Broadcast and wireless communications equipment	$ 137,125	$ 34,065,431
Investigation and security services	$ 2,659,254	$ 32,358,192
Home health care services	$ 20,628,162	$ 31,918,806

Description	Net Commodity Supply*	Imports
Women's and girls' cut and sewn apparel	$ 11,805	$ 30,559,353
Software	$ 2,849,828	$ 29,974,137
Hotels and motel services, including casino hotels	$ 39,208,205	$ 29,411,919
Insurance agencies, brokerages, and related services	$ 19,207,148	$ 26,924,349
Office administrative services	$ 4,508,859	$ 26,091,962
Amusement parks, arcades, and gambling recreation	$ 16,438,366	$ 25,175,938
Personal care services	$ 12,119,883	$ 23,881,663
Animal products, except cattle, poultry and eggs	$ 1,086,642	$ 22,215,883
Other private educational services	$ 14,544,795	$ 19,728,938
Environmental and other technical consulting services	$ 5,180,485	$ 19,615,272
Computer terminals and other computer peripheral equipment	$ 1,565,629	$ 18,827,253
Canned, pickled and dried fruits and vegetables	$ 4,263,870	$ 18,003,105
Frozen foods	$ 9,965	$ 15,754,663
Electronic and precision equipment repairs and maintenance	$ 14,285,336	$ 14,655,177
Processed animal (except poultry) meat and rendered byproducts	$ 17,297,467	$ 14,546,963
Footwear	$ 583,957	$ 14,162,749
Machined products	$ 1,058,638	$ 13,053,251
Spectator sports	$ 2,914,682	$ 12,924,912
Other computer related services, including facilities management	$ 56,070,812	$ 12,848,977
Electricity and signal testing instruments	$ 270,519	$ 12,841,320
Flavoring syrups and concentrates	$ 990,717	$ 12,726,217
Elementary and secondary education from private schools	$ 13,898,636	$ 12,621,464
Ornamental and architectural metal products	$ 1,280,098	$ 10,753,290
Veterinary services	$ 5,855,904	$ 10,600,803
Warehousing and storage services	$ 19,262,575	$ 10,367,961
Institutional furniture	$ 1,192,488	$ 10,039,909
Plastics packaging materials and unlamented films and sheets	$ 113,651	$ 9,864,219
Sporting and athletic goods	$ 36,996	$ 9,603,275
Museum, heritage, zoo, and recreational services	$ 1,582,105	$ 9,032,539
Other commercial and service industry machinery	$ 136,095	$ 8,371,505
Valves and fittings other than plumbing	$ 9,431	$ 7,904,260
Management, scientific, and technical consulting services	$ 62,118,417	$ 7,758,631
Other plastics products	$ 21,792,933	$ 7,472,770
Relay and industrial controls	$ 15,880	$ 7,105,727
Greenhouse, nursery, and floriculture products	$ 6,532,184	$ 6,670,838
Photographic services	$ 268,353	$ 6,226,964
Specialized design services	$ 1,366,535	$ 5,986,199
Other information services	$ 920,736	$ 5,837,855
Coated and laminated paper, packaging paper and plastics film	$ 29,831	$ 5,818,142
Coated, engraved, heat treated products	$ 907,430	$ 5,544,698
Internet publishing and broadcasting services	$ 481,407	$ 5,459,165
Automotive equipment rental and leasing services	$ 31,486,874	$ 5,229,606

* Net Commodity Supply is the value of a commodity/service available for consumption by local industries, institutions, and households. It is "net" of industry self-consumption (some industries consume a portion of their own production as inputs).

Source: IMPLAN, Authors' calculations.

The manufacturing-related commodities in Table 4 (above) include the sectors shown below (in the same order as the preceding table). The right-hand column shows potential connections of sectors to Yuma Region manufacturing-related Leading Industries.

Commodity	Possible tie to Yuma Region Leading Manuf.-related Industries
Search, detection, and navigation instruments	Aviation/defense
Fertilizer	Food/agribusiness
Electronic computers	
Pesticides and other agricultural chemicals	Food/agribusiness
Broadcast and wireless communications equipment	
Women's and girls' cut and sewn apparel	
Animal products, except cattle, poultry and eggs	Food/agribusiness
Computer terminals and other computer peripheral equipment	
Canned, pickled and dried fruits and vegetables	Food/agribusiness
Frozen foods	Food/agribusiness
Processed animal (except poultry) meat and rendered byproducts	Food/agribusiness
Footwear	
Machined products	Industrial manufacturing
Electricity and signal testing instruments	Aviation/defense
Flavoring syrups and concentrates	Food/agribusiness
Ornamental and architectural metal products	
Institutional furniture	
Plastics packaging materials and unlamented films and sheets	
Sporting and athletic goods	
Other commercial and service industry machinery	Industrial manufacturing
Valves and fittings other than plumbing	Industrial manufacturing
Other plastics products	
Relay and industrial controls	Industrial manufacturing
Greenhouse, nursery, and floriculture products	Food/agribusiness
Coated and laminated paper, packaging paper and plastics film	
Coated, engraved, heat treated products	Industrial manufacturing

Table 5 (below) focuses on retail trade opportunities. An import of a retail trade good or service suggests that expected household spending in a given sector reflects local and non-local spending. Of course, some of these exports reflect internet and other electronic purchasing, which is not likely to be recaptured. Still, there appears to be market opportunity for growth in the regional retail trade sector, which would increase county employment and tax revenues.

TABLE 5. IMPORTS IN RETAIL TRADE SECTORS

Description	Net Commodity Supply*	Imports
Restaurant, bar, and drinking place services	$ 255,826,518	$ 81,472,737
Retail Services - Nonstory, direct and electronic sales	$ 15,570,211	$ 61,410,025
Retail Services - Clothing and clothing accessories	$ 22,823,329	$ 36,180,059
Retail Services - Health and personal care	$ 22,585,448	$ 22,896,660
Retail Services - Food and beverage	$ 76,921,251	$ 18,707,598
Retail Services - Electronics and appliances	$ 15,149,682	$ 15,154,249
Retail Services - Furniture and home furnishings	$ 13,092,606	$ 10,399,053
Retail Services - Building material and garden supply	$ 41,073,831	$ 8,481,508
Retail Services - Sporting goods, hobby, book and music	$ 10,622,056	$ 8,155,981

* The value of a commodity/service available for consumption by local industries, institutions, and households.

Source: IMPLAN, Authors' calculations

Manufacturing Focus

Focusing economic development strategies toward manufacturing recognizes manufacturing industries' advantages, generally, of: 1) higher average wages, 2) creating more indirect economic activity for the local region through the purchase of goods and supplies to support production activities, 3) having a large impact on the local tax base, and 4) providing a source of net cash inflows from the export of manufactured goods to buyers outside of the region. In this analysis we focus on potential manufacturing industries as targets of opportunity for economic development that were not covered in previous components of our research.

Our approach to this manufacturing-centric analysis is to consider any manufacturing industry with 20 or more employees in Yuma County, based on 2013 employment estimates. All of these detailed industries were included in our assessment described above, but did not make the cut for one or more reasons. It is possible that some of these industries may represent opportunities for development in the Yuma Region, but they may pose higher risk to reward ratios than other industries. This does not mean that the Yuma Region should not consider these opportunities, but local economic development leaders will need to consider the potential for higher risk. For example, it is possible that the Yuma Region is highly competitive in an industry that is not expected to grow nationally over the next several years. That particular industry may offer near term opportunities for growth creating regional jobs in the short run, but requires careful monitoring to see if conditions remain favorable.

Table 6 below shows 21 detailed manufacturing sectors in the Yuma County economy that have at least 20 jobs, and are not among the two manufacturing industries selected through the "Competitively Strong Industries Based on Employment Data" process described above. The table summarizes an initial evaluation of the 21 industries' suitability for potential inclusion in a comprehensive economic development strategy. Some have impressive location quotients and other measures of relative strength. For each industry, we highlight these strengths, along with indicators of potential weakness. The table identifies industries having potential linkages with commodities, based on the import and export data tabulated above, that could represent opportunities, and also assigns an "industry cluster" title to some.

Table 6. Manufacturing Industries in the Yuma Region, Target Industry Considerations

Industry	2013 Jobs	Key Positive	Cautions	Potential Linkage to Commodity Analysis	Cluster	Possible tie to Yuma Region Leading Industries
Noncellulosic Organic Fiber	259	LQ 33.8, strong shift share	Declining sector, nationally: -26% US 2023 projection	Exports	Textiles/apparel	
Pesticide and Other Agricultural Chemical	186	LQ 27.7, shift share shows only moderate local advantage	Declining industry, nationally: -7% through 2023.	Imports	Agribusiness	Food/agribusiness
Storage Battery	153	Strong LQ & shift share	No future growth according to national projections; but auto-related prospects could differ considerably		Transportation equip.	Other
Fluid Milk	152	Strong LQ & shift share due to emergence in the Yuma Region	No future growth, nationally	Exports	Agribusiness	Food/agribus.
Other Plastic Products	104	Good shift share	No future growth, nationally			
Glass Product Made of Purchased Glass	88	Strong LQ, good shift share, possible future growth	Recent national trends negative (Recession-related)		Construction materials	
Wood Container and Pallet	84	Strong LQ and shift share	Support industry only			
Ready-Mix Concrete	81	Good LQ, interesting company	Environmental considerations	Exports	Construction materials	
Nitrogenous Fertilizer	76	Very Strong LQ, good shift share, emerging industry	No future national growth	Imports	Agribusiness	Food/agribus.
Aircraft	70	Strong LQ	Presence is tied to defense installations		Aviation/defense	Aviation/defense
Trusses	65	Strong LQ	Shift share show no local advantage, declining industry nationally	Exports	Construction materials	
Fabricated Structural Metal Manufacturing	52	Decent LQ (1.3) and shift share.	Recent declines, but could be offset by future growth		Construction materials	
Metal Stamping	41	Good LQ	Negative shift share	Exports	Ind. manuf.	Ind. manuf.

Industry	2013 Jobs	Key Positive	Cautions	Potential Linkage to Commodity Analysis	Cluster	Possible tie to Yuma Region Leading Industries
Misc. Textile Product Mills	39	Good LQ, Good Shift share	No future growth, nationally	Imports	Textiles/apparel	
Misc. Chemical Products & Preparations	38	Good LQ	No local competitive advantage based on shift share	Exports	Agribusiness	Food/agribus.
Signs	31	Market opportunity (LQ 0.6). Good shift share.	Usually not high wage			
Asphalt Paving Mixture and Block	26	Good LQ and shift share.	Only modest future growth, nationally		Construction materials	
Yarn Texturizing, Throwing, and Twisting Mills	25	Very strong LQ	Massive local job losses, very negative shift share	Exports	Textiles/apparel	
Wood Kitchen Cabinet and Countertops	25	Market opportunity (LQ 0.5)	No local competitive advantage, only modest forecasted industry growth		Construction materials	
Ice	21	Strong LQ, good shift share	Not a growing industry, local commodity			
Other Basic Inorganic Chemicals	20	Decent LQ (1.5) and shift share.	Small base, uncertain industry categorization, negative outlook nationally	Exports	Ind. manuf.	Ind. manuf.

The group of industries in Table 6 above can be organized by cluster groups as follows (with clusters listed roughly in NAICS numbering order):

Industry	TNDG Cluster Assignment
Pesticide and Other Agricultural Chemical	Food/Agribusiness
Fluid Milk	Food/Agribusiness
Nitrogenous Fertilizer	Food/Agribusiness
Misc. Chemical Products & Preparations	Food/Agribusiness
Noncellulosic Organic Fiber	Textiles/apparel
Misc. Textile Products	Textiles/apparel
Yarn Texturizing, Throwing, and Twisting Mills	Textiles/apparel
Glass Product Made of Purchased Glass	Construction materials
Ready-Mix Concrete	Construction materials
Trusses	Construction materials
Fabricated Structural Metal Manufacturing	Construction materials
Asphalt Paving Mixture and Block	Construction materials
Wood Kitchen Cabinet and Countertops	Construction materials
Metal Stamping	Industrial manufacturing
Other Basic Inorganic Chemicals	Industrial manufacturing
Storage Battery	Transportation equip.
Aircraft	Aviation/defense
Other Plastic Products	Misc.
Wood Container and Pallet	Misc.
Signs	Misc.
Ice	Misc.

The following paragraphs briefly describe and analyze each of these industries. The industry descriptions are based in part on the North American Industry Classification System (NAICS) from the U.S. Census Bureau.

Food/agribusiness

Pesticide and Other Agricultural Chemical Manufacturing: Given the Yuma Region's continued economic strength in agricultural production, it makes sense that agriculture-supporting manufacturing industries could provide growth and development opportunities. This industry sector boasts a regional location quotient of 27.7, but has actually been on a declining employment trend for more than a decade, nationally and to a lesser extent locally. The industry does not show strong potential as a national market as projected national employment change over the next decade suggests continuing job losses. Commodity import demand figures, however, show potential opportunity in the Yuma Region for this industry.

Fluid Milk Manufacturing: Another agricultural-based industry that has recently performed well in the Yuma Region. This industry was not selected in our employment-based analysis (above) due to national

employment trends. However, given the industry's growth in Yuma, adding 150 jobs in the past decade, this sector could offer an opportunity for the Yuma Region to attract a bigger share of overall milk production activities. The industry shows a strong commodity-export linkage.

Nitrogenous Fertilizer Manufacturing: This agricultural industry support sector, while showing regional job growth, is not projected to be a significant growth industry at the national level. There is however potential opportunity linked to commodity import demand.

Miscellaneous Chemical Products and Preparations Manufacturing: This is a very broad catch-all industry classification and it is therefore difficult to discern any specific growth opportunities for this sector. There are several firms in this industry in the Yuma Region, producing agricultural products and custom blending. At 38 local jobs, it is not an industry that would seem to present substantial future opportunities for growth in the Yuma Region. Moreover, the sector shows no local competitive advantage based on a shift share analysis. That is not to say that a specific company may not be worthy of support, and there is a possible strong commodity-export linkage at present. However, as an aggregated industry this is not an attractive expansion target.

Textiles/apparel

Noncellulosic Organic Fiber Manufacturing: "Establishments primarily engaged in (1) manufacturing noncellulosic (i.e., nylon, polyolefin, and polyester) fibers and filaments in the form of monofilament, filament yarn, staple, or tow, or (2) manufacturing and texturizing noncellulosic fibers and filaments" (www.census.gov). This industry has an impressive regional location quotient of 33.8 and represents 259 estimated jobs in Yuma County in 2013. However, employment in this industry in 2007 approached 600 total jobs and the overall national trend for the 2001 to 2013 period was a 47% decline in industry employment. Moreover, the industry is projected to decline by another 26% nationally through 2023. The Yuma Region could see gains in local employment by capturing industry consolidation, but this is not projected to be an overall growth industry in the U.S. and therefore has to be considered a marginal investment of economic development resources. There is a possible positive commodity-export linkage at present, however

Miscellaneous Textile Product Mills: As described by the U.S. Census Bureau: "this industry comprises establishments primarily engaged in manufacturing textile products (except carpets and rugs; curtains and linens; textile bags and canvas products; rope, cordage, and twine; and tire cords and tire fabrics) from purchased materials. These establishments may further embellish the textile products they manufacture with decorative stitching. Establishments primarily engaged in adding decorative stitching such as embroidery or other art needlework on textile products, including apparel, on a contract or fee basis for the trade, are included in this industry." While having grown in Yuma County over the past several years, this is still a relatively small sector that is characterized by, generally, jobs with low skill requirements and wages. There is potential opportunity for this industry linked to commodity import demand.

Yarn Texturizing, Throwing, and Twisting Mills: This industry shows a 2013 location quotient of 7.9. However, it has lost almost 400 jobs in the county since 2001, and substantial job losses are projected nationally. Consequently the industry cannot be considered a likely opportunity for future growth, even though trade-flow data indicate a possible strong commodity-export linkage.

Construction materials

Glass Products Made of Purchased Glass Manufacturing: This industry exemplifies the presence of a significant existing industry in the Yuma Region. The industry has grown locally, but not more than what can be explained by external factors such as overall economic growth and national industry trends. Construction industry trends dominate this industrial sector and therefore, assuming the national economy continues to recover from the recession of 2007-2009, then targeting this sector for business expansion support activities may make sense.

Ready Mix Concrete Manufacturing: This industry also cycles with the other construction industries. While there is currently a strong commodity-export linkage, future growth depends on construction growth in the region. Concrete technology is evolving and in ways that can make it an important player in "green" building practices and therefore a somewhat unique opportunity.

Trusses Manufacturing: The manufacture of wood trusses is strongly represented in the Yuma Region with a regional location quotient of 6.2. However, overall employment trends for this industry in the Yuma Region have been declining for several years and projections for future national growth suggest continuing job losses. Currently, there is a strong commodity-export linkage.

Fabricated Structural Metal Manufacturing: This broad industry is associated with the production of a wide range of products ranging from river barge components, to television broadcast towers, prefabricated bridge components, and reinforcing bars (rebar) used for concrete structures. This industry is a relatively new entrant for the Yuma Region economy. It does possess a positive location quotient (1.3) that is just slightly below the cutoff described above. At the national level, employment in this sector has declined, but expectations are for this sector of the economy to grow over the next several years. This industry may offer an opportunity to encourage existing business expansion.

Asphalt Paving Mixture and Brick Manufacturing: This is an industry that emerged only recently in the Yuma Region according to our data sources. While that is a desirable economic development outcome, the overall industry outlook for this sector is not strong and consequently its prospects for growth will depend primarily on regional demand for paving, which would include new construction and maintenance.

Wood Kitchen Cabinets and Countertop Manufacturing: This industry is underrepresented in the local economy with a location quotient of 0.5. While this may suggest market opportunity, the industry has shed almost 50% of its Yuma County employment base since 2001. The industry is not expected to grow at the national level, and consequently its prospects for growth, as with some other local construction-related industries, will depend primarily on regional demand.

Industrial manufacturing

Metal Stamping: This sector is strongly represented in Yuma County, but is another overall declining industry over the past several years. The industry is projected to have minimal growth over the next decade at the national level, though the Yuma Region could see growth in this sector as the result of development in other industry sectors that rely on metal stamping companies to support other operations. The nature of this industry is such that firms will often be contract manufacturers. There is currently a strong commodity-export linkage for this sector in the Yuma Region.

Other Basic Inorganic Chemical Manufacturing: This industry is a catch-all category of chemical manufacturers. In the Yuma Region the output appears to be industrial chemicals. This activity has emerged in recent years in the Yuma Region. It is a small sector and any economic development efforts would be targeted towards a given company instead of this industry. Trade-flow data show a strong commodity-export linkage. However, industry projections show negative national employment growth for the next decade.

Transportation equipment

Storage Battery Manufacturing: This has been a strong performer for the Yuma Region adding about 150 jobs to the regional economy over the past several years. The industry demonstrates a strong regional location quotient and has grown much more quickly in the Yuma Region than national industry patterns would predict. National growth projections through 2023 predict little change for this industry. However, battery production associated with the auto industry (as in the Yuma Region) could have significant growth prospects. Consequently, this sector may be a good target for business expansion strategies.

Aviation/defense

Aircraft Manufacturing: This employment sector of the local economy is largely based on the presence of 20-25 (not all firms give identifiable addresses) defense contractors with support personnel located at Marine Corps Air Station Yuma (about 40% of firms), or conducting tests (or supporting testing activities) at Yuma Proving Ground (approximately 60%). The LQ for this industry is 0.6, which makes it in the economic development "target of opportunity" range, but shift share is negative. However, given the particularly diverse nature of this industry in the Yuma Region and the specific mission of the local firms, usual measures of competitiveness based on national data have limited meaning. The local firms engaged in this industry are nevertheless a unique opportunity (see cluster discussion below).

Miscellaneous

Other Plastics Product Manufacturing: This is a "catch-all" category that is defined more by what is does not include. According to the U.S. Census Bureau, the "industry comprises establishments primarily engaged in manufacturing plastics products (except film, sheet, bags, profile shapes, pipes, pipe fittings, laminates, foam products, bottles, plumbing fixtures, and resilient floor coverings)." This industry has grown impressively in the Yuma Region adding about 100 jobs over the past decade, but showing declining employment since 2007. Nationally, this industry has declined by about one-third since 2001 and is expected to decline another 4% by 2023. Given the lack of a clear industry identity and these job trends, efforts to support this industry locally might be focused on the nature of and conditions affecting specific local firms.

Wood Container and Pallet Manufacturing: This industry has grown locally, but it is a support sector and therefore will potentially grow organically, locally, based on the ability of the Yuma Region to grow and develop businesses that purchase these products, not because of specific economic development interventions.

Sign Manufacturing: This industry has shown local growth, and with a location quotient of only 0.6, there is apparently additional local market to capture for companies in this trade sector. However, in

general, this is not a high-wage, high-valued-added industry, and so may not represent a desirable target industry. Still, individual companies may be worthy of business expansion support activities.

Ice Manufacturing: This is generally a locally serving industry. While it demonstrates a strong location quotient in Yuma County, it is a small sector of the local economy and does not present meaningful economic development opportunities.

Summary of analysis observations by cluster, manufacturing focus

Food/agribusiness. This cluster is integral to the region's current economic base and will continue to be a source of opportunities for expansion due to market forces and inter-industry linkages with related and supporting firms. In the Industry Competitiveness Assessment at the beginning of this section, Perishable Prepared Food Manufacturing (NAICS code 311991) was one of two manufacturing industries to meet the screening criteria applied. Over 610 workers were employed in the cluster in the Yuma Region in 2013.

Textiles/apparel. This cluster spans a number of industries, only some of which have strong functional relationships with one another (Noncellulosic Organic Fiber Manufacturing tends to be the most interrelated). Some industries are linked to the construction sector. Over 320 workers were employed in the cluster in 2013.[2] Note that this cluster has been recommended as a target industry in a draft of the *Yuma Port Authority Business Plan* study.

Construction materials. There are six industries in the Manufacturing Focus list above for this cluster, which combined had over 330 employees in 2013. This cluster is tied to construction cycles that, in a growing state such as Arizona, tend to be pronounced but sometimes achieve some degree of balance through different sub-sectors (homebuilding, commercial development, public works, etc.) peaking and falling at different times. During the recent recession, however, all sub-sectors suffered, and consequently employment dropped sharply on most construction-related manufacturing industries as well as the construction industry itself. As a location with considerable public-works investment (in federal installations particularly), and also general population and employment growth, the Yuma Region will support some of the output of the local cluster, but certainly not all.

Industrial manufacturing. This cluster is of particular interest to the Yuma Region and the IMCP process, because the industries in this cluster tend to be manufacturing materials that are used by other industries to produce finished goods. Based on the Manufacturing Focus data, the cluster is small in the Yuma Region (approximately 60 employees in 2013).

Transportation equipment. In the Industry Competitiveness Assessment at the beginning of this section, Truck Trailer Manufacturing (NAICS code 336212) was one of two manufacturing industries to meet the screening criteria applied. The other industry identified in the Manufacturing Focus list above is Storage Battery Manufacturing. The two industries combined had an estimated (approximately) 185 employees in 2013. These two industries have little in common, and both probably relate more closely to the Aviation/defense cluster, in terms of production interrelationships and support industry requirements.

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[2] Counts of employees in this section include firms with 20 or more employees.

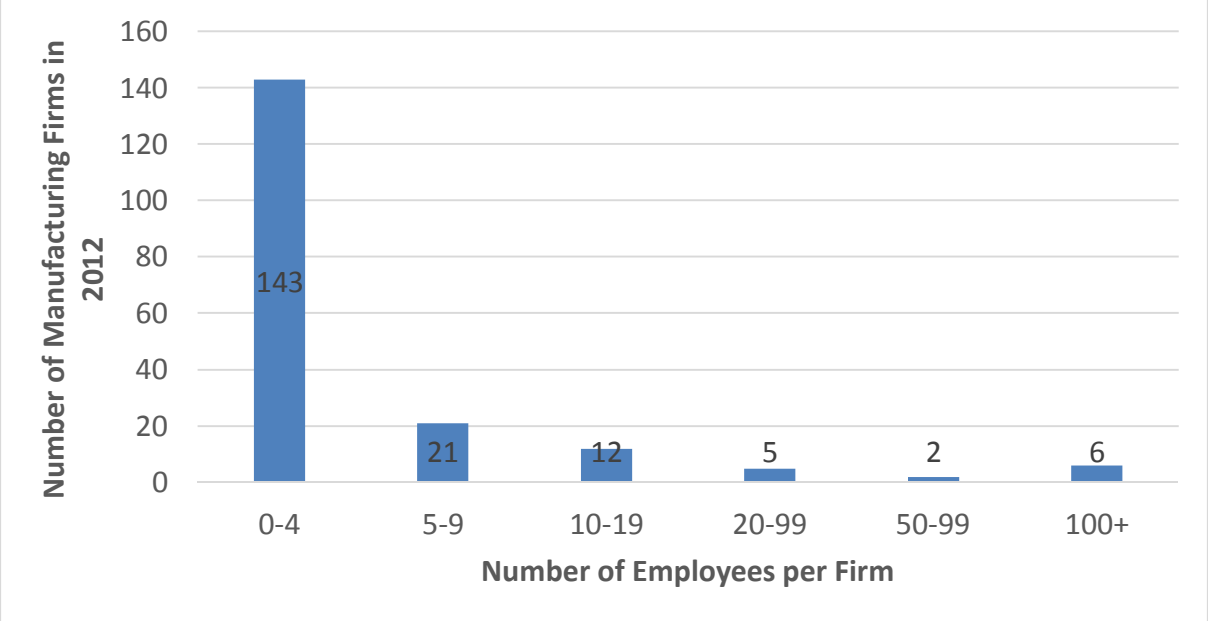
Aviation/defense. This cluster is composed of firms that have in common primarily the need to be of service to, or make use of, the Marine Corps Air Station Yuma or Yuma Proving Ground installations. Potentially, local contract manufacturers and other manufacturing industries could provide additional support to the various operational requirements of the firms in this cluster. To the extent these requirements could be made known, local firms could respond and the use of the two installations could be more efficient.

Miscellaneous. Within the Manufacturing Focus list above, this group of various industries make up a small proportion of manufacturing employment.

Manufacturing firms of less than 20 employees

Figure 1 (below) shows the number of manufacturing firms in Yuma County by employee-size class. The first, "0-4" column includes 121 "nonemployee" firms, which generally indicate a sole proprietorship with at least one person working full-time.

FIGURE 1. MANUFACTURING FIRMS IN YUMA COUNTY, 2011



Source: County Business Patterns, 2012.
[County Bus patterns-Yuma]

According to the EMSI data for Yuma County compiled for this study, most of the employees in industries with 5 to 19 employees are in the four clusters of Food/agribusiness, Construction materials, Transportation equipment, and Miscellaneous other.

Manufacturing facility requirements: site selection measures

Table 7 (below) shows an assessment of the relationship between the Yuma Region manufacturing industries and a set of location factors typically associated with manufacturing activities. The factors were used as one of the screening mechanisms in the "manufacturing industries competitive factors summary" section. The factors are *generally* arranged, from left to right, in order of the extent to which they can be considered a strength in the Yuma Region.

Table 7. Location factors by industry

1= critical 2= important 3=less important uk=Unknown

NAICS Code	Yuma Manufacturing Industries	Water supply	Real estate costs (3)	Labor costs (5)	Availability of labor training	Air-quality tolerances	Waste-water processing	Truck accessibility (road design, age of bldg) (1)	Rail siding (2)	Skilled labor	Electric service reliability	Electricity rates	Air transport services connec-tions (4)	Advanced ICT services
325222	Noncellulosic Organic Fiber Manufacturing	uk		1		uk	uk	2	uk	2	1	2	3	uk
325320	Pesticide and Other Agricultural Chemical Manuf.	1		1		depends	1	2	1	2	1	1	3	1
311991	Perishable Prepared Food Manufacturing	1		1		3	1 or 2	2	3	3	1	1	2	2
335911	Storage Battery Manufacturing	2		1		2	1	2	uk	2	1	1	3	2
311511	Fluid Milk Manufacturing	2		1		3	2	2	3	2	1	1	3	2
326199	All Other Plastics Product Manufacturing	uk		1		3	uk	2	depends	2	1	1	3	uk
327215	Glass Product Manuf., from Purchased Glass	2		1		3	3	2	3	2	1	2	3	2
321920	Wood Container and Pallet Manufacturing	3		1		3	3	2	3	3	2	2	3	3
327320	Ready-Mix Concrete Manufacturing	1		1		1	1	2	1 or 2	2	1	2	3	2
325311	Nitrogenous Fertilizer Manufacturing	2		1		1 or 2	1	2	1	2	1	1	3	2
336411	Aircraft Manufacturing	2	3	1	1	2	2	2	3	1	1	1	1 or 2	1
321214	Truss Manufacturing	3		1		3	3	2	3	3	2	2	3	3
332312	Fabricated Structural Metal Manufacturing	uk		1	1	depends	2	2	depends	2	1	2	3	2
332116	Metal Stamping	2		1	1	3	2	2	3	2	1	2	2 or 3	2
314999	All Other Miscellaneous Textile Product Mills	uk		1		3	uk	2	2	3	1	1	3	uk
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	uk		1		depends	uk	2	2	2	1	1	3	uk
336212	Truck Trailer Manufacturing	3		1		3	2	2	3	2	1	2	3	3
339950	Sign Manufacturing	2	3	1		3	2	2	3	3	1	2	3 or 2	3
324121	Asphalt Paving Mixture and Block Manufacturing	3		1		2	2	2	1 or 2	3	1	2	3	3
313112	Yarn Texturizing, Throwing, and Twisting Mills	3		1		3	3	2	3	3	1	1	3	3
337110	Wood Kitchen Cabinet and Countertop Manufacturing	3	3	1		3	3	2	3	1	2	2	3	3
312113	Ice Manufacturing	1		1		3	2	2	3	2	1	1	3 or 1	3
325188	All Other Basic Inorganic Chemical Manufacturing	1 or 2		1		depends	1 or 2	2	depends	1 or 2	1	1	3	2
Industry categories suggested by Stakeholders														
333---	Solar panel manufacturing	uk		1	1	uk	uk	2	uk	1	1	1	uk	1
321991	Manufactured homes/RVs	2		1	3	3	2	2	3	2	1	2	3	3
336---	Unmanned vehicle manufacturing	uk	3	1	1	uk	uk	2	uk	1	1	1	1 or 2	1
332710	CNC machining	uk	3	1	2	3	uk	2	3	1	1	1	2	1 or 2
333111	Irrigation equipment manufacturing	1		1	2	3	3	2	uk	2	1	2	3	2

1. Depends on specific needs of individual firms.
2. Rail open to reciprocal switching, if applicable.
3. Depends on size and nature of operation. As a rule, real estate costs are less of a concern the higher the value of products produced.
4. Depends on nature of operation: headquarters (1), national sales staff (1) others (2).
5. Includes direct labor costs, indirect labor costs (workers comp rates), and presence of organized labor.

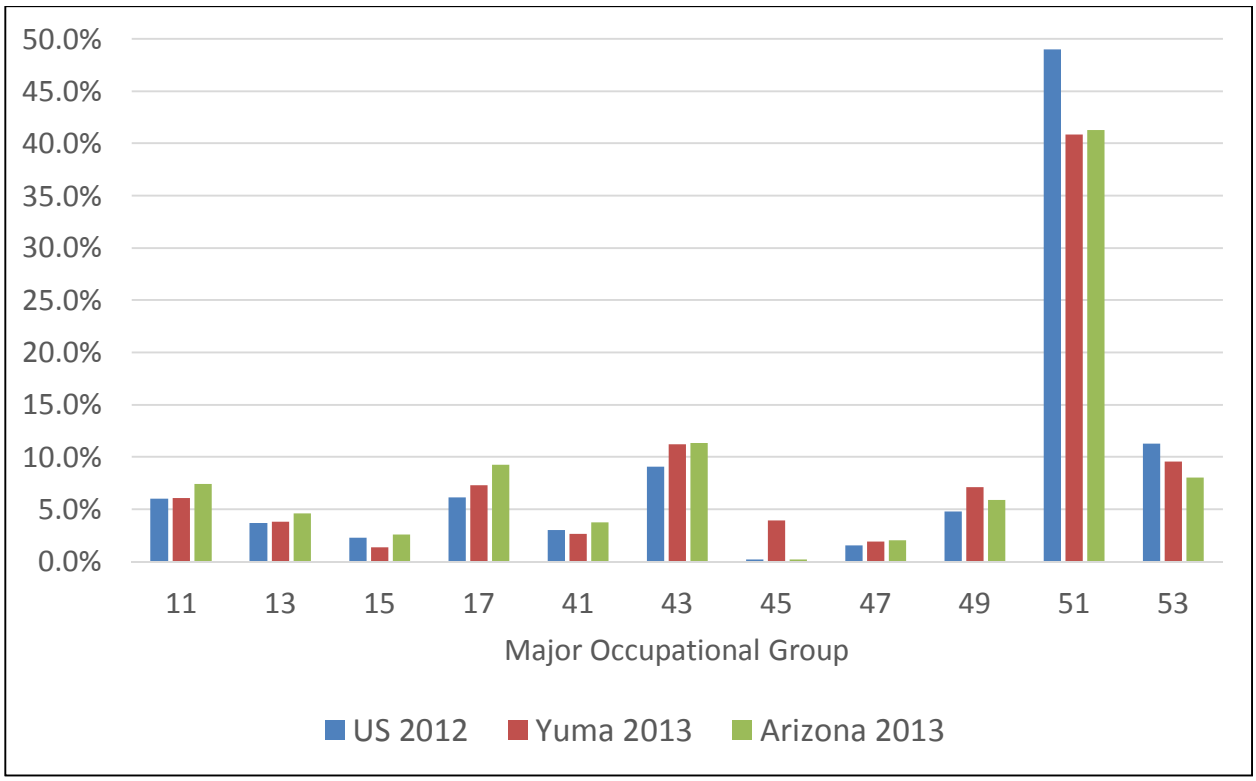
Chapter 4: Occupational analysis from a manufacturing perspective

Figure 2 shows the distribution of percent of employment by occupation, for just the manufacturing sector, for 11 of the 22 major occupational categories (2-digit SOC codes) listed below, for Yuma County, the US, and the state of Arizona. The allocation of workers by occupation to the Manufacturing sector for Arizona and Yuma County is estimated by applying the U.S. percentages to those areas. Consequently, the analysis in this section is theoretical rather than based on actual data.

The 22 categories are shown below. The highlighted entries are those that are included in Figure 2. The categories left off the chart, not highlighted, had very minimal percentage figures.

SOC code	Category Title
11-0000	Management occupations
13-0000	Business and financial operations occupations
15-0000	Computer and mathematical occupations
17-0000	Architecture and engineering occupations
19-0000	Life, physical, and social science occupations
21-0000	Community and social service occupations
23-0000	Legal occupations
25-0000	Education, training, and library occupations
27-0000	Arts, design, entertainment, sports, and media occupations
29-0000	Healthcare practitioners and technical occupations
31-0000	Healthcare support occupations
33-1000	Supervisors of protective service workers
35-0000	Food preparation and serving related occupations
37-0000	Building and grounds cleaning and maintenance occupations
39-0000	Personal care and service occupations
41-0000	Sales and related occupations
43-0000	Office and administrative support occupations
45-0000	Farming, fishing, and forestry occupations
47-0000	Construction and extraction occupations
49-0000	Installation, maintenance, and repair occupations
51-0000	Production occupations
53-0000	Transportation and material moving occupations

FIGURE 2. THEORETICAL MIX OF MANUFACTURING-RELATED OCCUPATIONS FOR YUMA COUNTY AND ARIZONA BASED ON NATIONAL FIGURES



Figures in this chart were derived through the following process:

1. National employment data showing the number of employees in each occupation connected to the manufacturing industry sector, and the percent of the total workers in each occupation working in the manufacturing sector, were extracted from the Bureau of Labor Statistics website.
2. National figures for the percent of the total workers in each occupation working in the manufacturing sector were applied to the employment-by-occupation figures (from EMSI) for Yuma County and the state of Arizona.
3. The resulting figures were used to calculate the percent of total manufacturing employment represented by each occupational category.

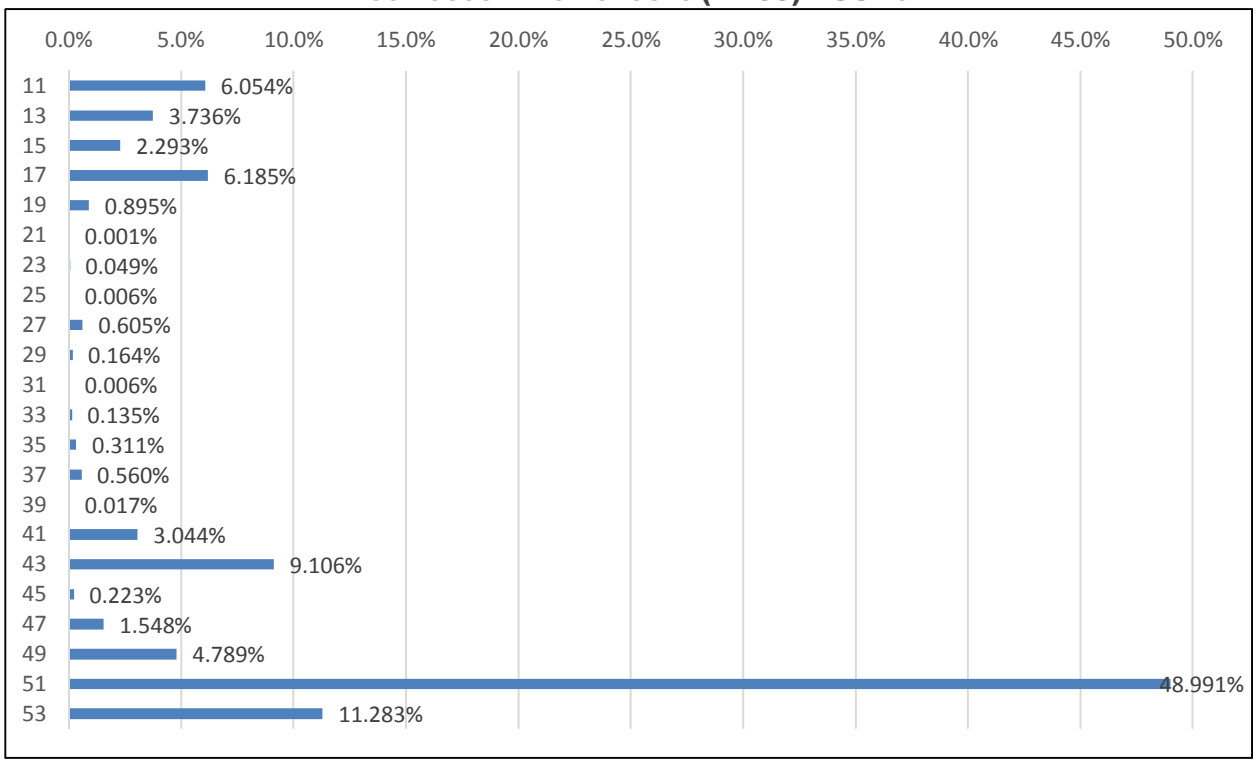
The chart shows the high percentages in all areas in category 51, Production Occupations, and that figures for the US are higher than for Yuma County and Arizona. The national percentage for Transportation and Material Moving Occupations is also higher for the US. The percentages for Architecture and Engineering Occupations are higher than the US for both Yuma County and Arizona. Both Yuma County and Arizona also have higher percentages than the US in the following occupational categories: a) Office and administrative support occupations (43), and b) Installation maintenance and repair occupations (49).

Although we can assume that the Yuma Region's allocation of workers, by occupation, to Manufacturing is not the same as the U.S. (since applying the national percentages to the Yuma Region's workforce yields a higher estimate of manufacturing employment than actually exists), the analysis provides a relative measure of capacity within the Yuma Region workforce to support Manufacturing. It should be

noted as well that the comparison of the Yuma Region with the U.S. and Arizona has a "relative validity" in that the figures are influenced by the overall occupational mix within a geographic area. For example, the data indicate that Yuma County has a much higher percentage in manufacturing-related Farming Fishing and Forestry Occupations; but to some extent this merely reflects the county's overall industry/occupational composition. Given these limitations, however, the data indicate that Yuma County's manufacturing occupational mix *could* reveal, based on applying national percentages to the occupation categories, less capacity in production workers and more in administrative and technical occupations, and on installation/repair workers.

The preceding chart, and Figure 3 below, also provide a sense of how manufacturing-related employment is distributed within the workforce. Note that while category 51, Production Occupations, has the highest percentage of Manufacturing employment, representing 49 percent of the occupational workforce, this means that just over half of the jobs in the Manufacturing sector are held by workers in occupational categories that would otherwise not appear to have a direct manufacturing link, such as Office and Administrative Support.

FIGURE 3. PERCENT OF TOTAL MANUFACTURING EMPLOYMENT IN MAJOR OCCUPATION GROUPS (11-53) – US TOTAL



Chapter 5: Resident Workers and Job Locations

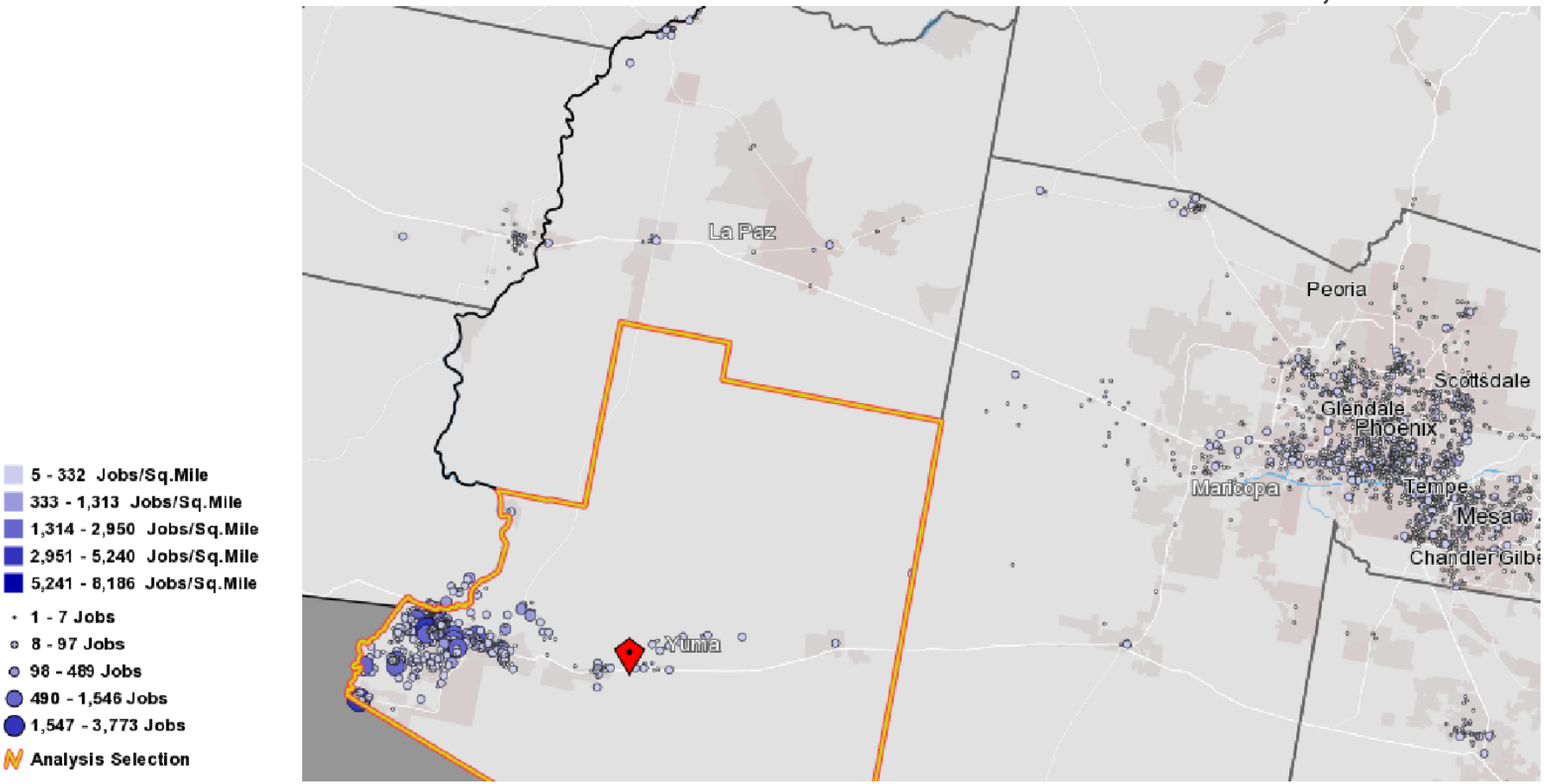
According to the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program,[3] Yuma County's resident workforce exceeds the number of jobs in the county by just 5 percent. However, the data also indicate that 25.4 percent of the Yuma County resident workforce commuted outside the county for work in 2011. Either as a result of the indicated level of out-commuting or some other reason, filling the jobs that exist in Yuma County requires that 22 percent of the region's jobs be taken up by workers from outside the County. Both of these figures, the percent out-commuting and in-commuting, seem to be very large numbers given the region's relative isolation. Census data based on household surveys[4] show an entirely different picture of out-commuting in Yuma County, namely that only 3.5 percent of resident workers have a commute time of 60 or more minutes.

As with any database, the Census LEHD figures can be subject to errors of assigning workplace locations. The findings can perhaps best be interpreted as an indication of the business ties between the Yuma Region and other parts of the state. This database can be monitored in future years to see how the reporting might evolve as the system, which is still relatively new, matures.

Accepting the data at face value, most of the out-commuters (over 75 percent) were working "east" or "northeast" from Yuma County, and Figure 4 below confirms that most of these workers would be either literally traveling to, or more likely somehow involved with, firms located in the Phoenix metro area.

[3] The latest data are for 2011.
[4] U.S. Census Bureau, 2013 American Community Survey 1-Year Estimates.

FIGURE 4. CENSUS LEHD PORTRAYAL OF YUMA COUNTY RESIDENT WORKERS' JOB AFFILIATIONS/LOCATIONS, 2011



Source: Census OnTheMap, 2014.

Chapter 6: Manufacturing employment and target-industry interrelationships in the Yuma Region

The following material summarizes the interrelationships in industry employment among the geographic areas that are of interest in this project. Table 8 (below) provides a summary of manufacturing jobs by 3-digit sector for the following geographies:

- Arizona
  - Pima County, Arizona
  - Santa Cruz County, Arizona
  - Yuma County, Arizona
- Imperial County, California
- Sonora, Mexico
- Baja California, Mexico

The table summarizes the relative importance of 3-digit manufacturing sectors: magnitude of employment in each sector for each place, and whether the industry is represented in a place's industry targets or similar designation. The table shows size-ranking categories that are generated for each place, for sectors where employment in those sectors exists. The rankings have been color-coded by rank interval (i.e. 1-5, 6-10, and 11-20). The columns to the right of the color-coded ranking identify if that subsector relates to an identified target industry (or similar designation), for each geography. The target industries for each of the geographies were compiled from multiple sources – including those available on the Web. Renewable energy and biotech are shown specifically because these targets were identified by multiple entities, and have apparent/potential relationships with various manufacturing sectors, which are interpreted in the table as shown. Of course, depending on the form of activity that emerges within these targets, such associations could vary or be different from what is suggested in the table.

The table also includes a column showing sectors ranked by "interaction potential" as illustrated on Table 8 (below). The sectors that generally, at the national level, contribute most to industries of particular interest in the Yuma Region have a rank of 1. The highlighted industries are those that have been identified in preceding sections of this report as especially competitive in the Yuma Region.

Key findings:

- The following manufacturing sectors rank relatively high, in employment levels, among all geographies, where data are available:
  - Fabricated metal products
  - Food manufacturing (ranked within the top five in for five of the seven areas)
  - Electrical equipment, appliance, etc.
  - Machinery (ranked within the top ten in four of the six areas – one area's data were not available)
  - Transportation equipment (ranked in the top five in six of the seven areas)
  - Miscellaneous & other
- Biotech and Renewable Energy were both identified as targets by most of the geographic areas – Santa Cruz County has neither and Yuma County has Food Technology (combined with Agribusiness) and Renewable Energy.

Table 8. Alignment of manufacturing industry employment and targets (or other focus) across the Yuma IMCP region

Field values show rank of manufacturing subsectors by Total Jobs (2013)

NAICS 3-DIGIT	NAICS DESCRIPTION	Sector ranked by inter-action (1)	CA			MEX						AZ									
			Imperial			Sonora			Baja California			Pima			Santa Cruz		Yuma		Arizona		
			Rank by ttl jobs	TI 1	TI 2	Rank by ttl jobs	TI 1	TI 2	Rank by ttl jobs	TI 1	TI 2	Rank by ttl jobs	TI 1	TI 2	Rank by ttl jobs	TI 1	Rank by ttl jobs	TI 1	Rank by ttl jobs	TI 1	TI 2
31	Manufacturing (General, not specified)															TI		TI			
SP	Specialized/adv. manuf, no NAICS			RE			RE			RE			RE					RE		TI	RE
311	Food Manufacturing	13	1	TI	BIO	4	TI		11			9			3	TI	2	TI	4		
312	Beverage and Tobacco Products	13	4			10			13			10					12		13		
313	Textile Mills	11															16		19		
314	Textile Product Mills	11	12						19			17					11		17		
315	Apparel Manufacturing	18	8			8			10			18									
316	Leather and Allied Products	18							18			16					18		18		
321	Wood Products	14	13	TI		15			17			11					5		14		
322	Paper	5	9						9								7		16		
323	Printing & Related Activities	15	14			14			15			6					17		6		
324	Petroleum and Coal Products	4															14		20		
325	Chemical	2	15	BIO	RE		BIO	RE	14	BIO	RE	12	BIO	RE			1	RE	10	BIO	RE
326	Plastics and Rubber Products	6		BIO	RE	6	BIO	RE	5	BIO	RE	13	BIO	RE			9	RE	12	BIO	RE
327	Nonmetallic Mineral Products	10	2			13			12			7					3		8		
331	Primary Metal	1				12			16			15							11		
332	Fabricated Metal Products	3	6	RE		7	RE		4	RE		3	RE		4		6	RE	3		RE
333	Machinery	8	11			9			8			5					19		7		
334	Computer and Electronic Products	7	7			2	TI		1			2					12		1	TI	
335	Electrical Equip, Appliance, etc.	12		RE		5	RE		6	RE		8	RE				4	RE	15	RE	
336	Transportation Equipment	9	5	TI		1	TI		3			1	TI		2	TI	8		2	TI	
337	Furniture and Related Products	17	10			11	TI		7			14					14		9		
339	Miscellaneous & Other	16	3			3			2			4			1		10		5		

#	Subsectors ranked 1-5, based on total existing jobs for each geography, where sector employment exists
#	Subsectors ranked 6-10, based on total existing jobs for each geography, where sector employment exists
#	Subsectors ranked 11-20, based on total existing jobs for each geography, where sector employment exists
TI	Denotes an identified target industry for that entity
BIO	Industries with apparent/potential biotech-related potential - where Biotech was identified as a target industry.*
RE	Industries with apparent/potential renewable energy-related potential - where renewable energy was identified as a target industry.*
	* Selected industry categories are not intended to be an exhaustive list of potential sectoral relationships.

Note 1: Numbers in this column refer to rankings in Table 10, below, Input requirements by manufacturing sector. Highlighted entries are those deemed competitively strong in the Yuma Region (Table 1).

Source: EMSI, Bureau of Labor Statistics, INEGI: Monthly Survey of Manufacturing Industry, TNDG.

Table 9 below shows the employment distribution of manufacturing jobs (by 3-digit NAICS), and manufacturing jobs as a percentage of total employment. In some cases the sectors have been aggregated, and the data represent the same geographies previously identified. The table lines are color-coded to match the industries shown in Figure 5.

Key findings:

- Both Sonora, and especially Baja California, are manufacturing powerhouses when compared to any of the Arizona or California counties, and are comparable in employment size to Arizona in many sectors, with Baja California's employment exceeding Arizona's by 56 percent. When looking at state-level data for Sonora and Baja California, the question arises as to how much of this activity is in the border cities. While employment data at the sub-state level could not be obtained, population data can serve as a crude indicator of concentration within the two Mexican states. San Luis Rio Colorado has 7 percent of Sonora's population, while Mexicali has 30 percent of Baja California's population. Consequently, Baja California's industry base, which also employs more than double the workers of Sonora, is also more likely to be concentrated on the border (near the Yuma Region).
- For Pima County and Sonora, Transportation Equipment has the highest proportion of jobs within the Manufacturing category. For Pima County, this sector represents nearly 50% of all manufacturing jobs. Transportation Equipment is also a relatively large sector in Arizona and Santa Cruz County.
- Yuma, Santa Cruz and Imperial (CA) counties have higher proportions of Food, Beverage and Tobacco manufacturing jobs compared to the other areas. For Imperial County, this sector represents nearly 70% of all manufacturing.
- The Baja California and Arizona areas have the highest proportion of Computer and Electronic Equipment manufacturing jobs among the geographic areas, followed by Sonora (Mexico) and Pima County.

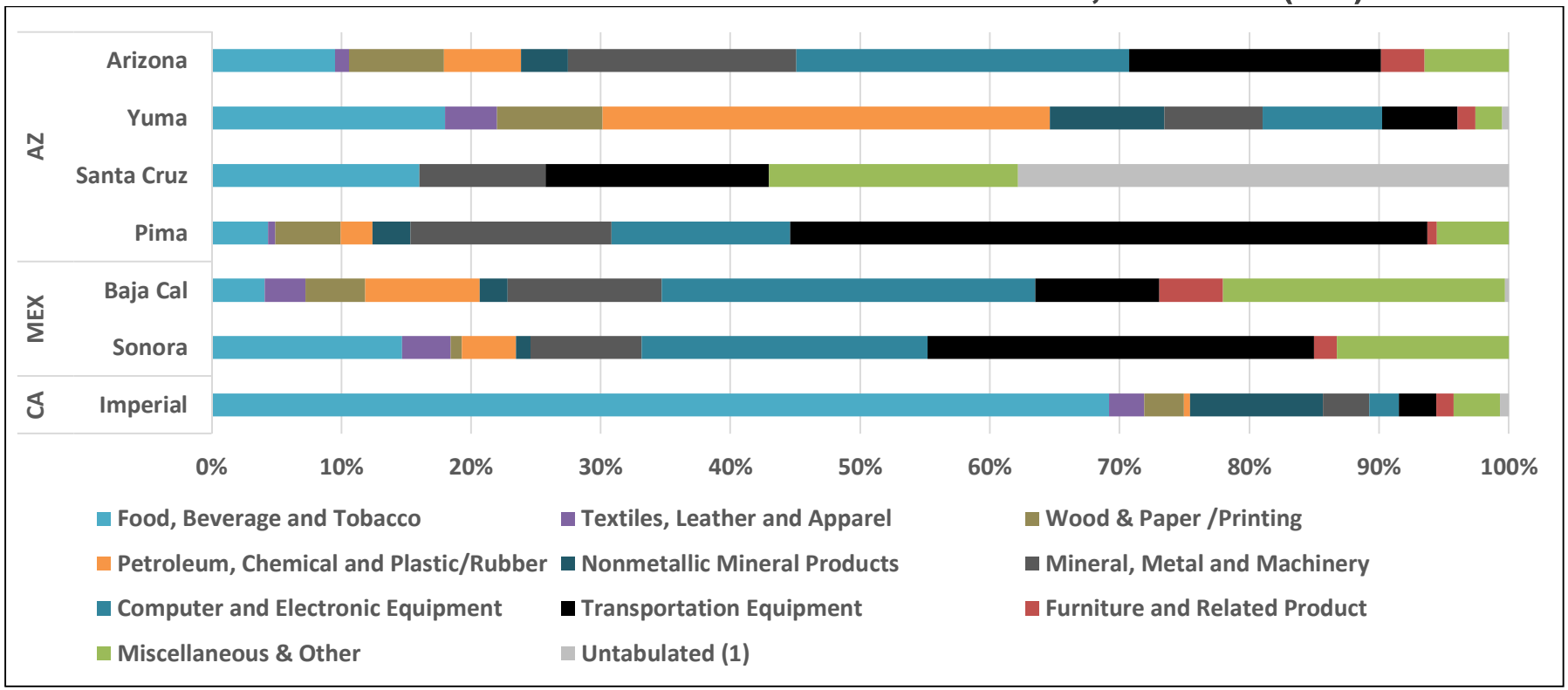
TABLE 9. NUMBER OF JOBS BY 3-DIGIT NAICS FOR MANUFACTURING SECTORS, BY GEOGRAPHY (2013)

NAICS 3-DIGIT	NAICS DESCRIPTION	AZ				CA	MEXICO	
		Pima	Santa Cruz	Yuma	AZ	Imperial	Sonora	Baja Cal
311-312	Food, Beverage and Tobacco	1,004	66	396	14,733	2,044	16,294	9,816
313 - 316	Textiles, Leather and Apparel	128	-	88	1,630	80	4,144	7,635
321-323	Wood & Paper/ Printing	1,159	-	327	11,316	90	943	11,152
324-326	Petroleum, Chemical and Plastic/Rubber	569	-	759	9,241	15	4,647	21,334
327	Nonmetallic Mineral Products	667	-	194	5,574	302	1,250	5,217
327 - 333	Mineral, Metal and Machinery	3,580	40	167	27,228	106	9,504	28,697
334-335	Computer and Electronic Equipment	3,175	-	203	39,731	67	24,461	69,689
336	Transportation Equipment	11,320	71	128	30,040	86	33,042	23,070
337	Furniture and Related Product	169	-	30	5,151	39	1,937	11,832
339	Miscellaneous & Other	1,282	79	45	10,101	105	14,745	52,644
	Untabulated (1)	1	156	12	-	21	-	725
Total Manufacturing		**23,054**	**412**	**2,337**	**154,745**	**2,955**	**110,967**	**241,811**
Total Jobs (best estimates for Sonora/Baja)		**280,366**	**9,508**	**83,371**	**2,094,954**	**77,455**	**150,996**	**291,712**
Manufacturing as % of total jobs		**8.2%**	**4.3%**	**2.8%**	**7.4%**	**3.8%**	**73.5%**	**82.9%**

Source: EMSI, Bureau of Labor Statistics, INEGI: Monthly Survey of Manufacturing Industry, TNDG
(1) Sectors that are unreported in the original data source.

Figure 5 provides a graphic summary of how employment in industry categories, as a percent of total employment in each place, is distributed among the geographic areas in Table 9. Each line on the chart displays the percent of employment in each of the industry categories that are listed in the legend below the chart. The legend is read from left to right, line by line. The chart underscores the differences in the employment composition among the places shown.

FIGURE 5. PERCENT OF JOBS BY 3-DIGIT NAICS FOR MANUFACTURING SECTORS, BY GEOGRAPHY (2013)



Source: EMSI, Bureau of Labor Statistics, INEGI: Monthly Survey of Manufacturing Industry, TNDG.
(1) Sectors that are unreported in the original data source for confidentiality reasons. Applies primarily to Santa Cruz County.

Employment patterns of Yuma sub-regions

A general assessment of the existing and projected competitive position of Yuma County communities, and the overall pattern of manufacturing and other employment throughout the County, can be derived from the EMSI employment data generated for this project. These data are summarized on Figure 6 (below), below, using employment data for 2013 and projected 2023 employment. The data show that the percentage of manufacturing jobs is modest in all areas, but generally higher in the smaller places than in the City of Yuma; but manufacturing jobs as a percent of total are projected to decline in all the small communities by 2023. Of the small communities, only San Luis and Fortuna Foothills (a "Census designated place" and recognized area in the County, but one without any governing body that would play a role in economic development) are expected to have noticeable overall employment growth 2013 to 2023.

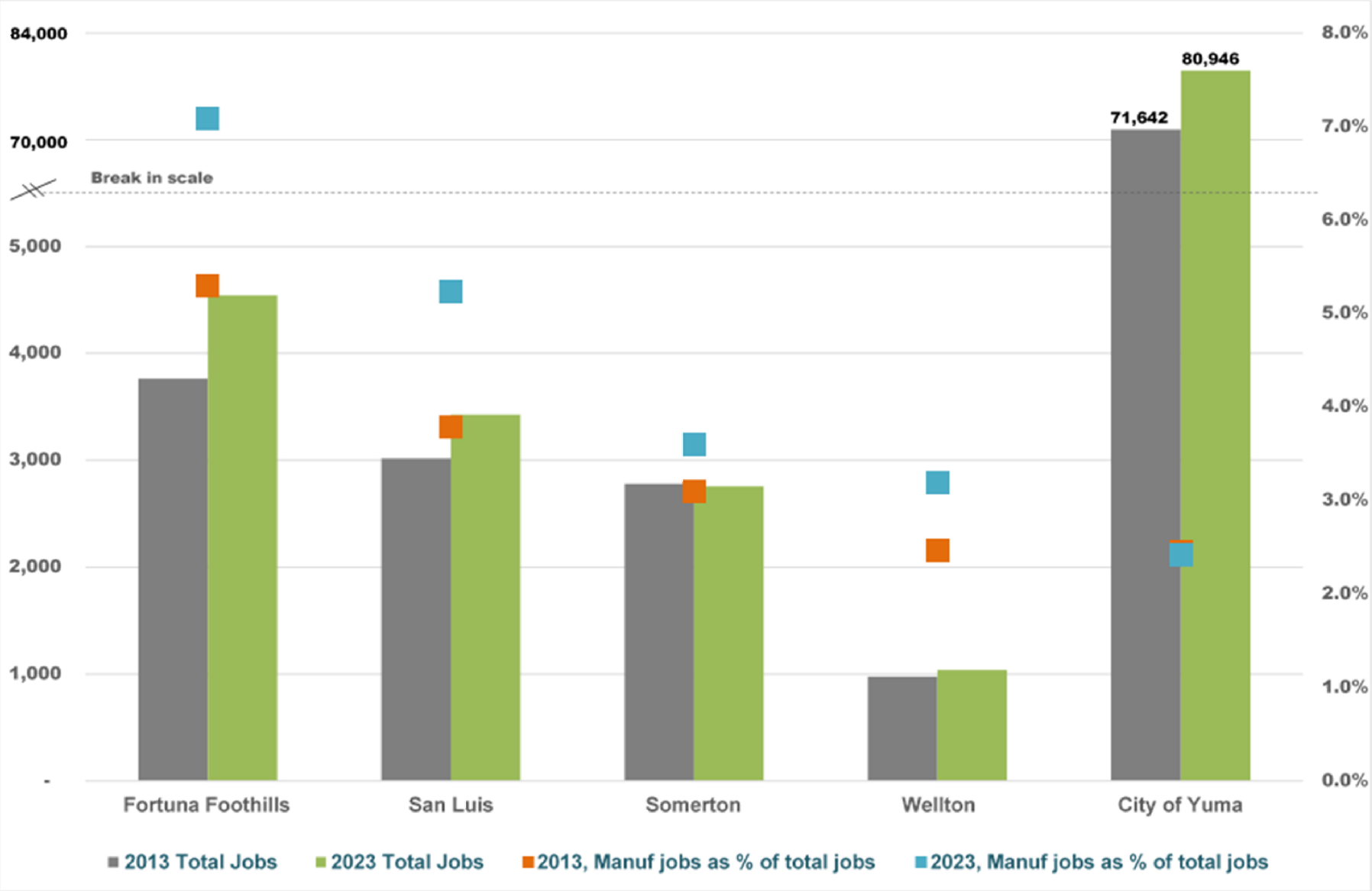
Regardless of projected employment patterns, the potential for manufacturing activity to expand in the various Yuma County communities is primarily a function of infrastructure conditions, present and future, and market conditions. Infrastructure conditions are addressed in depth in Chapter 8 and Appendix B. Broadly speaking, variations in (non-infrastructure) market conditions within the County have the following dimensions:

- Cost to acquire and develop property, including dollar costs and also timing, construction-industry access, and other considerations.
- Access to labor, or the relative proximity of workers most suitable for the industry prospect.
- Proximity/access to supporting industries, which may be material suppliers, other manufacturers, or other activities.
- Proximity to markets, if there are markets in the immediate area.

Project Stakeholders noted that the South County area might have certain locational advantages in being closer to abundant low-cost labor and to Mexican support industries or markets.[5]

[5] IMCP Stakeholder meeting of June 4, 2014.

Figure 6. Total Jobs and Manufacturing Jobs (as % of total jobs) for 2013 and 2023. Yuma County Communities



Assessment of inter-industry relationships, from Bureau of Economic Analysis (BEA) Input-Output data

Table 10 (below) is configured to show what sectors, including other manufacturing sectors and others, are of primary importance for supporting manufacturing industries, both individually and particularly for the group of Yuma key industries. Note that only a partial table is shown, for purposes of illustrating the concept in a readable format. The table is an extraction of the BEA summary-level (69 mostly 3-digit sectors) industry-by-industry total requirements data from the national Industry Input-Output (Requirements) accounts for 2012. These data were released on January 23, 2014, as part of the comprehensive revision to the industry economic accounts (IEAs). The columns are the 19 manufacturing sectors (also highlighted in the Industry Description column).

The table shows the production that is required, directly and indirectly, from each industry and each commodity to deliver a dollar of a (column) commodity to final users. To illustrate, the Chemical Products (Line 2, Code 325) sector will contribute the following to one dollar of output in the (column) industries listed:

- 0.07 units of input for Wood Products
- 0.10 units of input for Nonmetallic Mineral Products
- 0.097 units of input for Miscellaneous Manufacturing
- 1.413 units of input for Chemical Products

The highlighted cells within the matrix field are conditionally formatted based on their value ranges, with the lowest highlighted values (light green) representing about the 35th percentile (arbitrarily selected) of the values in the table, and the top values the darkest red. The uncolored cells are below the 35th percentile threshold. The rows retained in the table include all the manufacturing sectors.

The table is sorted based on the rank of the sum (row totals) of the 61 (of 69 total) requirements-contributing industries, across nine selected key Yuma Region industries, which are highlighted (columns) in purple at the top of the table and at their corresponding rows. The cells in which industries relate to themselves are left out of the summation. This summation has no "meaning" but is used here as a rough approximation for identifying which row industries are most contributory to the output of each of key (column) industries. The sort-rank column is immediately to the right of the Industry Requirements field.

Table 10. Requirements for manufacturing sectors, from U.S. Bureau of Economic Analysis (partial table)

	= Yuma key manufacturing-related inds																				
	Industry / Industry	Wood products	Nonmetallic mineral products	Primary metals	Fabricated metal products	Machinery	Computer and electronic products	Electrical equip., appliances, & comp.	Motor vehicles, bodies and trailers, and parts	Other transportation equipment	Furniture and related products	Miscellaneous manufacturing	Food and beverage and tobacco products	Textile mills and textile product mills	Apparel and leather and allied products	Paper products	Printing and related support activities	Petroleum and coal products	Chemical products	Plastics and rubber products	Rank, Yuma sector sum
Code	Industry Description	321	327	331	332	333	334	335	3361MV	3364OT	337	339	311FT	313TT	315AL	322	323	324	325	326	R-Ys
331	Primary metals	0.036	0.042	1.527	0.408	0.253	0.065	0.314	0.197	0.150	0.121	0.131	0.032	0.025	0.011	0.037	0.021	0.017	0.016	0.042	1
325	Chemical products	0.077	0.104	0.042	0.064	0.060	0.040	0.066	0.082	0.042	0.104	0.097	0.070	0.377	0.075	0.161	0.130	0.040	1.413	0.459	2
42	Wholesale trade	0.119	0.074	0.124	0.092	0.120	0.059	0.114	0.158	0.078	0.115	0.080	0.122	0.100	0.098	0.103	0.059	0.029	0.072	0.091	3
55	Management of companies and enterprises	0.058	0.059	0.050	0.048	0.051	0.031	0.043	0.107	0.078	0.049	0.061	0.057	0.087	0.048	0.062	0.053	0.046	0.074	0.059	4
111CA	Farms	0.022	0.003	0.002	0.002	0.002	0.001	0.002	0.003	0.001	0.006	0.006	0.399	0.033	0.022	0.011	0.009	0.001	0.018	0.010	5
5412OP	Miscellaneous professional, scientific, and technical services	0.059	0.055	0.063	0.061	0.054	0.025	0.042	0.058	0.051	0.069	0.062	0.045	0.066	0.057	0.049	0.056	0.022	0.035	0.051	6
332	Fabricated metal products	0.051	0.045	0.068	1.155	0.137	0.044	0.109	0.121	0.091	0.074	0.050	0.037	0.027	0.015	0.054	0.031	0.012	0.022	0.050	7
324	Petroleum and coal products	0.040	0.049	0.051	0.030	0.031	0.011	0.034	0.027	0.020	0.032	0.024	0.048	0.043	0.017	0.058	0.053	1.042	0.060	0.050	8
211	Oil and gas extraction	0.033	0.041	0.043	0.026	0.026	0.010	0.028	0.023	0.017	0.027	0.020	0.039	0.038	0.015	0.049	0.043	0.740	0.064	0.045	9
334	Computer and electronic products	0.015	0.017	0.020	0.024	0.040	1.155	0.043	0.058	0.100	0.024	0.023	0.010	0.017	0.009	0.024	0.021	0.003	0.011	0.018	10
212	Mining, except oil and gas	0.007	0.113	0.146	0.042	0.027	0.007	0.034	0.022	0.017	0.015	0.016	0.010	0.009	0.003	0.020	0.006	0.005	0.012	0.011	11
561	Administrative and support services	0.030	0.030	0.041	0.043	0.030	0.020	0.025	0.031	0.039	0.028	0.025	0.022	0.029	0.045	0.029	0.050	0.010	0.016	0.025	12
484	Truck transportation	0.033	0.039	0.043	0.025	0.025	0.009	0.024	0.029	0.018	0.031	0.018	0.044	0.027	0.019	0.032	0.017	0.009	0.014	0.023	13
113FF	Forestry, fishing, and related activities	0.168	0.002	0.002	0.002	0.002	0.001	0.002	0.003	0.001	0.019	0.005	0.032	0.004	0.015	0.040	0.006	0.000	0.003	0.019	14
322	Paper products	0.015	0.024	0.021	0.018	0.018	0.008	0.020	0.020	0.012	0.032	0.024	0.041	0.021	0.011	1.284	0.125	0.002	0.014	0.037	15
326	Plastics and rubber products	0.018	0.020	0.015	0.017	0.038	0.013	0.023	0.076	0.024	0.081	0.037	0.035	0.021	0.014	0.028	0.016	0.003	0.020	1.090	16
333	Machinery	0.013	0.015	0.026	0.027	1.122	0.008	0.033	0.073	0.033	0.011	0.016	0.014	0.008	0.004	0.017	0.021	0.012	0.012	0.019	17
22	Utilities	0.019	0.035	0.039	0.023	0.017	0.007	0.018	0.017	0.012	0.017	0.012	0.018	0.022	0.009	0.039	0.017	0.009	0.020	0.023	18
521CI	Federal Reserve banks, credit intermediation, and related activities	0.020	0.024	0.027	0.024	0.021	0.008	0.017	0.023	0.017	0.023	0.020	0.023	0.024	0.019	0.019	0.019	0.010	0.013	0.020	19
532RL	Rental and leasing services and lessors of intangible assets	0.016	0.020	0.020	0.021	0.020	0.011	0.016	0.022	0.019	0.015	0.020	0.019	0.017	0.017	0.019	0.019	0.015	0.017	0.017	20
531	Real estate	0.018	0.015	0.018	0.017	0.015	0.007	0.013	0.018	0.013	0.019	0.014	0.029	0.019	0.015	0.015	0.017	0.007	0.011	0.014	21
482	Rail transportation	0.019	0.031	0.040	0.016	0.011	0.003	0.013	0.011	0.007	0.013	0.008	0.015	0.007	0.003	0.025	0.008	0.003	0.013	0.015	22
3361MV	Motor vehicles, bodies and trailers, and parts	0.015	0.013	0.019	0.014	0.052	0.007	0.013	1.394	0.034	0.013	0.009	0.010	0.008	0.004	0.013	0.008	0.003	0.005	0.009	23
513	Broadcasting and telecommunications	0.015	0.014	0.015	0.015	0.014	0.008	0.011	0.015	0.014	0.020	0.014	0.011	0.016	0.013	0.013	0.015	0.006	0.009	0.012	24
524	Insurance carriers and related activities	0.013	0.014	0.015	0.012	0.013	0.006	0.013	0.013	0.009	0.014	0.010	0.021	0.017	0.034	0.011	0.011	0.006	0.008	0.010	25
81	Other services, except government	0.013	0.013	0.017	0.013	0.011	0.006	0.010	0.013	0.009	0.011	0.009	0.010	0.014	0.008	0.014	0.012	0.005	0.008	0.010	26
5415	Computer systems design and related services	0.010	0.009	0.010	0.014	0.015	0.009	0.007	0.012	0.017	0.009	0.009	0.008	0.010	0.008	0.009	0.013	0.011	0.007	0.009	27
327	Nonmetallic mineral products	0.016	1.122	0.023	0.012	0.013	0.004	0.019	0.022	0.007	0.011	0.009	0.010	0.009	0.003	0.006	0.003	0.003	0.004	0.011	28
335	Electrical equipment, appliances, and components	0.013	0.005	0.018	0.015	0.048	0.018	1.077	0.019	0.024	0.007	0.011	0.005	0.004	0.002	0.007	0.005	0.002	0.003	0.008	29

Manufacturing sectors

The following table shows the *manufacturing* categories extracted from the preceding matrix, and in the same order of most-to-least interaction with Yuma Region manufacturing sectors. The industries that tend to have more relevance to Yuma are highlighted. The right-hand column groups Yuma Region manufacturing industries discussed above (in the Manufacturing Focus and Industry Competitiveness Assessment sections) under their corresponding categories in the first two columns. Because the Requirements table industries are listed in the order of their contribution to the output of other industries, this table provides an indication of the level of potential interrelatedness of Yuma Region manufacturing industries with one another. Additional insight into this potential can be revealed with further review of Table 10 **(**above). Yuma Region industries (at the 6-digit NAICS level) are represented in nearly all of these 3-digit sectors, as the right-hand column indicates. Some of this representation is in the form of industries with small employment totals.

Requirements table manufacturing-industry categories		Yuma Region detailed manufacturing industries (1)
331	Primary metals	(Yuma Region has no firms in this sector, and is very unlikely to)
325	Chemical products	Noncellulosic Organic Fiber Manufacturing
		Pesticide and Other Agricultural Chemical Manufacturing
		All Other Basic Inorganic Chemical Manuf.
		Nitrogenous Fertilizer Manufacturing
		All Other Miscellaneous Chemical Product and Preparation Manufacturing
332	Fabricated metal products	Fabricated Structural Metal Manufacturing
		Metal Stamping
324	Petroleum and coal products	Asphalt Paving Mixture and Block Manufacturing
334	Computer and electronic products	(Yuma Region has 9 industries within this 3-digit summary level, with a total of 55 employees)
322	Paper products	Converted Paper Product Manufacturing
326	Plastics and rubber products	All Other Plastics Product Manufacturing
333	Machinery	(Yuma Region has 9 industries within this 3-digit summary level, with a total of 51 employees)
3361MV	Motor vehicles, bodies and trailers, & parts	Truck Trailer Manufacturing
327	Nonmetallic mineral products	Glass Product Manuf., from Purchased Glass
		Ready-Mix Concrete Manufacturing
335	Electrical equipment, appliances, and components	Storage Battery Manufacturing
313TT	Textile mills and textile product mills	Yarn Texturizing, Throwing, and Twisting Mills
		All Other Miscellaneous Textile Product Mills
311FT	Food and beverage and tobacco products	Perishable Prepared Food Manufacturing
		Fluid Milk Manufacturing
321	Wood products	Truss Manufacturing
		Wood Container and Pallet Manufacturing
3364OT	Other transportation equipment	Aircraft Manufacturing

Requirements table manufacturing-industry categories		Yuma Region detailed manufacturing industries (1)
323	Printing and related support activities	(Yuma Region has 5 industries within this 3-digit summary level, with a total of 36 employees)
339	Miscellaneous manufacturing	Sign Manufacturing
337	Furniture and related products	Wood Kitchen Cabinet and Countertop Manufacturing
315AL	Apparel and leather and allied products	Miscellaneous Textile Product Mills

1. Industries with 20 or more employees in 2013, except as noted, based on EMSI data.

Non-manufacturing sectors

Table 11 (below) shows the *non-manufacturing* categories extracted from the preceding matrix, and in the same order of most-to-least interaction with Yuma Region manufacturing sectors. The adjacent column groups Yuma Region non-manufacturing industries discussed in the Industry Competitiveness Assessment, above, under their corresponding categories in the first two columns. Because the Requirements table industries are listed in the order of their contribution to the output of other industries, this table provides an indication of the level of potential interrelatedness of Yuma Region non-manufacturing industries with one another. Additional insight into this potential can be revealed with further review of Table 10 (above). The right-hand column shows Yuma Region sectors not included in the "competitive" column that have especially high or low Location Quotient values. Yuma Region competitively strong industries (at the 6-digit NAICS level) are represented in many of these 2-3-digit sectors, as the corresponding column indicates. Unless otherwise noted in the right-hand column, the other sector groups are reasonably represented, with some of the noted exceptions (low LQ values) with relevance to this study being in: Management of companies and enterprises; Insurance carriers and related activities; Legal services; and Air transportation.

TABLE 11. INDUSTRY CATEGORIES WITH NON-MANUFACTURING YUMA REGION PRESENCE

Requirements table industry categories		Yuma Region competitive detailed non-manuf. industries	Yuma sectors with low/ high LQ's (1)
42	Wholesale trade	Fresh Fruit and Vegetable Merchant Wholsl	
55	Management of companies & enterprises		L
111CA	Farms		H
5412OP	Miscellaneous professional, scientific, and technical services	Engineering Services	
		Testing Laboratories	
		Custom Computer Programming Services	
		Administrative / General Management Consulting Services	
		Marketing Consulting Services	
211	Oil and gas extraction		
212	Mining, except oil and gas		L
561	Administrative and support services	Telemarketing Bureaus	
484	Truck transportation	Specialized Freight (except Used Goods) Trucking, Long-Distance	
113FF	Forestry, fishing, and related activities		L
22	Utilities		
521CI	Federal Reserve banks, credit intermediation, and related activities		L (NAICS 523)
532RL	Rental and leasing services and lessors of intangible assets		

Requirements table industry categories		Yuma Region competitive detailed non-manuf. industries	Yuma sectors with low/ high LQ's (1)
531	Real estate		
482	Rail transportation		
513	Broadcasting and telecommunications		
524	Insurance carriers and related activities		L
81	Other services, except government		
5415	Computer systems design and related services		
523	Securities, commodity contracts, and investments	Portfolio Management	
		Investment Advice	
514	Data processing, internet publishing, and other information services		
487OS	Other transportation & support activities	Support Activities for Rail Transportation	
GFG	Federal general government		
5411	Legal services		L
GSLE	State and local government enterprises		
722	Food services and drinking places	Full-Service Restaurants	
		Food Service Contractors	
23	Construction		
481	Air transportation		L
493	Warehousing and storage	Refrigerated Warehousing and Storage	
GSLG	State and local general government		
562	Waste management and remediation services		
511	Publishing industries, except internet (includes software)		L
GFE	Federal government enterprises		
4A0	Other retail		
483	Water transportation		(n/a)
721	Accommodation		
711AS	Performing arts, spectator sports, museums, and related activities		L
486	Pipeline transportation		(n/a)
213	Support activities for mining		(n/a)
485	Transit and ground passenger transportation	Special Needs Transportation	
441	Motor vehicle and parts dealers		H
512	Motion picture and sound recording industries		
713	Amusements, gambling, and recreation industries	Amusement and Theme Parks	
		Golf Courses and Country Clubs	
452	General merchandise stores	Warehouse Clubs and Supercenters	
61	Educational services	Elementary /Secondary Schools (Private)	
		Fine Arts Schools (Private)	
525	Funds, trusts, and other financial vehicles		L
445	Food and beverage stores		
621	Ambulatory health care services	Offices of Physicians (except Mental Health)	
		Offices of Dentists	
		Physical, Occupational, Speech Therapists	
		Offices of Other Misc. Health Practitioners	

Requirements table industry categories		Yuma Region competitive detailed non-manuf. industries	Yuma sectors with low/ high LQ's (1)
		Outpatient Mental Health and Substance Abuse Centers	
		HMO Medical Centers	
		Kidney Dialysis Centers	
		Home Health Care Services	
623	Nursing and residential care facilities	Nursing Care Facilities	
624	Social assistance	Services for the Elderly and Persons with Disabilities	
622	Hospitals	General Medical and Surgical Hospitals (Pvt)	

Source: preceding tables.

Specialized industry categories

The following specialized manufacturing categories, which were mentioned specifically in this assignment's RFP, were addressed in a number of ways: 1) review for correspondence with relevant NAICS code categories, 2) employment and LQ values for the associated industry categories, for the Yuma Region, 3) input from local manufacturers and economic development professionals.

- Programmatic logic controls (this term was later re-interpreted as *Programmable* logic controls)
- Welding and machining (Welding was separated from Machining for purposes of this investigation)
- Computer numeric coding, and
- Customized precision manufacturing industries

These processes are discussed in detail in Appendix A. Of all the activities, Machining is considered the most important and viable "support industry" to bring to the Yuma Region. Training capacity for this activity needs to be developed in the Yuma Region. Currently, the Yuma Region does not have a machining program at any of the local high schools, or the facility and equipment to be able to teach machining.

Chapter 7: Yuma Region manufacturing industries competitive-factor summary

Table 12 (below) summarizes the relationship between the Yuma Region's manufacturing industries and a set of competitive factors that are, for most factors, discussed in preceding sections of this document. The table also includes input from the initial IMCP Stakeholder meeting of June 4, 2014, regarding suggested new manufacturing activity and local competitive advantages.

While the table is not intended to constitute a formal ranking process (for example, no attempt has been made to weight the factors), the industries that ranked "best" (had the most relationships with the positive indicators across the top of the matrix) are shown on Table 13. This list can be considered a "second tier screening" group for which strategic considerations subsequently provide focus from an economic development operational standpoint. This group of industries was also compared, from an occupational-demand perspective, to the existing occupation mix of Yuma Region residents. The results of this analysis are shown in the following section.

TABLE 12. YUMA REGION MANUFACTURING INDUSTRIES COMPETITIVE-FACTOR SUMMARY

					Strong exist. related-industry base in:									
NAICS code	Manufacturing industry description	2013 Jobs	Yuma's advantages mentioned by Stakeholders (1)	TNDG Compet-itive screening	Yuma	No. Mexico	Pima Cnty/ IFS	Imperial Cnty	Ariz.	Strong contri-butor to other Yuma manuf. (2)	Support from non-manuf. sectors (3)	Minimal locational require-ments (4)	Potential link to Biotech or Renewable Energy	Potential military facility link
325222	Noncellulosic Organic Fiber Manufacturing	259												
325320	Pesticide and Other Agricultural Chemical Manufacturing	186												
311991	Perishable Prepared Food Manufacturing	164	Ample, competitive labor; ag. link	X	X	X	X	X	X		X		X	
335911	Storage Battery Manufacturing	153	Climate (solar)		X	X	X	X	X				X	X
311511	Fluid Milk Manufacturing	152	Ag. link		X	X	X	X	X			X		
3222	Converted Paper Product Manufacturing	148			X					X		X	X	
326199	All Other Plastics Product Manufacturing	104			X	X				X			X	
327215	Glass Product Manuf. [from bulk glass]	88			X		X	X				X	X	
321920	Wood Container and Pallet Manufacturing	84			X						X	X		
327320	Ready-Mix Concrete Manufacturing	81			X		X	X						
325311	Nitrogenous Fertilizer Manufacturing	76			X		X			X			X	
336411	Aircraft Manufacturing	70	Military link, climate, ret. military, strong logistics		X	X	X	X	X					X
321214	Truss Manufacturing	65	Labor, logistics		X							X		
332312	Fabricated Structural Metal Manufacturing	52	Util. rates, logistics		X	X	X	X	X	X			X	
332116	Metal Stamping	41			X	X	X	X	X	X				
314999	All Other Miscellaneous Textile Product Mills	39	Labor, ag. link											
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	38	Ag. link		X					X			X	
336212	Truck Trailer Manufacturing	33	Util. rates, logistics	X	X	X	X	X	X		X	X		
339950	Sign Manufacturing	31			X	X	X	X	X			X		
324121	Asphalt Paving Mixture and Block Manuf.	26								X		X		
313112	Yarn Texturizing, Throwing, & Twisting Mills	25									X	X		
337110	Wood Kitchen Cabinet and Countertop Manufacturing	25	Labor			X					X	X		
312113	Ice Manufacturing	21												
325188	All Other Basic Inorganic Chemical Manuf.	20	Ag. link											
Industry categories suggested by Stakeholders														
333---	Solar panel manufacturing		Climate, utilities	(n/a)			X			X	X		X	X
321991	Manufactured homes/RVs		Labor	(n/a)	X	X	X	X	X			X		
336---	Unmanned vehicle manufacturing		Climate, military	(n/a)	X	X	X	X	X					X
332710	CNC machining		Retired mil.	(n/a)	X	X	X	X	X	X				X
333111	Irrigation equipment manufacturing		Ag. link	(n/a)			X		X	X		X		

1. Applied here to industries by a combination of Stakeholders' and TNDG's observations.
2. Potential contribution to output of other Yuma Region major industries, based on broader industry group (3-digit level; see Table 10).
3. Non-manufacturing sectors with a strong presence in the Yuma Region provide higher levels of support for these industries than for others. See Table 10.
4. See Table 7.

TABLE 13. YUMA REGION MANUFACTURING INDUSTRIES COMPETITIVE-FACTOR "SHORT LIST"

					Strong exist. related-industry base in:									
NAICS code	Manufacturing industry description	2013 Jobs	Yuma's advantages mentioned by Stakeholders (1)	TNDG Compet-itive screening	Yuma	No. Mexico	Pima Cnty/ IFS	Imperial Cnty	Ariz.	Strong contri-butor to other Yuma manuf. (2)	Support from non-manuf. sectors (3)	Minimal locational require-ments (4)	Potential link to Biotech or Renewable Energy	Potential military facility link
311991	Perishable Prepared Food Manufacturing	164	Ample, competitive labor; ag. link	X	X	X	X	X	X		X		X	
335911	Storage Battery Manufacturing	153	Climate (solar)		X	X	X	X	X				X	X
311511	Fluid Milk Manufacturing	152	Ag. link		X	X	X	X	X			X		
336411	Aircraft Manufacturing	70	Military link, climate, ret. military, strong logistics		X	X	X	X	X					X
332312	Fabricated Structural Metal Manufacturing	52	Util. rates, logistics		X	X	X	X	X	X			X	
332116	Metal Stamping	41			X	X	X	X	X	X				
336212	Truck Trailer Manufacturing	33	Util. rates, logistics	X	X	X	X	X	X		X	X		
339950	Sign Manufacturing	31			X	X	X	X	X			X		
321991	Manufactured homes/RVs		Labor	(n/a)	X	X	X	X	X			X		
336---	Unmanned vehicle manufacturing		Climate, military	(n/a)	X	X	X	X	X					X
332710	CNC machining		Retired mil.	(n/a)	X	X	X	X	X	X				X

1. Applied here to industries by a combination of Stakeholders' and TNDG's observations.
2. Potential contribution to output of other Yuma Region major industries, based on broader industry group (3-digit level; see Table 10).
3. Non-manufacturing sectors with a strong presence in the Yuma Region provide higher levels of support for these industries than for others. See Table 10.
4. See Table 7.

Occupational strength/weakness in the Yuma Region compared to the occupational needs for all manufacturing and for the "short list" industries

The following analysis, on Table 14, is based on (except as noted) national occupational requirements that apply to manufacturing in total and to the specific industries that correspond to the short list of recommended industries shown below and in Table 13. (The occupational data were available at the 3-digit level, and are consequently generalized in terms of the 6-digit short-list industries. Occupations not represented in 5 or more industries were deleted.) The occupation list is sorted by most to least workers required by all manufacturing (nationally). The table is color-coded (see legend below) to indicate:

- Where the Yuma Region has a larger or smaller Location Quotient (LQ) with respect to numbers of workers in each occupation in the U.S.
- For the short-list industries, where the proportion of workers in each occupation, in any specific (3-digit) industry, is above or below the proportion for all manufacturing (a factor of 20% above/below is used in this analysis).

The table provides multiple indicators:

- The most manufacturing-dependent occupations.
- The extent to which the Yuma Region is strong or weak in manufacturing-dependent occupations.
- The extent to which the short-list industries have a greater or lesser dependence, than manufacturing in general, on any particular occupation, which can then be compared to the Yuma Region's relative strength/weakness relative to that occupation.

For the sake of conciseness, the table shows only the 33 most manufacturing-dependent occupations, which on a national scale represent 57 percent of all manufacturing jobs.

The table shows that the Yuma Region's LQs are low for many of the most manufacturing-dependent occupations. Examining the columns for the individual industries shows that 335911: storage battery manufacturing, might present the most staffing challenges (that is, its occupational requirements for the occupations shown, most of which have low LQs in the Yuma Region, are proportionately greater than for all manufacturing), and 336411: aircraft manufacturing, the least challenges.

Short list of recommended industries

NAICS	Manufacturing Industry Description
311511	Fluid Milk Manufacturing
311991	Perishable Prepared Food Manufacturing
321991	Manufactured homes/RVs
332116	Metal Stamping
332312	Fabricated Structural Metal Manufacturing
332710	CNC machining
335911	Storage Battery Manufacturing
336000	Unmanned Vehicle Manufacturing
336212	Truck Trailer Manufacturing
336411	Aircraft Manufacturing
339950	Sign Manufacturing

Color Key Legend for Table 14, below

= Yuma LQ is relatively low

= Yuma LQ is similar to U.S.

= Yuma LQ is relatively high

= Proportion of employment in occupation is 20% higher than national manufacturing proportion

= Proportion of employment in occupation is 20% lower than national manufacturing proportion

Table 14. Occupational requirements for manufacturing and specific industries

OCS Codes	OCS Classifications	All Yuma	All US	All Yuma	Manu. In US	Location Quotient	Proportion of employment in each occupation										
							311511	311991	321991	332116	332312	332710	335911	336000	336212	336411	339950
51-2092	Team Assemblers	137	0.0058	0.0016	0.0628	0.2815	0.0149	0.0261	0.1289	0.0357	0.0606	0.0167	0.0990	0.1397	0.1990	0.0298	0.1134
51-1011	First-Line Supervisors of Production and Operating Workers	173	0.0033	0.0021	0.0349	0.6208	0.0350	0.0331	0.0378	0.0459	0.0421	0.0478	0.0362	0.0296	0.0357	0.0209	0.0393
51-4041	Machinists	51	0.0023	0.0006	0.0265	0.2659		0.0006	0.0016	0.0367	0.0168	0.3157	0.0201	0.0339	0.0041	0.0407	0.0147
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	115	0.0029	0.0014	0.0258	0.4826	0.0157	0.0203	0.0139	0.0408	0.0135	0.0276	0.0346	0.0312	0.0146	0.0405	0.0159
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	676	0.0130	0.0081	0.0229	0.6256	0.0619	0.0383	0.0416	0.0133	0.0182	0.0082	0.0282	0.0157	0.0171	0.0109	0.0178
51-9198	Helpers--Production Workers	197	0.0024	0.0024	0.0215	1.0061	0.0268	0.0197	0.0288	0.0245	0.0321	0.0216	0.0129	0.0117	0.0301	0.0034	0.0155
51-9111	Packaging and Filling Machine Operators and Tenders	237	0.0021	0.0028	0.0209	1.3817	0.1320	0.1161	0.0059	0.0071	0.0021	0.0007	0.0113	0.0011		0.0002	0.0098
41-4012	Sales Reps., Wholesale and Manufacturing, Except Technical and Scientific Products	385	0.0094	0.0046	0.0183	0.4913	0.0149	0.0168	0.0277	0.0153	0.0297	0.0138	0.0161	0.0076	0.0244	0.0041	0.0408
51-4121	Welders, Cutters, Solderers, and Brazers	175	0.0022	0.0021	0.0183	0.9749			0.0043	0.0255	0.1148	0.0443	0.0105	0.0332	0.1348	0.0067	0.0102
11-1021	General and Operations Managers	827	0.0114	0.0099	0.0175	0.8685	0.0112	0.0157	0.0197	0.0194	0.0244	0.0301	0.0169	0.0116	0.0122	0.0111	0.0257
49-9071	Maintenance and Repair Workers, General	616	0.0079	0.0074	0.0165	0.9335	0.0276	0.0203	0.0160	0.0184	0.0124	0.0082	0.0217	0.0118	0.0114	0.0065	0.0144
43-5071	Shipping, Receiving, and Traffic Clerks	250	0.0039	0.0030	0.0157	0.7639	0.0201	0.0174	0.0107	0.0214	0.0141	0.0163	0.0217	0.0123	0.0122	0.0089	0.0242
53-7064	Packers and Packagers, Hand	220	0.0039	0.0026	0.0152	0.6773	0.0283	0.0691	0.0064	0.0092	0.0053	0.0021	0.0064	0.0025	0.0008	0.0010	0.0170
51-2022	Electrical and Electronic Equipment Assemblers	42	0.0011	0.0005	0.0142	0.4670				0.0010	0.0003	0.0007	0.0926	0.0104	0.0081	0.0101	0.0117
49-9041	Industrial Machinery Mechanics	188	0.0019	0.0023	0.0142	1.1750	0.0276	0.0232	0.0064	0.0122	0.0079	0.0057	0.0040	0.0107	0.0073	0.0073	0.0023
53-7051	Industrial Truck and Tractor Operators	185	0.0029	0.0022	0.0136	0.7765	0.0276	0.0395	0.0320	0.0112	0.0094	0.0021	0.0121	0.0097	0.0114	0.0016	0.0060
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	13	0.0010	0.0002	0.0133	0.1537			0.0075	0.1296	0.0503	0.0128	0.0209	0.0163	0.0187	0.0036	0.0193
17-2112	Industrial Engineers	25	0.0012	0.0003	0.0130	0.2422	0.0037	0.0023	0.0048	0.0112	0.0056	0.0050	0.0209	0.0271	0.0106	0.0379	0.0068
43-9061	Office Clerks, General	999	0.0182	0.0120	0.0125	0.6602	0.0089	0.0104	0.0176	0.0112	0.0203	0.0298	0.0097	0.0068	0.0130	0.0047	0.0227
43-4051	Customer Service Representatives	1,557	0.0135	0.0187	0.0119	1.3881	0.0067	0.0110	0.0096	0.0082	0.0103	0.0043	0.0153	0.0048	0.0081	0.0036	0.0257
51-2099	Assemblers and Fabricators, All Other	79	0.0016	0.0009	0.0116	0.5830		0.0012	0.0378	0.0031	0.0124	0.0025	0.0072	0.0340	0.0739	0.0045	0.0412
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	4	0.0008	0.0000	0.0116	0.0609				0.0367	0.0121	0.0865	0.0121	0.0172	0.0073	0.0166	0.0079
11-3051	Industrial Production Managers	71	0.0010	0.0009	0.0110	0.8958	0.0119	0.0099	0.0085	0.0143	0.0112	0.0120	0.0113	0.0106	0.0114	0.0103	0.0098
17-2141	Mechanical Engineers	60	0.0015	0.0007	0.0110	0.4901			0.0005	0.0112	0.0065	0.0085	0.0145	0.0228	0.0073	0.0265	0.0060
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	15	0.0009	0.0002	0.0107	0.1985											
53-3032	Heavy and Tractor-Trailer Truck Drivers	1,087	0.0122	0.0131	0.0106	1.0671	0.0418	0.0209	0.0234	0.0031	0.0091	0.0021	0.0016	0.0026	0.0081	0.0012	0.0008
51-4072	Molding, Coremaking, and Casting Mach. Setters, Oper., and Tenders, Metal and Plastic	11	0.0007	0.0001	0.0100	0.1920	0.0007			0.0071	0.0024	0.0028	0.0258	0.0072	0.0057	0.0030	0.0242
51-9199	Production Workers, All Other	56	0.0015	0.0007	0.0100	0.4586	0.0075	0.0360	0.0123	0.0031	0.0065	0.0021	0.0169	0.0086	0.0106	0.0041	0.0151
43-3031	Bookkeeping, Accounting, and Auditing Clerks	675	0.0113	0.0081	0.0094	0.7198	0.0104	0.0093	0.0096	0.0102	0.0132	0.0156	0.0105	0.0049	0.0081	0.0034	0.0174
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	97	0.0007	0.0012	0.0087	1.7771	0.0112	0.0209		0.0010			0.0008	0.0005		0.0004	0.0019
43-5061	Production, Planning, and Expediting Clerks	54	0.0017	0.0006	0.0086	0.3919	0.0052	0.0070	0.0064	0.0082	0.0074	0.0050	0.0105	0.0125	0.0065	0.0178	0.0091
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	112	0.0018	0.0013	0.0081	0.7551	0.0037	0.0046	0.0053	0.0082	0.0079	0.0074	0.0121	0.0135	0.0106	0.0233	0.0076
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	4	0.0005	0.0000	0.0070	0.0980			0.0011	0.0265	0.0127	0.0110	0.0233	0.0119	0.0041	0.0091	0.0098

Chapter 8: Infrastructure analysis

As part of the Infrastructure Tasks for the Yuma County Area IMCP (Task 5, Transportation, Task 6, Utilities, and Task 7, Broadband), commentary was solicited from area technical personnel, planners, and engineers to document existing and planned infrastructure and, where possible, evaluate infrastructure capacity for expansion as it relates to selected industrially planned areas around the County. The detailed findings from this process are provided in Appendix B.

For each of the evaluated areas, described in the appendix and shown on Figure 7 and Figure 8 (the same maps are available at a higher resolution through the Yuma County Development Services Department), an evaluation of its relative strength was conducted using the following Ranking System:

Rank	Rank Description
I	Well Developed
II	Adequate
III	Needs Some Improvements

This fact-based analysis was accomplished based on Core Engineering Group's Technical Memorandums for Task 5 (Transportation), Task 6 (Utilities), and Task 7 (Broadband/Internet), combined in Appendix B.

It should be noted that Transportation has a subcategory not considered in the overall ranking - the presence of rail access. This is simply a YES/NO with commentary.

Figure 7 and Figure 8 also show development-restricted areas associated with the Airport. The associated zoning restrictions pertaining to industrial uses are summarized below.

Yuma County

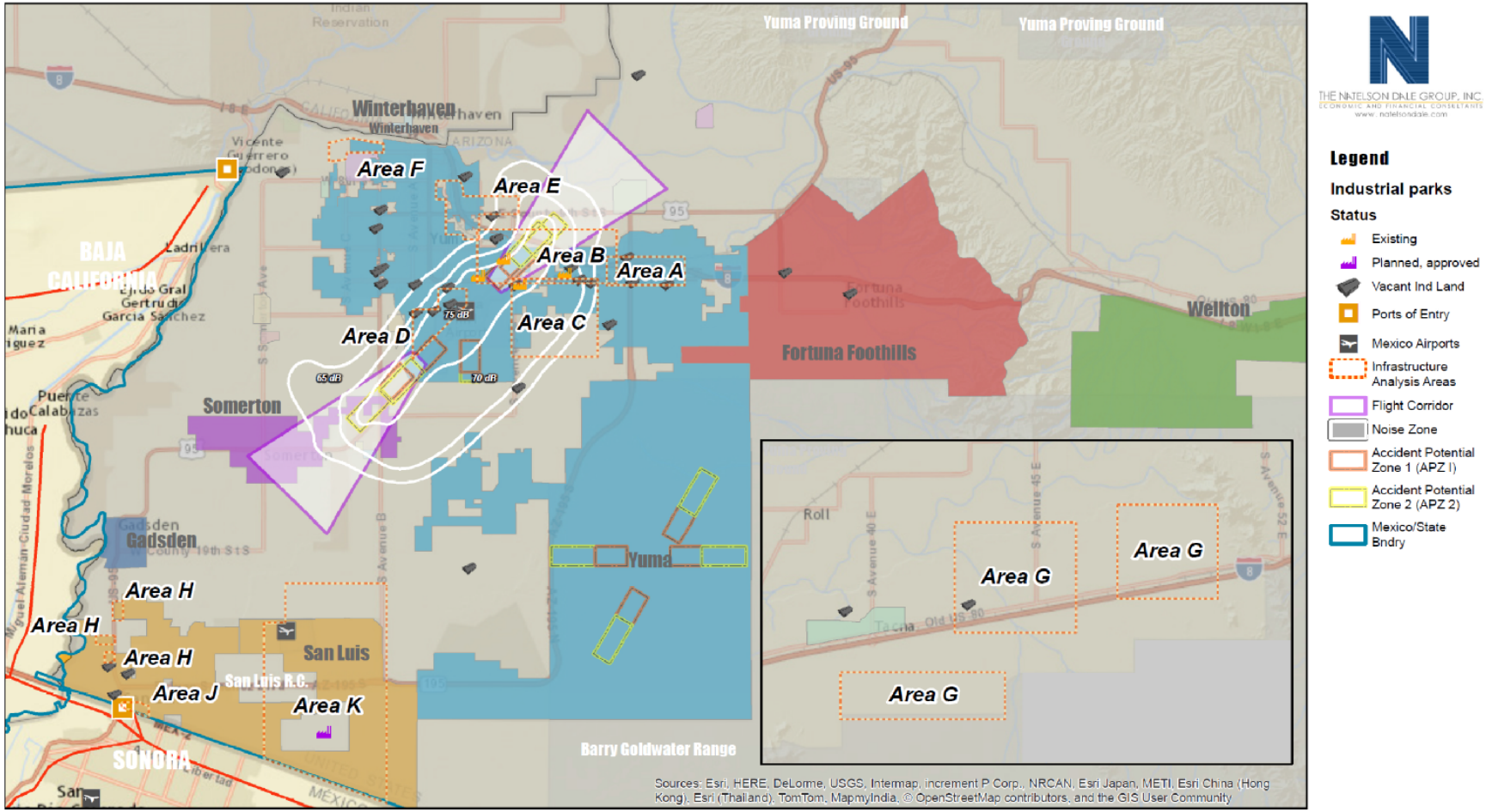
Geographically designated areas are defined for the Airport Industrial Overlay Districts (AIOD-1 and AIOD-2). Yuma County airport restrictions for Industrial Land Uses within that district include: No industrial use[6] is permitted within high noise contour areas of 85+ dB or within the Accident Potential Zone 1 (APZ-1).

City of Yuma, AZ

Geographically designated areas are defined for the Airport Industrial Overlay Districts (AIOD-1 and AIOD-2), and the Airport Overlay District (AD). City of Yuma airport restrictions for Industrial Land Uses within those districts include the following: None of the industrial uses[7] are permitted within the clear zone or within the Accident Potential Zone 1 (APZ-1). Chemical and Allied Product Manufacturing is also not permitted in Accident Potential Zone 2. Professional, Scientific and Controlling Instrument Manufacturing is not permitted within high-noise-contour areas of 80+ dB or within all of the areas previously noted.

[6] As listed in section 706.07 (Permitted Land Use Matrix) of the Yuma County Zoning Ordinance,
[7] As listed in Table No. 2 (Airport Overlay District Land Use Matrix) section 154-14.05 of the City of Yuma, AZ Zoning Ordinance.

Figure 7. Industrial Land – Regional Scale, with Infrastructure Analysis Areas

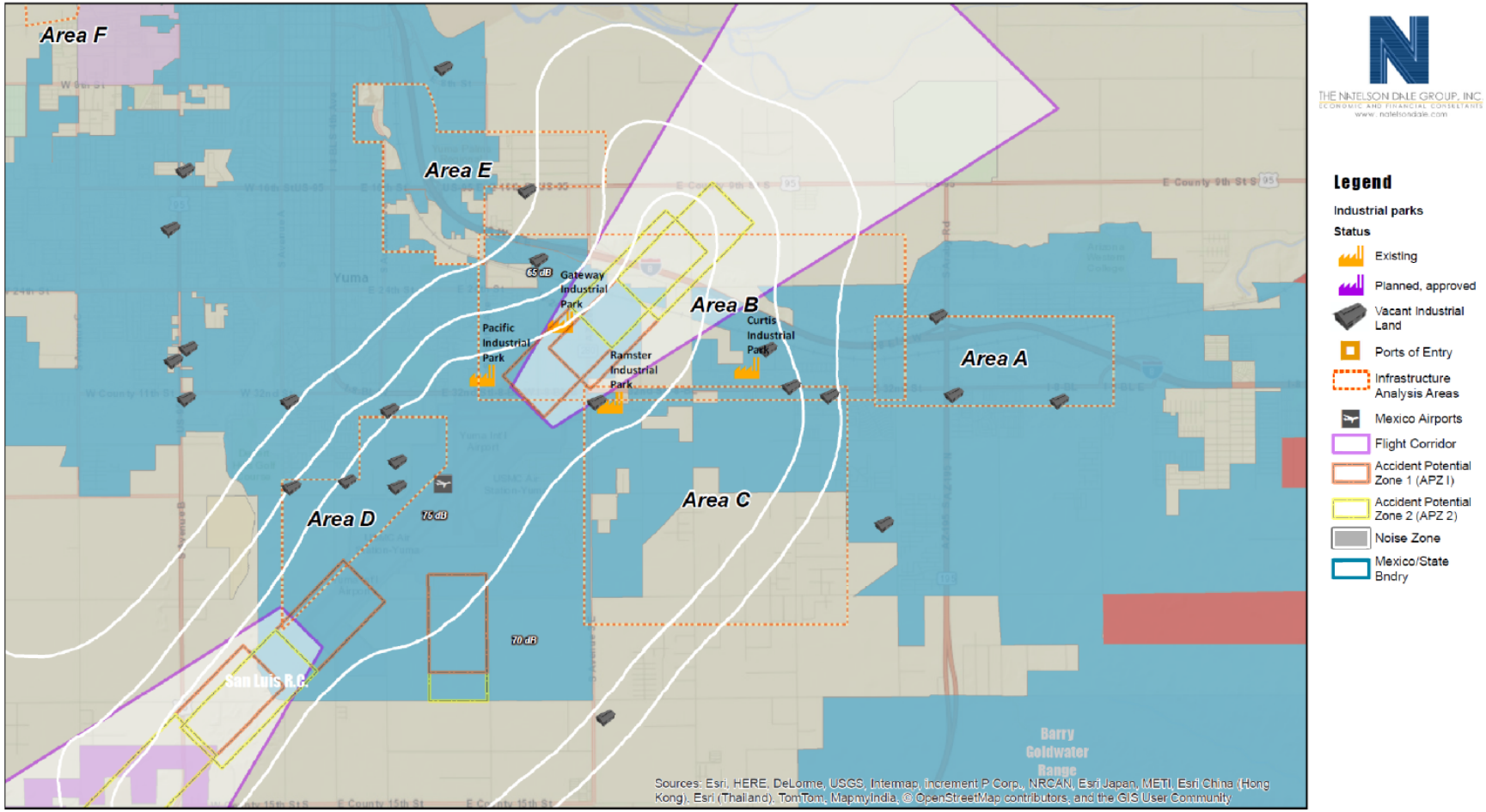


Yuma Manufacturing: Vacant Industrial Land, Industrial Parks, Major Employers, Flight Corridors and Noise Zones

Date: 2/2015

Source: Yuma County GIS, Bing Maps, ESRI Note: Data shown illustrating airport related information is generalized and should be verified with appropriate authorities.

Figure 8. Industrial Land – Airport Area, with Infrastructure Analysis Areas



Yuma Manufacturing: Vacant Industrial Land, Industrial Parks, Major Employers, Flight Corridors and Noise Zones

Date: 2/2015

Source: Yuma County GIS, Bing Maps, ESRI Note: Data shown illustrating airport related information is generalized and should be verified with appropriate authorities.

AREA A – Area South of I-8 to 32nd Street, from East of Avenue 6E to Avenue 8E

Infrastructure Item	Rank	Commentary
Transportation	I	Has immediate access to an interchange and road facilities that have been recently improved and has more improvements starting construction soon (Araby Traffic Interchange improvements).
Rail Presence?	NO	Adjacent to community preferred route for future rail.
Utilities	I	Only minor utility extensions required and available excess electric capacity is available. High-pressure gas service is available.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

AREA B – Area South of I-8 to 32nd Street, from Pacific Avenue to Avenue 6E

Infrastructure Item	Rank	Commentary
Transportation	I	There has been recent improvements completed along Avenue 3E with more coming in the immediate future. Rail is accessible and there are existing spurs that may be utilized.
Rail Presence?	YES	Adjacent to existing UPRR Route. Spurs available.
Utilities	I	Some utility extensions required, particularly sewer. High-pressure gas service is available.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds. There is a minor area of "Gigabit" internet available.

AREA C – Area South of 32nd Street to 40th Street and from Avenue 3E to Avenue 5½E

Infrastructure Item	Rank	Commentary
Transportation	II	Good two lane roadway infrastructure is in place. May need local/collector improvements and widening.
Rail Presence?	NO	Adjacent to community preferred route for new rail.
Utilities	II	Extensions of sewer collection network may be required. Excess electric capacity is available. High-pressure gas service is available.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

AREA D – Area North and West of the Yuma International Airport

Infrastructure Item	Rank	Commentary
Transportation	I	Adjacent to well-developed roadway system. Excellent opportunity for airport access.
Rail Presence?	NO	None.
Utilities	II	Minor electric and sewer improvements could provide more capacity to this area. High-pressure gas service can be extended to the area.

Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds. There is a minor area of "Gigabit" internet available.

AREA E – Central Municipal Yuma Area

Infrastructure Item	Rank	Commentary
Transportation	I	Excellent interstate access as well as a well-developed roadway infrastructure.
Rail Presence?	YES	Potential for spurs adjacent to northern subarea.
Utilities	I	Utilities are well served to the area. There is some potential for expansion of utilities to serve east side areas. High-pressure gas service is available.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds. There is a noted area of "Gigabit" internet available per broadband mapping tool.

AREA F –West of 23rd Avenue, East of Avenue C½, North of 1st Street & South of Levee

Infrastructure Item	Rank	Commentary
Transportation	III	Limited access. A four lane roadway that borders residential neighborhood. About 2 miles from interstate access.
Rail Presence?	YES	Existing spur along north side of subarea. It would require rehabilitation and a rail line would have to cross 4th Avenue in order to provide service to the spur.
Utilities	II	Some minor improvements may be required for water and sewer. Electricity is abundant with 21 MW of excess available. High-pressure gas service is available.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

AREA G – East County Wellton/Tacna Area

Infrastructure Item	Rank	Commentary
Transportation	I	Interstate is adjacent to potential development areas. Some local improvements would be required to better serve noted subareas.
Rail Presence?	YES	Subareas are immediately adjacent to mainline UPRR.
Utilities	III	Water service would likely be by wells. Sewer would be septic or alternative system. WMIDD electric service would need extensions. High-pressure gas service can be extended to the area.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

AREA H – Northwest San Luis

Infrastructure Item	Rank	Commentary
Transportation	I	Locations benefit from adjacent 5 lane highway and proximity to Mexico.
Rail Presence?	NO	None.
Utilities	II	Sewer service is available. Water would need extension of city system located 1.5 miles to the south. Some electric capacity exists, however some improvements may be needed.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

AREA J – Downtown San Luis adjacent to Main Port of Entry

Infrastructure Item	Rank	Commentary
Transportation	I	Location benefits from port access and current/ongoing improvements to adjacent local roads.
Rail Presence?	NO	None.
Utilities	I	Water and Sewer service is readily available. Some electric capacity exists, however some improvements may be needed. High-pressure gas service can be extended to the area.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

AREA K – Eastern San Luis: East of Port II and Rolle Airfield Area

Infrastructure Item	Rank	Commentary
Transportation	I	Port and airfield nearby. Some local roadway improvements may be required, but it should be noted Avenue E and County 25th Street are scheduled to be improved in 2015.
Rail Presence?	NO	Adjacent to community preferred future USA/Mexico rail interface.
Utilities	II	Sewer and water service is readily available with some capacity available. Some additional development of this infrastructure may be needed to serve a customer. High-pressure gas service is available.
Broadband/Internet	II	Full coverage available. Could use some improvements to data transmissions speeds.

Chapter 9: Partnerships

Two broad categories of potential economic development partnerships are discussed below: 1) partnerships specific to economic development-related organizations, and 2) government partnerships. Economic development organizations are listed in two categories: a) border coordination or other ad hoc group, and b) regional entities. Part of the basis and rationale for partnering with these groups is presented in the report section entitled, "Manufacturing industry employment and target-industry interrelationships within the Yuma IMCP region."

Potential government partnerships are organized under the headings of Federal, State, and Local. A number of federal agencies and their programs are also shown in the Federal Incentive section, which follows; the agencies listed under the Partnership section are those most likely to have a direct rather than indirect involvement in the Yuma Region's development.

Potential Economic Development Partnerships

Entity	General Basis for Partnership	Key Partnership Points	Documented By
Border-coordination or other ad hoc group			
ADOT, AZ-Mexico Commission, and others in coalition: "Roadmap"	Focused on border-region issues	Key goals of Roadmap: 1) Expand Arizona's border region's economic viability and impact; 2) Build positive image/awareness of an economically strong border region; 3) Expand and strengthen relationships for Arizona's economic initiatives; 4) Build border infrastructure; 5) Promote border-community economic investment	Arizona Border Communities Roadmap http://www.azmc.org/border-roadmap
Arizona State University, others	Trilateral Border Issues Symposium; issues discussions	Promotes international trade, mostly through policy recommendations[8]	https://trilateralborders.asu.edu/content/past-conferences
Border Environment Cooperation Commission	Energy efficiency	Provide technical assistance focus and needs assessment	www.becc.org
The Innovation Frontier Southwest (IFS) Consortium	This is the partnership group with which the Yuma Region participated in seeking IMCP designations	The comprehensive nature of this group and its programmatic focus could help the Yuma Region leverage internal resources while expanding markets	IFS application for designation as a Manufacturing Community
Regional entities			
CaliBaja	Cross-border coordination; only includes California and aja Cal. For now	Intend to do joint marketing, among members, of region[9]	www.calibaja.net
GYEDC – Greater Yuma Economic Development Council	Implements economic development functions	Focuses on selected, job-generating sectors	Misc. GYEDC website materials http://www.greateryuma.org

[8] Attend/monitor meetings.
[9] Relevant even if only to monitor or model from.

Entity	General Basis for Partnership	Key Partnership Points	Documented By
YPIC - the Yuma Private Industry Council	Plays key role in workforce development	YPIC has also been instrumental in sponsoring economic development strategic planning processes that encompass and go beyond workforce issues	http://www.ypic.com
Other economic-development-related organizations: YVB - Yuma Visitors Bureau; The Yuma County Chamber of Commerce, and other Chambers; WAEDD - Western Arizona Economic Development District	These organizations address various aspects of economic activity with either direct or indirect applicability and/or coordinating functions with economic sub-groups	YVB: Coordinates tourism-development efforts, which markedly affect the region's image and quality of life. The Yuma County C of C, and others: Interface with business community generally WAEDD: Coordinates various aspects of economic development activity.	Associated websites
WACOG – Western Area Association of Governments	Broadband Steering Committee; also provides coordinated planning and technical assistance related to transportation	Broadband Committee: Activities are funded in part by a federal broadband grant administered through the State of Arizona's Digital Arizona Project (DAP). Transportation-related work includes planning and technical assistance for highway and local roadway improvement, population data collection and projections, regional and local transit studies, and coordination of regional transit programs.	http://www.wacog.com/index.html
YMPO – Yuma Municipal Planning Organization	Transportation-coordinating entity for Yuma County	Partners closely with ADOT in planning and implementation	http://ympo.org
Yuma County Airport Authority	Airport Authority: oversees airport operations	Airport is key facility as both a focus for economic activity and a crucial transportation element.	https://www.yumaairport.com/yumahome.nsf
GYPA - the Greater Yuma Port Authority	GYPA members include Cocopah Indian Tribe, Yuma County, City of Yuma, and City of San Luis	GYPA is the local unified agency for the planning and building of the new commercial border crossing east of San Luis	http://www.gypa.org

Entity	General Basis for Partnership	Key Partnership Points	Documented By
Imperial County	Have goal of international and bi-national trade development	Compatible target industries: Agribusiness, Renewable Energy, International Trade & Logistics, Manufacturing, Tourism[10]	Imperial County CEDS, 2012-13
Imperial Valley Economic Development Corporation (IVEDC)	Coordinates closely with CaliBaja and megaregion concept	Compatible target industries (see Imperial County)	http://www.ivedc.com
Pima Association of Governments, Arizona-Sonora Binational Megaregion	Officials with PAG, city of Tucson, Sonora, SCMPO, CAG, MAG, and League of AZ Cities signed Partnering Charter. YMPO has since been invited to join and has representatives assigned.	The parties "have agreed to build mutual understanding, share knowledge, and develop social capital in the process of setting policy direction within what will hereinafter be known as the Arizona- Sonora Binational Megaregion."	Partnering Charter: Formation of an Arizona-Sonora Binational Megaregion
Military installations: YPG - the Yuma Proving Ground MCAS – Marine Corps Air Station		YPG: Has a special organizational status – technically a military installation, but with a strong private-industry interface based on the installation's ability to provide for premier test facilities and support. MCAS: Like, YPG, attracts hi-tech activity to the Yuma Region, and also requires special protection involving land-use regulation for the preservation of base and range operations.	

[10] The Economic Development Division was transferred to the County Executive Office; Web presence is minimal.

POTENTIAL GOVERNMENT PARTNERSHIPS

Entity	General Basis for Partnership	Key Partnership Points	Documented By
Federal (the agencies below could have a direct role in partnering for economic development in Yuma County, and also have programs discussed in the Federal Incentive section)			
Small Business Administration	Accelerator Program for start-ups	See Chapter 10, Federal Incentives	SBA website: https://www.sba.gov/blogs/sba-launches-growth-accelerator-fund
Department of Agriculture	Numerous grant and loan/loan guarantee funding opportunities	See Chapter 10, Federal Incentives	http://www.rurdev.usda.gov/AZHome.html
US Dept. of Commerce, Economic Development Administration (EDA)	Agency tends to be responsive to economically distressed areas and conditions	See Chapter 10, Federal Incentives	EDA website; locally coordinated by Comprehensive Economic Development Strategies (CEDS) documents
US Dept. of Commerce, Minority Business Development Agency (MBDA)	MBDA promotes the growth and global competitiveness of businesses owned and operated by members of the minority communities	See Chapter 10, Federal Incentives	http://www.mbda.gov
State			
ADOT – Arizona Department of Transportation	Road/rail transportation coordination; POE prioritization	Goal: Multimodal integration for improved accessibility to and within regional activity centers, and across border	*Yuma County Rail Corridor Study*, YMPO, 2013; *2014-2037 Regional Transportation Plan*, YMPO; *Arizona Border Communities Roadmap*, YMPO [reports of these types are typically funded through ADOT]
Arizona Commerce Authority	Manages state incentives and state-level ED promotion	Target industries are compatible with Yuma Region	http://www.azcommerce.com
Digital Arizona Program	Attempts to keep broadband data up-to-date for rural AZ	Has extensive database of broadband suppliers and details for the Yuma Region	https://digitalarizona.az.gov/

Entity	General Basis for Partnership	Key Partnership Points	Documented By
Local			
City of San Luis	Relates to GYEDC targets, strategies; also focuses on compatible sectors of logistics support, hospitality, solar energy	General Plan recommends that a specific economic development strategy should be developed by the City in coordination with Yuma County and regional efforts. Ideally this would be regionally coordinated.	General Plan 2020
City of Yuma	Focus on infrastructure and growth-area enhancements	Include growth area for industry: Araby Road/I-8 from 24th Street to 32nd Street	City of Yuma General Plan
Other local entities: City of Somerton Town of Wellton Cocopah Tribe Quechan Tribe	These smaller entities will have an influence on the region's development, even if that comes about by way of inaction	Somerton: Has industrially designated land (but with no feasible rail access unless there are major line improvements upstream into Yuma). Wellton: Has large areas designated for industrial use. Cocopah and Quechan Tribes: Control land area that will influence development, also have access to unique funding sources for development	Related websites: http://www.cityofsomerton.com http://town.wellton.az.us http://www.cocopah.com http://itcaonline.com/?page_id=1173

Potential regulatory barriers

Land use regulations throughout Yuma County do not appear to constrain industrial development. In the City of Yuma alone, 5,587 acres are designated for Industrial use in the *City of Yuma 2012 General Plan*, and another 4,766 are designated Agricultural/Industrial. In addition, over one thousand acres are designated for Business Park use.

Developable land in the Yuma Region is constrained however by vast acreages of public land in various uses. According to the Yuma County 2020 Comprehensive Plan (2012, with amendments through August 19 of 2013), only 8.8 percent of the *unincorporated* land in Yuma County is in private ownership; although this still amounts to 472.3 square miles of property. The *Yuma Regional Development Plan* (undated but approx. 2011), which represents the combined planning efforts of the Cities of San Luis, Somerton, and Yuma, the Town of Wellton, Yuma County, Marine Corps Air Station (MCAS), and the U.S. Army Yuma Proving Ground (YPG), summarizes how land use plans throughout the County can help protect the County's military-use and other important land resources, such as agriculture. This document, although it represents a form of land-use constraint, also helps preserve important economic drivers within the County and on balance probably helps focus development of infrastructure and land more efficiently than would otherwise occur.

To the extent that certain public utilities operate within restricted markets within the County (for example electricity is a regulated utility in Arizona), and utility costs are, for whatever reason, disproportionately high, this could be interpreted as a form of regulatory constraint on the expansion of manufacturing. According to electricitylocal.com (http://www.electricitylocal.com/states/arizona/yuma/), the average industrial electricity rate in the Yuma Region, at 7.87¢/kWh, is over 20 percent higher than the state average and 18 percent higher than the national average. It is important to note that comparisons of this type are limited by a number of factors including for example the fact that "average rates" for different geographical areas are not necessarily derived using universally applied methods and factors, and rates can change over time according to seasonal and other influences. The reported price estimates may not be entirely free of bias (Electricity Local appears to be a group advocating electric utility deregulation). Nevertheless, this information is "in the public domain" and may also reflect a perception on the part of some local manufacturers, based on business survey comments received by GYEDC and made available to consultants for this project. On the other hand, input from some stakeholders for this project indicated that electricity rates were favorable for the Yuma Region. (Yuma Proving Ground has particularly favorable rates due to its allocation of power from the Western Area Power Administration.)

Upon review of the discussion presented above in a draft document, the County suggested that APS be requested to provide input on these matters. The response from APS, provided below,[11] highlights the complexity of attempting to evaluate the competitiveness of electric power rates.

> *Large industrial electricity rates that would apply to manufacturing customers can vary dramatically based on peak electrical demand, the way in which customers use energy throughout the day, and the voltage level at which service is provided. APS's large customer rate*

[11] The TNDG Team acknowledges our appreciation of Bart Edwards, APS Key Accounts Manager, SW Division (Yuma) for facilitating this response from APS's Rates & Regulatory Department.

design recovers most of APS's fixed costs through capacity related charges (peak demand) and recovers costs that vary with the energy consumed through an energy charge. APS's large customers that use energy consistently across the day will have a lower average cost of electricity because the peak demand related charges will be averaged over a larger quantity of energy. For customers that have more sporadic energy consumption, the peak related costs will create a higher average cost of electricity.

In Arizona, APS's largest peer utilities are Salt River Project (SRP) and Tucson Electric Power Company (TEP). APS compares favorably to TEP in almost all cases across various customer sizes, usage patterns and service voltages. SRP's large customer rate design has lower peak demand charges and higher energy charges when compared to APS. At higher customer load factors and higher voltage service levels, APS compares very favorably to SRP. At lower load factors and lower voltage service levels, SRP's rates are more favorable.

Using average cost of electricity data collected by the Federal Energy Information Administration can be misleading due to the averaging of the information and due to reporting differences between different utilities that may have different rate designs and tariff designations with different definitions for what qualifies as a large customer. APS recommends specific rate schedule comparisons on a case by case basis to develop an accurate comparative cost of electricity for large customers.

Energy-production requirements that relate to mandating renewable sources or limiting coal-fired plants could drive up Arizona's energy costs in general, and this could affect some parts of the state more than others. While the TNDG team has not attempted to forecast such implications, power-intensive industries will be at a disadvantage if the Yuma Region's rates increase more than the state and national averages.

According to research conducted for this report, the Yuma Region is deficient in the quality of broadband service. Specifically, the investigation showed that, while broadband coverage exceeded 80 percent of the region, broadband speeds averaged 39 percent slower than the state average and 35 percent slower than the national average. This deficiency however is apparently related to market conditions rather than regulatory barriers. In a letter to Mayor Nicholls, generated as a request for information about broadband capacity in the Yuma Region, Nick Reese of broadbandnow stated the following: "Fortunately Arizona is one of the 31 states that don't put heavy barriers to entry on municipalities from building their own fiber networks."

Border security at the San Luis ports of entry are a potential source of "regulatory barriers" for the region. According to some sources[12], commercial vehicles typically cross at the new San Luis II port with minimal or no wait times.

[12] http://traffic.calit2.net/border/border-wait-times.php?type=commercial&sub=standard&port=260802

Chapter 10: Federal incentive programs

The following section lists federal government incentive programs associated with the "manufacturing playbook" developed by the Investing in Manufacturing Communities Partnership (IMCP). This federal partnership encourages communities to devise comprehensive economic development strategies that strengthen their competitive advantage for attracting global manufacturers and their supply chains.

In the section below, the initial table lists the programs in an index in order to facilitate locating each program listing by name and the individually coded key assigned to that program. The coded key listed next to the name of the program in the index table is associated with the same code in the second table, which has the full name, general incentive for the program, and the key incentive elements of each program.

The incentive programs are organized under the following headings:

A. Infrastructure and Capital Investment
B. Employee Training, Capacity Building, etc.
C. Job Creation

To facilitate the process of coordinating these incentives with state and local incentives also available to support manufacturing development, relevant state/local incentives are listed in Appendix C.

Table Index

Ind. Key	Entity
A1	Environmental Protection Agency (EPA)
A2	Dept. of Comm. (DOC), Economic Development Administration (EDA)
A3	Dept. of Agr. (USDA) - IMCP Partner
A4	Dept. of Agr. (USDA)
A5	Dept. of Agr. (USDA)
A6	Dept. of Energy (DOE) Clean Energy Manufacturing Initiative (CEMI)
A7	Council of Development Finance Agencies (CDFA) Federal Financing Clearinghouse (FFC)
A8	Dept. of Energy (DOE) Better Plants Program's State Incentives and Resource Database
A9	Dept. of Agr. (USDA) Rural Energy for America Program (REAP)
A10	National Network for Manufacturing Innovation (NNMI) and Other Accelerators
A11	Dept. of Comm. (DOC), Census Bureau Profile of Importing and Exporting Companies
A12	Opportunity Finance Network (OFN) Community Development Financial Institutions (CDFI) Database
A13	Mission Investors Exchange Community Foundation Field Guide to Impact Investing
A14	Dept. of Agr. (USDA) Business and Industry Guaranteed Loan Program
A15	Dept. of Agr. (USDA) Rural Business Investment Program
A16	Federal Finance Facilities Available for Energy Efficiency Upgrades and Clean Energy Deployment
B1	Dept. of Labor (DOL)
B2	Dept. of Labor (DOL)
B3	Dept. of Labor (DOL)
B4	Environmental Protection Agency (EPA)
B5	Dept. of Agr. (USDA)
B6	Environmental Protection Agency (EPA) jointly w/ Dept. of Comm. (DOC), National Inst. of Standards and Technology Manufacturing Ext. Partnership (NIST MEP)
B7	BusinessUSA
C1	Small Business Administration (SBA)
C2	Dept. of Comm. (DOC), Economic Development Administration (EDA)
C3	Dept. of Comm. (DOC), Minority Business Development Agency (MCDA)
C4	Dept. of Agr. (DOA)
C5	Environmental Protection Agency (EPA) jointly w/ Dept. of Comm. (DOC), National Inst. of Standards and Technology Manufacturing Ext. Partnership (NIST MEP)
C6	National Institute of Standards and Technology (NIST) Holings Manufacturing Extension Partnership (MEP)
C7	Dept. of Comm. (DOC), Economic Development Administration (EDA) Trade Adjustment Assistance Centers (TAA)
C8	Manufacturing Extension Partnership Centers (MEP) ExporTech
C9	Export.gov
C10	SelectUSA.gov
C11	Dept. of Agr. (USDA) Rural Economic Development Loan and Grant

Potential Manufacturing Playbook Sources for the Yuma Region

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
Infrastructure and Capital Investment				
A1	Environmental Protection Agency (EPA)	Help deal with brownfields and address the associated uncertainties (TBA program)	Programs include: Targeted Brownfield Assessments (TBA); Brownfield Site Assessment/cleanup	http://www.manufacturing.gov/imcp/resources/workforce.html
A2	Dept. of Comm. (DOC), Economic Development Administration (EDA)	Leverage regional assets to support the implementation of regional economic development strategies.	Program: Investments for Public Works and Economic Development Facilities, providing funding through construction, non-construction, and revolving loans.	EDA website; projects are locally coordinated through Comprehensive Economic Development Strategies (CEDS) documents.
A3	Dept. of Agr. (USDA) - IMCP Partner	Rural Development Energy Programs, with a focus on renewable energy.	Multiple programs can support energy audits, provide renewable energy development assistance, make energy efficiency improvements, and install renewable energy systems. Also, programs that help convert older heating sources to cleaner technologies, produce advanced biofuels, install solar panels, build biorefineries, among other purposes. Options including grants, guaranteed loans and payments.	http://www.rurdev.usda.gov/Energy.html
A4	Dept. of Agr. (USDA)	Telecommunications Loans and Grants	Programs include (among others): Telecommunications Loan Program, Broadband Loan Program (Farm Bill), and Community Connect Broadband Program	http://www.rurdev.usda.gov/UTP_Programs.html

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
A5	Dept. of Agr. (USDA)	Water and Environmental Programs, which can provide key infrastructure for supporting growth and specific new development	Programs provide loans, grants and loan guarantees for drinking water, sanitary sewer, solid waste and storm drainage facilities in rural areas (also have grants to nonprofit organizations to provide technical assistance and training to assist rural communities with their water, wastewater, and solid waste problems)[13]	http://www.rurdev.usda.gov/UWEP_HomePage.html
A6	Dept. of Energy (DOE) Clean Energy Manufacturing Initiative (CEMI)	Increase U.S. competitiveness in the production and productivity of clean energy products.	Strategically invests in technologies and practices that leverage American competitive advantages, enable manufacturers to increase energy efficiency, take advantage of low-cost domestic energy sources, and overcome other competitive disadvantages.	http://energy.gov/eere/cemi/clean-energy-manufacturing-initiative
A7	Council of Development Finance Agencies (CDFA) Federal Financing Clearinghouse (FFC)	Online resource cataloging development finance programs offered by the federal government.	Includes overviews of over 170 federal financing programs available to both public and private sector users.	http://www.cdfa.net/cdfa/cdfaweb.nsf/ffcsearch.html
A8	Dept. of Energy (DOE) Better Plants Program's State Incentives and Resource Database	Online resource that provides assistance for managers looking to make energy efficiency upgrades in their facilities.	Includes a database of financial and technical incentives, tools, and resources available by location.	State and Utility Engagement Activities: http://www.energy.gov/eere/amo/state-and-utility-engagement-activities Database of State Incentives: http://www.dsireusa.org

[13] USDA and EPA also jointly produced the 2014 study: U.S. Mexico Border Needs Assessment and Support Project, Phase 1 Scoping Assessment Report, to estimate coverage gaps in water and waste disposal infrastructure (on the US side).

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
A9	Dept. of Agr. (USDA) Rural Energy for America Program (REAP)	Provides financial assistance to agricultural producers and rural small businesses in rural America to finance energy efficiency improvement costs.	Loan guarantees and grants are provided by the program to eligible applicants that want to install renewable energy systems, make energy efficiency improvements, and conduct energy audits and feasibility studies.	http://www.rurdev.usda.gov/BCP_Reap.html
A10	National Network for Manufacturing Innovation (NNMI) and Other Accelerators	Accelerates the development and adoption of cutting-edge manufacturing technologies for making new, globally competitive products.	Provides network of Institutes of Manufacturing Innovation (IMI) that provide innovation infrastructure to support regional manufacturing hubs.	NNMI Program Overview: http://manufacturing.gov/nnmi_overview.html NNMI Program Preliminary Design: http://manufacturing.gov/docs/nnmi_prelim_design.pdf
A11	Dept. of Comm. (DOC), Census Bureau Profile of Importing and Exporting Companies	Data series reports US export and import statistics.	Variety of US export and import statistics by type, employment size, and select state level data (latest year of data available - 2011)	Applicable Data Release Reports: http://www.census.gov/foreign-trade/Press-Release/edb/2011/ http://www.census.gov/foreign-trade/Press-Release/edb/2011/exh6a.pdf http://www.census.gov/foreign-trade/Press-Release/edb/2011/exh6d.pdf
A12	Opportunity Finance Network (OFN) Community Development Financial Institutions (CDFI) Database	Provides database of OFN Members affiliated with CDFI.	Database provides search capabilities for finding OFN Members that are affiliated with CDFI for each state.	http://ofn.org/cdfi-locator. Resource is derived from Export.gov
A13	Mission Investors Exchange Community Foundation Field Guide to Impact Investing	Comprehensive resource that specifically focuses on the needs of a community foundation.	Field Guide takes community foundations through three main stages of the impact investing, which include learning, designing, and activating the financing for community foundations.	https://www.missioninvestors.org/system/files/tools/FieldGuide_102113_PRINT_v3.pdf

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
A14	Dept. of Agr. (USDA) Business and Industry Guaranteed Loan Program	Bolster existing private credit structure through the guarantee of quality loans which provide lasting community benefits.	Improve, develop, or finance business, industry, and employment, and to improve the economic and environmental climate in rural communities.	http://www.rurdev.usda.gov/BCP_gar.html
A15	Dept. of Agr. (USDA) Rural Business Investment Program	Promotes economic development in mostly rural areas.	Provides equity capital investment assistance that smaller enterprises located in rural areas need.	http://www.rurdev.usda.gov/BCP_RBIP.html
A16	Federal Finance Facilities Available for Energy Efficiency Upgrades and Clean Energy Deployment	Resource that lists the various federal financing programs allocated for energy efficiency and clean energy funding.	Identifies funding sources for state, local and tribal leaders, along with private sector partners that are searching for capital to finance energy efficiency and clean energy projects.	http://energy.gov/sites/prod/files/2014/10/f18/Federal%20Financing%20Guide%2009%2026%2014.pdf
Employee Training, Capacity Building, etc.				
B1	Dept. of Labor (DOL)	DOL's Employment and Training Administration, Workforce Development Grants	Different grant programs support a variety of priorities in employment and training programming and services	http://www.doleta.gov/grants/find_grants.cfm
B2	Dept. of Labor (DOL)	Workforce3One, an e-learning, knowledge-sharing web space	Site offers workforce professionals, employers, economic development, and education professional's innovative workforce solutions. The site hosts online learning events, resource information, and other tools.	https://www.workforce3one.org/
B3	Dept. of Labor (DOL)	Part of Workforce3One: 21st Century Registered Apprenticeship "Community of Practice," an online resource for apprenticeship programs	Site intended for stakeholders from throughout the Registered Apprenticeship system and its partners to share information regarding the innovative strategies and partnerships being used to train U.S. workers	https://21stcenturyapprenticeship.workforce3one.org/page/about
B4	Environmental Protection Agency (EPA)	Environmental Workforce Development and Job Training Program	Program helps train and employ low-income and minorities living in areas affected by solid and hazardous waste	http://www.epa.gov/brownfields/job.htm

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
B5	Dept. of Agr. (USDA)	Rural Community Development Initiative grants: Intent is to develop the capacity and ability of private, nonprofit community-based housing and community development organizations to enhance community and economic development projects in rural areas.	Grants may be used for training sub- grantees to conduct a program for minority business entrepreneurs; provide technical assistance to sub-grantees on how to effectively prepare a strategic plan; provide technical assistance to sub-grantees on how to access alternative funding sources; building organizational capacity through board training; and develop training tools	http://www.rurdev.usda.gov/HAD-RCDI_Grants.html
B6	Environmental Protection Agency (EPA) jointly w/ Dept. of Comm. (DOC), National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP)	E3: Economy, Energy, and Environment's Veterans Resources	When companies have implemented E3 recommendations to the point where they are looking to expand their workforce, they may be able to take advantage of tax credits and other incentives by hiring veterans.	http://www.e3.gov/action/veterans.html
B7	BusinessUSA	Provides resources to help small businesses and exporters connect to needed services or information that will efficiently and effectively navigate the federal bureaucracy.	Quickly connects businesses to the services and information relevant to them, regardless of the location of or the associated agency's website, call center, or physical location of the agency's office.	BusinessUSA website: http://business.usa.gov
Job Creation				
C1	Small Business Administration (SBA)	Accelerator Program	Program supports organizations established to help start-ups to grow, become commercially viable and have real and sustained economic impact[14]	SBA website: https://www.sba.gov/blogs/sba-launches-growth-accelerator-fund

[14] USDA and EDA are among the partners in a similar program: Rural Jobs and Innovation Accelerator Challenge.

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
C2	Dept. of Comm. (DOC), Economic Development Administration (EDA)	Agency tends to be responsive to distressed areas and conditions (as in programs for economic adjustment and trade adjustment)	Has programs for funding: Economic Adjustment (when economic base is threatened by external conditions), Partnership Planning (local ED planning assistance for CEDS production)	EDA website; locally coordinated by Comprehensive Economic Development Strategies (CEDS) documents
C3	Dept. of Comm., Minority Business Development Agency (MCDA)	MBDA mission is to help create and maintain U.S. jobs by promoting the growth and global competitiveness of businesses owned and operated by members of the minority communities	Through a national network of business centers and domestic and international strategic partners, MBDA provides technical assistance and access to capital, contract opportunities and new markets	http://www.mbda.gov
C4	Dept. of Agr. (DOA)	Rural Business Enterprise Grants (RBEG) Program	Grants for rural projects that finance and facilitate development of small and emerging rural businesses, help fund distance learning networks, and help fund employment-related adult education programs	http://www.rurdev.usda.gov/bcp_rbeg.html
C5	Environmental Protection Agency (EPA) jointly w/ Dept. of Comm. (DOC), National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP)	E3: Economy, Energy, and Environment, technical assistance	For E3-designated communities, intent is to connect small and medium-sized manufacturers with experts from federal agencies, states, and regions. so that teams can design and conduct customized technical assessments	http://www.e3.gov/about/e3.html
C6	National Institute of Standards and Technology (NIST) Holings Manufacturing Extension Partnership (MEP)	Vital Partnerships	Work with small and mid-sized U.S. Manufacturers to help create and retain jobs, increase profits, and save time and money.	http://www.nist.gov/mep/

Ind. Key	Entity	General Purpose of Incentive	Key Incentive Elements	Documented By
C7	Dept. of Comm. (DOC), Economic Development Administration (EDA) Trade Adjustment Assistance Centers (TAA)	Federal program, sponsored by U.S. Department of Commerce, provides financial assistance to manufacturers affected by import competition.	Cost sharing federal assistance pays for half the cost of consultants or industry-specific experts for projects that improve a manufacturer's competitiveness.	http://www.taacenters.org/ https://www.cfda.gov/programs/11.313
C8	Manufacturing Extension Partnership Centers (MEP) ExporTech	National export assistance program that aides companies entering or expanding in global markets	Structured export strategy development process that assists companies to accelerate growth. Aides in the development of a written export plan that is subsequently vetted by a panel of experts upon completion. Efficiently connects companies with experts that help navigate the export sales process.	http://www.nist.gov/exportech/index.cfm
C9	Export.gov	Collaborative resources from various governmental agencies that assist businesses in planning their international sales strategies to enter the global marketplace.	Services provided include information and counseling assistance, business strategy and planning assistance, market research and due diligence assistance, advertising and promotional event planning assistance, market entry and expansion assistance, as well as advocacy and dispute resolution assistance.	http://export.gov/faq/eg_main_017486.asp
C10	SelectUSA.gov	Provides information resources to understand the complete value proposition offered to firms located in the United States.	Information provided includes a searchable guide of federal programs and services available to businesses operating in the US. Examples include grants, loans, loan guarantees, and tax incentives. In addition, industry snapshots are provided to describe the competitive landscape of each industry as well as an overview of the advantages to operating a business in the US.	http://selectusa.commerce.gov
C11	Dept. of Agr. (USDA) Rural Economic Development Loan and Grant	Provides funding to rural projects through local utility organizations.	Provides zero interest loans to local utilities that create revolving loan funds that are distributed in the form of loans to local businesses for projects that create and retain employment in rural areas.	http://www.rurdev.usda.gov/bcp_redlg.html

Chapter 11: Marketing and implementation plan

The marketing framework outlined in this chapter reflects the detailed assessment (provided in the remainder of this document) of opportunities and challenges relative to expanding manufacturing activities in the Yuma Region. These opportunities and challenges are briefly highlighted as follows:

Strengths/Opportunities	Weaknesses/Challenges
• Unique economic "drivers" (agriculture, military) with potential connections to manufacturing and innovations • Strategic "dual border" (U.S.-Mexico, Arizona-California) location; excellent port of entry infrastructure • Focal point of renewable energy development • Developable land appropriate for manufacturing facilities • Development-friendly local governments; responsive public/private "partners" with history of collaborating to address economic development issues • Expanding capacity for training of technical workforce • Location within a larger, dynamic region (and with expanding levels of intraregional cooperation)	• Limited base of manufacturing activity • Difficulty in recruiting technical workforce • Inadequate infrastructure assets in areas planned for industrial development • Limited access to venture capital from local sources • Limited track record in commercialization of technology (i.e., large military presence in the Yuma Region has not been significantly leveraged for manufacturing activities) • Bi-national (U.S.-Mexico) manufacturing supply chain tends to favor south-of-the-border locations for actual production

The marketing and implementation plan is organized in terms of three major themes and twelve program recommendations. In some cases the program recommendations represent continuation of existing programs, with the intent that these efforts be refocused to support the manufacturing-specific emphasis of the IMCP strategy.

As noted below, an overarching theme of the implementation plan is regional collaboration, with a particular emphasis on leveraging the forthcoming implementation of the Innovation Frontier Southwest (IFS) initiative. IFS is a public-private partnership composed of public and private sector entities, educational and workforce providers, economic development organizations, state agencies, and non-profit service providers. IFS consists of the following entities: City of Tucson, Pima County, Tech Parks Arizona, Pima Community College, Pima County One-Stop, City of Sierra Vista, Greater Yuma Economic Development Corporation, Yuma Private Industry Council, New Mexico State University and the New Mexico MEP. The IFS region spans the US-Mexico border from Yuma/San Luis, Arizona to Las Cruces/Santa Teresa, New Mexico. The region is anchored by the Tucson/Nogales metropolitan area. The IFS recently (April 2014) submitted an application for IMCP designation. Although the application was unsuccessful, it is anticipated that the consortium organized for the process will continue to collaborate on regional-scale economic development initiatives.

The IMCP process has identified a number of manufacturing sectors that are potentially viable targets for the Yuma Region based on connections to existing local strengths. However, due to the relatively small size of the Yuma Region's existing manufacturing base (in which only a handful of individual sectors have sizeable numbers of existing employees), major expansion of the Yuma Region's manufacturing economy is probably best accomplished by positioning the Yuma Region as part of a large, dynamic region. In this context, the Yuma Region will be more readily recognized (by prospect firms) as a component of a large supply chain rather than appearing to be a smaller community in an isolated location. The IFS consortium provides an excellent framework for continued regional collaboration on manufacturing development. Ongoing participation in IFS initiatives provides an opportunity for the Yuma Region to leverage finite local resources with the larger marketing investment and name recognition of the larger communities in the IFS region.

The twelve major recommendations are outlined below and detailed in the subsequent tables.

Major Theme: Expanding the Yuma Region's Capacity and Attractiveness for Manufacturing Activities

Recommendation 1: Designate **Manufacturing Investment Zones** in strategic areas of the Yuma Region; concentrate available resources on enhancing the "project readiness" of these areas.

Recommendation 2: Establish **Manufacturing Red Team** composed of officials from the local municipalities, Yuma County, and GYEDC. The Red Team should focus on maintaining a manufacturing-friendly regulatory environment and streamlining development/permitting processes for manufacturing projects.

Recommendation 3: Establish a **Manufacturing Skills Taskforce** (including representatives of JTED, AWC, YPIC, etc.) to ensure that the Yuma Region's educational and workforce training systems are responsive to the needs of existing and prospective manufacturing employers.

Major Theme: Manufacturing-focused Business Development

Recommendation 4: Continue to foster a **culture of industry clustering** (i.e., supply chain networking) among the Yuma Region manufacturing firms and related support businesses.

Recommendation 5: Expand **outreach to existing Yuma Region manufacturing firms** to define the business case for needed manufacturing support activities (i.e., supply chain firms); determine specific support needs to facilitate businesses expansions or start-ups related to the identified business opportunities.

Recommendation 6: **Target high-priority manufacturing industries** (as identified and refined through the efforts connected with this project) as part of GYEDC's marketing and business attraction programs.

Recommendation 7: Position the Yuma Region as a key player in regional marketing and cluster-development efforts of the **Innovation Frontier Southwest (IFS) initiative**; actively and directly participate in IFS implementation to expand the reach of the Yuma Region's marketing and business recruitment efforts.

Recommendation 8: Expand cross-border collaboration focused on **development of bi-national manufacturing supply chains**; optimize the Yuma Region's capture of this activity (which may include non-manufacturing components of the supply chain) based on the Yuma Region's strategic "dual border" (U.S./Mexico and Arizona/California) location.

Recommendation 9: Continue to serve as **clearinghouse for financial incentives and business capital** programs; expand access to business capital through coordination with IFS initiatives (see also Recommendation 12) and other entities identified in this report

Major Theme: Organizational Support / Securing Resources for IMCP Implementation

Recommendation 10: Establish **IMCP Implementation Taskforce** to coordinate ongoing implementation of this strategic plan.

Recommendation 11: Aggressively pursue **federal and state funding** to address critical infrastructure gaps affecting the immediate availability of developable property within the Manufacturing Investment Zones; establish **Manufacturing Infrastructure Committee** to recommend to the proper local agency a prioritization of infrastructure projects and funding applications.

Recommendation 12: Pursue **strategic partnerships to expand access to angel funding and venture capital** for entrepreneurial start-ups and technological innovation in the Yuma Region; promote availability of these resources through local clearinghouse function (see Recommendation 9).

As indicated on the chart on the next page, implementation of the IMCP strategic plan will involve collaboration of several partner organizations including the following key entities:

- Yuma County
- Cities (cities of Yuma, Somerton and San Luis)
- Greater Yuma Economic Development Corporation (GYEDC)
- Western Arizona Economic Development District (WAEDD)

Implementation Partners

	County	GYEDC	WAEDD	Cities	Other Local Entities	External Entities
Expanding the Yuma Region's Capacity/Attractiveness for Manufacturing Activities						
Site/facility/infrastructure readiness	X	X	X	X	X	
Regulatory environment	X	X		X		X
Manufacturing workforce		X			X	
Manufacturing-focused Business Development						
Manufacturing "cluster" networks	X	X	X	X		X
Business expansion	X	X		X		
Marketing/business attraction	X	X	X	X		
Regional manufacturing supply chain (IFS region)	X	X		X		X
Bi-national marketing and supply chain development	X	X		X	X	X
Capital Access	X	X		X		X
Organizational Support/Resources of IMCP Implementation						
IMCP Implementation Taskforce	X	X	X	X		
Federal and state funding resources	X		X	X		X
Angel funding and venture capital		X	X			X

The following tables provide additional details on the twelve major recommendations.

Recommendation 1:	**Designate Manufacturing Investment Zones (MIZ's) in strategic areas of the Yuma Region; concentrate available resources on enhancing the "project readiness" of these areas.**
Need/Opportunity Addressed: In order to maximize its competitiveness for attracting manufacturing firms, the Yuma Region needs to ensure an ample supply of industrial development sites that are truly "shovel ready" in terms of zoning, entitlement, environmental clearance and built infrastructure. The ICMP planning process identified ten (10) distinct areas in the county that have sizeable acreages of industrial land potentially suitable for manufacturing activities. As described in the Infrastructure Analysis chapter, existing infrastructure varies from location to location. Manufacturing Investment Zones (MIZ's) should be designated and prioritized based on the degree of project-readiness. Areas with infrastructure gaps should be prioritized for future capital improvements based on the levels of investment needed to remedy existing deficiencies, sources of funds available for such improvements, the relationship of land prices to infrastructure-investment costs, and similar considerations	
Action Items: A. Identify highest-priority MIZ's (preliminary recommendations are provided in this report). B. For each affected jurisdiction (County or cities), develop list of discretionary approvals needed for new industrial development within the MIZ areas. C. Review County and city policies on expedited project reviews, abatement of impact fees, timing of when fees are assessed (relative to developer's cash flow), and setting of preferential fees for targeted development areas such as MIZ's. D. Define conceptual building designs for manufacturing facilities for each MIZ, with the intent that future development proposals falling within the envelope of the prototypes would be allowed by right in a certain zoning district to the maximum extent possible. Ideally, this kind of process would be extended to allow fast-track construction of prototypes. E. Coordinate with city, county, and special district infrastructure planning processes to include MIZ-related infrastructure projects in Capital Improvement Plans (see also Recommendation 11). F. Coordinate with WACOG Broadband Steering Committee to address high-priority broadband improvements needed in MIZ areas.	
Lead Entity: Yuma County, as facilitators in conjunction with overall IMCP Implementation Taskforce (Recommendation 10); cities implement	**Partner/Support Entities:** Cities, WAEDD, utility service providers, GYEDC
Year 1 Implementation Milestone: Designation of MIZ's; completion of conceptual building designs and related processes.	

Recommendation 2:	**Establish Manufacturing Red Team composed of officials from the local municipalities, Yuma County, and GYEDC. The Red Team should focus on maintaining a manufacturing-friendly regulatory environment and streamlining business permitting processes for manufacturing projects.**
Need/Opportunity Addressed: Whereas Recommendation 1 primarily focuses on pre-development issues for industrial sites, Recommendation 2 is intended to address the need for business friendliness as it relates to the initial occupancy of industrial buildings and the ongoing operation of manufacturing entities. The Red Team should coordinate closely with the Yuma Manufacturers Association (YMA) to ensure public sector policy actions are responsive to the needs of local manufacturing firms.	
Action Items: A. Through GYEDC, coordinate periodically with YMA to identify any manufacturing-specific "business friendliness" issues needing attention. B. Develop a user-friendly, streamlined checklist of local permitting and licensing requirements for new manufacturing businesses. Since the potential Manufacturing Investment Zones fall in several jurisdictions, the checklist should list the requirements of each jurisdiction (i.e., the County and cities) separately and then provide a cross-reference table indicating which requirements apply to each MIZ. C. Implement one-stop permitting/licensing programs at County and city levels; facilitate expedited permitting for new manufacturing businesses; whether it is the current expansion of an existing manufacturing use or the construction and development of a new building.	
Lead Entities: GYEDC	**Partner/Support Entities:** Yuma County municipalities, YMA, Chamber, Education partners, YMPO
Year 1 Implementation Milestone: Red Team organized; checklist of permitting requirements complete, one-stop permitting programs implemented.	

Recommendation 3:	**Establish a Manufacturing Skills Taskforce to ensure that the Yuma Region's educational and workforce training systems are responsive to the needs of existing and prospective manufacturing employers.**
Need/Opportunity Addressed: Developing and retaining an adequate pipeline of technical workers is an ongoing challenge in the Yuma Region, although the community has taken significant steps in recent years to expand the range of technical training and degree programs available locally. These improvements include: Online and Yuma branch campus programs available through Northern Arizona University (NAU); a degree program in Agricultural Systems Management offered through a collaborative program of the University of Arizona (UA), NAU, and Arizona Western College (AWC); and the recently approved Yuma County Joint Technical Education District (JTED). In addition, AWC and the Yuma Private Industry Council (YPIC) have long histories of customizing training programs to meet the workforce demands of local employers, and of providing for the retraining and certification needs of older workers. Collectively, these programs represent a tremendous resource for improving the manufacturing-readiness of the Yuma Region's workforce.	

The recommended Manufacturing Skills Taskforce is intended to serve in advocacy and "clearinghouse" roles related to the workforce needs of the Yuma Region's manufacturing economy. In this capacity, the Taskforce will be a resource available to individual firms (both existing and prospective) to facilitate the development of training programs to meet specific needs, and will also guide comprehensive planning of training programs to ensure alignment with the Yuma Region's overall business development goals. As the Yuma Region expands the reach of its business development efforts through collaboration with IFS and other regional initiatives, the Manufacturing Skills Taskforce should coordinate with IFS workforce development initiatives to ensure that the Yuma Region's programs are poised to respond to the training needs of the types of manufacturing firms targeted for attraction within the larger region.

Action Items:

A. Convene initial meeting of workforce development partners to inventory existing programs relevant to manufacturing and to identify capacity for future customization of programs to support IMCP business development goals.

B. Meet as needed to define new program goals (in response to evolving employer demands as the local manufacturing sector grows) and to build community support for implementation of needed programs.

C. Through GYEDC, serve as workforce training clearinghouse for prospective manufacturing firms interested in a customized program of training solutions.

D. As part of marketing efforts related to manufacturing, prepare brochure (and page on GYEDC website) touting the responsiveness of the Yuma Region's workforce development system and summarizing specific services available to manufacturing firms.

E. Appoint a Taskforce member to track IFS initiatives and coordinate with regional efforts where appropriate.

Lead Entity:	**Partner/Support Entities:**
GYEDC	JTED, AWC, YPIC, NAU, UA, School Districts, YMA

Year 1 Implementation Milestone:

Taskforce structure in place; initial inventory of relevant resources; completion of brochure (and GYEDC webpage) highlighting the "manufacturing readiness" of the Yuma Region's workforce development system.

Recommendation 4: Continue to foster a culture of industry clustering (i.e., supply chain networking) among the Yuma Region manufacturing firms and related support businesses.

Need/Opportunity Addressed:

The overarching vision of the IMCP strategic plan is to transform the Yuma Region's relatively small base of existing manufacturing activity into a dynamic industry cluster that maximizes supply chain linkages among local manufacturers and related support businesses. While industry clustering is a market phenomenon, a true cluster is more than the coincidental co-location of complementary firms and industries in a particular region. A full-fledged cluster involves *systematic interaction and networking* among the co-located firms. The most successful clusters in the most dynamic regions

have evolved over long periods of time and have often been facilitated by public/private partnerships to strengthen networking opportunities and to enhance the area's comparative advantages through strategic investments in foundational elements critical to the clustered industries.

From an implementation standpoint, one of the key challenges for growing the Yuma Region's manufacturing cluster will be creating a cluster mindset among relevant local firms. The Yuma Manufacturers Association (YMA) provides a starting point for this effort. The action items listed below are intended to enhance formal and informal cluster networking in the Yuma Region. It should be emphasized that coordination of cluster networks (a role for which GYEDC is well-positioned through its existing coordination of the YMA) is an activity that can be pursued at various levels of effort/investment, depending on available resources, local interest/support, and other factors. In the Yuma Region's case, it is anticipated that these efforts will evolve over time based on initial results. At its core, cluster networking is a matter of identifying the relevant local constituents, which includes primary firms, support firms, and institutional assets for the manufacturing cluster as well as promoting interaction among them. The actual format of this interaction can be tailored to the preferences of the participants and the level of available resources to support the coordination effort.

In order to maximize the Yuma Region's opportunities for growing its base of manufacturing and related firms, it will be essential to more fully participate in cluster networking and development efforts for regional manufacturing supply chains. In this regard, the IFS initiative will potentially provide an excellent framework for expanding the reach of the Yuma Region's cluster networking efforts.

Action Items:

A. Continue to facilitate regular meetings of the YMA and to utilize the YMA as a vehicle for strengthening intra-county and external supply chain linkages for the Yuma Region's targeted sectors.

B. Continue GYEDC business outreach efforts (e.g., Business Retention Expansion Survey) and utilize as ongoing means of identifying unmet opportunities for manufacturing firms to source inputs locally.

C. Promote cluster-oriented, local supplier relationships via a "Yuma Delivers" campaign. The intent of this campaign would be to expand local supplier capacity (to capture local cluster demand that is currently exported) and to expand opportunities for existing suppliers to achieve greater capture of local demand (either existing or potential) through buy-local initiatives. Intra-county supplier relationships could eventually be facilitated via a website that identifies available suppliers and potential linkages.

Lead Entity:	**Partner/Support Entities:**
GYEDC/YMA	WAEDD, IFS partners (for networking)

Year 1 Implementation Milestone:

Prepare marketing brochure for "Yuma Region Delivers" campaign, highlighting intra-county and regional opportunities for existing and future Yuma Region firms to expand business through supply chain networking.

Recommendation 5:	**Expand outreach to existing Yuma Region manufacturing firms to define a business case for needed manufacturing support activities (i.e., supply chain firms); and determine specific support needs to facilitate businesses expansions or start-ups related to the identified business opportunities.**

Need/Opportunity Addressed:

GYEDC survey research utilized for this process identified – on a very preliminary basis – potential opportunities for new manufacturing support businesses in the Yuma Region, based on existing needs that are not fulfilled locally. These potential opportunities include:

- Programmable logic controls
- Welding and machining/tooling
- Computer numeric coding
- Customized precision manufacturing industries

Depending on the depth of demand for these activities, they could potentially generate sufficient business volumes to support new firms or the diversification of existing firms. In order to move from "possible opportunities" to actual business expansions or start-ups, further research is needed to quantify the depth of demand and fully define the business case for investment. The potential business case can likely be strengthened by incorporating research on the support needs of manufacturing firms in the larger IFS region.

Action Items:

A. Conduct a follow-up survey of manufacturing firms to specifically query demand for the support businesses listed above. Survey questions should pinpoint the specific types of products/services needed and quantify the annual dollar volume of purchases by the surveyed firms.

B. Conduct regional outreach through IFS initiative to document potential additional demand for manufacturing support activities in the larger region.

C. Prepare marketing document summarizing the specific business opportunities identified on the basis of this research.

Lead Entity:	**Partner/Support Entities:**
GYEDC	Yuma County and all county municipalities, San Luis Business Incubator

Year 1 Implementation Milestone:

Completion of GYEDC follow-up survey.

Recommendation 6:	**Target high-priority manufacturing industries as part of GYEDC's marketing and business attraction programs.**

Need/Opportunity Addressed:
As documented in detail in this report, the IMCP strategic planning process has identified a "short list" of ten manufacturing sectors that are strong candidates for attraction to the Yuma Region:

- Perishable Prepared Food Manufacturing
- Storage Battery Manufacturing
- Fluid Milk Manufacturing
- Aircraft Manufacturing
- Fabricated Structural Metals Manufacturing
- Metal Stamping
- Truck Trailer Manufacturing
- Sign Manufacturing
- Unmanned Vehicle Manufacturing
- CNC Machining

The above opportunities have been identified primarily on the basis of connections to existing local strengths and, as such, represent natural extensions of GYEDC's existing business attraction program. Additional broadening of the program (i.e., beyond manufacturing activities with direct existing links to the Yuma Region) is addressed in Recommendation 7 below.

As a practical matter, the indicated short list should be refined to a list of no more than five "high priority" targets, so as not to dilute marketing resources over too many initial targets.

Action Items:

A. Through input of various stakeholders, refine the initial short list to identify a final list of no more than five high-priority targets.

B. Develop manufacturing-specific marketing materials (print and web-based) customized to the high-priority targets.

C. Expand trade show and industry association marketing to include events/organizations specifically relevant to these targeted sectors.

D. Consider purchasing "qualified" prospect lists of firms in the targeted manufacturing industries (i.e., databases that have been screened to identify firms that have a high likelihood of expansion/relocation).

E. Expand the advertising program to include specific focus on targeted manufacturing activities.

Lead Entity:	**Partner/Support Entities:**
GYEDC	WAEDD, Yuma County, cities

Year 1 Implementation Milestone:
Updated marketing materials (website, etc.) to reflect emphasis on the identified manufacturing targets.

Recommendation 7:	**Position the Yuma Region as a key player in regional marketing and cluster-development efforts of the Innovation Frontier Southwest (IFS) initiative; actively and directly participate in IFS implementation to expand the reach of the Yuma Region's marketing and business recruitment efforts.**
Need/Opportunity Addressed: The IMCP process has identified a number of manufacturing sectors that are potentially viable targets for the Yuma Region based on connections to existing local strengths. However, due to the relatively small size of the Yuma Region's existing manufacturing base, in which only a handful of individual sectors have sizeable numbers of existing employees, major expansion of the Yuma Region's manufacturing economy will require positioning the Yuma Region as part of a larger dynamic region. In this context, the Yuma Region will be more readily recognized (by prospect firms) as a component of a large supply chain rather than appearing to be a smaller community in an isolated location. The consortium organized for the recent (April 2014) IFS application for IMCP designation provides an excellent framework for continued regional collaboration on manufacturing development. Ongoing participation in IFS initiatives provides an opportunity for the Yuma Region to leverage finite local resources with the larger marketing investment and name recognition of the larger communities in the IFS region.	
Action Items: A. Maintain an active role in future IFS initiatives. Although the initial IFS application for IMCP designation was unsuccessful, the Yuma Region should actively participate in any follow-up applications and in other ongoing collaboration to strengthen regional manufacturing supply chains. B. Expand the focus of the Yuma Region's business development efforts to include manufacturing sectors targeted by IFS (i.e., manufacturing sectors not otherwise identified as targets for the Yuma Region). C. Actively participate in manufacturing-oriented cluster initiatives in the larger IFS region in order to effectively position the Yuma Region as a viable option for attracting appropriate components of regional supply chains. Include maintaining dialog with Sonora economic development entities as part of this process. D. Through IFS, network in industry associations relevant to targeted manufacturing sectors.	
Lead Entities: GYEDC/Yuma County	**Partner/Support Entities:** IFS partners, Chamber
Year 1 Implementation Milestone: TBD – initial activities will depend on roll-out schedule for IFS (which is a new and evolving initiative).	

Recommendation 8:	**Expand cross-border collaboration focused on the development of bi-national manufacturing supply chains; optimize the Yuma Region's capture of this activity (which may include non-manufacturing components of the supply chain) based on the Yuma Region's strategic "dual border" (U.S./Mexico and Arizona/California) location.**
Need/Opportunity Addressed: Yuma County's immediate proximity to San Luis, Rio Colorado, offers unique opportunities to connect to the established manufacturing base in Northern Mexico. These connections represent another means by which the Yuma Region can position itself as being part of larger region with a dynamic manufacturing supply chain. The existing collaboration of GYEDC, the City of San Luis (Arizona), and Copresan (the economic development organization serving San Luis Rio Colorado) provides a framework for expanded coordination on manufacturing business development. Given Mexico's significant advantages with respect to labor costs and in-place manufacturing infrastructure, it needs to be recognized that the production components of bi-national supply chains are likely to gravitate to the Mexican side of the border. The potential benefits to the Yuma Region would relate to capturing support and distribution facilities requiring a U.S. presence.	
Action Items: A. Conduct joint marketing efforts with Copresan to attract maquiladora operations to the Arizona/Sonora region, with the goal of maximizing the Yuma Region's capture of the U.S.-based components of bi-national operations. B. Actively participate in implementation of the Arizona Border Communities Roadmap. C. Coordinate with Greater Yuma Port Authority on marketing opportunities originating from Implementation of the GYPA Business Plan. The focus on this coordination should be on supporting the attraction of manufacturing-related tenants to existing and planned business parks in the vicinity of the Ports of Entry.	
Lead Entities: GYEDC, Copresan	**Partner/Support Entities:** City of San Luis, Yuma County, Greater Yuma Port Authority, Foreign Trade Zone (FTZ) #219
Year 1 Implementation Milestone: Preparation of Memorandum of Understanding (MOU) for coordination with Copresan.	

Recommendation 9:	**Continue to serve as clearinghouse for financial incentives and business capital programs; expand access to business capital through coordination with IFS initiatives (see also Recommendation 12).**
Need/Opportunity Addressed: In collaboration with Yuma County and the individual cities, GYEDC currently serves as a central information source about financial incentives and business capital programs available to existing and prospective firms in the Yuma Region. GYEDC should continue to serve in this clearinghouse role and highlight manufacturing-relevant incentives in all marketing materials. In order to improve the Yuma Region's ability to facilitate entrepreneurial start-ups, a wider array of business capital resources is needed, as described under Recommendation 12 below.	
Action Items: See recommendation 12.	
Lead Entity: GYEDC	**Partner/Support Entities:** Yuma County, cities, IFS partners, SBDC
Year 1 Implementation Milestone: See recommendation 12.	

Recommendation 10:	**Establish IMCP Implementation Taskforce to coordinate ongoing implementation of this strategic plan.**
Need/Opportunity Addressed: Implementation of the IMCP strategic plan will require ongoing coordination of the entities overseeing the plan development, and additional collaboration with other local and regional partners. In order to sustain attention on the issues identified in the plan, it is recommended that the local partners assume a permanent role as the IMCP Implementation Taskforce.	
Action Items: A. During initial year of implementation, meet at least quarterly to identify quarterly priorities and review initial progress on high-priority action items. B. Assign responsibility for maintaining an "Implementation Resources Clearinghouse," to facilitate IMCP activities. C. Meet on as-needed basis in subsequent years to review progress and refine implementation actions based on initial results.	
Lead Entities: Yuma County, GYEDC	**Partner/Support Entities:** WAEDD, cities, GYEDC, WAEDD, other entities as warranted
Year 1 Implementation Milestone: Prepare a progress report on Year 1 milestone accomplishments for the other major recommendations presented to the Yuma County Board of Supervisors and the GYEDC Board of Directors.	

Recommendation 11:	**Aggressively pursue federal and state funding to address critical needs relating to all elements of the IMCP marketing and implementation plan, including but not limited to infrastructure gaps affecting the immediate availability of developable property within the Manufacturing Investment Zones**
Need/Opportunity Addressed: Federal and state funding opportunities can potentially address a range of IMCP-related strategic implementation items. A key component of this will be infrastructure. Full implementation of the Manufacturing Investment Zone (MIZ) concept will require infrastructure improvements in many of the identified development areas (see Infrastructure Analysis chapter for a detailed discussion of infrastructure needs). These future capital projects need to be prioritized and funding sources need to be secured to enable implementation to proceed.	
Action Items: A. Establish a Manufacturing Infrastructure Committee to recommend to the proper local agency a prioritization of infrastructure projects and funding applications. B. Concurrent with the process of designating and prioritizing the MIZ's (per Recommendation 1), develop 1-year and 5-year lists of candidate infrastructure projects for the IMCP program. C. Develop cost estimates for the 1-year and 5-year capital improvement projects. D. Identify a focused list of appropriate federal funding programs based on the funding source research provided in this strategic plan (see Federal Incentive Programs chapter). E. Devote County and city staff resources to prepare applications for targeted funding programs.	
Lead Entity: Yuma County	**Partner/Support Entities:** WAEDD, cities
Year 1 Implementation Milestone: Preparation of 1-year and 5-year project lists; identification of funding sources; preparation of initial round of funding applications (pursuant to the application cycles of the targeted programs).	

Recommendation 12:	**Pursue strategic partnerships to expand access to angel funding and venture capital for entrepreneurial start-ups and technological innovation in the Yuma Region; promote availability of these resources through local clearinghouse function (see Recommendation 9).**

Need/Opportunity Addressed:

The 2014 IFS application for IMCP designation describes challenges related to the venture capital environment in the overall IFS region:

> "The IFS Region experiences a challenge of scale with respect to private investment since the nodes and towns within nodes simply don't have sufficient activity today to attract and organize regional capital…"
>
> "The IFS Region has limited infrastructure that organizes and focuses private capital specific to manufacturing…"

The regional "challenge of scale" is exacerbated in the Yuma Region, which is much smaller than the Tucson-Nogales metropolitan area that anchors the IFS region. As such, it is probably unrealistic for the Yuma Region to develop substantial local sources of capital in the foreseeable future. A more feasible approach would be to link to the capital strategy for the IFS region, which the IFS application notes is still in conceptual stages:

> "Recognizing that the [IFS] region's capacity with regards to a strategy for capital is emerging, the IFS Region's first steps will be to develop a team that can help to guide and refine the strategy."

The Yuma Region should position itself to be an active participate on the "team" for the IFS capital strategy. In addition, it should be noted that any shortage of local *sources* of venture capital does not mean that *projects* located in the Yuma Region will not be able to access capital from non-local sources. Thus, the overall strategy for investment capital should also consider means of streamlining access to non-local funding sources.

Action Items:

A. Track and actively participate in IFS efforts to develop a regional capital strategy.

B. Within the IFS framework, identify capital funding sources most applicable to the Yuma Region and develop strategic partnerships to create angel and venture capital networks accessible to Yuma Region start-ups.

Lead Entity:	**Partner/Support Entities:**
GYEDC	WAEDD, IFS partners, SBDC

Year 1 Implementation Milestone:

TBD – initial activities will depend on roll-out schedule for IFS (which is a new and evolving initiative).

Appendix A: Specialized manufacturing categories

This appendix summarizes information pertaining to the following specialized manufacturing categories that were mentioned specifically in this assignment's RFP:

1. Programmatic logic controls (this term was later re-interpreted as *Programmable* logic controls)
2. Welding and machining (Welding was separated from Machining for purposes of this investigation)
3. Computer numeric coding, and
4. Customized precision manufacturing industries

The first section shows the results of using a NAICS look-up function with each of the specialized-category names, which produces lists of industry descriptions that fall under the NAICS code designations that most closely match the names entered. There is no direct NAICS code designation for the specialized category names. The lists and descriptive language for the NAICS categories come directly from http://www.census.gov/eos/www/naics/

The second section shows the employment and LQ values for the associated industry categories (as given by the NAICS look-up process) for Yuma, in selected years from 2001-2013, and projected to 2023. The third section summarizes input from local manufacturers and economic development professionals.

We do not have data at a level of detail sufficient to meaningfully assess the presence of these special industry categories in Mexico.

NAICS look-up results

1. Programmable Logic Controls

335314 Relay and Industrial Control Manufacturing. Establishments primarily engaged in manufacturing relays, motor starters and controllers, and other industrial controls and control accessories.

2012 NAICS	Corresponding Index Entries
335314	Armature relays manufacturing
335314	Brakes and clutches, electromagnetic, manufacturing
335314	Brakes, electromagnetic, manufacturing
335314	Control circuit devices, magnet and solid-state, manufacturing
335314	Control circuit relays, industrial, manufacturing
335314	Control equipment, electric, manufacturing
335314	Controls and control accessories, industrial, manufacturing
335314	Controls for adjustable speed drives manufacturing
335314	Crane and hoist controls, including metal mill, manufacturing
335314	Flow actuated electrical switches manufacturing
335314	Industrial controls (e.g., push button, selector, and pilot switches) manufacturing
335314	Marine and navy auxiliary controls, manufacturing

335314	Motor control accessories (including overload relays) manufacturing
335314	Motor control centers, manufacturing
335314	Motor controls, electric, manufacturing
335314	Motor starters, contractors, and controllers, industrial, manufacturing
335314	Numerical controls, manufacturing
335314	Relays, electrical and electronic, manufacturing
335314	Rheostats, industrial control, manufacturing
335314	Solenoid switches, industrial, manufacturing
335314	Timing devices, mechanical and solid-state (except clockwork), manufacturing
335314	Vacuum relays manufacturing

334513 Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables. Establishments primarily engaged in manufacturing instruments and related devices for measuring, displaying, indicating, recording, transmitting, and controlling industrial process variables. These instruments measure, display or control (monitor, analyze, and so forth) industrial process variables, such as temperature, humidity, pressure, vacuum, combustion, flow, level, viscosity, density, acidity, concentration, and rotation.

2012 NAICS	Corresponding Index Entries
334513	Absorption analyzers, industrial process type (e.g., infrared), manufacturing
334513	Acidity (i.e., pH) instruments, industrial process type, manufacturing
334513	Analyzers, industrial process control type, manufacturing
334513	Annunciators, relay and solid-state types, industrial display, manufacturing
334513	Boiler controls, industrial, power, and marine-type, manufacturing
334513	Buoyancy instruments, industrial process-type, manufacturing
334513	Chromatographs, industrial process-type, manufacturing
334513	Combustion control instruments (except commercial, household furnace-type) manuf.
334513	Controllers for process variables (e.g., electric, electronic, mechanical, pneumatic operation) manufacturing
334513	Coulometric analyzers, industrial process-type, manufacturing
334513	Data loggers, industrial process-type, manufacturing
334513	Density and specific gravity instruments, industrial process-type, manufacturing
334513	Differential pressure instruments, industrial process-type, manufacturing
334513	Digital displays of process variables manufacturing
334513	Display instruments, industrial process control-type, manufacturing
334513	Draft gauges, industrial process-type, manufacturing
334513	Electric and electronic controllers, industrial process-type, manufacturing
334513	Electrodes used in industrial process measurement manufacturing
334513	Electrolytic conductivity instruments, industrial process-type, manufacturing
334513	Electromagnetic flowmeters manufacturing
334513	Flow instruments, industrial process-type, manufacturing
334513	Fluidic devices, circuits, and systems for process control, manufacturing
334513	Gas analyzers, industrial process-type, manufacturing
334513	Gas and liquid analysis instruments, industrial process-type, manufacturing
334513	Gas chromatographic instruments, industrial process-type, manufacturing

334513 Gas flow instrumentation, industrial process-type, manufacturing
334513 Gauges (i.e., analog, digital), industrial process-type, manufacturing
334513 Humidity instruments, industrial process-type, manufacturing
334513 Hydrometers, industrial process-type, manufacturing
334513 Hygrometers, industrial process-type, manufacturing
334513 Indicators, industrial process control-type, manufacturing
334513 Industrial process control instruments manufacturing
334513 Infrared instruments, industrial process-type, manufacturing
334513 Instruments for industrial process control manufacturing
334513 Level and bulk measuring instruments, industrial process-type, manufacturing
334513 Liquid analysis instruments, industrial process-type, manufacturing
334513 Liquid concentration instruments, industrial process-type, manufacturing
334513 Liquid level instruments, industrial process-type, manufacturing
334513 Magnetic flow meters, industrial process-type, manufacturing
334513 Manometers, industrial process-type, manufacturing
334513 Measuring instruments, industrial process control-type, manufacturing
334513 Mechanical measuring instruments, industrial process-type, manufacturing
334513 Meters, industrial process control-type, manufacturing
334513 Moisture meters, industrial process-type, manufacturing
334513 Panelboard indicators, recorders, and controllers, receiver industrial process-type, manufacturing
334513 Pneumatic controllers, industrial process type, manufacturing
334513 Potentiometric instruments (except X-Y recorders), industrial process-type, manuf.
334513 Pressure gauges (e.g., dial, digital), industrial process-type, manufacturing
334513 Pressure instruments, industrial process-type, manufacturing
334513 Primary elements for process flow measurement (i.e., orifice plates) manufacturing
334513 Primary process temperature sensors manufacturing
334513 Process control instruments, industrial, manufacturing
334513 Programmers, process-type, manufacturing
334513 Pyrometers, industrial process-type, manufacturing
334513 Recorders, industrial process control-type, manufacturing
334513 Refractometers, industrial process-type, manufacturing
334513 Resistance thermometers and bulbs, industrial process-type, manufacturing
334513 Telemetering instruments, industrial process-type, manufacturing
334513 Temperature instruments, industrial process-type (except glass and bimetal thermometers), manufacturing
334513 Thermal conductivity instruments, industrial process-type, manufacturing
334513 Thermistors, industrial process-type, manufacturing
334513 Thermocouples, industrial process-type, manufacturing
334513 Thermometers, filled system industrial process-type, manufacturing
334513 Time cycle and program controllers, industrial process-type, manufacturing
334513 Transmitters, industrial process control-type, manufacturing
334513 Turbidity instruments, industrial process-type, manufacturing
334513 Turbine flow meters, industrial process-type, manufacturing
334513 Variable control instruments, industrial process-type, manufacturing

334513	Viscosimeters, industrial process-type, manufacturing
334513	Water quality monitoring and control systems manufacturing

2. Computer Numeric Coding

541511 Custom Computer Programming Services. Establishments primarily engaged in writing, modifying, testing, and supporting software to meet the needs of a particular customer.

2012 NAICS	Corresponding Index Entries
541511	Applications software programming services, custom computer
541511	Computer program or software development, custom
541511	Computer programming services, custom
541511	Computer software analysis and design services, custom
541511	Computer software programming services, custom
541511	Computer software support services, custom
541511	Programming services, custom computer
541511	Software analysis and design services, custom computer
541511	Software programming services, custom computer
541511	Web (i.e., Internet) page design services, custom

541512 Computer Systems Design Services. Establishments primarily engaged in planning and designing computer systems that integrate computer hardware, software, and communication technologies. The hardware and software components of the system may be provided by this establishment or company as part of integrated services or may be provided by third parties or vendors. These establishments often install the system and train and support users of the system. Illustrative Examples:

- Computer systems integration design consulting services
- Local area network (LAN) computer systems integration design services
- Information management computer systems integration design services
- Office automation computer systems integration design services

2012 NAICS	Corresponding Index Entries
541512	CAD (computer-aided design) systems integration design services
541512	CAE (computer-aided engineering) systems integration design services
541512	CAM (computer-aided manufacturing) systems integration design services
541512	Computer hardware consulting services or consultants
541512	Computer software consulting services or consultants
541512	Computer systems integration analysis and design services
541512	Computer systems integration design consulting services
541512	Computer systems integrator services
541512	Computer-aided design (CAD) systems integration design services
541512	Computer-aided engineering (CAE) systems integration design services
541512	Computer-aided manufacturing (CAM) systems integration design services
541512	Information management computer systems integration design services
541512	Local area network (LAN) computer systems integration design services
541512	Network systems integration design services, computer

541512	Office automation computer systems integration design services
541512	Systems integration design consulting services, computer
541512	Systems integration design services, computer

3. **Welding.** Welding does not have a manufacturing-related NAICS function.

4. Machining

332710 Machine Shops. Establishments known as machine shops are primarily engaged in machining metal and plastic parts and parts of other composite materials on a job or order basis. Generally machine shop jobs are low-volume-using machine tools, such as lathes (including computer numerically controlled); automatic screw machines; and machines for boring, grinding, and milling.

2012 NAICS	Corresponding Index Entries
332710	Chemical milling job shops
332710	Machine shops

5. Customized Precision Manufacturing

There is no way to delineate this activity via NAICS codes unless we know what the establishments make; and lacking that, by definition, it could be just about anything.

Yuma employment and LQ values for the associated NAICS industry categories

The table below shows the NAICS categories, discussed above, that most closely match the special industry categories addressed and for which Yuma has some level of employment, at either the four-digit or six-digit NAICS level (or both). The table Location Quotient figures indicate very low LQ values for Yuma for all but NAICS code 5415, Computer Systems Design & Related Services.

NAICS Code	Special category	Description	2001 Jobs	2007 Jobs	2013 Jobs	2018 Jobs	2023 Jobs	LQ
3327	3	**Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing**	**<10**	**13**	**12**	**15**	**16**	**0.067**
332710		Machine Shops	<10	13	12	15	16	
3345	1	**Navigational, Measuring, Electro-medical, and Control Instruments Manufacturing**	**<10**	**12**	**23**	**24**	**24**	**0.125**
3353	1	**Electrical Equipment Manufacturing**	**0**	**0**	**<10**	**<10**	**<10**	**--**
335314		Relay and Industrial Control Manufacturing	0	0	<10	<10	<10	

NAICS Code	Special category	Description	2001 Jobs	2007 Jobs	2013 Jobs	2018 Jobs	2023 Jobs	LQ
5415	2	**Computer Systems Design & Related Svcs.**	**43**	**333**	**575**	**787**	**936**	**0.595**
541511		Custom Computer Programming Svcs.	<10	292	357	470	544	
541512		Computer Systems Design Services	25	35	139	199	253	

1. Programmable logic controls
2. Welding and machining
3. Computer numeric coding

Source: EMSI

Input from local manufacturers and economic development professionals

Part of the TNDG Team's process in examining these specialized industries was to obtain input from local manufacturers and economic development professionals. The discussions below summarize this input, most of which was initially compiled, from a variety of sources, by GYEDC.

All five activities. All of the activities listed below are viable needs in Yuma insofar as certified skills are concerned, and all would be portable skills that someone could take with them to any other community. Yuma needs to develop vocational programs to help expand local capability in these activities. Recent approval of the JTED program in the County should leverage this development.

Programmable Logic Controls/ PLCs. This activity is being handled in-house for most of the larger manufacturers in Yuma, or by contracted electrical technicians. There has been little interest at the high school and community college level to take courses as they relate to Industrial Maintenance Technicians.

Computer numeric coding (CNC). Most needs are currently being handled in house. There is coursework available at AWC to address this activity, and there is a developing need for this skill with many Yuma manufacturing businesses. Until the region closes this skills gap, most CNC work is being taught on-the-job/in-house.

Welding. Most firms are handling in-house, or by contracting for the work. Feeling is that it would take a firm a long time to establish themselves and be deemed useable by long standing businesses, particularly in Ag Industry.

Machining. Of all the activities discussed in this section, Machining is considered the most viable "support industry" to bring to Yuma. Previously in the Yuma region, manufacturers proposed the idea of creating a "machining campus," perhaps in partnership with AWC, where classrooms would be combined with a version of a machining hotel, and contract work from local manufacturers could provide a portion of the funding. Grant funding could also possibly be secured through the AWC partnership.

At a minimum, there is a need for certified skills training, and for this support industry, due to the fact that many of the local Agriculture and Manufacturing businesses do currently out-source their bigger

machining/tooling needs to Phoenix, Tucson, or El Centro. Currently, Yuma does not have a machining program at any of the local high schools, or the facility and equipment to be able to teach machining. The welding department at AWC is being expanded, and it is unclear if there will even be room for the machining equipment at AWC going forward. Except for a program in eastern Arizona, the entire state is deficient in this type of program.

Customized precision manufacturing industries. This term generally refers to the activity of contract manufacturing, where a manufacturer produces some component of a product for another manufacturer to incorporate into their product. The “precision” component indicates that the output is produced with a high degree of technical capability. There are few such activities in Yuma, and the local manufacturing community did not feel strongly about this industry category. As a rule, the markets for such activities may be anywhere in the world, so their contribution to the functionality of local manufacturers may or may not be meaningful.

Appendix B: Detailed infrastructure assessments

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TECHNICAL MEMORANDUM

Date: December 12, 2014
Revised February 19, 2015

To: Nancy Ngai, Yuma County Community Planning Coordinator

From: Douglas Nicholls, P.E., R.L.S.

Re: IMCP Task 5 Transportation Infrastructure Summary

Registered Professional Engineer (Civil)
CERTIFICATE NO.
32329
DOUGLAS J.
NICHOLLS
Date Signed 2/19/15
ARIZONA, U.S.A.

Expires 3/31/16

Introduction

As part of Task 5 (Transportation Evaluation) for the Yuma County Area IMCP, commentary was solicited from area technical personnel, planners, and engineers to prioritize planned projects for the area as it relates to industrial planning areas. We received commentary from Yuma County, City of Yuma, Yuma Metropolitan Planning Organization (YMPO), and the Town of Wellton. Engineering judgment was also employed to note some potential projects in certain areas that were lacking projects that were directly beneficial to attracting a larger manufacturing base. The following provides discussion and provides some priority projects for each planning area.

Each reviewer identified between 3 and 5 different top projects for each area that would benefit transportation as it pertains to manufacturing. Those projects were weighted the same and then a final aggregate score of the top projects for an area was summarized. These are presented in tabular format for the discussion of each area. Appendix A has the full tabular summary of the identified projects.

General Discussion

Generally speaking, all of the planning areas could benefit from roadway capacity improvements and all were also identified to benefit from a traffic signal interconnect/intelligent transportation systems. This type of improvement has been ongoing and has been implemented as improvements projects have allowed.

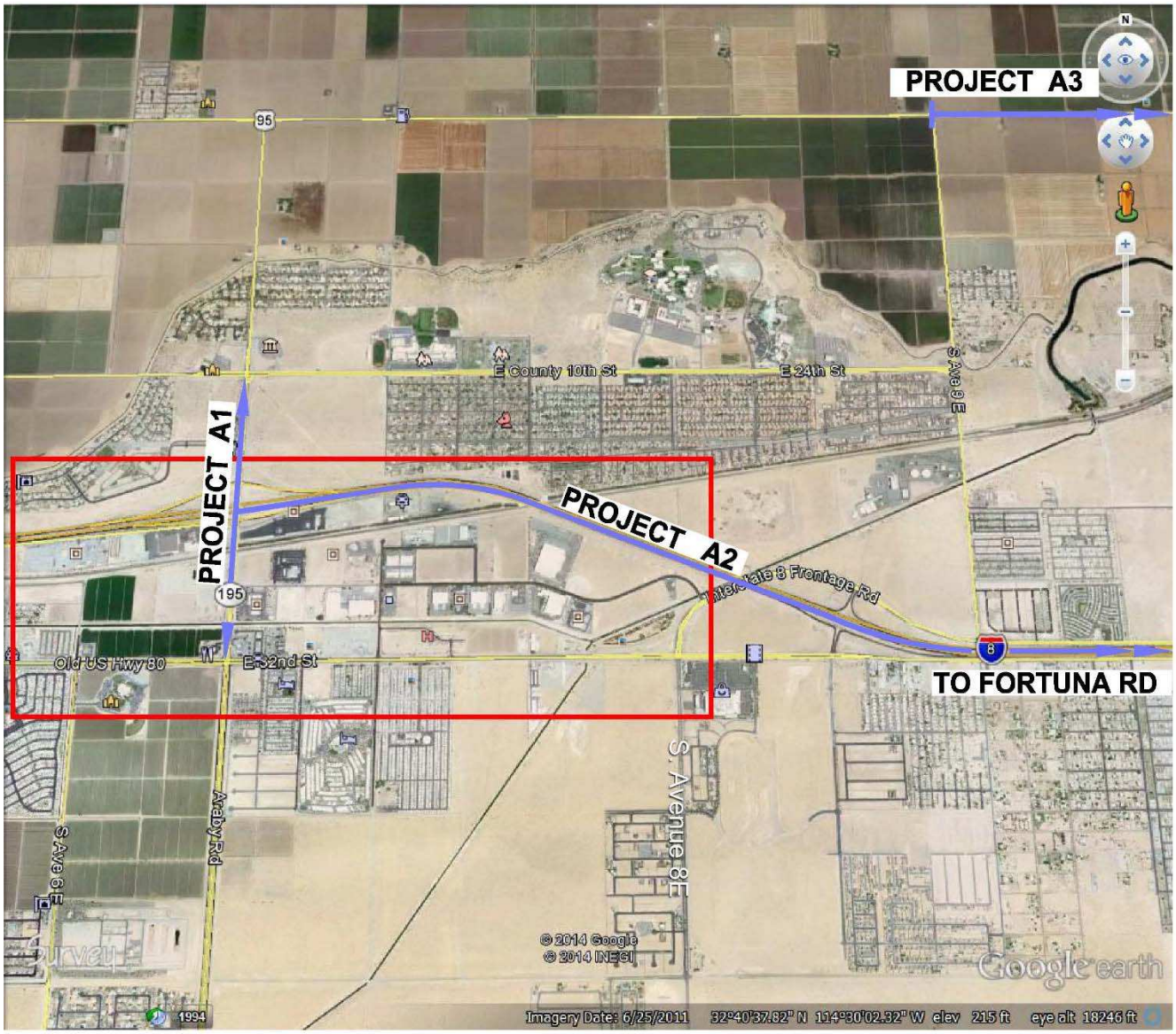
With regard to rail service, it should be noted as well that the ability to add rail to an area is typically limited to the use of existing spurs. These Union Pacific Rail spurs are in close proximity to the rail alignment which roughly parallels Interstate 8 from about Avenue 9E westerly through the community to about 1st Street in downtown Yuma. However it cannot be stressed enough that the addition and expansion of rail access could greatly expand the manufacturing base for the area, particularly a connection to the Ferromex rail line as documented in the YMPO sponsored "Yuma County Rail Corridor Study".

Finally, with regard to use of airport facilities, Area D as discussed below has the potential to benefit from this mode of transportation. One of goals and objectives of the Yuma International Airport's Master Plan (2008) states that it should "…be coordinated with related and regional development projects". This has been the case in recent years as YIA has had success in attracting industry complimentary and supported by the Airport's mission.

Area A: South of I-8 to 32nd St., from Avenue 6E to 8E

Area A has available zoned land and facilities that a manufacturing user could readily use. Three projects identified by the rankings that are directly within its identified boundary, and which would be of immediate benefit, are listed below. Additionally, it should be noted that this area has access to the interstate and rail service that could be accessible subject to the approval of Union Pacific Railroad and availability of railroad spurs.

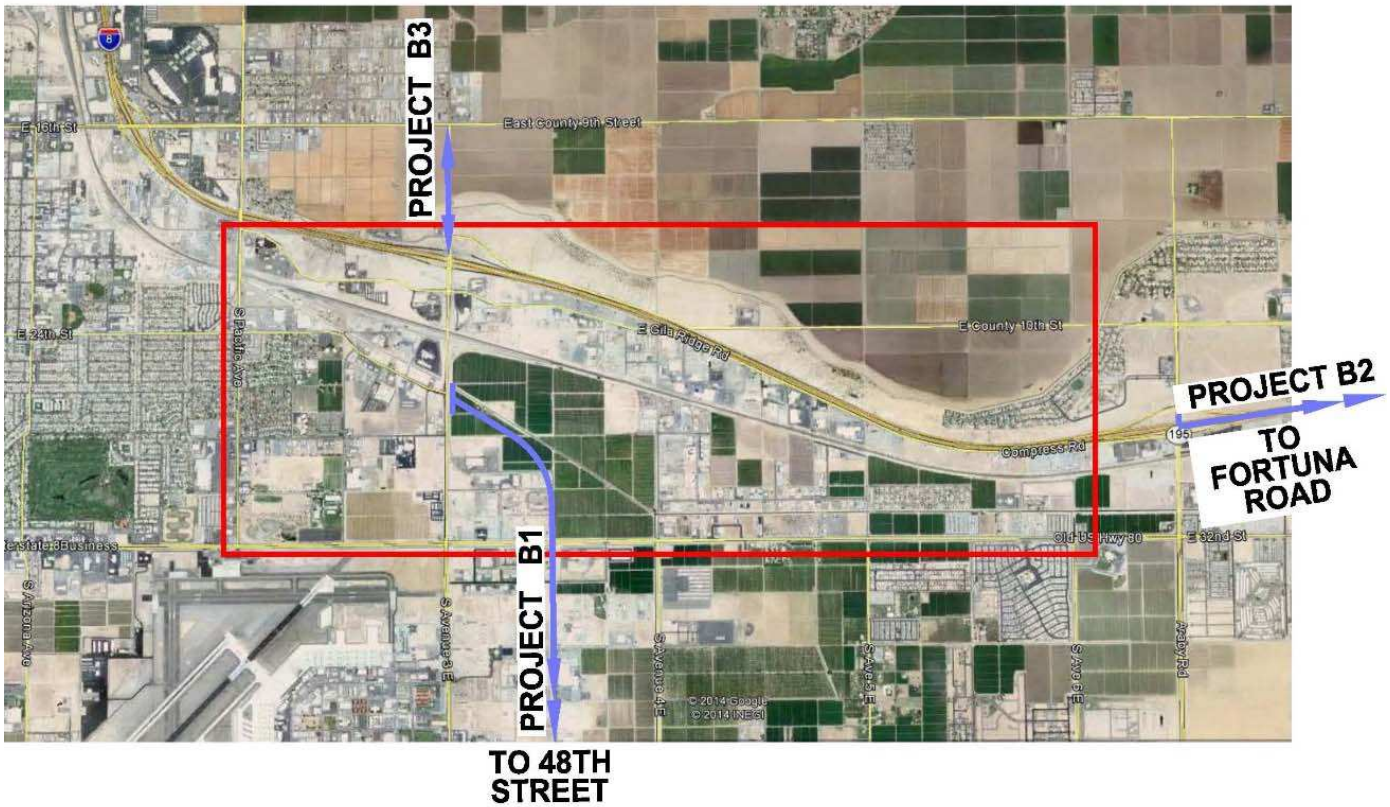
Project	Cost
A1. Widening of SR-195/Araby between 24th Street and 32nd Street	$78.8 Million
A2. I-8 Widening to Six Lanes between Araby and Fortuna	$86.2 Million
A3. US 95 Widening: Avenue 9E to Imperial Dam Rd (4 Projects over 15 years)	$191 Million



Area B: South of I-8 to 32nd St., from Pacific to Avenue 8E

Area B is adjacent and similar to Area A in terms of zoning opportunities. There were three projects identified with two of those projects providing immediate potential benefit to the area, namely B1 and B3. These provide improved circulation within the area boundary, which would benefit industrial shipping/supply traffic in and out of the area.

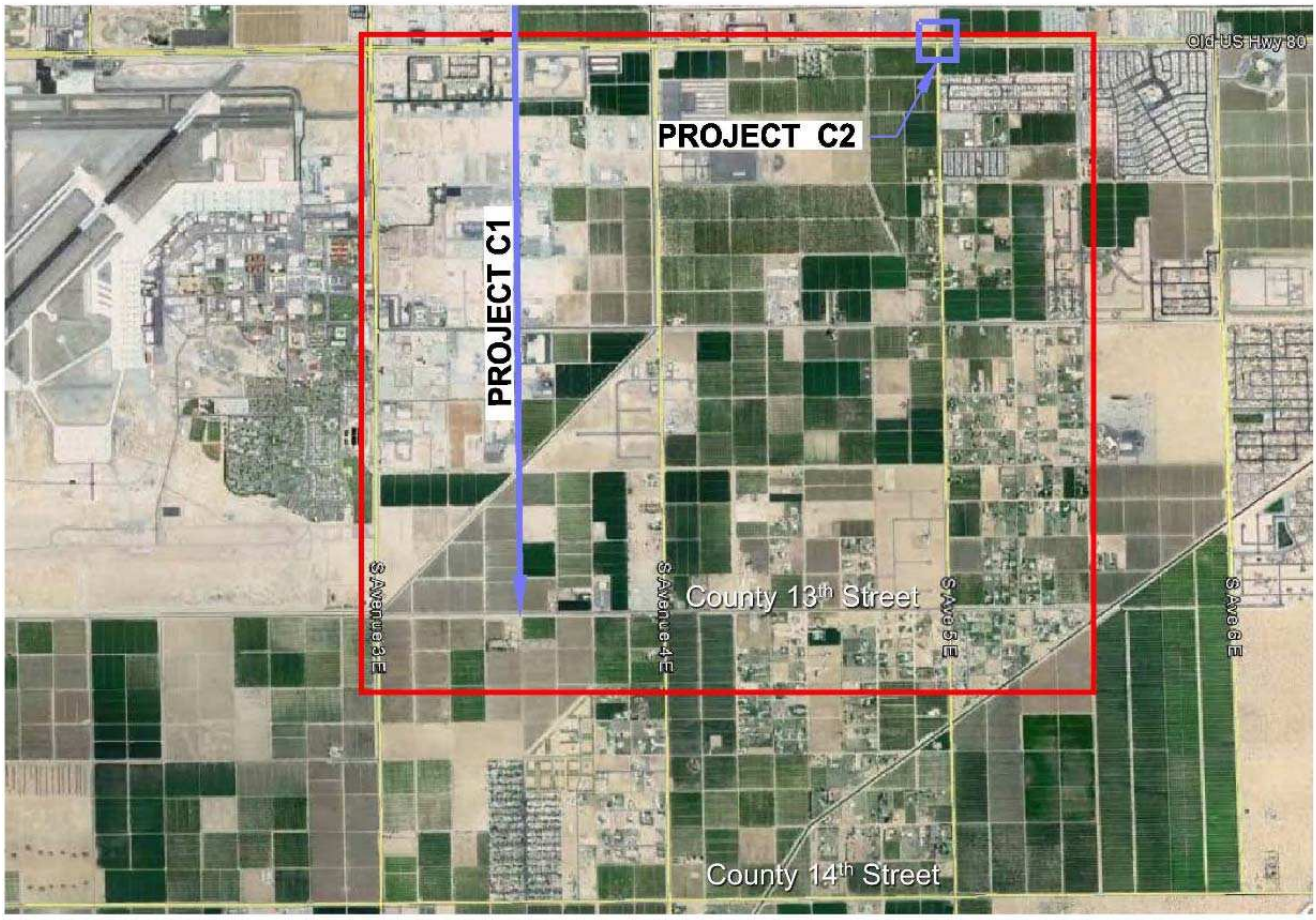
Project	Cost
B1. Avenue 3 ½E Connect: 3E to 3 ½E, East along B Canal and widen 3 ½E to 48th St.	No Estimate
B2. I-8 Widening to Six Lanes between Araby to 16th Street	Not Programmed
B3. Avenue 3E widening I-8 to 16th St	$6.7 Million



Area C: South of 32nd St. to 40th St., from Avenue 3E to 5 ½E

Area C is relatively undeveloped. Similarly, the roadway network is less developed and therefore more improvements may be required for realized growth in manufacturing. Two of the three transportation projects were identified by local review as having benefit to the area (C2 and C3). C1 is a general observation, which notes that the area as whole could benefit from transportation improvements. Additionally, it should be noted that this area has access to the interstate and rail service is nearby, but is unlikely to be extended to the area.

Project	Cost
C1. Local Roadway Improvements	Not Programmed
C2. Avenue 3 ½ Connect: 3E to 3 ½E, East along B canal and widen 3 ½E to 48th St.	Not Programmed
C3. I-8 Widening to Six Lanes between Araby and Fortuna	$86.2 Million

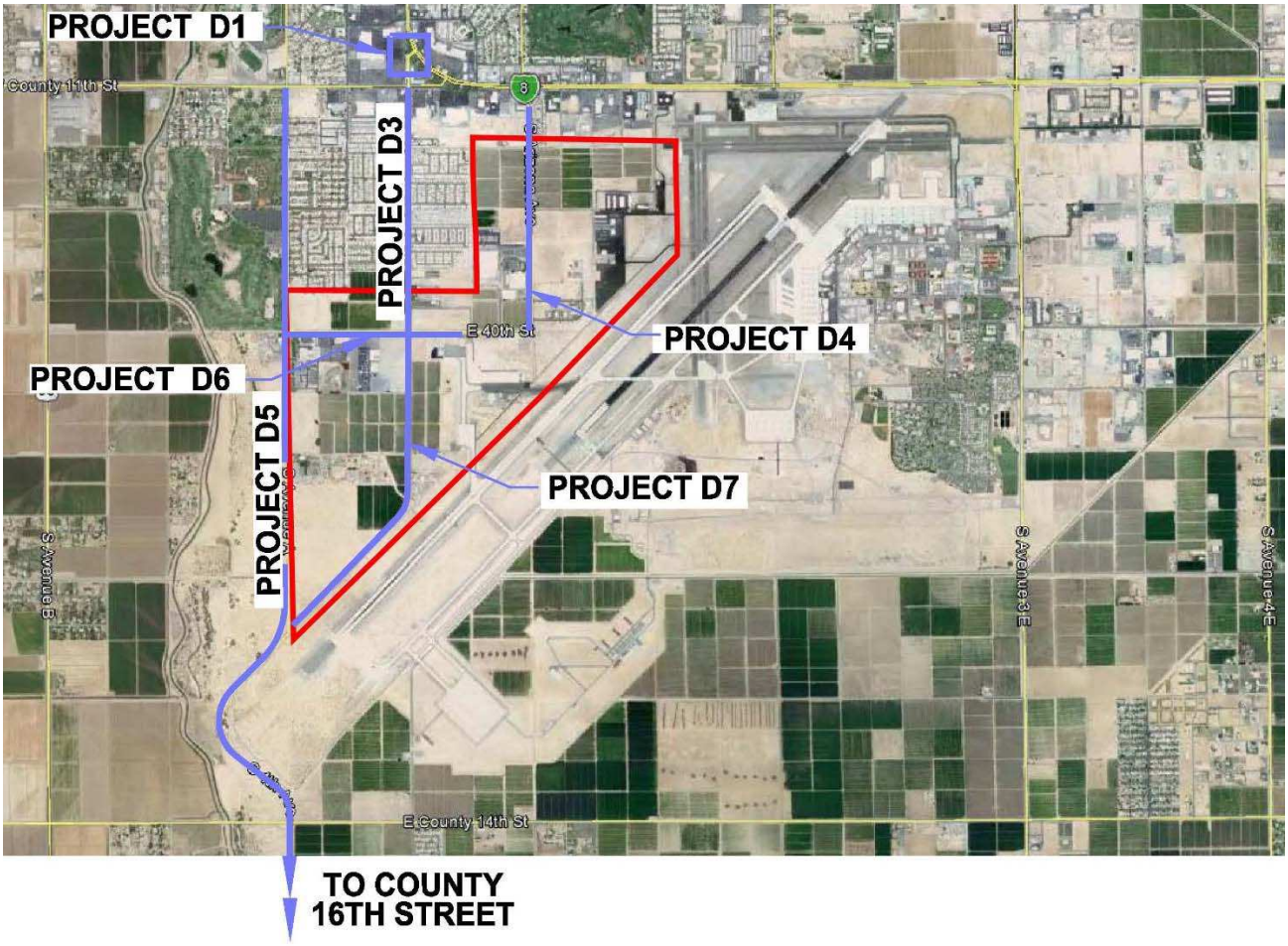


NOTE: PROJECT C3 NOT SHOWN (I-8 WIDENING TO SIX LANES BETWEEN ARABY AND FORTUNA), BUT IS ADJACENT TO CORRIDOR LOCATION

Area D: Area North and West of Yuma International Airport

Area D is isolated from direct interstate access, but conversely it is an area that is uniquely positioned to take advantage of airport travel and/or deliveries. In the near future this area will be benefitting from project D1. Project D2 is a broad, long term project to improve traffic flow by "intelligent transportation systems" that could benefit the area, but is scheduled to be done in phases over the next 15 years. Projects D3 through D6 have not been funded, but would greatly improve circulation to the area. Project D7 would have the potential for providing more land adjacent to the airport for development as a manufacturing or industrial use.

Project	Cost
D1. 4th Avenue and Big Curve Turn Lane	$178,000
D2. Traffic Signal Interconnect/ITS Improvements (phased across 2014-2037)	$7.9 Million
D3. 4th Avenue Ext Improvements, 32nd to 40th St	Not Programmed
D4. Arizona Avenue Improvements, 32nd to 40th St	Not Programmed
D5. Avenue A Improvements: 32nd to County 16th	Not Programmed
D6. 40th Street Improvements: Avenue A to Arizona Avenue	Not Programmed
D7. Abandon 4th Avenue Extension South of 40th Street	Not Programmed

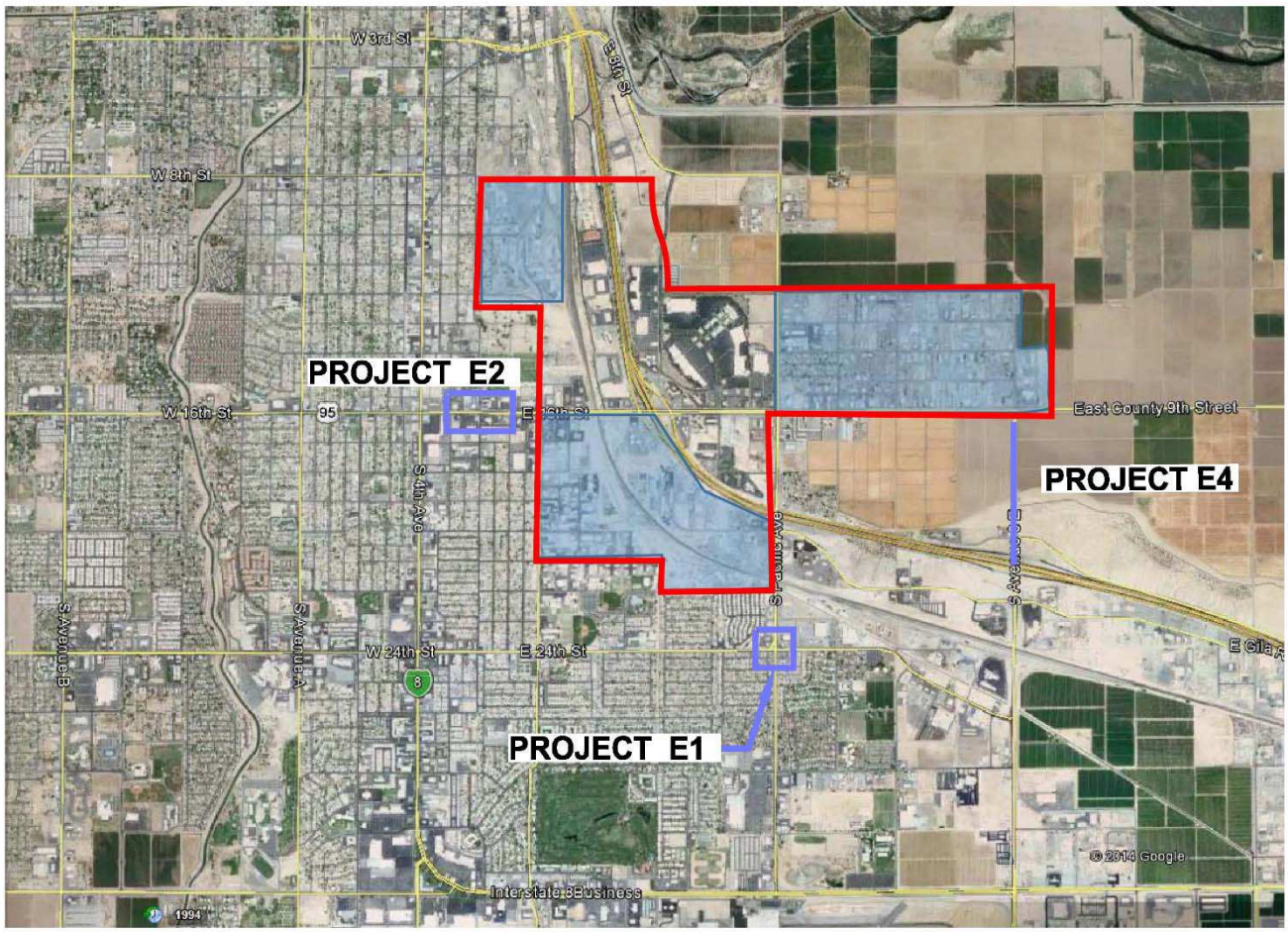


NOTE: PROJECT D2 NOT SHOWN (TRAFFIC SIGNAL/ITS IMPROVEMENTS)

Area E: Central Municipal Yuma Area

Area E is a well-developed central area of Yuma, but there are some land and zoning opportunities for the sub areas identified on the map. Improvements that could immediately benefit roadway capacity are projects E2 and E3. Adjacent projects that could indirectly benefit the area are projects E1 and E4. Additionally, it should be noted that this area has access to the interstate and rail service is nearby that could be accessible subject to the approval of Union Pacific Railroad and availability of railroad spurs.

Project	Cost
E1. Pacific Avenue/24th St. Safety Improvements (turn lanes)	$2 Million
E2. 16th St Widening 3rd Avenue to Maple Avenue	$2.9 Million
E3. Traffic Signal Interconnect/ITS Improvements (phased across 2014-2037)	$7.9 Million
E4. Avenue 3E widening I-8 to 16th Street	$2.5 Million



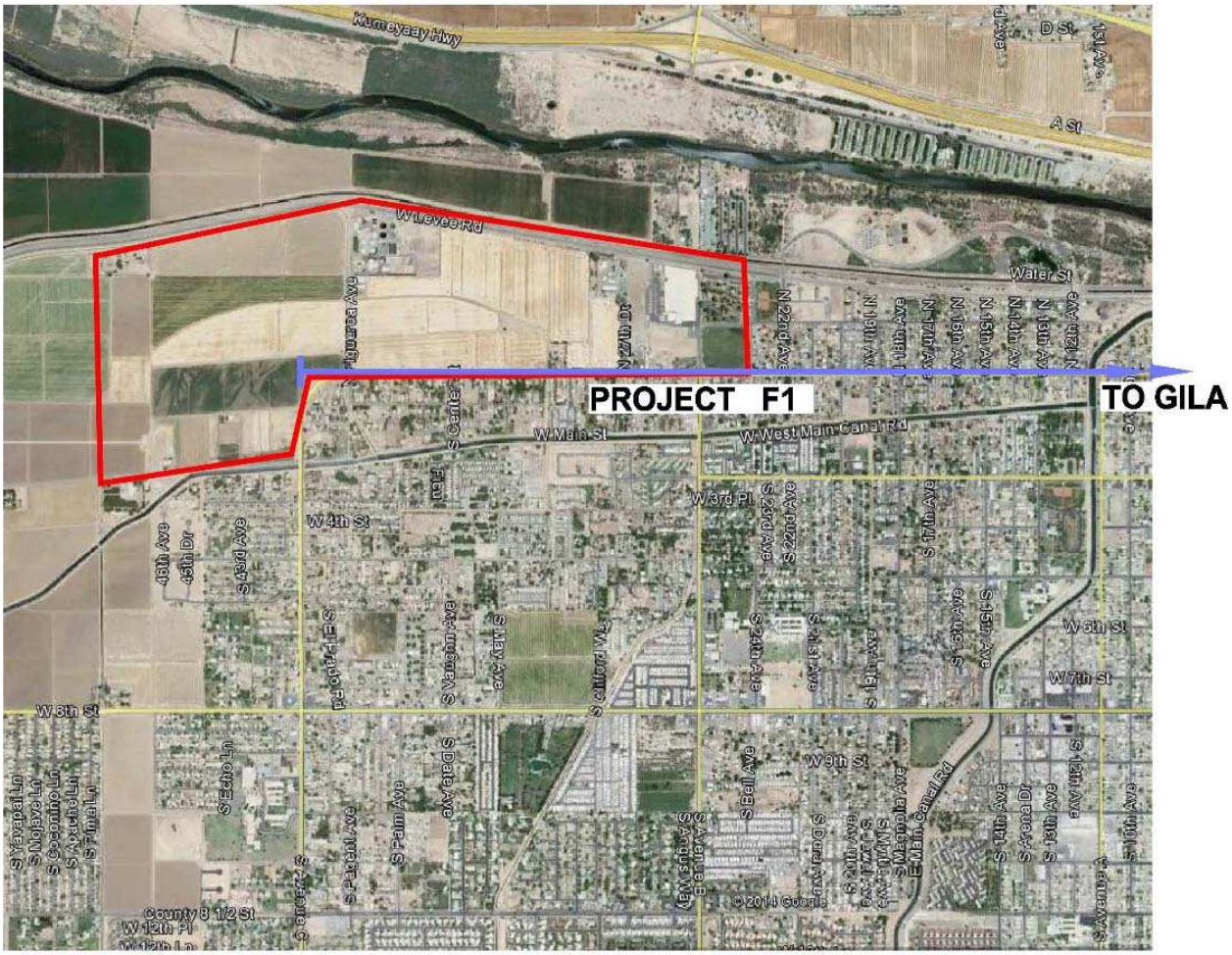
NOTE: PROJECT E3 NOT SHOWN (TRAFFIC SIGNAL/ITS IMPROVEMENTS)

Map Revised 2/19/15

Area F: West of 23rd Avenue., East of Avenue C½, North of 1st Avenue, South of Levee

Area F is in an older part of Yuma but has existing uses complimentary to a manufacturing user. Direct access to the area from the interstate could be 1st Street from the Interstate exit at 4th Avenue, however the City recently completed a Road Safety Audit (RSA) which suggests reducing the street section from 4 lanes (no center turn lane) to 2-lanes with center turn lane and bike lanes. If said recommendations are implemented, truck traffic would likely exit the interstate from 16th Street and turn North up either Avenue B or Avenue C. This scenario would then benefit from the implementation of projects F2 and F3. It should also be noted that there is an existing rail spur along the northern boundary to the area, but it is not currently in service.

Project	Cost
F1. 1st Street Improvements: Gila to Avenue C (TBD by Road Safety Audit)	Not Programmed
F2. Avenue B/16th Street Reconstruction	Not Programmed
F3. Traffic Signal Interconnect/ITS Improvements	$7.9 Million
F4. Local Roadway Improvements	Not Programmed

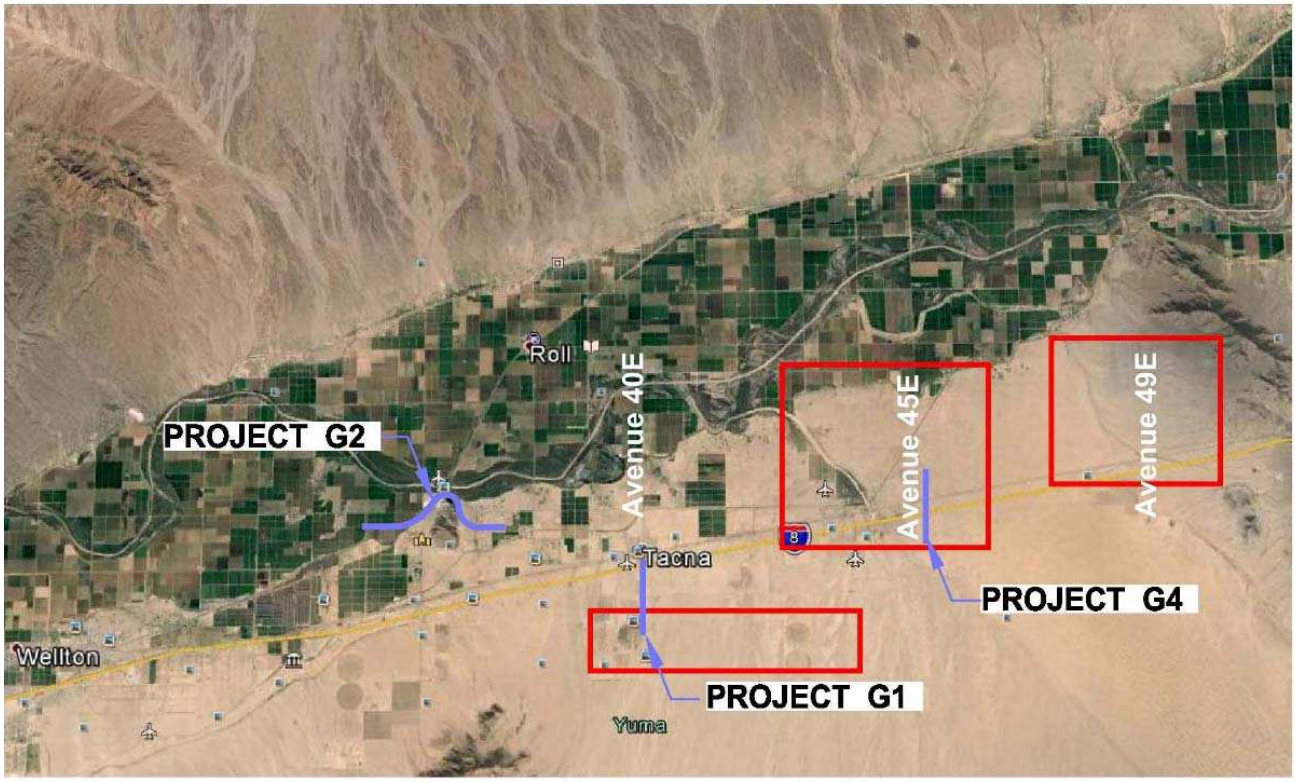


NOTE: PROJECT F2 NOT SHOWN (AVENUE B/16TH STREET IMPROVEMENTS), BUT IS ADJACENT TO CORRIDOR LOCATION
NOTE: PROJECT F3 NOT SHOWN (TRAFFIC SIGNAL INTERCONNECT/ITS IMPROVEMENTS)

Area G: East County Wellton/Tacna

Area G is a broadly defined east County area. Primarily there are three areas identified to be used for industrial/manufacturing as shown on the map as east of Avenue 40E. Projects G2 and G3 were identified by planning personnel to potentially benefit the area as it relates to manufacturing. Subsequently, projects G1 and G4 were additionally identified as having potential to attract a manufacturing user as well. Finally, it should be noted that this area has access to the interstate and rail service is nearby that could be accessible subject to the approval of Union Pacific Railroad and availability of railroad spurs.

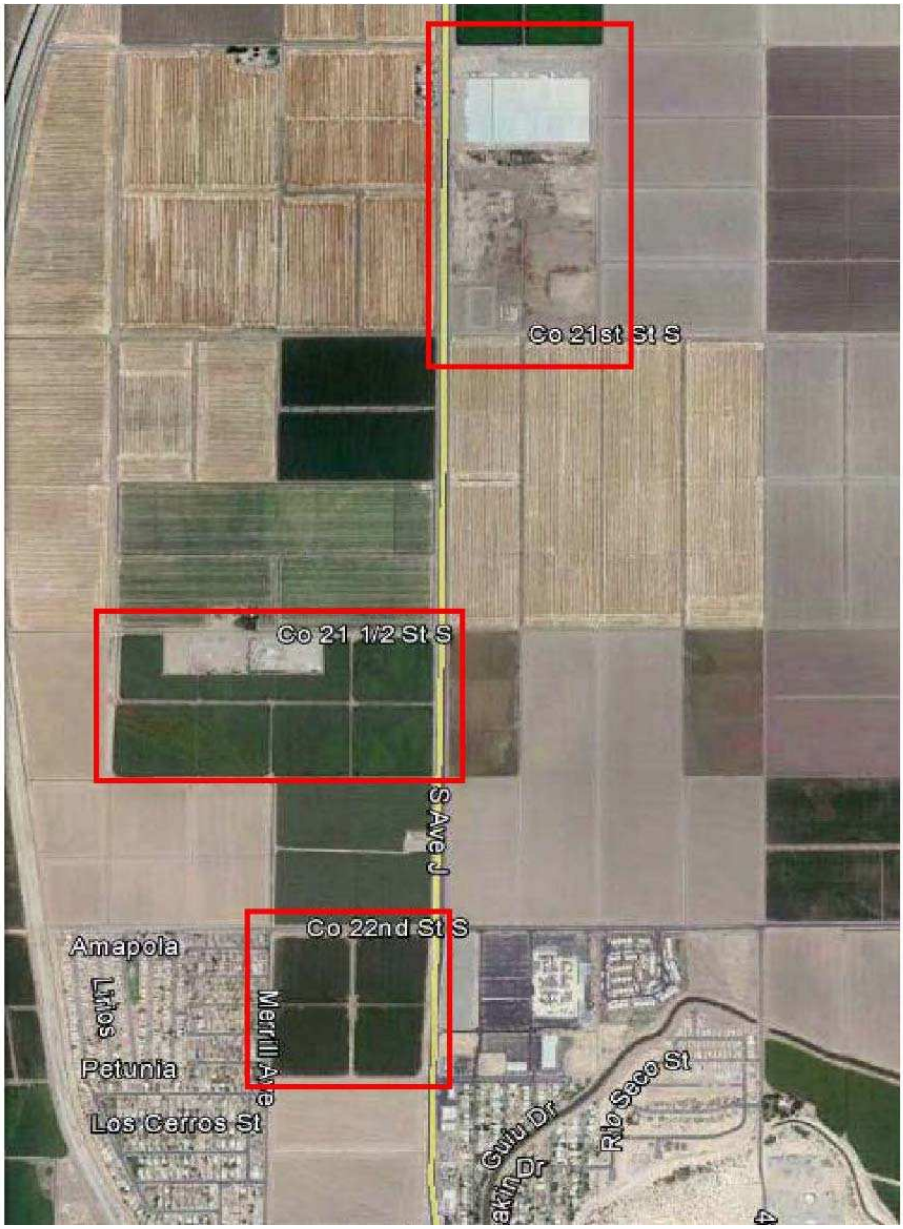
Project	Cost
G1. Local Roadway Improvements	Not Programmed
G2. County 8th St Extension, Avenue 36E to Avenue 37E	Not Programmed
G3. Rail Service	Not Programmed
G4. Freeway Interchange at Avenue 45E	Not Programmed



Area H: Northwest San Luis

Area H is situated northwest of San Luis and has several subareas that could readily be used for manufacturing that have direct access to Avenue J(former US 95) as well as close proximity to two ports of entry from Mexico. There was limited commentary for this area, but these areas could be improved with local roads to precipitate access by a manufacturing user. Please also note that there may be some indirect benefit to these areas by improvements to Juan Sanchez Blvd should a manufacturing user transport goods through the Commercial Port of Entry at the southern end of Avenue E.

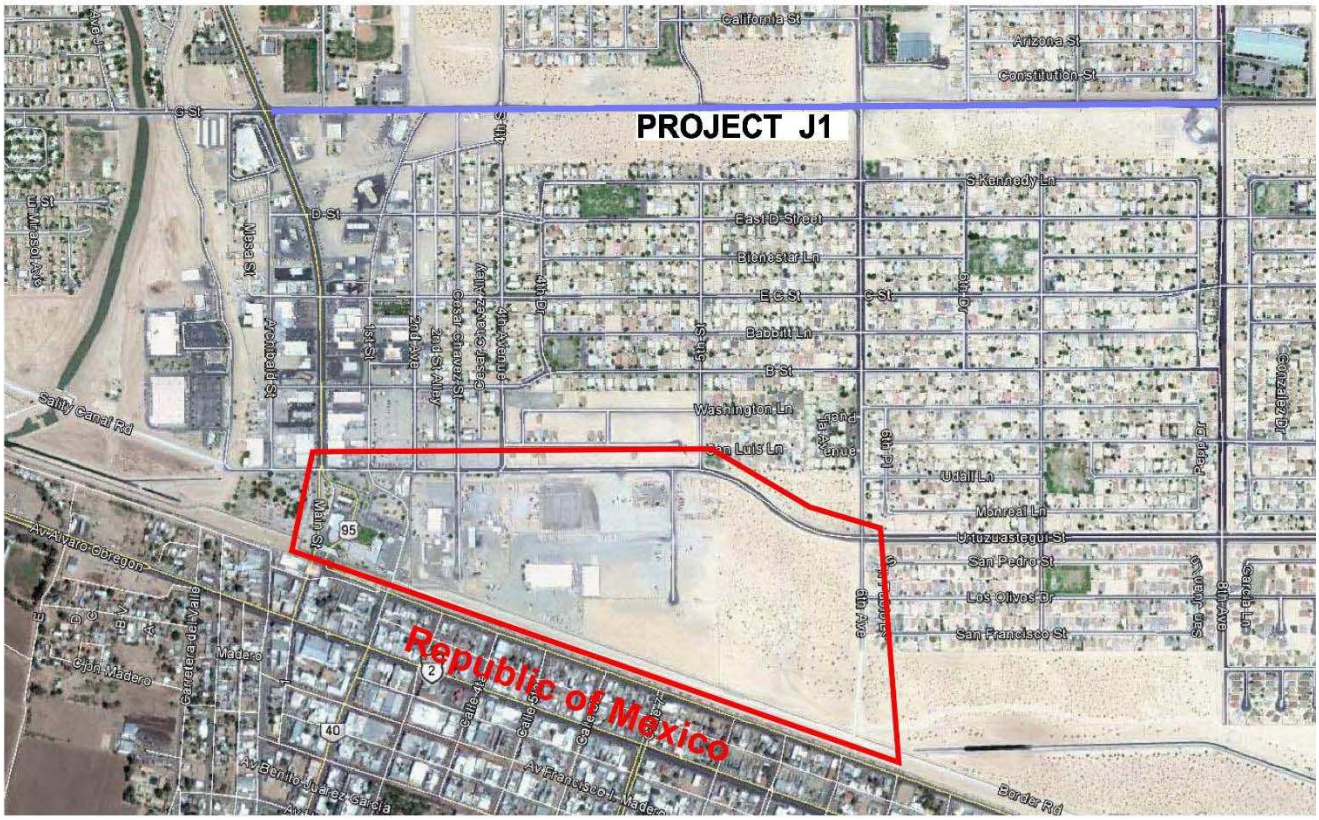
Project	Cost
H1. Local Roadway Improvements H2. See Notes above on Juan Sanchez Blvd	Not Programmed



Area J: Downtown San Luis, Adjacent to Port of Entry

Area J is situated adjacent to the original San Luis Port of Entry and is in an older area of the community. Similar to Area H, this area could benefit from the Juan Sanchez Blvd widening projects (J1 to J4) but may get the most benefit from the County 24th Street two lane road (Project J5) that is planned about 1 mile east of the identified planning area.

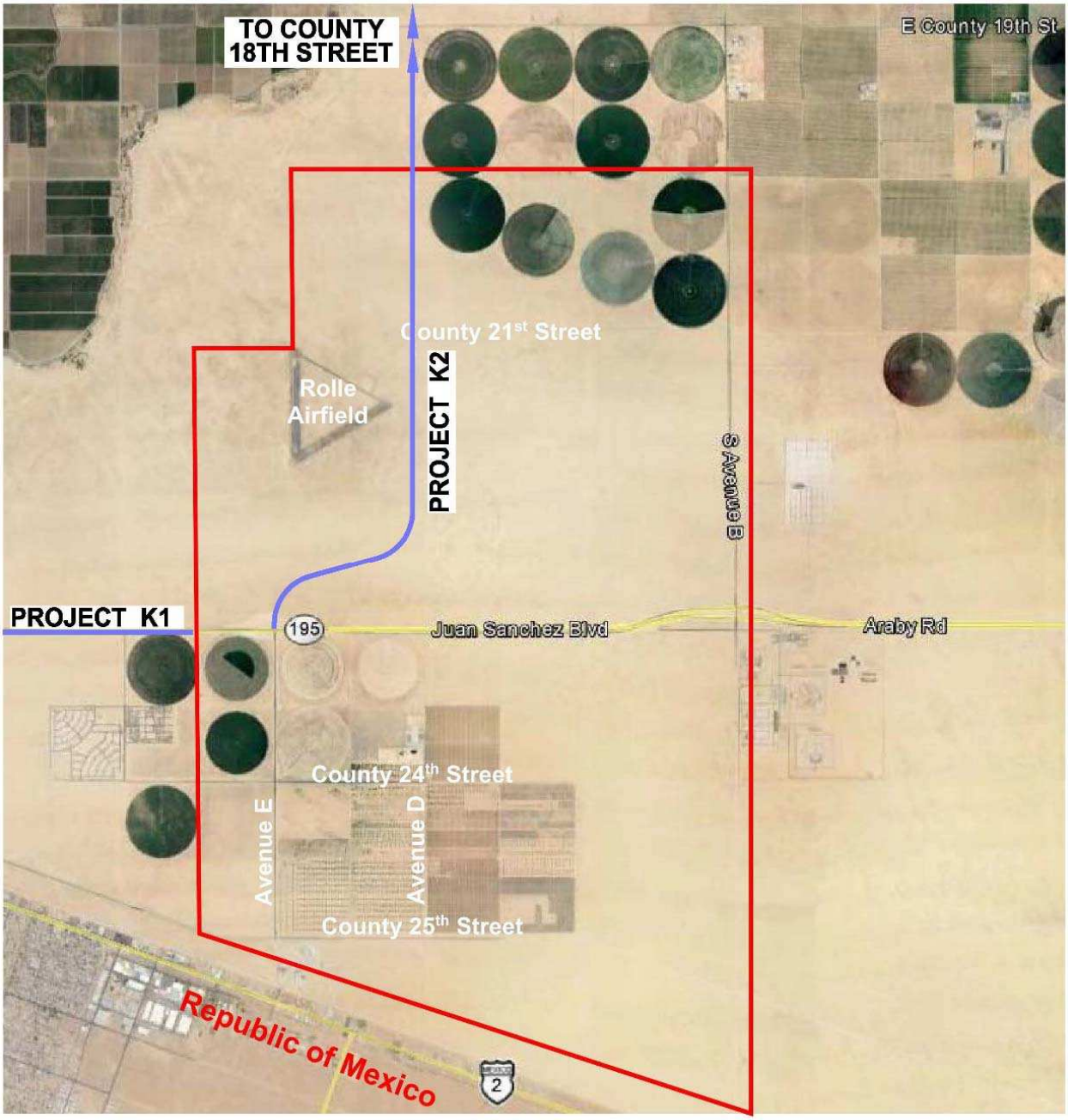
Project	Cost
J1. Juan Sanchez Blvd Widening: Main St. to 8th Avenue	6.5 Million
J2. Juan Sanchez Blvd Widening: 8th Avenue to Avenue G	14.7 Million
J3. Juan Sanchez Blvd Widening: Avenue G to Avenue F ½	7.4 Million
J4. Juan Sanchez Blvd Widening: Avenue F ½ to E ½	11.1 Million
J5. County 24th St: 10th Avenue to Avenue F: New Two Lane Rd	Not Programmed


PROJECT J1
Republic of Mexico
California St
Arizona St
Constitution St
G St
D St
E St
S Kennedy Ln
East D Street
Bienestar Ln
E G St
Babbitt Ln
B St
Washington Ln
San Luis Ln
Udall Ln
Monreal Ln
Urtuzuastegui St
San Pedro St
Los Olivos Dr
San Francisco St
Av Alvaro Obregon
Av Benito Juarez Garcia
Av Francisco I Madero
Calle Madero
Carretera del Vale
Sally Canal Rd
Border Rd
Avenida Juarez
Calle Vale
Calle Sur
Calle Norte
Calle Oriente
Calle Poniente
Calle Cuarta
Calle Tercera
Calle Segunda
Calle Primera
Calle Cuarta Alley
Calle Segunda Alley
Calle Primera Alley
Calle Tercera Alley

Area K: Eastern San Luis: POE II and Rolle Airfield

Area K is situated in the area from the Commercial Port of Entry north to Rolle airfield. This is an area that could also benefit from Juan Sanchez Blvd improvements as well as an unfunded project that has been approved to go to design concept (30%) stage. That is the "Avenue E" extension from County 23rd (Juan Sanchez Blvd) to County 18th. It should be noted that despite its name, it mostly follows an Avenue D alignment.

Project	Cost
K1. Juan Sanchez Blvd Widening: Avenue F ½ to E ½	11.1 Million
K2. Avenue E Extension: Co. 23rd Street to County 18th Street	Not Programmed
K3. Local Roadway Improvements	Not Programmed



Appendix A

Raw Data Summary

Appendix A

Raw Data Summary

Ranking Totals	Area/Project	YMPO	City of Yuma	Yuma County
	Area A: South of I-8 to 32nd St., from Avenue 6E to 8E			
2	US 95 Widening: 9E to Imperial Dam Rd	1		1
2	SR 195 and 32nd Street Safety Improvements	1	1	
2	I-8 Widening to Six Lanes between Araby and Fortuna		1	1
2	Widening of SR-195/Araby between 24th and 32nd Street		1	1
1	Traffic Signal System Implementation	1		
1	32nd Street Widening 3E to 5E	1		
1	Rail Service	1		
1	32nd St Turn Lanes at Avenue 7E and Avenue 8E		1	
1	32nd Street Widening 3E to 5E			1
1	Yuma East Freeway			1
	Total Ranked (Check)	***5***	***4***	***5***
	Area B: South of I-8 to 32nd St., from Pacific to Avenue 8E			
3	Avenue 3.5 Connect: 3E to 3.5E, east along B Canal and widen 3.5E to 48th St.	1	1	1
2	I-8 Widening to Six Lanes between Araby and Fortuna		1	1
2	Avenue 3E widening I-8 to 16th St		1	1
1	US 95 Widening: 9E to Imperial Dam Rd	1		
1	32nd Street and 5E Turn Lanes	1		
1	32nd St. Widening: Avenue 3E to 5E	1		
1	Traffic Signal Implementation	1		
1	32nd St. and Pacfic Turn Bays		1	
1	24th St. and Pacific Avenue Turn bays		1	
1	US 95 Widening: 9E to Imperial Dam Rd			1
1	32nd Street and 5E Turn Lanes			1
	Total Ranked (Check)	***5***	***5***	***5***
	Area C: South of 32nd St. to 40th St., from Avenue 3E to 5.5 E			
2	Avenue 3.5 Connect: 3E to 3.5E, east along B canal and widen 3.5E to ~~56th St~~. 48th St.	1	1	
2	32nd Street and 5E Turn Lanes	1	1	
2	I-8 Widening to Six Lanes between Araby and Fortuna		1	1
1	Avenue 3E widening From 40th St. to County 19th		1	
1	SR 195 and 32nd Street Safety Improvements	1		
1	I-8/SR-195 Safety Improvements at Interchange			1
1	Rail Service	1		
1	Avenue 3E widening I-8 to 16th St			1
1	40th Street Widening from Avenue 3.5E to Avenue 10E		1	
1	56th Street - ASH to Avenue 13E			1
1	Avenue 6E - 32nd St. to 40th St.			1
1	32nd Street Expressway: Avenue 3E to 5E Widen 4 to 6 lanes	1		
	Total Ranked (Check)	***5***	***5***	***5***

Ranking Totals	Area/Project	YMPO	City of Yuma	Yuma County
	Area D: Area North and West of Yuma International Airport			
3	4th Avenue and Big Curve Turn Lane	1	1	1
2	Traffic Signal Implementation	1	1	
2	4th Avenue Ext, 32nd to 40th St	1		1
2	Arizona Avenue 32nd to 40th St	1		1
2	Avenue A: 32nd to County 16th		1	1
1	Avenue A: 24th to 32nd St (32nd St. Expressway)	1		
1	Avenue 3E widening I-8 to 16th St		1	
1	32nd St. and Arizona Avenue Turn Lane		1	
1	36th St - AZ Avenue to 4th Avenue			1
	Total Ranked (Check)	***5***	***5***	***5***
	Area E: Central Municipal Yuma Area			
3	Pacific Ave/24th St. Safety Improvements (turn lanes)	1	1	1
3	16th St Widening 3rd Avenue to Maple Avenue	1	1	1
2	Traffic Signal Implementation	1	1	
2	Avenue 3E widening I-8 to 16th St		1	1
1	16th Street Turn Lane: Maple to 1st Avenue	1		
1	1st Avenue: 12th to 16th St.	1		
1	16th Street Widening: Avenue A to 6th Avenue			1
1	Giss Park Extension/Improvements (scope changed)			1
	Total Ranked (Check)	***5***	***4***	***5***
	Area F: West of 23rd Ave., East of Avenue C1/2, North of 1st Ave, South of Levee			
3	1st Street: Gila to Avenue C	1	1	1
2	Avenue B/16th Street Safety Study	1	1	
2	Traffic Signal Implementation	1	1	
1	3rd Street: Magnolia Avenue to Avenue B	1		
1	4th Avenue Gateway			1
1	1st to Colorado St. - Avenue A to 23rd Avenue Paving			1
1	Avenue B - I-8 to 80th (city says this wont be in TMP)			1
	Total Ranked (Check)	***4***	***3***	***4***
	Area G: East County Wellton/Tacna	**YMPO**	**Wellton**	**Yuma County**
1	County 11th Street: 29E to 31E	1		
1	County 8th St Extention, Avenue 36E to Avenue 37E	1		
1	Rail Service	1		
1	Freeway Interchange at Exit 25		1	
	Area H: Northwest San Luis	**YMPO**	**San Luis**	
1	Juan Sanchez Blvd Widening: Main St. to 8th Avenue	1		
1	Juan Sanchez Blvd Widening: 8th Avenue to Avenue G	1		
1	Juan Sanchez Blvd Widening: Avenue G to Avenue F	1		
1	Juan Sanchez Blvd Widening: Avenue F to E 1/2	1		
1	County 24th St: 10th Avenue to Avenue F: New Two Lane Rd	1		

Ranking Totals	Area/Project	YMPO	City of Yuma	Yuma County
	Area J: Downtown San Luis, Adjacent to Port of Entry	**YMPO**	**San Luis**	
2	Juan Sanchez Blvd Widening: Main St. to 8th Avenue	1		1
2	Juan Sanchez Blvd Widening: 8th Avenue to Avenue G	1		1
2	Juan Sanchez Blvd Widening: Avenue G to Avenue F	1		1
2	Juan Sanchez Blvd Widening: Avenue F to E 1/2	1		1
	Total Ranked (Check)	***4***	***0***	***4***
	Area K: Eastern San Luis: POE II and Rolle Airfield	**YMPO**	**San Luis**	
2	Juan Sanchez Blvd Widening: 8th Avenue to Avenue G	1		1
2	Avenue E Extension: Co 23rd to County 18th	1		1
1	Juan Sanchez Blvd Widening: Main St. to 8th Avenue	1		
1	Juan Sanchez Blvd Widening: Avenue G to Avenue F	1		
1	Juan Sanchez Blvd Widening: Avenue F to E 1/2	1		
1	County 25th Avenue Paving, Avenue E to D			1
1	County 24th St. 10th Avenue to Avenue F			1
	Total Ranked (Check)	***5***	***0***	***4***

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Yuma, Arizona 85364

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www.CoreEngineeringGroup.com

TECHNICAL MEMORANDUM

Date: December 12, 2014
Revised February 19, 2015

To: Nancy Ngai, Yuma County Community Planning Coordinator

From: Douglas Nicholls, P.E., R.L.S.

Re: IMCP Task 6 Utility Infrastructure Summary

Registered Professional Engineer (Civil)
CERTIFICATE NO.
32329
DOUGLAS J.
NICHOLLS
Date Signed 2/19/15
ARIZONA, U.S.A.
Expires 3/31/16

As part of the Utility Infrastructure Task 6 for the Yuma County Area IMCP, commentary was solicited from area technical personnel, planners, and engineers to document existing utility infrastructure and, where possible, evaluate facility capacity for expansion as it relates to industrial planning areas.

We received commentary from the following organizations:

City of Yuma	Jay Simonton	928-373-4500
Southwest Gas (SWG),	Michael Gomez	520-794-6428
Arizona Public Service (APS)	Scott Kerns	928-336-9869
Yuma County Water Users Association (YCWUA),	Omar Penunuri	928-627-8824
Wellton-Mohawk Irrigation & Drainage Dist. (WMIDD)	Fermin Ruiz	928-785-3351
Town of Wellton	Joe Grant	928-785-3348

Additionally, commentary was solicited but was not received in writing from the City of San Luis, El Paso Natural Gas, and the Yuma Irrigation District.

The following summarizes by area the information we received.

AREA A – Area South of I-8 to 32nd Street, from East of Avenue 6E to Avenue 8E

Waterline Commentary

- The water facilities in this area are supplied primarily by the City of Yuma Agua Viva Water Treatment Plant (AVWTP) through 16" and 20" transmission lines along 32nd Street provide the backbone for the water supply. Within the Yuma Commerce Center in the area is a network of 8" and 10" waterlines capable of supporting domestic and fire prevention needs.
- AVWTP is permitted for 20 MGD capacity and is use peaks at around 14 MGD during the summer.
- There is adequate ability to supply water to the area although some improvements may be needed. Specifically the City could require installation of 12" or 10" lines on section and mid-section lines respectively.
- There are no known deficiencies. AVWTP has the capacity to serve a new industrial facility.
- Within the next 5 to 10 years Groundwater Well No 1 at Agua Viva will need to be replaced.

Wastewater Commentary

- Wastewater treatment is provided solely by the Desert Dunes Water Reclamation Facility (DDWRF) and associated gravity collection system. It has a capacity of up to 3.3 MGD and is permitted to be expanded up to 3.3 MGD more.
- The Yuma Commerce within the area has two primary collection lines for conveying wastewater from the area. These are a 12" line from Avenue 8E to the west for ½ mile along 30th Street. The second is an 18" line on Avenue 7E that terminates about 31st Place. To provide service for the western 2/3 of the area would mean the extension of the 18" line on Avenue 7E north to 30th Street to allow 12" line installation east and west in 30th Street.
- Similarly for the area from Avenue 6E east to Araby Road, an extension of an 18" gravity line at Avenue 6E and 32nd Street would be required. The depth of cover would allow an extension of roughly 1/2 mile either east or west along the future 30th Street alignment.
- Currently DDWRF has excess capacity. Its average daily flow into the facility is still slightly less than half the permitted capacity noted. It should also be noted that this area has seen the largest connections for the City by area and is expected to continue to grow.
- Since the DDWRF is relatively new and the network of collection lines is not built out, an investment in new collection lines similar to what was described above may be needed to connect to the City system, dependent upon facility location.
- Other Notes: DDWRF produces Class A+ effluent and meets all discharge permit requirements. This effluent could be used by a manufacturing customer in its processes in a "gray-water" application. There is roughly 1 MGD available to a user that currently percolates into the ground.
- Improvements Planned:
    - Desert Dunes Reclaimed Water System changes (if reclaimed water partner is found)
    - Desert Dunes UV Disinfection Upgrades
    - Desert Dunes Solids Handling Upgrades

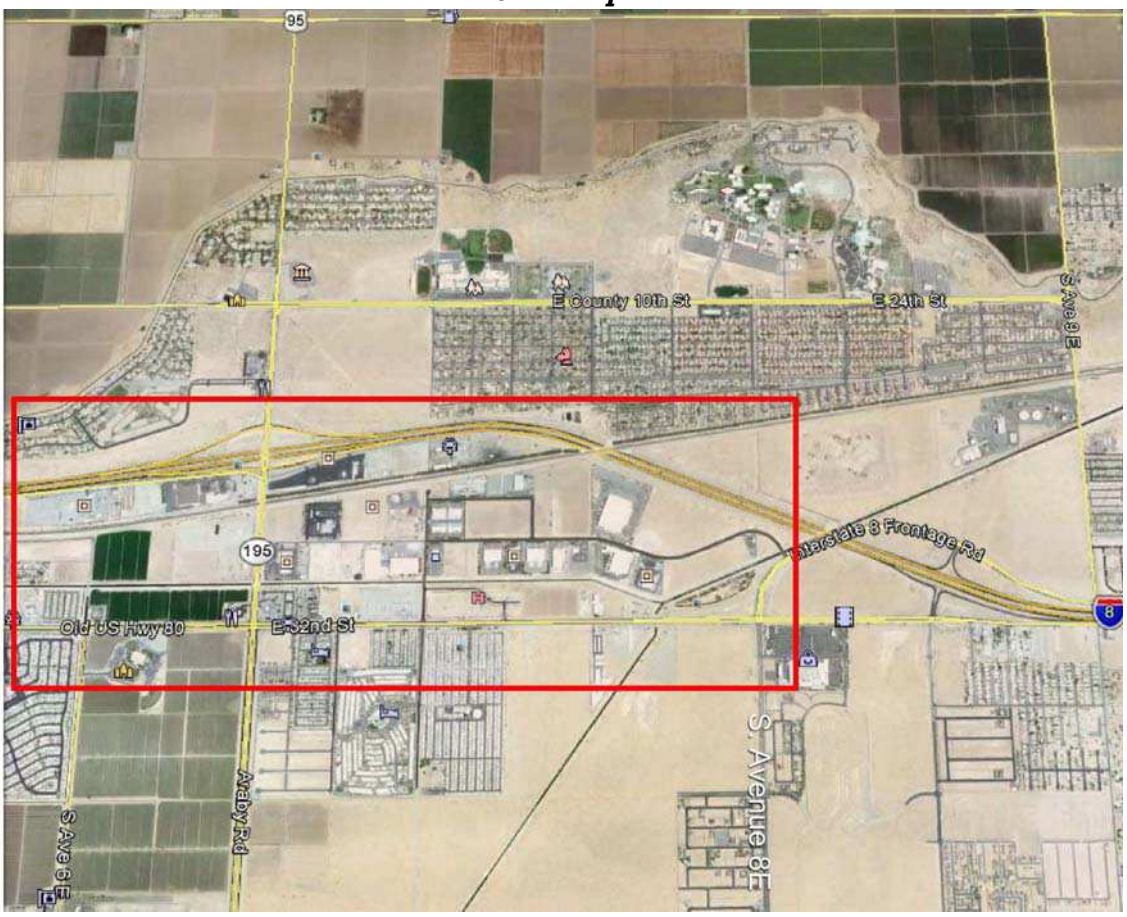
Electric Power Commentary (Based on 3000amp/240v Service)

- APS has two substations and three distribution feeders in the service area - Araby substation at 32nd Street and Ave 8E and the Marine Air substation at Ave 3E and city 36th Street alignment.
- Araby has two distribution feeders and Marine Air has one distribution feeder that serve the area.
- A moderate 13 MW of combined excess capacity is available in the area.
- An identified strength for the area is the distribution/transmission and ability to add one transformer at Araby Substation.
- Moderate excess transformer capacity at both substations.
- A noted deficiency is the congested electrical corridor exists north to 32nd Street from Araby Station.
- No distribution improvements are planned however some transmission projects are planned. APS did not identify the planned transmission projects in their commentary.

Natural Gas Commentary

- SWG has a high-pressure main serving the area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area A Map:



Area B – Area South of I-8 to 32nd Street, from Pacific Avenue to Avenue 6E

Waterline Commentary

- Water is supplied by the City of Yuma AVWTP and associated 16" lines on 32nd Street and Gila Ridge Road. These lines provide the backbone for the supply, much of it constructed within the last 15 years. This area can also be supplied by the City's Main Street WTP via the same transmission system. There is currently a 12" line along Gila Ridge Road from Avenue 4E to Pacific Avenue.
- There are no known water supply weaknesses or water supply improvements planned.

Wastewater Commentary

- Wastewater service to the area is limited. There is a 10" gravity line from Pacific Avenue to Avenue 3E, but no wastewater collection from Avenue 3E to Araby Road. Many existing facilities in the area use on-site treatment/septic systems for wastewater disposal purposes.
- Gravity lines could be extended by a developer north along Avenues 4E, 5E or 6E to provide service. If done, those sewer lines would then convey the wastewater to the DDWRF.
- It should be noted that the area's development is subject to the requirements of the Arizona Department of Environmental Quality (ADEQ), and new sewer installations would be required despite adjacent properties having on-site septic treatment.

Electric Power Commentary (Based on 3000amp/240v Service)

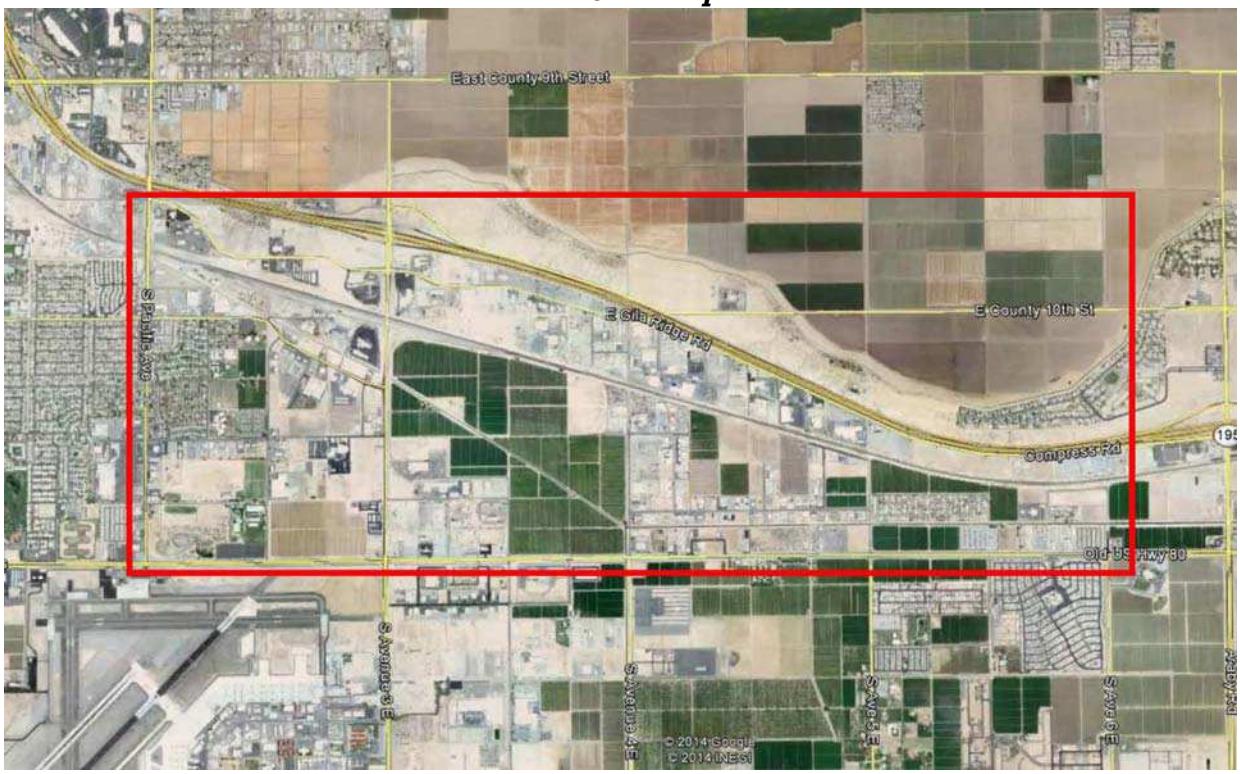
- APS currently has three substations that serve the area: Marine Air at Avenue 3E/36th Street, Ivalon near Avenue 2 ½ E and 24th Street , and also Yuma Palms Temp between Pacific and Engler Avenue on 16th Street.

- Seven distribution feeders provide capacity to the area; two from Marine Air, four from valon, and one from Yuma Palms Temp.
- A moderate 14 MW of combined excess capacity is available in the area. Some improvements may be required depending on the location of a new customer and demands.
- Identified strengths for the area include the distribution/transmission and ability and that existing land is already available for replacing Yuma Palms Temp.
- There is moderate transformer capacity at Ivalon and Yuma Palms Temp.
- As its name indicates, Yuma Palms substation is meant to be a temporary facility.
- No improvements are planned to distribution or transmission systems.

Natural Gas Commentary

- SWG has a high-pressure main serving the area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area B Map:



AREA C – Area South of 32nd Street to 40th Street and from Avenue 3E to Avenue 5 ½E

Waterline Commentary

- Water in this area is supplied by the AVWTP and its associated 16" water transmission line in 32nd Street and the large 30" transmission line on 40th Street. These provide the backbone to the distribution system. The distribution system is comprised of 12" and 10" lines installed on the section and mid-section line alignments respectively. Local 10" and 8" lines comprise the rest of the network in the area within the public right-of-way.
- There are no known weakness in the area.
- Minimal water distribution improvements would be required for many of the potential industrial sites in the area.
- Since much of the area is unincorporated, a development agreement with the City would have to be in place prior to use of City water service. Additionally the new development would be subject to ADEQ requirements.

Wastewater Commentary

- The wastewater collection and treatment for this area is provided by the City's DDWRF and its associated collection system. As part of the construction, the city installed a deep interceptor sewer along 40th Street from the DDWRF west to Avenue 4E and then north about 1/2 mile to 36th Street. MCAS Yuma and many commercial developments in the area along Avenue 3E discharge into the City's 36th Street lift station, which is then pumped to Avenue 4E.
- Despite what is noted above, much of the localized collection system to connect to the trunk noted has yet to be fully developed.
- Since much of the area is unincorporated, a development agreement with the City would have to be in place prior to use of City wastewater service. Additionally the new development would be subject to ADEQ requirements.
- Other Notes: DDWRF produces Class A+ effluent and meets all discharge permit requirements. This effluent could be used by a manufacturing customer in its processes in a "gray-water" application. There is roughly 1 MGD available to a user that currently percolates into the ground.
- Improvements Planned:
    - Desert Dunes Reclaimed Water System changes (if reclaimed water partner is found)
    - Desert Dunes UV Disinfection Upgrades
    - Desert Dunes Solids Handling Upgrades

Electric Power Commentary (Based on 3000amp/240v Service)

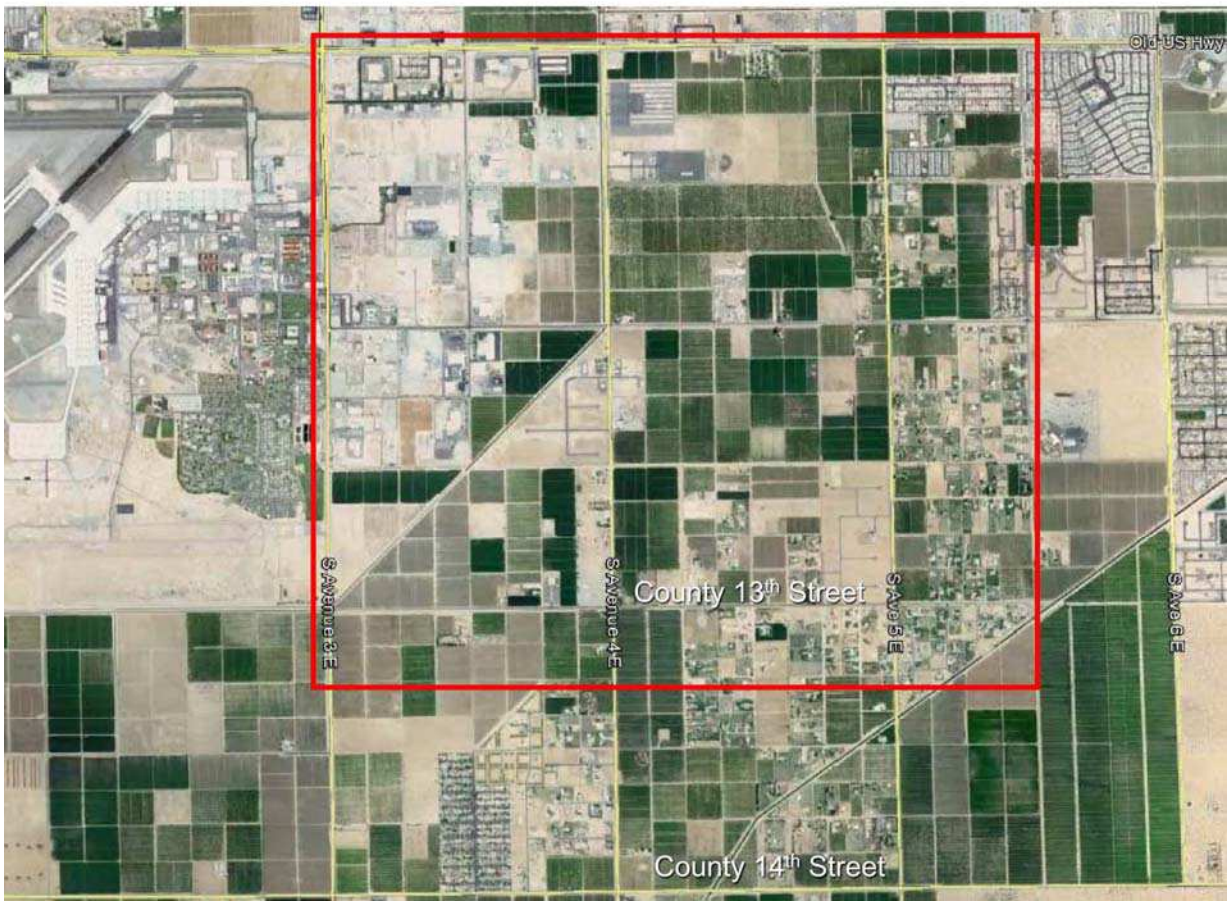
- APS currently has two substations in the area, Araby substation and Marine Air substation.
- Four distribution feeders provide capacity to the area, one from the Araby substation and three at the Marine Air substation.
- A moderate 14 MW of combined excess capacity is available in the area. Some improvements may be required depending on the location of a new customer and demands.
- An identified strength for the area is the distribution/transmission lines in the area. There is also a large excess transformer capacity at Marine Air. Finally, there is also the ability to accommodate an additional transformer at Araby.
- A noted deficiency is the congested electrical corridor exists north to 32nd Street from Araby Station.
- No distribution improvements are planned however some transmission projects are planned. APS did not identify the planned transmission projects in their commentary.

Natural Gas Commentary

- SWG has a high-pressure main serving the area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.

- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area C Map:



AREA D – Area North and West of the Yuma International Airport

Waterline Commentary

- Water supply for this area is by a combination of AVWTP and the Main Street WTP (40 MGD capacity plant). The main distribution system for the area is 12" waterlines on Arizona Avenue, 40th Street, 4th Avenue and Avenue A. Local 10" and 8" waterlines comprise the remainder of the distribution system in the area.
- There are no known deficiencies concerning the water supply or distribution system.
- There are no major water projects planned for the area.

Wastewater Commentary

- The wastewater collection and treatment for this area is provided by the City's Figueroa WRF (12 MGD capacity plant) and its combination of gravity and wastewater lift-station. Wastewater in the area is intended to gravity feed to an existing lift-station on 40th Street between 4th Avenue and Arizona Avenue.
- The lift-station is about 75% of capacity and any significant increase in discharge would likely required the station to be upgraded with a larger wet well size and pumping capacity. Within the next 1 to 3 years, the City will through its CIP project program be addressing the capacity issues at this lift station.

- Various manhole replacement projects are planned for the downstream collection system over the next several years.

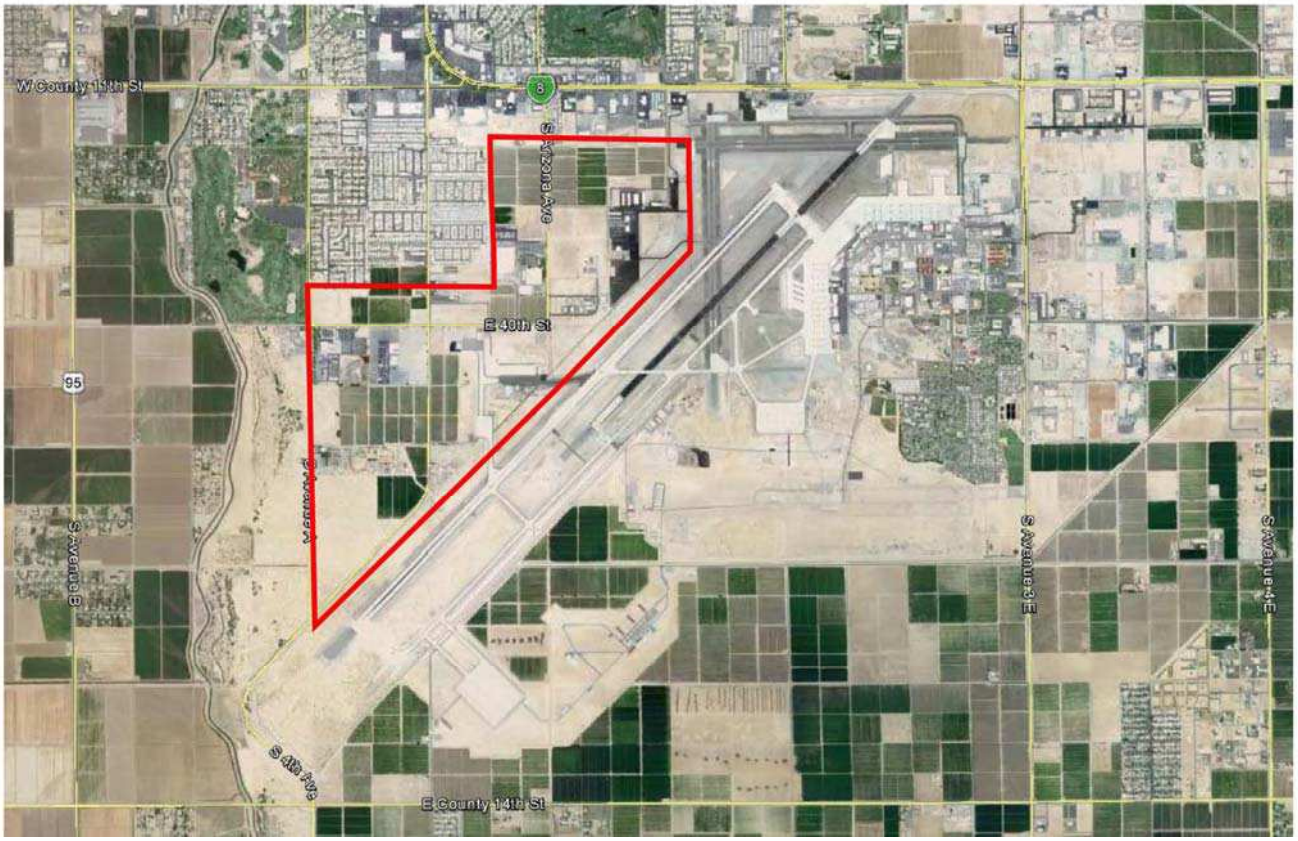
Electric Power Commentary (Based on 3000amp/240v Service)

- APS currently has one substation at 32nd Street and Avenue A serves this area.
- The 32nd Street substation has and two distribution feeders providing capacity to the area.
- A low to moderate 10 MW of combined excess capacity is available in the area. Some improvements may be required depending on the location of a new customer and demands.
- An identified strength for the area is the distribution/transmission lines in the area. There is also the ability to accommodate an additional transformer and feeder bays at the noted substation.
- A limitation for the area is the proximity to the MCAS flight path which restricts overhead transmission pole height.
- No distribution improvements or transmission projects are planned.

Natural Gas Commentary

- SWG can extend a high-pressure to the area if needed. There is an existing line on the east side of MCAS which could be extended along 32nd Street. There is also a line running along Arizona Avenue that ends at Palo Verde Street which could be extended south into this area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area D Map:



AREA E – Central Municipal Yuma Area (Subareas as highlighted below)

Waterline Commentary

- The majority of the planning area is situated within the City of Yuma's existing water distribution network ranging from 6" to 12" in size. The supply is by the City's Main Street WTP (MSWTP) with some blending from the AVWTF for the eastern and southern subarea identified.
- There are no known deficiencies for the water supply and distribution.
- There are not any planned improvements to the water supply and distribution system for the planning area.

Wastewater Commentary

- The northern and southern sub-areas have established collection systems in the proximity of any potential manufacturing locations. These sub-areas would convey wastewater to the City of Yuma's Figueroa WRF (FWRF) via interceptors ranging from 14" to 36" in diameter.
- The eastern sub-area is deficient in that it has limited access to the City's current wastewater collection system. The closest line is on the west side of the area on Pacific Avenue. For this area, Yuma County has proposed a future improvement district for the residential areas immediately east of the Yuma Palms Mall. The City has asked the County to plan installation of sewer for this area deep enough so that it could be extended to the east side of the identified eastern sub-area.
- The FWRF facility is an older treatment facility with older technologies. Since it discharges treated effluent into the Colorado River, its permit is required to be renewed every 5 years by the ADEQ. Should ADEQ impose stricter discharge limits prior to a renewal cycle, this could greatly affect the operation of the facility. This is currently not foreseen prior to the next renewal in 2017.
- Planned Improvements:
    - FWRF Bar-Screen replacement
    - FWRF Bio-solids dewatering upgrades
    - FWRF Capacity Study

Electric Power Commentary (Based on 3000amp/240v Service)

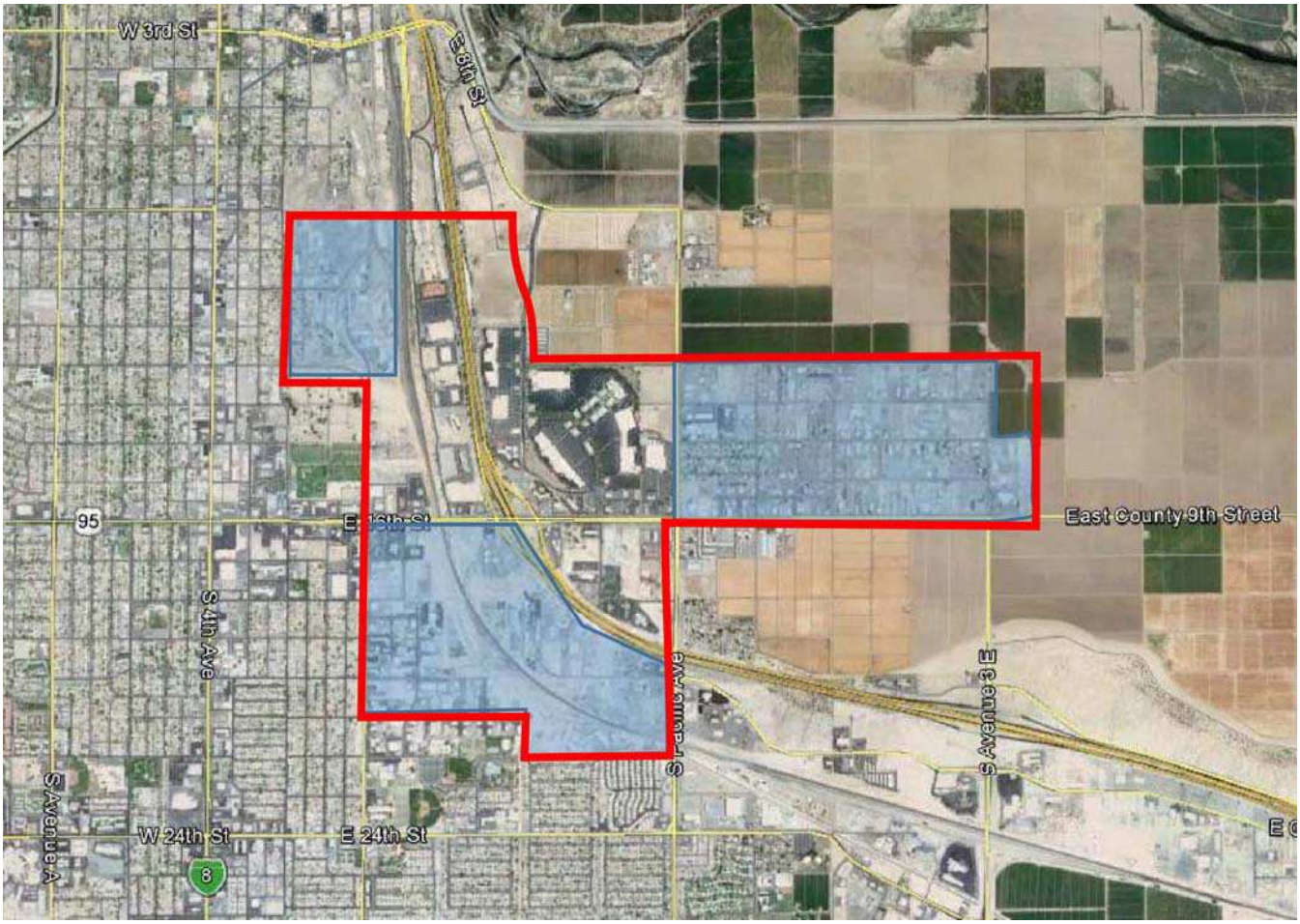
- Two substations serve the area. They are Quechan at 1st Avenue/14th Street and Yuma Palms Temp off of 16th Street between Pacific Avenue and Engler Avenue.
- Distribution feeder breakdown:
    - Northwest subarea is fed by Quechan
    - East subarea is fed by Yuma Palms Temp
    - South subarea is fed by one from Quechan and one from Yuma Palms Temp.
- Subarea Capacity
    - Northwest subarea has about 8MW capacity
    - East subarea has about 1MW capacity
    - South subarea has about 4MW capacity
- Some improvements may be required depending on the location of a new customer and demands.
- A strength for the area is the distribution and transmission lines. There is also a permanent site available to replace the Yuma Palms Temp substation adjacent to the existing site. Finally, there is a high transformer capacity at the Quechan Substation.
- Deficiency: Yuma Palms Temp is a temporary substation with limited transformer capacity. Any significant customer in its vicinity would require permanent facilities.
- No improvements are planned to distribution or transmission at this time.

Natural Gas Commentary

- SWG has a high-pressure main serving the area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.

- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area E Map:



Map Revised 2/19/15

AREA F –West of 23rd Avenue, East of Avenue C½, North of 1st Street & South of Levee

Waterline Commentary

- The Water supply for this planning area is from the City of Yuma's MSWTP as supplied by a 12" waterline along 1st Street and another 12" line along Avenue C. Additionally there is a 12" line along Figueroa Avenue and another that runs south out of the area on Avenue C.
- There are no known deficiencies in the area as it pertains to water supply and distribution, however since much of the identified area is currently agricultural, any repurposing of use would require installation of 10" or 8" supply lines to serve a new facility.
- A development outside of City limits wishing to use City water service would need a development agreement with the City and compliance with ADEQ requirements for the installation of a distribution system,

Wastewater Commentary

- Wastewater service is from the City's FWRF. With the exception of the Colorado River Levee Interceptor Sewer there is very little wastewater collection in the area and much of the area does not lie within the city development limits.
- A development outside of City limits wishing to use City wastewater service would need a development agreement with the City and compliance with ADEQ requirements for the installation of a collection system,
- A deficiency of the area is the lack of a wastewater collection system, however conversely a strength of the area is its proximity to the Figueroa Facility which would minimize the improvement cost of connecting to the facility.
- The FWRF is an older treatment facility with older technologies. Should ADEQ adopt stricter discharge limits prior to the facility's license renewal with ADEQ, this change could greatly affect the operation of the facility as described in more detail in the Area E section.
- Planned Improvements:
    - Figueroa Bar-Screen replacement
    - Figueroa Bio-solids dewatering upgrades
    - Figueroa Capacity Study

Electric Power Commentary (Based on 3000amp/240v Service)

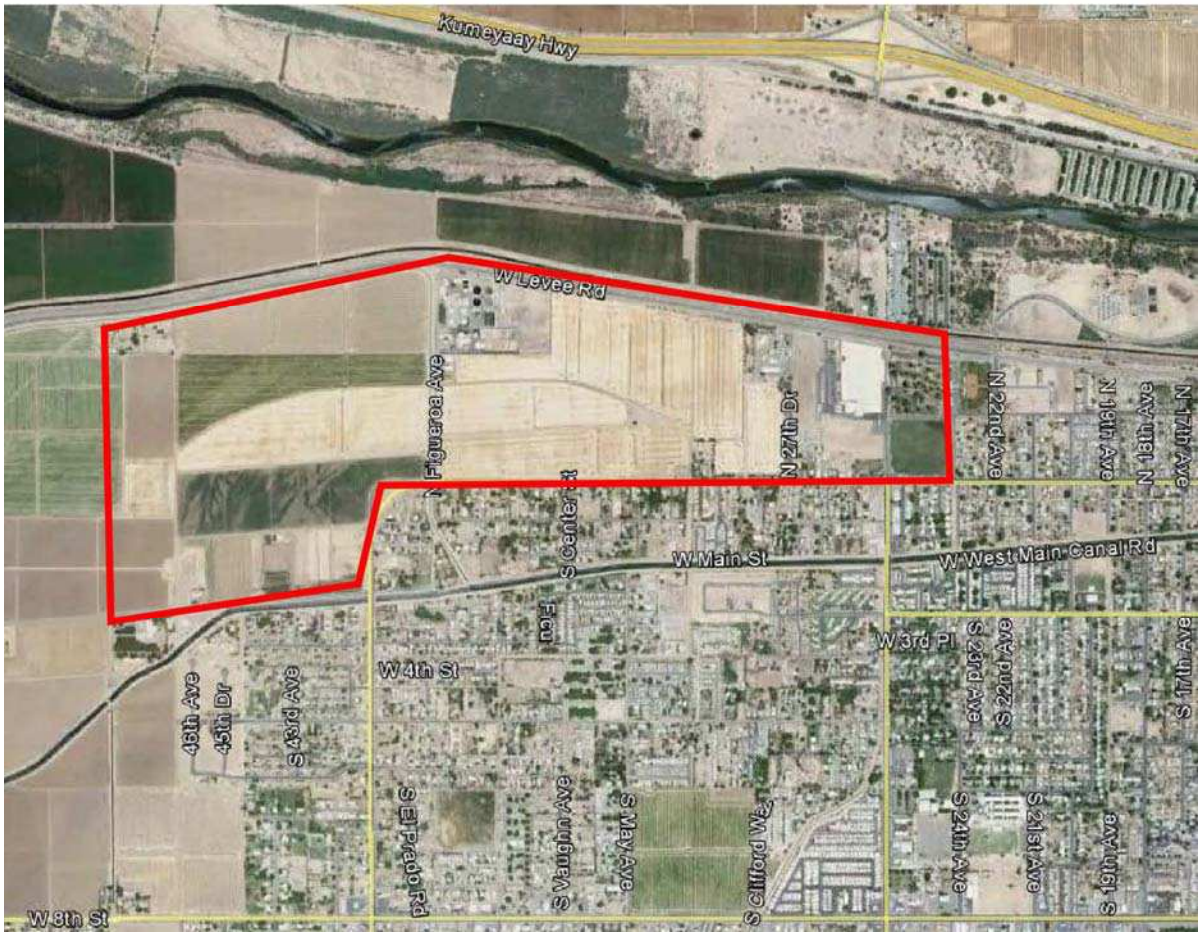
- APS currently has three substations serving the area. They are Riverside substation at northeast of 27th Drive/1st Street, the Cocopah substation at 12th Street/Avenue C, and Tenth Street substation at 10th St/Avenue A.
- Four distribution feeders serve the area. Two from Cocopah and one each from the other two.
- A high capacity of 21 MW in the area to supply a new industrial customer. Some improvements may be required depending on the location of a new customer and demands.
- There is moderate transformer excess capacity at Cocopah and Tenth Street substations.
- A strength for the area is the distribution and transmission lines. Additionally the Riverside substation property can accommodate an additional transformer.
- Some deficiencies for the area include that the Riverside substation is of smaller size that has a transformer of limited excess capacity. A larger customer could trigger upgrades and improvements at the Riverside substation.
- No improvements are planned to distribution system and some improvements are planned for the transmission system. The transmission improvements were not identified in the APS commentary.

Natural Gas Commentary

- SWG has a high-pressure main serving the area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.

- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area F Map:



AREA G – East County Wellton/Tacna Area

Waterline Commentary

- None provided. There are facilities within the Town of Wellton's development area to the west of Area G, however there are no facilities in the immediate area. A new user would be required to develop onsite wells for water supply per ADEQ regulations.

Wastewater Commentary

- None provided. There are facilities within the Town of Wellton's development area to the west of Area G, however there are no facilities in the immediate area. A new user would be required to develop onsite effluent treatment per ADEQ regulations.

Electric Power Commentary (Based on 3000amp/240v Service)

- APS does not have facilities serving Area G. This area falls under Wellton-Mohawk Irrigation Drainage District for power service.
- 3-Phase power with the basis of design being a 3000 amp/240v service is available to the area.
- There are no improvements planned for the area and any improvements would be at the customer's cost.
- 3-phase power is available in the area bounded by County 8th Street to County 10th Street and Avenue 39½ E to Avenue 41E. Capacity is a problem outside the previously noted area as the electricity supply is primarily serving agriculture and light density residential.

Natural Gas Commentary

- SWG can extend high-pressure to the area as needed. There is a line running parallel to I-8 north of the freeway. It crosses the I-8 at 43E and ends just south of I-8 right-of-way.
- Due to security restrictions, the exact location of proximate high-pressure mains cannot be identified for this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area G Map:

AREA H – Northwest San Luis

Waterline Commentary

- Written commentary was not provided by the City of San Luis, however a phone conversation with the Deputy Director of Public Works of San Luis indicated that the water system terminates at Avenue J (US 95) and County 22nd Street.
- An option for water service to the areas noted is wells, subject to the requirements of ADEQ.

Wastewater Commentary

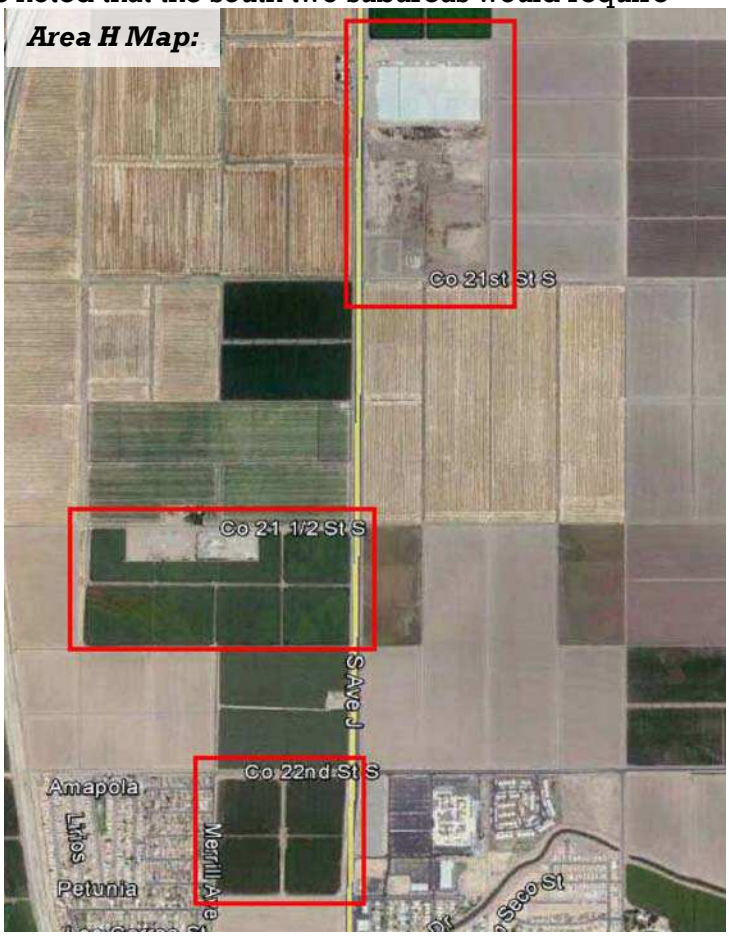
- Written commentary was not provided by the City of San Luis, however a phone conversation with the Deputy Director of Public Works of San Luis indicated that there is a wastewater force main along the west side of Avenue J that provides sewer service to the census-designated place of Gadsden, AZ. Subject to any capacity restrictions, this provides some opportunity for the middle and southern areas identified.
- Another option for local subarea wastewater disposal is also a septic system, subject to the requirements of ADEQ.

Electric Power Commentary (Based on 3000amp/240v Service)

- APS currently has one substation, the San Luis Substation at County 23rd Street and 8th Avenue which serves the subareas identified.
- Similarly, one distribution feeder serves the subareas identified.
- There is a low 3 MW of transformer capacity to feed a new industrial customer in the area. Some improvements may be required depending on the location of a new customer and demands.
- There are some notable strengths for the area including the distribution/transmission lines and the fact that the substation can accommodate a transformer upgrade to a larger unit.
- Conversely a deficiency for the area is the existing low excess transformer capacity. Additional capacity to feeder would require trench and conduit to parallel substation exits for full feeder rating. Finally, it should be noted that the south two subareas would require customer financed facilities to be constructed for service to be provided.
- No distribution improvements or transmission projects are planned in the noted area.

Natural Gas Commentary

- SWG has a high-pressure main serving the area near the north subarea. The identified middle and south subarea can have high-pressure extended to from the northern subarea as needed.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified for this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.



AREA J – Downtown San Luis adjacent to Main Port of Entry

Waterline Commentary

- A 10" water main occurs along Urtuzuastequi Street fronting the noted area. 8" waterlines branch south along Cesar Chavez and Industrial Avenue serving this area.

Wastewater Commentary

- Sewer collection for the area noted is provided by 8" lines along Cesar Chavez and Industrial Avenue.

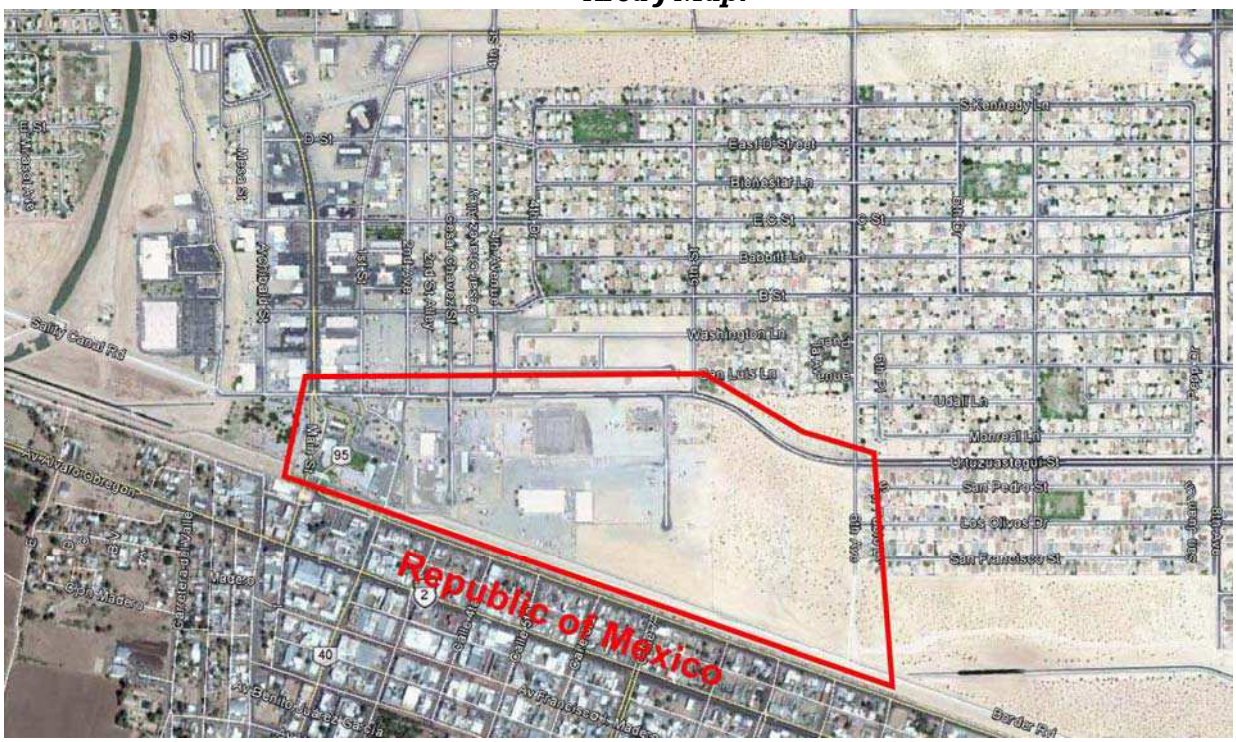
Electric Power Commentary (Based on 3000amp/240v Service)

- APS currently has one substation, the San Luis substation at County 23rd Street and 8th Avenue which feeds the area.
- One distribution feeder serve the area from the noted station.
- A low 2 MW of feeder capacity available to feed a new industrial customer in the area. Some improvements may be required depending on the location of a new customer and demands.
- There are some notable strengths for the area including the distribution/transmission lines and the fact that the substation can accommodate a transformer upgrade to a larger unit.
- A notable deficiency is that any significant additional customer load may require new feeder construction.
- No distribution improvements or transmission projects are planned in the noted area.

Natural Gas Commentary

- SWG can extend high-pressure to the area as needed. The nearest high pressure lines are at Avenue I/County 21st Street and County 24th/Avenue F (both over 3+ miles away). It should be noted that some industrial customers may be able to be served from a lower pressure system.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.

Area J Map: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Av Benito Juarez Cesar
Av Francisco Madero
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AREA K – Eastern San Luis: East of Port II and Rolle Airfield Area

Waterline Commentary

- Written commentary was not provided by the City of San Luis. However it is known that there is an existing 12" waterline along a portion of Avenue E, and a new planned 12" waterline that will be constructed in County 25th Street between Avenue E and Avenue D.

Wastewater Commentary

- Written commentary was not provided by the City of San Luis. However it is known that there is a sewer lift station at approximately County 25th Street and Avenue D which directs wastewater flow to the San Luis East Wastewater Plant northwest of Avenue D and County 24th Street. It has a constructed capacity of 1 MGD with current commitments of 0.6 MGD.

Electric Power Commentary (Based on 3000amp/240v Service)

- APS currently has one station serving the area, the Baja substation. It is located at Juan Sanchez Blvd and Avenue F.
- Two distribution feeders provide capacity from the noted Baja station.
- Approximately 4 MW of excess feeder capacity is available to feed a new industrial customer in the area. Some improvements may be required depending on the location of a new customer and demands.
- There are two notable strengths for the area. The first is the distribution/transmission lines and the second is that the Baja substation can accommodate additional transformers required for some growth to the area.
- Conversely, a deficiency is the existing transformer capacity.
- Some distribution improvements have been identified for the area but the timing of those improvements have not been scheduled. APS did not provide further discussion on those improvements in their commentary.
- No area improvements are planned for the transmission system.

Natural Gas Commentary

- SWG has a high-pressure main serving the area.
- Due to security restrictions, the exact location of nearby high-pressure mains cannot be identified in this commentary.
- SWG can provide 300,000 CF of gas per day. The cost of providing the infrastructure to the site will depend on the hourly gas demand, pressure requirements and annual usage and site location.
- It should be noted that it is best to involve SWG early in the planning process of a new facility. They strive to offset capital costs needed to serve very large customers based on usage.
- For the noted area, SWG has some reinforcements planned for the south county area near the San Luis Port of Entry II.

Appendix A

Raw Data Summary

Appendix A

Raw Data Summary

MEMORANDUM

Utilities Department

TO: **Kevin Burge, P.E. Core Engineering Group.**

FROM: **Jay Simonton, M.P.A. Director of Utilities , City of Yuma**

DATE: **October 21st, 2014**

RE: **Investing in Manufacturing Communities Partnership (IMCP) – Location Data Sheet Responses**

Kevin,

The following is the information requested for the IMCP project. If you need additional information or would like to schedule a follow-up meeting(s) to discuss any of information in more detail please let me know.

AREA A – Area South of I-8 to 32nd St, from East of Ave 6E to Ave 8E

A. Location of primary utility line and size/capacity

Waterlines

The water supply for this area is supplied by the City's AV WTP and the associated 16" and 20" transmission lines along 32nd Street, the transmission lines provide the backbone for water supply. Per City of Yuma standards 12" and 10" water mains are installed along section lines and mid-section lines respectively and provide for primary distribution system connectivity. Within the Yuma Commerce Center there is a network of 8" and 10" waterlines capable of providing water for domestic, process and fire prevention needs.

Wastewater

Wastewater collection and treatment for this area is provided solely by the City's DD WRF and the associated gravity collection system. The Yuma Commerce Center has two primary collection lines to convey wastewater from the area. The first is a 12" line extending from Ave 8 west approximately 1/2mile along 30th Street. To extend the line further West would have to be closely examined due to elevation and depth of cover issues. The second line capable of providing a means to convey wastewater from the Yuma Commerce area is an 18" line installed on Ave 7E to 31st Place. To provide service to western 2/3 of the area would require the extension of the 18" line north to 30th Street to allow 12" line extensions east and west along 30th St.

The area from Ave 6E east to Araby Road would require the extension of an 18" gravity line at Ave 6E and 32nd Street. The depth of cover of the line would allow for extension for approximately ½ mile either east or west along the future 30th St alignment.

B. Any area deficiencies and/or strengths

There are no know deficiencies with regard to water production or supply within this area. The AV WTP and associated water distribution system has the capacity to supply water for any potential industrial or manufacturing

facility within the planning area.

Currently the DD WRF has excess capacity. It's average daily flow into the facility is still slightly less than half its permitted capacity, however the DD service area has seen the largest number of residential connections and the area is expected to continue to see largest percentage of the City's overall growth. Because the DD facility and its associated collection system are relatively young and the collection network is not completely built-out, any potential manufacturing facility may require additional capital for offsite improvements to extend the gravity sewer to the new facility.

C. Special technical requirements for service to the area

Nothing at this time

D. Changes to local regulations that could promote capacity expansion

Nothing at this time, The Desert Dunes WRF produces the class A+ effluent and currently meets all discharge permit requirements. There are no known changes currently being considered either by the State or the EPA that would affect the operation of the facility. The only item that would require the expansion of DD would be an increased flow into the facility.

E. Top Five Projects

Water

1. There are no significant capital projects or priorities that would affect planning area A at this time.
2. Within the next 5 to 10 years Groundwater Well No. 1 at the AVWTP will have to be replaced due to age and water quality concerns.

Wastewater

1. Desert Dunes Minor Improvements Project
2. Desert Dunes Reclaimed Water System Modifications (Note only if reclaimed water customer identifies desire to use reclaimed water)
3. Desert Dunes UV Disinfection System Upgrades
4. Desert Dunes Solids Handling Upgrades

AREA B – Industrial Area South of I-8 to 32nd St. from Pacific Avenue to Avenue 6E

A. Location of primary utility line and size/capacity

Waterlines

The water supply for this area is supplied by the City's AV WTP and associated 16" transmission lines on 32nd Street and Gila Ridge Road. The transmission lines provide the backbone for the water supply. This area's water supply can also be supplied by the City's MS WTP via the same transmission line system. Per City of Yuma standards 12" and 10" water mains are installed along section lines and mid-section lines respectively and provide the primary distribution system connectivity. There is an additional 12" line along the Gila Ridge Road from Ave 4E to Pacific Ave.

Wastewater

Wastewater service to this area is limited. The area along Gila Ridge Road from Pacific Ave to Ave 3E can be served by a 10" gravity line. The Area along Gila Ridge Road from Ave 3E to Araby Road currently has no wastewater collection system installed. Current facilities on this corridor utilize on-site treatment/septic systems for wastewater treatment and disposal. Gravity lines can be extended north on Ave 6E, 5E and 4E respectively to provide service if needed. Wastewater would be conveyed to Desert Dunes Facility.

B. Any area deficiencies and/or strengths

There area has no known weakness with regard to water supply. The City completed the distribution network along Gila Ridge Road and extended distribution mains along Ave 4E and Ave 5E to reinforce the water supply in the area several years ago. As mentioned above the major weakness within this area is the lack of a developed wastewater collection network. If a collection system is constructed in the future, wastewater from the majority of this area would be conveyed to the DD WRF for treatment and disposal.

C. Special technical requirements for service to the area

Nothing at this time

D. Changes to local regulations that could promote capacity expansion

Nothing at this time

E. Top Five Projects

There are no major water and/or wastewater projects directly related to this area planned at this time.

AREA C – Industrial Area South of 32nd Street to 40th Street, from Ave 3E to Ave 5 1/2E

A. Location of primary utility line and size/capacity

Waterlines

The water supply for this area is primarily supplied by the City's AV WTP and its associated water 16" water transmission line on 32nd Street and the large 30" transmission line installed on 40th Street. The lines provide the backbone for the distribution system comprised of 12" and 10" lines installed on section and mid-section lines respectively. Local 10" and 8" water distribution lines comprise the rest of the piping network within developed rights-of-way in the area.

Wastewater

The wastewater collection and treatment for this area is provided by the City's DD WRF and its associated gravity collection system. As part of the DD WRF the City installed a very deep interceptor sewer along 40th Street from the DD facility west to Ave 4E and then north approximately 1/2mile to the 36th Street alignment. MCAS Yuma and the commercial developments along Ave 3E just east of the base discharges waste into the City's 36th Street lift-station. The wastewater is then pumped to the gravity line on Ave 4E. With the exception of the interceptor and the localized collection system on adjacent to 3E the remainder of the collection system has yet to be constructed.

B. Any area deficiencies and/or strengths

Similar to planning areas A & B, there are no known weaknesses with regard to water supply in this area. Many of the potential areas considered ideal for manufacturing in this area can be readily served by water distribution network with minimal distribution line extensions depending facility locations. Again, as mentioned above the weakness within this area is the lack of a developed wastewater collection network. The interceptor along 40th Street has been constructed but the majority of the localized collection system to connect to the trunk sewer has yet to be fully developed in this area.

C. Special technical requirements for service to the area

Nothing at this time

D. Changes to local regulations that could promote capacity expansion

Nothing at this time

E. Top Five Projects

Similar to Planning area outlined above.

AREA D – Area North and West of the Yuma International Airport

A. Location of primary utility line and size/capacity

Waterlines

The water supply for this area is supplied by a combination of the AV WTP facility and the City's MS WTP. The main distribution system feeders in this area are 12" waterlines installed on Arizona Ave, 40th Street, 4th Ave and Avenue A. Local 10" and 8" waterline comprise the remainder of distribution system network in this area.

Wastewater

Wastewater collection and treatment for this area is provided by the City's FAWPCF and its combination of gravity sewers and wastewater lift-stations. The areas gravity collection system is primarily comprised 10" lines on 40th Street and a 10" collection line on Arizona Ave. north to 38th St. The wastewater within this area is planned to gravity feed to an existing lift-station located on 40th Street between 4th Ave and Arizona Ave. The current lift-station is receives about 75% of its designed capacity any new connections to the local collection system will require station to be upgraded.

B. Any area deficiencies and/or strengths

There are no known deficiencies concerning the water supply or distribution system for this area. As mentioned above the 40th Street lift-station will limit additional connections until the wet-well size and pumping capacity can be increased.

C. Special technical requirements for service to the area

Nothing at this time

D. Changes to local regulations that could promote capacity expansion

Nothing at this time

E. Top Five Projects

There are no major water projects planned for this area. The City, through an annual lift-station CIP project will address the capacity issues associated with the 40th Street lift-station within the next 1 – 3 years. Various manhole replacement projects are planned for the downstream collection system over the next several years related to this planning area.

AREA E – Central Municipal Yuma Area

A. Location of primary utility line and size/capacity

Waterlines

The majority of this planning area is situated within the City's existing water distribution network. The network is

primarily comprised of 12", 10", 8" and 6" distribution system piping. The majority of this area's water supply is supplied by the City's MS WTP with some blending in sub-areas E2 & E3 with water from the City's AV WTP.

Wastewater

Sub areas E1 and E3 have established wastewater collections system either adjacent to or within close proximity of any potential manufacturing facility location. The wastewater from areas E1 and E3 are conveyed to the FAWPCF via the City's Industrial / Colorado River Levee Interceptor systems. The interceptors graduate from 14" in diameter up to 36" in diameter.

Sub area E2 has limited access to the City's current wastewater collection system. The closest collection line is located on the west boundary of the planning area on Pacific Avenue. Yuma County has a future Improvement District proposed for the residential areas immediately east of the Yuma Palms Mall. The City has instructed the County the gravity lines installed for the residential improvement district must be installed deep enough to extend east to allow for possible extension into the rest of what is currently shown as sub-area E2.

B. Any area deficiencies and/or strengths

There are no known deficiencies within these areas with regard to water supply and distribution. As stated above with the exception of area E2 the majority of the area can be serviced by the existing collection system.

C. Special technical requirements for service to the area

Nothing at this time

D. Changes to local regulations that could promote capacity expansion

This area's wastewater treatment is through the City's Figueroa Ave WPCF. Because the plant's effluent is discharged to the Colorado River the discharge permit for this facility has to be renewed every 5 years through the Arizona Department of Environmental Quality. The Figueroa facility is an older treatment facility with older treatment technology. If more stringent discharge limits are imposed by ADEQ during a renewal cycle has the potential to greatly affect the operation of the Figueroa Facility. The City is in the 2nd year of the current 5 year cycle, at the present time there are no new foreseen regulations that would significantly alter the current discharge permit parameters during the next permit renewal in 2017.

E. Top Five Projects

Because the a larger percentage of planning Area E is within older areas of the community areas E1 and portions of area E3 could be impacted by future waterline and or sewer line replacement projects.

Wastewater Treatment Projects Include:

FAWPC Bar-screen replacement
FAWPC On-site Manhole Replacement
FAWPC Bio-solids dewatering upgrades
FAWPC Capacity Study
FAWPC Corrosion Control Improvements

AREA F – Area West of 23rd Ave, East of Ave C ½, North of 1st St. and South of Levee

A. Location of primary utility line and size/capacity

Waterlines

The water supply for this planning area is from a 12" waterline along 1st Street and another 12" line along Ave C all the water supplied for this area is from the City's MS WTP.

Wastewater

Wastewater service would be from the City's Figueroa Facility. With the exception of the Colorado River Levee Interceptor Sewer there is very little wastewater collection infrastructure constructed in this planning area. But because of the proximity of the treatment facility the capital to extend the collection system should be minimal.

B. Any area deficiencies and/or strengths

There are no known water supply deficiencies within this planning area with the exception additional lines would have to be installed to the areas north of 1st Street and west of Figueroa Ave.

The only deficiencies within the wastewater system is the lack the collection system build-out but as noted above the proximity of this area to the Figueroa Facility should minimize the cost to connect to existing system.

C. Special technical requirements for service to the area

Nothing at this time

D. Changes to local regulations that could promote capacity expansion

Same as outlined for planning section E above

E. Top Five Projects

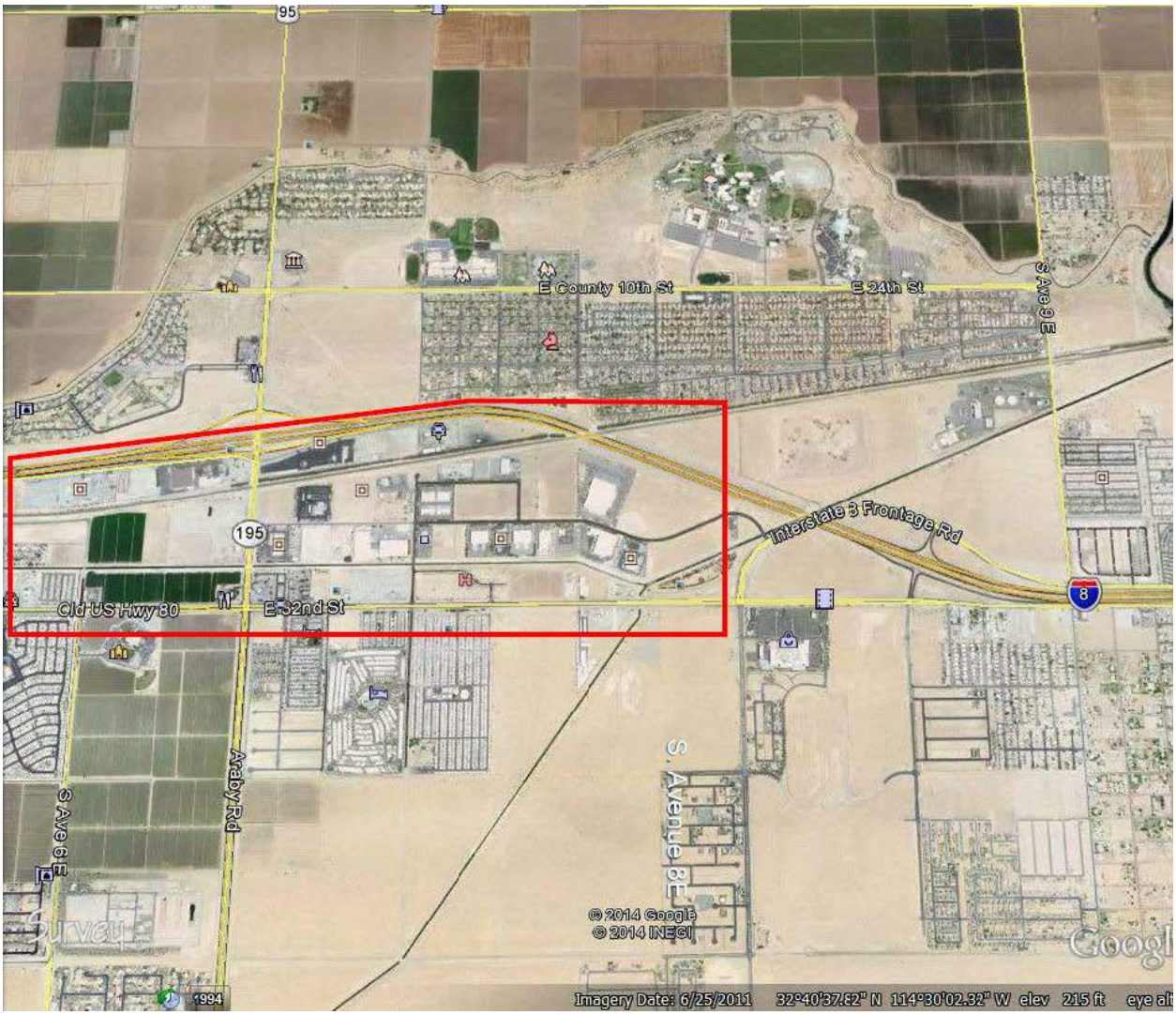
No major water system projects planned for this area.

Same wastewater treatment projects that effect Figueroa as listed in Planning Area E.

IMCP Task 6 Commentary by APS

Area A: Area South of I-8 to 32nd Street, from East of Ave 6E to Ave 8E

The following is the system evaluation for the area described as Area A: Area South of I-8 to 32nd Street, from East of Ave 6E to Ave 8E, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability to provide service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area to date. No detailed specific system improvements will be returned as the study only evaluates the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS substations located in area, Araby at 32nd Street and Ave 8E and a second station, Marine Air substation at Ave 3E and 12 Street.
    b. Three distribution feeders provide capacity to the area; two feeders from Araby and one feeder from Marine Air substation.
    c. Moderate capacity available to feed a new industrial customer, approximately 13MW of combined excess capacity from the multiple sources identified in the area.
    d. Some system improvements may be required dependent on the location of new load and the demand requested.
B. Area deficiencies and/or strengths
    a. Strength-Distribution and Transmission lines located within the study area.
    b. Strength-Substation property can accommodate an additional transformer at Araby.
    c. Deficiency-Moderate excess transformer capacity available at both stations.
    d. Deficiency-Araby Substation has a congested electrical corridor north to 32nd Street.
C. Special technical requirements for service to the area
    a. None identified
D. Change to local regulations that could promote capacity expansion
    a. Area is zoned for high industrial, light industrial and general commercial use.
E. Identified system planning area improvements
    a. No area improvements are identified for the distribution system.
    b. Some transmission projects are identified for the area to provide additional reliability.

Area B: Industrial Area South of I-8 to 32nd Street, from Pacific Ave to Ave 6E

The following is the system evaluation for the area described as Area B: Area South of I-8 to 32nd Street, from Pacific Ave to Ave 6E, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.

Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

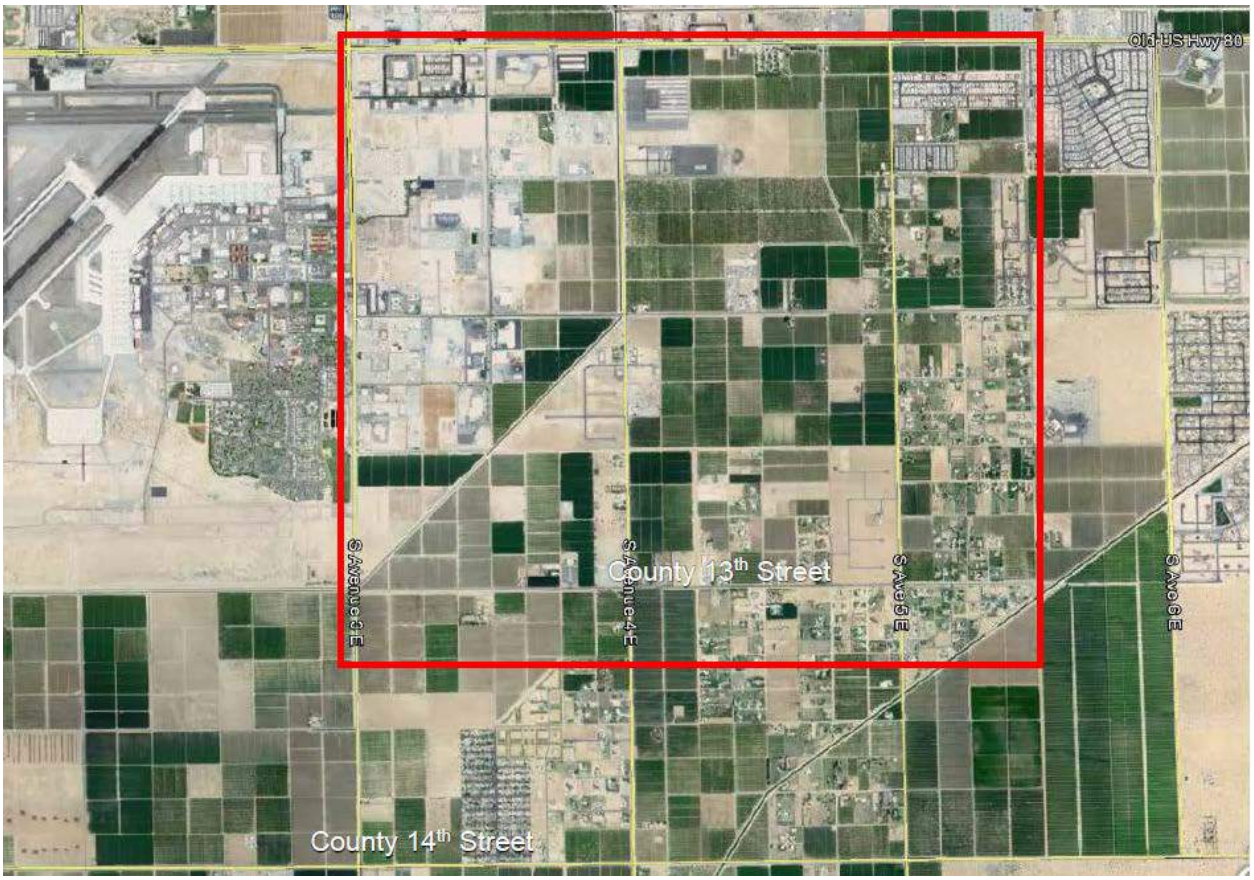
Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. Multiple APS substations located in area. The first is Marine Air substation at Ave 3E and 12 Street. A second substation Ivalon is located near Ivalon Rd and Ave 3E. Finally a third substation, Yuma Palms Temp at Pacific Ave and County 9th Street.
    b. Seven distribution feeders provide capacity to the area; two from Marine Air, four from Ivalon, and one from Yuma Palms Temp.
    c. Moderate capacity available to feed a new industrial customer, approximately 14MW of combined excess capacity from the multiple sources identified in the study area.
    d. Some system improvements may be required dependent on the location of new load and the demand requested.

B. Area deficiencies and/or strengths
    a. Strength-Distribution and Transmission lines located within the study area.
    b. Strength- Permanent substation site available to replace Yuma Mall Temp.
    c. Strength-Marine Air substation has high excess transformer capacity available.
    d. Deficiency-Moderate transformer capacity for a single station at both Ivalon and Yuma Mall Temp.
    e. Deficiency-Yuma Mall is a temporary substation with limited transformer capacity; permanent installations would be required for industrial customer user.
C. Special technical requirements for service to the area
    a. None identified
D. Change to local regulations that could promote capacity expansion
    a. Area is zoned for both high industrial and light industrial.
E. Identified system planning area improvements
    a. No area improvements are identified for the distribution system.
    b. No area improvements are identified for the transmission system.

Area C: Industrial Area South of 32nd Street to 40th St, from Ave 3E to Ave 5 ½ E

The following is the system evaluation for the area described as Area C: Industrial Area South of 32nd Street to 40th St, from Ave 3E to Ave 5 ½ E, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS substations located in area, Araby at 32nd Street and Ave 8E and a second Marine Air substation at Ave 3E and 12 Street.
    b. Four distribution feeders provide capacity to the study area; one from Araby and three from Marine Air substation.

   c. Moderate distribution feeder capacity available to feed a new industrial customer, approximately 14MW, of combined excess capacity of the multiple sources identified in the area.
   d. Some system improvements may be required dependent on location of the new load and the demand requested.

B. Area deficiencies and/or strengths
   a. Strength-Distribution and Transmission lines located within the area to accommodate new installations.
   b. Strength-Large amount of excess transformer capacity available at Marine Air.
   c. Strength-Araby Substation property can accommodate additional transformer.
   d. Deficiency-Araby Substation has a congested electrical corridor to the north to 32nd Street alignment.

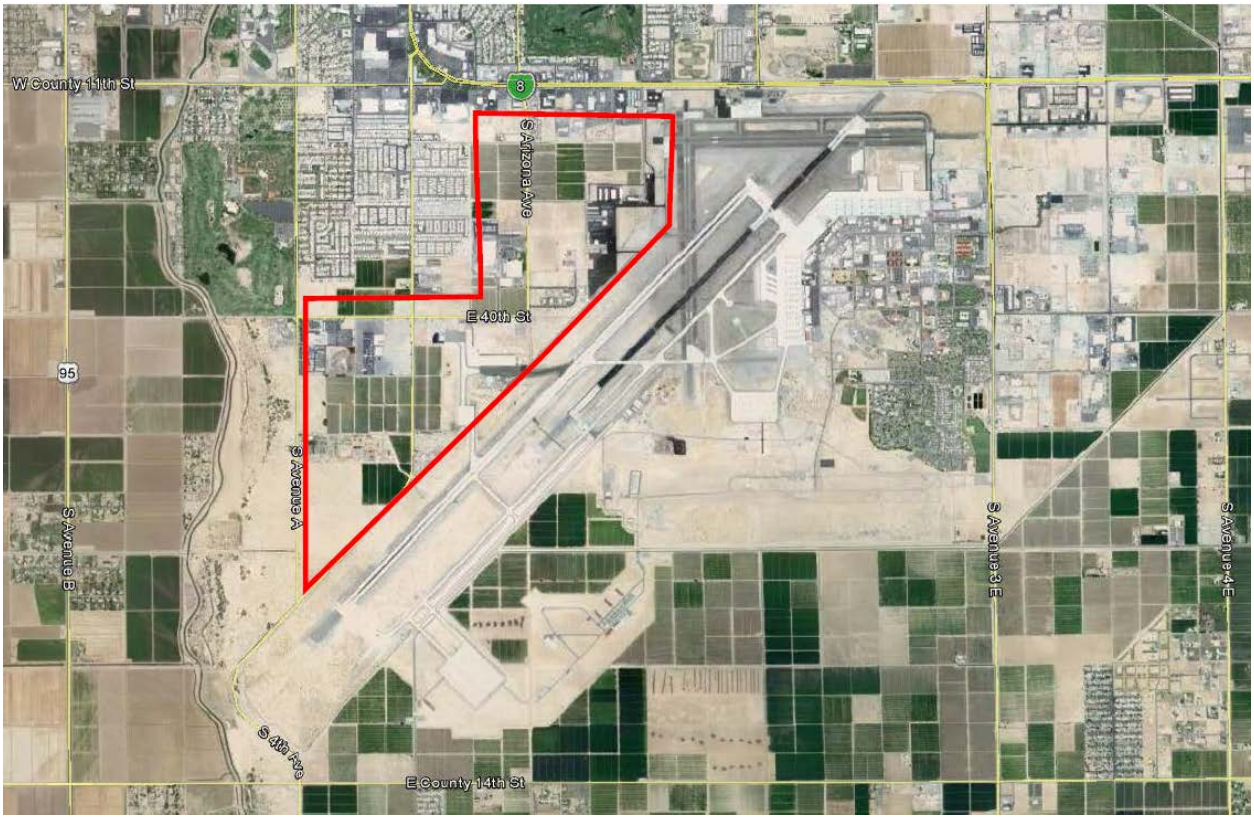
C. Special technical requirements for service to the area
   a. None identified

D. Change to local regulations that could promote capacity expansion
   a. Area is zoned for high industrial, light industrial, general commercial and agricultural use.

E. Identified system planning area improvements
   a. No area improvements are identified for the distribution system.
   b. Some area improvements are identified for the transmission system to increase reliability.

Area D: Area North and West of the Yuma International Airport

The following is the system evaluation for the area described as Area D: Area North and West of the Yuma International Airport, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

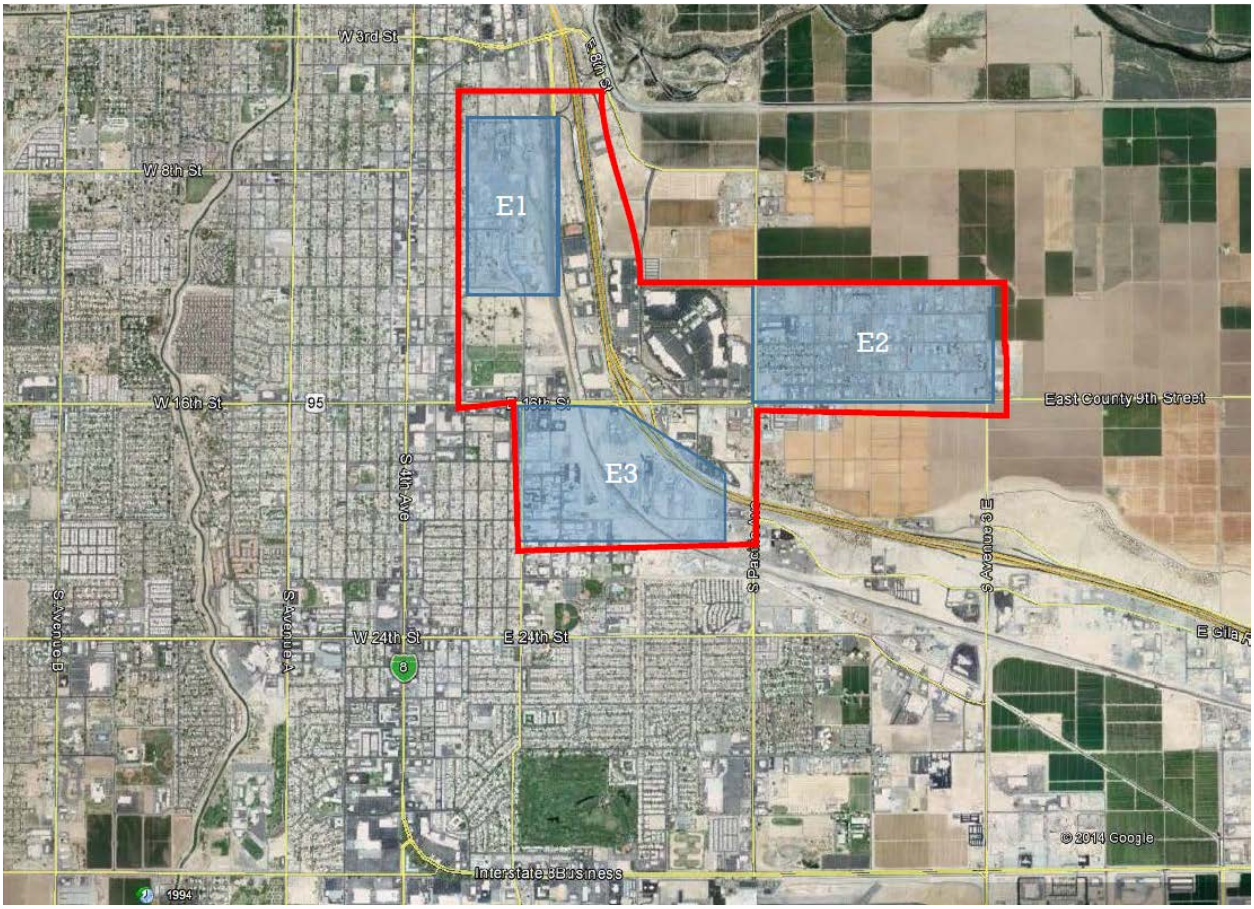
Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS substation located in area, Thirty Second Street at Ave A and 32nd Street.
    b. Two distribution feeders provide capacity to the area; both from Thirty Second Street substation.
    c. Low to moderate capacity available to feed a new industrial customer, approximately 10MW, contributed by the two existing sources in the area.
    d. Some system improvements may be required dependent on location of the new load and the demand requested to extend service to new site.

B. Area deficiencies and/or strengths
    a. Strength-Distribution and Transmission lines located within the area, strong transmission source at Thirty Second Street substation.
    b. Strength-Substation property can accommodate an additional transformer and feeder bays.
    c. Deficiency-Proximity to the Marine Air Base flight path, restrictions on pole height.
C. Special technical requirements for service to the area
    a. None identified
D. Change to local regulations that could promote capacity expansion
    a. Area is zoned for high industrial, light industrial, general commercial and agricultural use.
E. Identified system planning area improvements
    a. No area improvements are identified for the distribution system.
    b. No area improvements are identified for the transmission system.

Area E: Central Municipal Yuma Area (Subareas as highlighted below)

The following is the system evaluation for the area described as Area E: Central Municipal Yuma Area, (subareas as highlighted below), as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS substations located in area, Quechan at 1st Ave and 14th Street and Yuma Palms Temp at Pacific Ave and County 9th Street.

b. Four distribution feeders provide capacity to the areas, two from Quechan and two from Yuma Palms Temp.
    i. Subarea E1 feed by Quechan feeder.
    ii. Subarea E2 feed by Yuma Palms Temp feeder.
    iii. Subarea E3 one feeder from Quechan and one from Yuma Palms.
c. Low to moderate capacity available to feed a new industrial customer, approximately 13MW combined for all subareas.
    i. E1 moderate capacity available is approximately 8MW.
    ii. E2 low capacity available is approximately 1MW.
    iii. E3 low capacity available is approximately 4MW, of combined load.
d. Some system improvements may be required dependent on location of new load and the demand requested.

B. Area deficiencies and/or strengths
    a. Strength-Distribution and Transmission lines in the study area.
    b. Strength-Permanent substation site available to replace Yuma Mall Temp site.
    c. Strength-High transformer capacity available from Quechan substation.
    d. Deficiency-Yuma Mall Temp is a temporary substation installation with limited transformer capacity; permanent facilities would be required for any new industrial customer user.

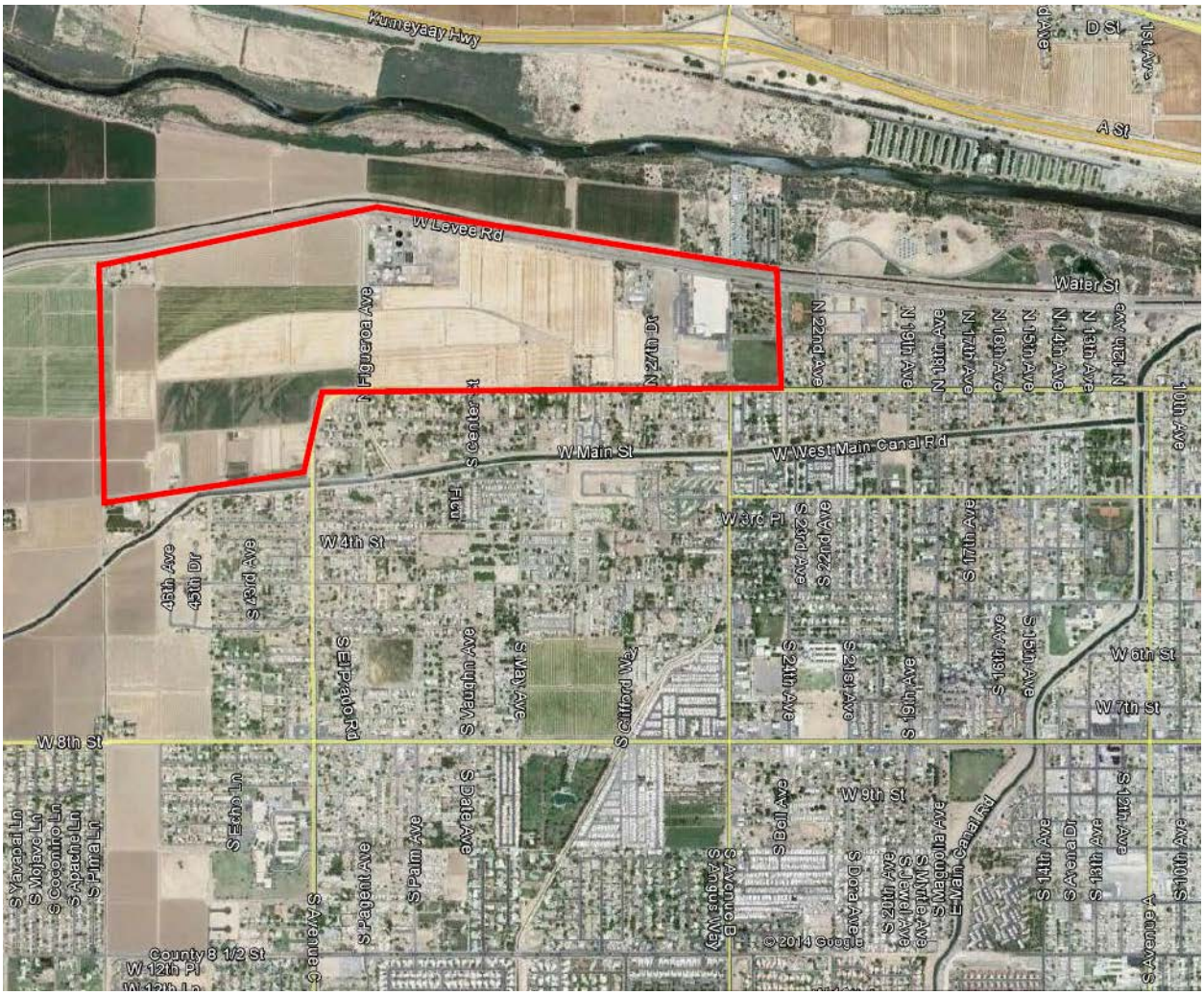
C. Special technical requirements for service to the area
    a. None identified

D. Change to local regulations that could promote capacity expansion
    a. Area E1 is zoned for heavy industrial.
    b. Area E2 is zoned for light industrial, light commercial and agricultural use.
    c. Areas E3 are zoned for light industrial.

E. Identified system planning area improvements
    a. No area improvements are identified for the distribution system.
    b. No area improvements are identified for the transmission system.

Area F: West of 23rd Ave, East of Ave C ½ , North of 1st St and South of

The following is the system evaluation for the area described as Area F: West of 23rd Ave, East of Ave C ½ , North of 1st Street and South of Levee, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity

   a. APS substations located in the area; Riverside at 27th Drive and Levee Road. A second substation Cocopah at County 8 ½ Street and Ave C. The third, Tenth Street, is located at 16th Street and Ave A.
   b. Four distribution feeders provide capacity to the area; two from Cocopah, one from Tenth Street, and one from Riverside.
   c. High capacity available to feed a new industrial customer, approximately 21MW, from the multiple sources in the area.
   d. Some system improvements may be required dependent on location of the new load and the demand requested.

B. Area deficiencies and/or strengths
   a. Strength-Distribution and Transmission lines in the study area.
   b. Strength-Substation property can accommodate additional transformer at Riverside.
   c. Deficiency-Moderate transformer excess capacity at Cocopah and Tenth Street.
   d. Deficiency-Riverside is a smaller unit size transformer with limited excess capacity. Larger industrial load customers may require upgrades and improvements at Riverside.

C. Special technical requirements for service to the area
   a. None identified

D. Change to local regulations that could promote capacity expansion
   a. Area is zoned for light industrial but currently being utilized as agricultural use. Some of the area is unincorporated and will require zoning change.

E. Identified system planning area improvements
   a. No area improvements are identified for the distribution system.
   b. Some transmission system projects have been identified for the area.

Area G: East County Wellton/ Roll/ Tacna Area

The following is the system evaluation for the area described as Area G: East Country Wellton/ Roll/ Tacna Area, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.

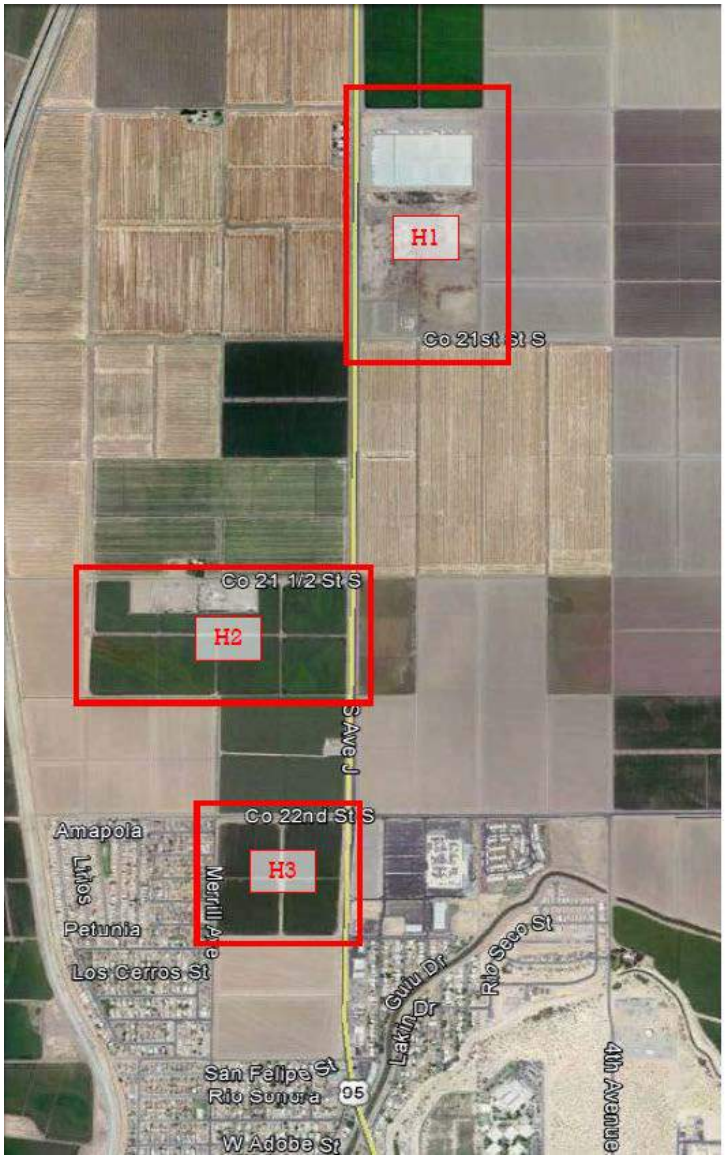
Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS has no facilities serving the area identified east of Wellton/ Roll/ Tacna Area, as this area fall outside of the defined APS serving territory.

Area H: Northwest San Luis

The following is the system evaluation for the area described as Area H: Northwest San Luis, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

B. Primary utility lines and size/capacity
   a. APS substation located in area, San Luis at County 23rd Street and 8th Avenue.
   b. One distribution feeder provides capacity to the areas H1, H2, and H3.
   c. Low transformer capacity available to feed a new industrial customer, approximately 3MW.
   d. Some system improvements may be required dependent on location of the new load and the demand requested.
C. Area deficiencies and/or strengths
   a. Strength-Distribution and Transmission lines in the study area.
   b. Strength-Substation can accommodate transformer upgrades to a larger unit.
   c. Strength-Subarea H1 distribution warehouse is currently vacant with access to US highway 95 and Mexico crossing available.
   d. Deficiency-H2 and H3 subareas will require customer facilities to be constructed as no current industrial facilities exist.
   e. Deficiency-Low excess transformer capacity at San Luis, although the station configuration does allow for station transformer to be upgraded to larger units.
   f. Deficiency-Additional capacity to feeder would require trench and conduit to parallel substation exists for full feeder rating.
D. Special technical requirements for service to the area
   a. None identified
E. Change to local regulations that could promote capacity expansion
   a. Area is zoned for light industrial use.
F. Identified system planning area improvements
   a. No area improvements are identified for the distribution system.
   b. No area improvements are identified for the transmission system.

Area J: Downtown San Luis adjacent to Main Port of Entry

The following is the system evaluation for the area described as Area J: Downtown San Luis adjacent to Main Port of Entry, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.

Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS substation located in area, San Luis at County 23rd Street and 8th Avenue.
    b. One distribution feeder provides capacity to the area.
    c. Low feeder capacity available to feed a new industrial customer, approximately 2MW.
    d. Some system improvements may be required dependent on location of the new load and the demand requested.
B. Area deficiencies and/or strengths

   a. Strength-Distribution and Transmission lines in the study area.
   b. Strength-Moderate existing transformer capacity available at San Luis station.
   c. Strength- Substation can accommodate transformer unit upgrade for added capacity.
   d. Deficiency-Additional customer load requires construction of new feeder to accommodate the new customer load.

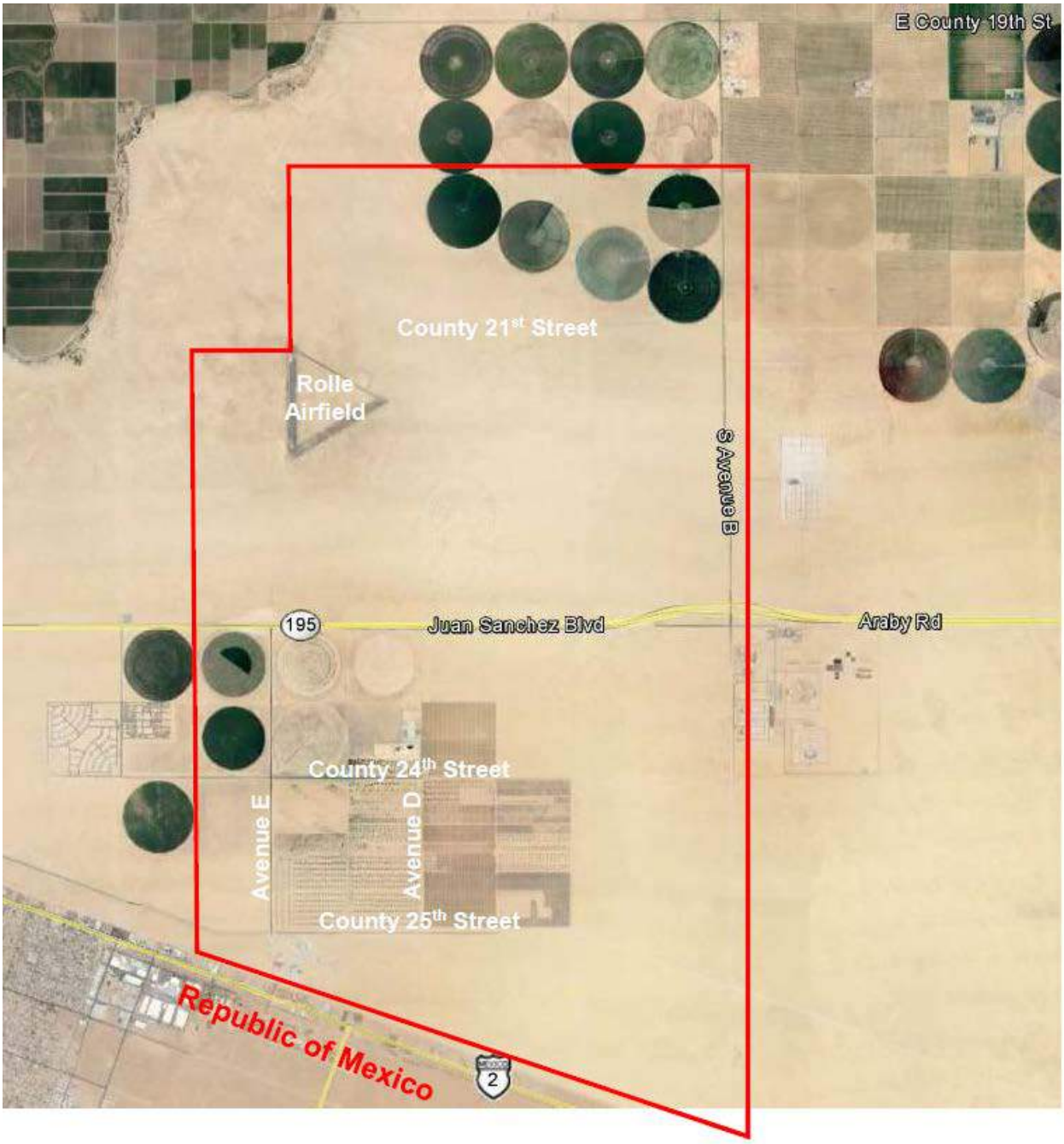
C. Special technical requirements for service to the area
   a. None identified

D. Change to local regulations that could promote capacity expansion
   a. Area is zoned for light industrial use.

E. Identified system planning area improvements
   a. No area improvements are identified for the distribution system.
   b. No area improvements are identified for the transmission system.

Area K: Eastern San Luis: East of Port II and Rolle Airfield Area

The following is the system evaluation for the area described as Area K: Eastern San Luis: East of Port II and Rolle Airfield Area, as part of the IMCP (Investing in Manufacturing Communities Partnerships), to provide utility feedback and commentary per the memorandum of Oct 7, 2014. APS is a participant and has evaluated the following site for its ability to interconnect industrial customers load users.



Assumptions: The study evaluates APS system availability of service capacity for an industrial user. The service is to provide 3 phase power at 3000Amp/240KV service. This is a high level evaluation with

identified capacity by area; since transformer sizing and demand are not available the study only identifies the excess capacity in the study area. No specific system improvements will be returned as the study only looks at the current system configuration.

Notes below are in respect to:

A. Primary utility lines and size/capacity
    a. APS substation located in area, Baja at Juan Sanchez Blvd and Avenue F.
    b. Two distribution feeders provide capacity to the area, both from Baja substation.
    c. Low capacity available to feed a new industrial customer, approximately 4MW.
    d. Some system improvements may be required dependent on location of new load and demand requested.
B. Area deficiencies and/or strengths
    a. Strength-Distribution and Transmission lines in the study area.
    b. Deficiency-Moderate excess transformer capacity at Baja substation.
    c. Strength-Substation property can accommodate additional transformers.
C. Special technical requirements for service to the area
    a. None identified
D. Change to local regulations that could promote capacity expansion
    a. Area is zoned for high industrial, light industrial, multiple use residential and general commercial.
E. Identified system planning area improvements
    a. Some area improvements have been identified for the distribution system, timing has not been identified.
    b. No area improvements are identified for the transmission system.

Core Engineering Group, PLLC
200 E. 16th Street, Suite # 150
Yuma, Arizona 85364

voice 928-344-5931
fax 928-344-5932
www.CoreEngineeringGroup.com

TECHNICAL MEMORANDUM

Registered Professional Engineer (Civil)
CERTIFICATE NO.
32329
DOUGLAS J.
NICHOLLS
Date Signed 2/19/15
ARIZONA, U.S.A.
Expires 3/31/16

Date: December 12, 2014
Revised February 19, 2015

To: Nancy Ngai, Yuma County Community Planning Coordinator

From: Douglas Nicholls, P.E., R.L.S.

Re: IMCP Task 7 Broadband/Internet Summary

As part of the Broadband and Internet Task 7 for the Yuma County Area IMCP, commentary was solicited from area technical personnel, planners, and engineers to document internet infrastructure. Despite several attempts to contact local providers and obtain information, we did not get a response. Alternative sources were sought out and are summarized in this Technical Memorandum.

Some key bullet points for the Yuma Area:

- Average broadband speed: 17.0 Mbps (Megabits per second transfer rate)
- Broadband speeds compared to state average: 39% slower
- Broadband speeds compared to National average: 35% slower
- Overall wired broadband coverage (Yuma County): 82.4%
- Population under-served (Yuma County): 63,435 (estimated)
- The City of Yuma is the 456th "fastest mid-size city in the USA"
- The City of Yuma is 39% slower than Arizona average and 35% slower than the US average.
- The City of San Luis is the 4363rd "fastest small city in the USA"
- The City of San Luis is 48% slower than the Arizona average and 44% slower than US average.

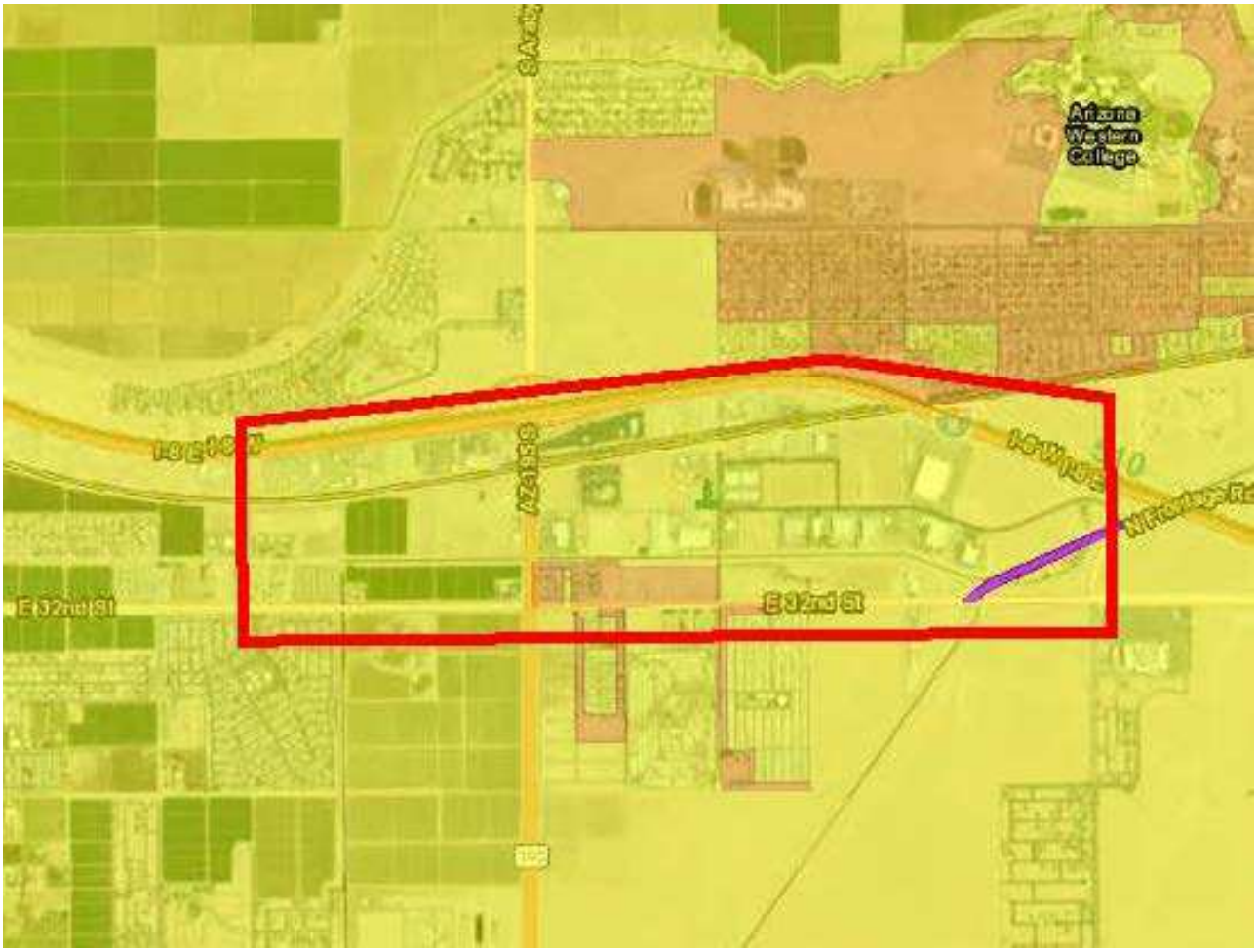
This information above is based on data collected by the Federal Communication Commission (FCC), the National Telecommunications and Information Administration (NTIA), and other sources and as presented by the "Broadband Now" organization.

Another source was leveraged to show broadband coverage for the areas indicated: The *Digital Arizona Program*. It is the State's broadband initiative (as setup by the NTIA) who's purpose is to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services that community institutions use.

They have some useful online map tools at https://digitalarizona.az.gov which were used to generate the maps included for visual reference in this report as it pertains to the previously identified Areas A through K and the available download speeds.

It should be noted that the identified speeds as sorted by color in the maps does not necessarily mean that those speeds are currently available to a property in that area, just that properties within that area can be served by those identified speeds. Additional infrastructure investment may be required to serve an individual property.

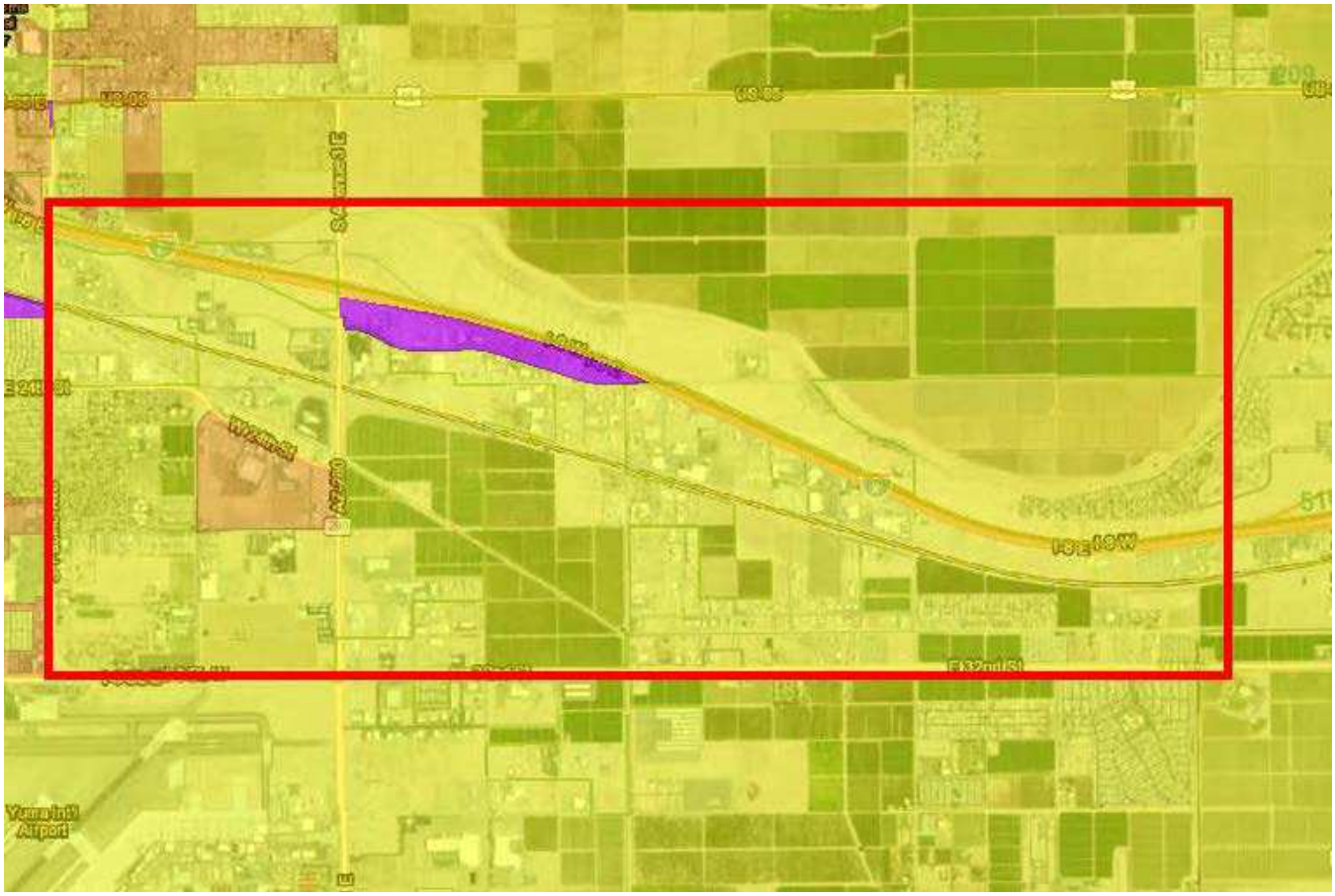
AREA A – Area South of I-8 to 32nd Street, from East of Avenue 6E to Avenue 8E



For the map provided above, two translucent layers exist identifying two different ranges of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The orange translucent layer designates a range of download speeds of between 25 Mbps and 50 Mbps.

It should be noted that while speeds in excess of 50 Mbps are not widely available to this area, there is a smaller area denoted in purple which has been reported as "Greater than 1 Gbps" by the mapping tool.

AREA B – Area South of I-8 to 32nd Street, from Pacific Avenue to Avenue 6E



For the map provided above, two primary (translucent) layers exist identifying two different ranges of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The orange translucent layer designates a range of download speeds of between 25 Mbps and 50 Mbps.

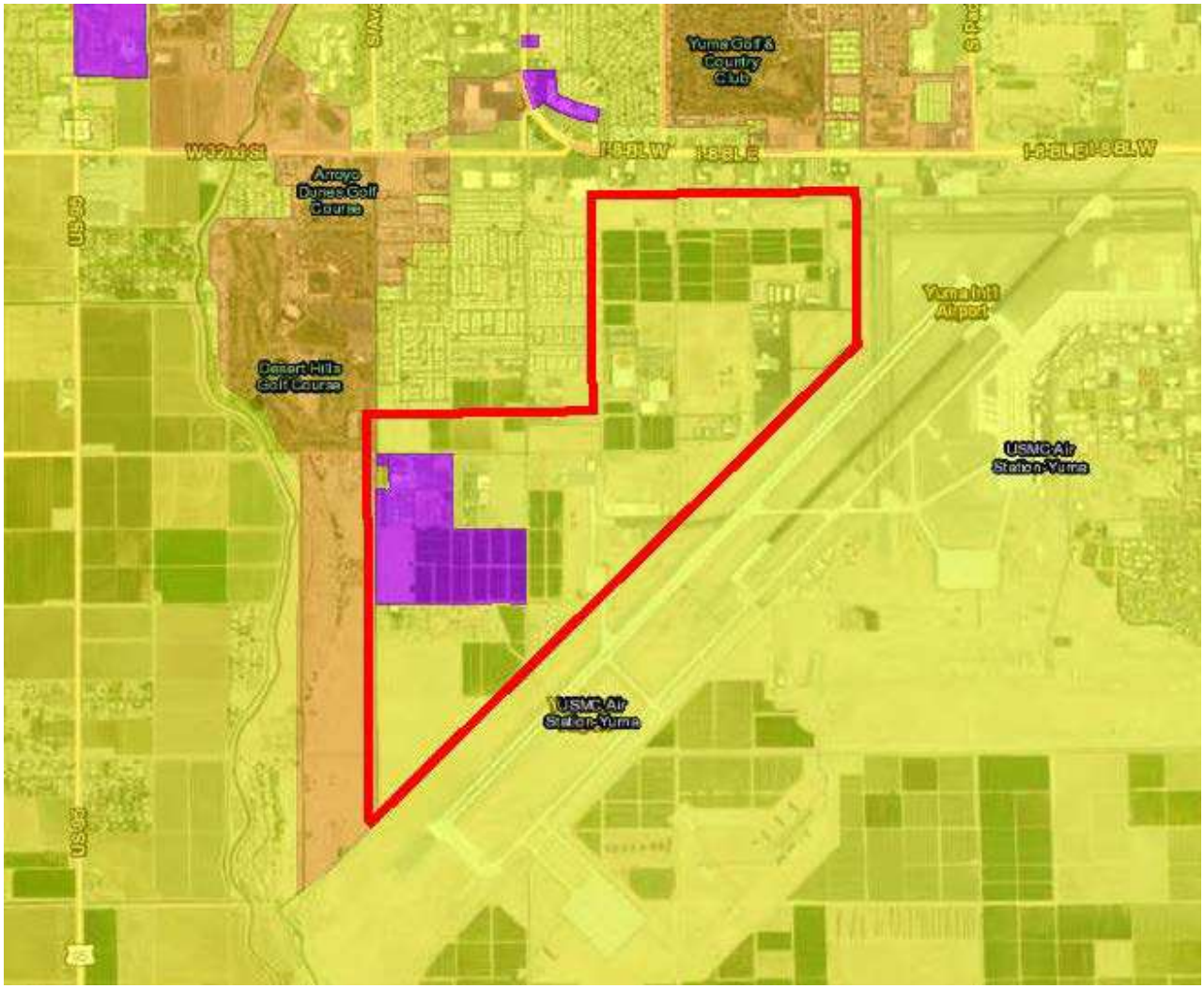
It should be noted that while speeds in excess of 50 Mbps are not widely available to this area, there is a smaller area denoted in purple which has been reported as "Greater than 1 Gbps" by the mapping tool. This purple area coincides with an identified fiber optic planning segment.

AREA C – Area South of 32nd Street to 40th Street and from Avenue 3E to Avenue 5 ½E

For the map provided above, two translucent layers exist identifying two different ranges of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The orange translucent layer designates a range of download speeds of between 25 Mbps and 50 Mbps.

Speeds of excess of 50 Mbps are not readily available to this area.

AREA D – Area North and West of the Yuma International Airport



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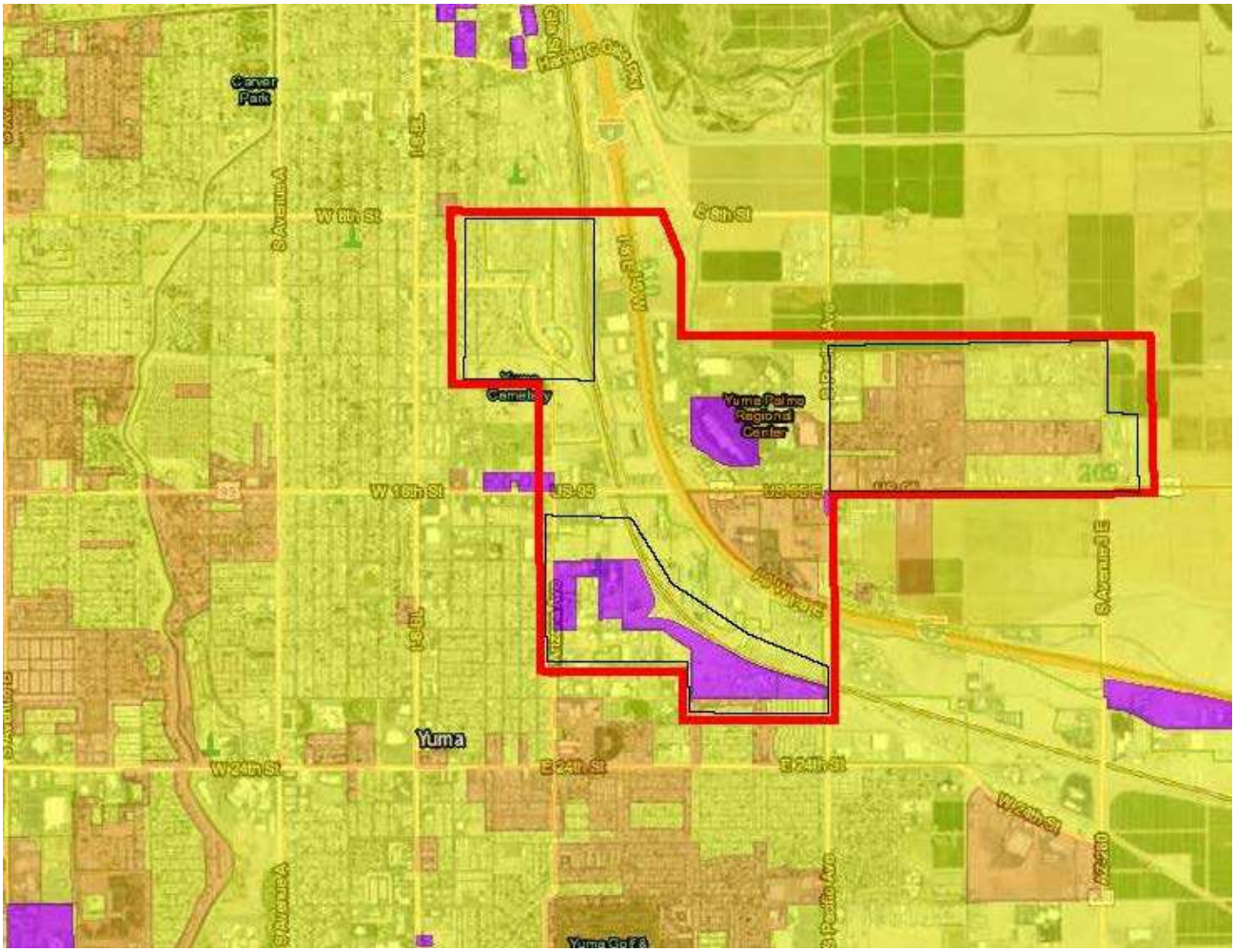
It should be noted that while speeds in excess of 50 Mbps are not widely available to this area, there is a smaller area denoted in purple which has been reported as "Greater than 1 Gbps" by the mapping tool.

AREA E – Central Municipal Yuma Area (Subareas as highlighted below)



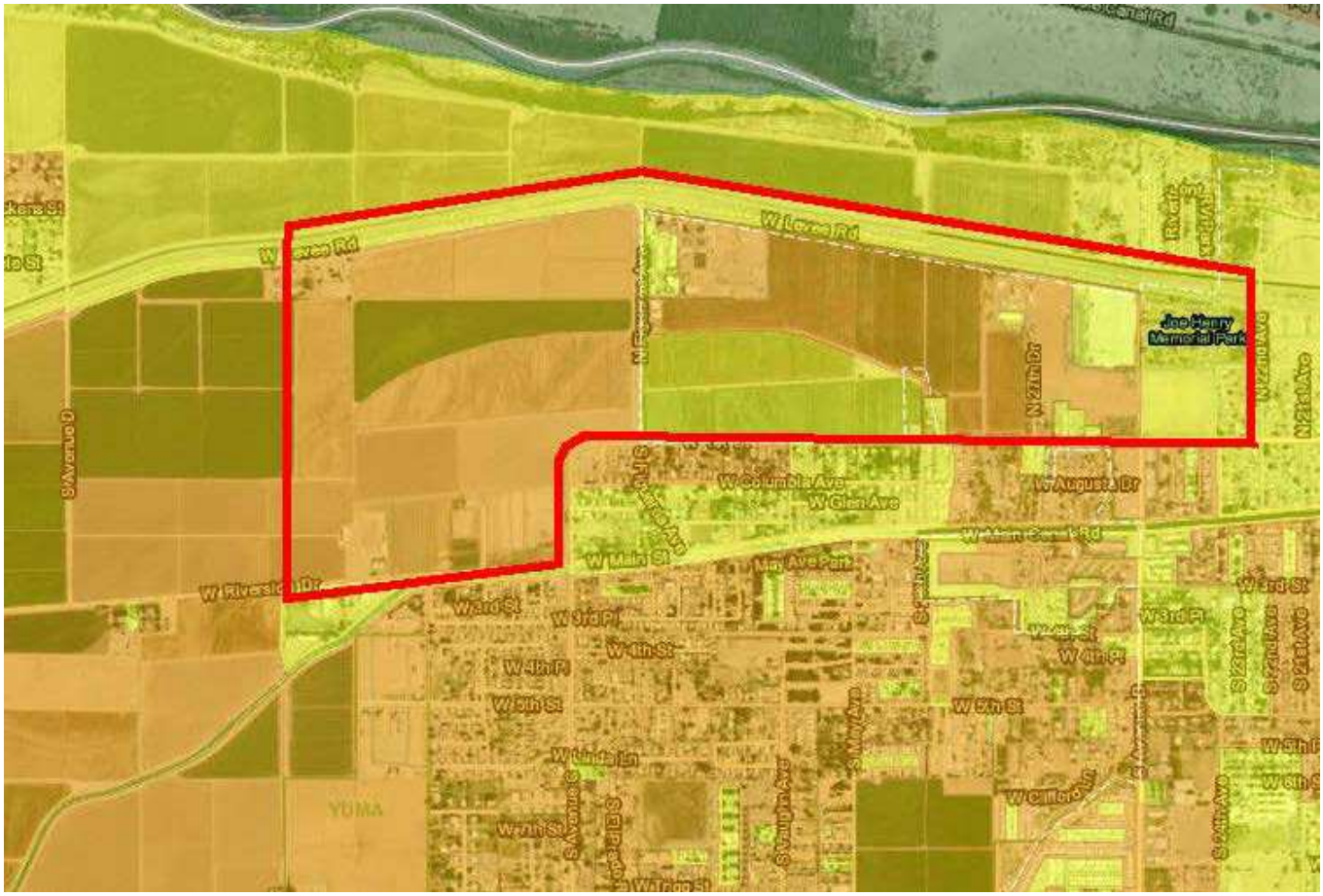
Map Revised 2/19/15

For the map provided above, two translucent layers exist identifying two different ranges of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The orange translucent layer designates a range of download speeds of between 25 Mbps and 50 Mbps.

It should be noted that while speeds in excess of 50 Mbps are not widely available to this area, there is a smaller area denoted in purple which has been reported as "Greater than 1 Gbps" by the mapping tool.

Note also that there are three subregions outlined in black which correspond to previously identified subareas where there has been a focus of industrial zoning/planning.

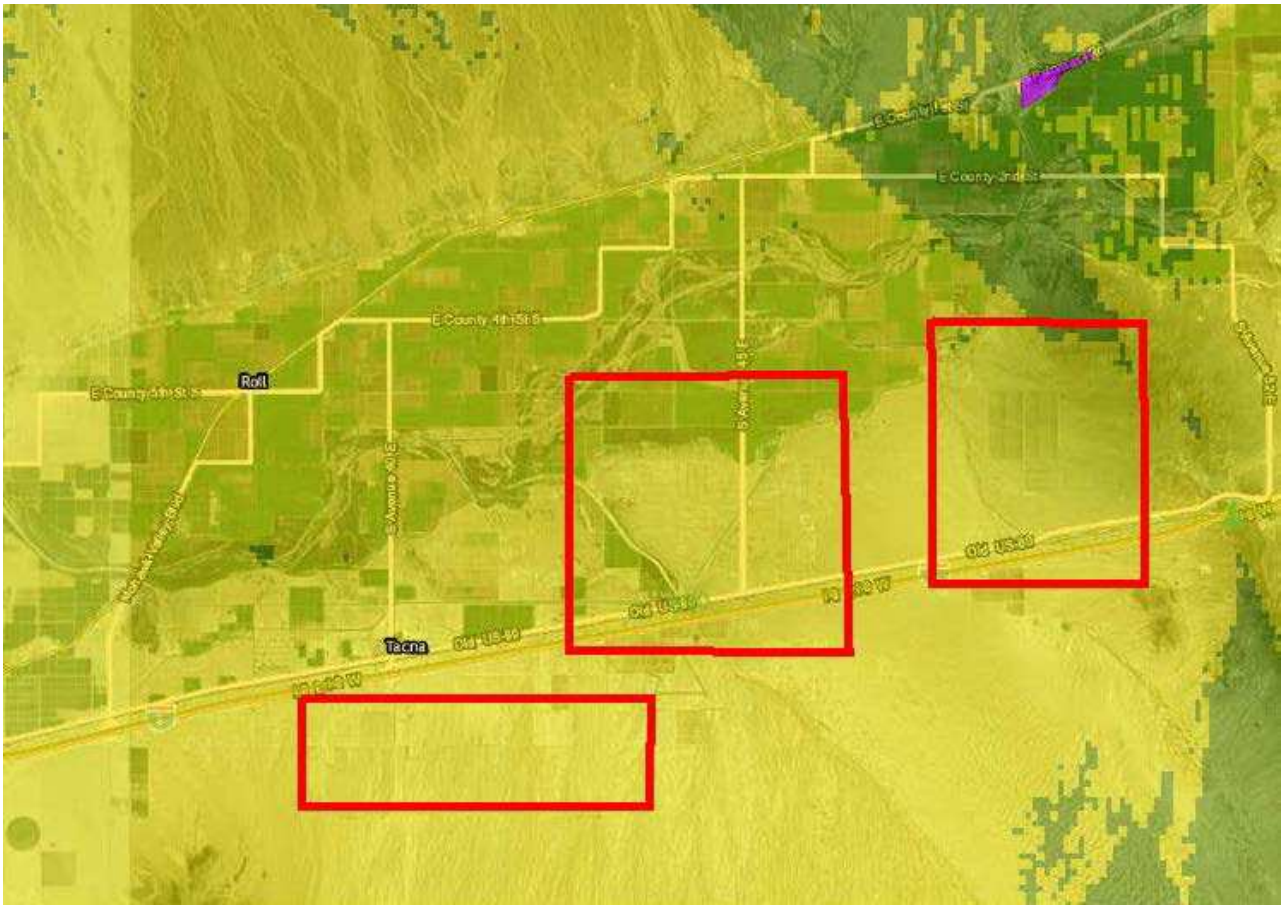
AREA F –West of 23rd Avenue, East of Avenue C½, North of 1st Street & South of Levee



For the map provided above, two translucent layers exist identifying two different ranges of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The orange translucent layer designates a range of download speeds of between 25 Mbps and 50 Mbps.

Speeds of excess of 50 Mbps are not readily available to this area.

AREA G – East County Wellton/Tacna Area



For the map provided above, two translucent layers exist identifying the range of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The green layer identified has download speeds ranging from 3 Mbps to 6 Mbps.

It should be noted that there is some overlap of much of the 10-25 range overlaps with the 6-10 Mbps range which doesn't display well with the tool. One can infer that some speed variation can be expected.

Speeds of excess of 50 Mbps are not readily available to this area.

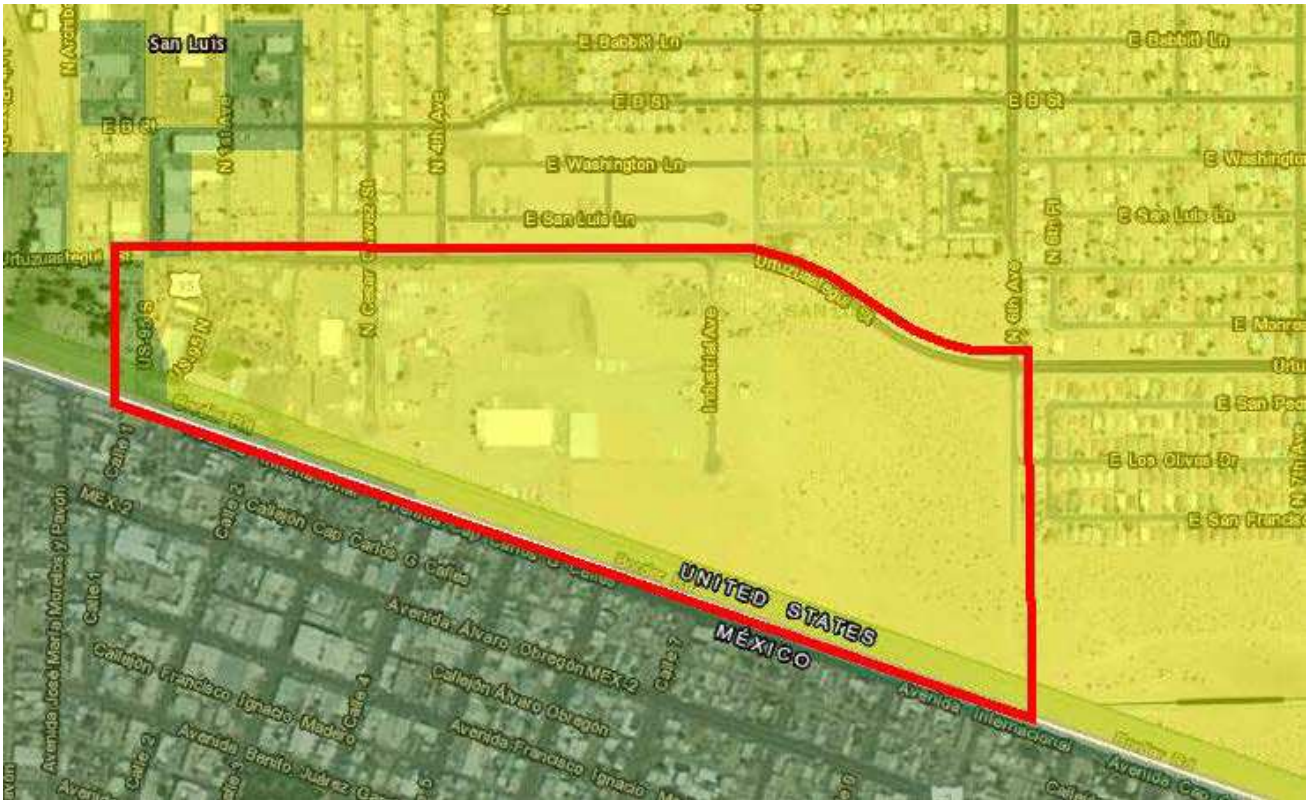
AREA H – Northwest San Luis

For the map provided above, two translucent layers exist identifying the range of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The green layer identified has download speeds ranging from 3 Mbps to 6 Mbps.

It should be noted that there is some overlap of much of the 10-25 range overlaps with the 6-10 Mbps range which doesn't display well with the tool. One can infer that some speed variation can be expected.

Speeds of excess of 50 Mbps are not readily available to this area.

AREA J – Downtown San Luis adjacent to Main Port of Entry

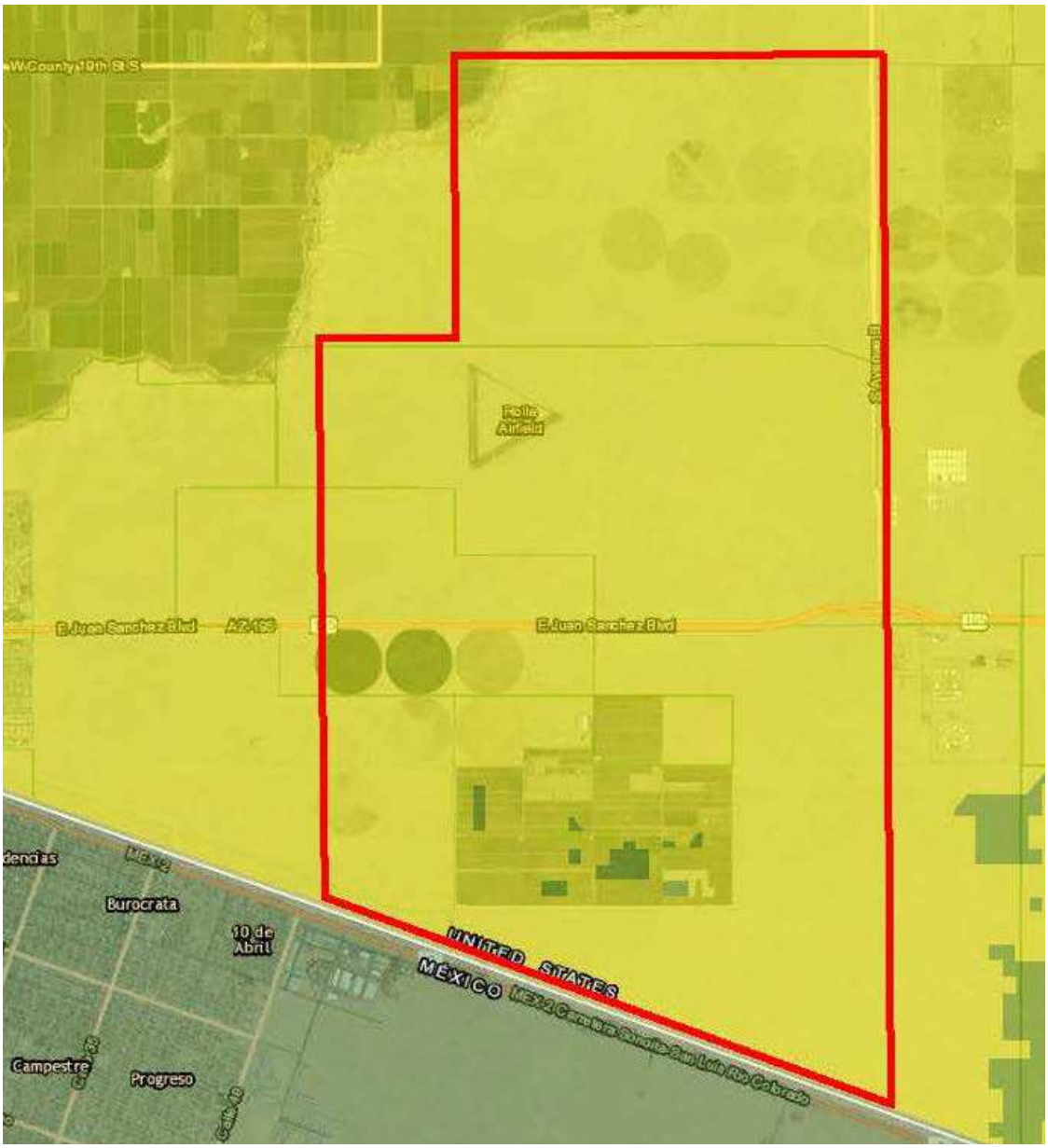


For the map provided above, two translucent layers exist identifying the range of speeds for the Area noted. The yellow translucent layer designates a range of download speeds of 10 Mbps to 25 Mbps. The green layer identified has download speeds ranging from 3 Mbps to 6 Mbps.

It should be noted that there is some overlap of much of the 10-25 range overlaps with the 6-10 Mbps range which doesn't display well with the tool. One can infer that some speed variation can be expected.

Speeds of excess of 50 Mbps are not readily available to this area.

AREA K – Eastern San Luis: East of Port II and Rolle Airfield Area



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It should be noted that there is some overlap of much of the 10-25 range overlaps with the 6-10 Mbps range which doesn't display well with the tool. One can infer that some speed variation can be expected.

Speeds of excess of 50 Mbps are not readily available to this area.

In closing, it should be noted that the recommendations found within the *WACOG Broadband Technical Report* Draft dated June 5, 2013 have several valid points to consider going forward if more broadband capacity development and improvement is to be encouraged for the area.

The short term activities and the strategic plan as proposed in the draft are quoted below:

"***Short Term Activities:***

1. *Educate citizens about options that already exist.*
2. *Support the expansion of wireless coverage in each County by facilitating use of existing towers by wireless providers and advocating that wireless providers expand coverage in known problem areas.*
3. *Work with ATII (Arizona Telecommunications and Information Institute) to apply for grants and loans to improve middle mile bandwidth.*
4. *Consider subsidizing infrastructure enhancements through grant funding.*

Develop a Strategic Pan as follows:

In order to use the Internet to its greatest potential (such as operating online businesses, telecommuting, and participating in video-based education) WACOG should plan for a long-term future that provides reliable Internet speeds in excess of 10Mbps – perhaps 50-100 Mbps – in all homes and businesses. In some cases the schools and businesses will require 1000Mbps. Because current offerings don't reach everyone and most are quite limited in bandwidth, WACOG could undertake the following longer-term activities to improve the situation.

1. *Encourage wireline telephone providers to apply for grants and loans that would allow them to expand coverage.*
2. *Seek out partnerships to build out a fiber backbone within the cities that would allow either a) fiber to the home (FTTH) or b) fiber as a middle mile technology. A fiber backbone like this potentially would be able to be shared between multiple providers and technologies. (See Graham County)*
3. *Research and consider pilot studies of other wired technologies, such as Broadband over Power Lines (BPL). Today, the most likely implementation of BPL would blend fiber in the middle mile with BPL for last mile connectivity.*
4. *Support efforts toward a community area network now being planned."*

A further reading of this report is encourage and it can be made available upon request.

broadbandnow

November 18, 2014

RE: Broadband Competition in Yuma, AZ

Dear Mayor Nicholls,

As you know, broadband infrastructure is a key factor consumers and businesses use to evaluate where to live and do business, yet in many areas consumers are drastically under-served.

So much so, that in 2013 the FCC reported to Congress that "Broadband is not yet being deployed to all Americans in a reasonable and timely fashion."

With that in mind, below you will find a detailed report on the availability and competition within the local Yuma broadband market.

This report is based on data collected by the FCC, NTIA, and other sources and is designed to help you and your team:

1. See a granular picture of broadband market in Yuma (specifically Yuma County).
2. See a broader picture of broadband competition in Arizona.
3. Understand what resources may be useful in bringing faster broadband to Yuma.

Our company originally collected this data to create a guide to help consumers find the best broadband in Yuma but we hope you also find it useful in your endeavors.

You can see the consumer facing guide here: http://broadbandnow.com/Arizona/Yuma

On behalf of the citizens of Yuma, thank you for all you do to make Yuma a wonderful place to live.

Best Regards,

Nick Reese

BroadbandNow: Dedicated to helping you find the best broadband in your neighborhood.
BroadbandNow.com/mission

Broadband competition in Yuma at a glance:

- Average broadband speed: 17.0 MBPS
- Broadband speeds compared to state average: 39% slower
- Broadband speeds compared to National average: 35% slower
- Overall wired broadband coverage (Yuma County): 82.4%
- Population under-served (Yuma County): 63,435 (estimated) †

Coverage by speeds	Yuma County	Arizona	U.S.
10+ mbps coverage	82.4%	91.4%	91.5%
50+ mbps coverage	0.0%	81.8%	82.0%
100+ mbps coverage	0.0%	76.9%	59.8%

Coverage By Tech	Yuma County	Arizona	U.S.
Wired (all types)	89.5%	95.1%	95.1%
Fiber Optic	0.0%	2.1%	24.3%
Cable	82.1%	88.7%	88.1%
DSL	76.7%	91.6%	88.6%
Fixed Wireless	90.6%	94.2%	49.3%
Mobile Broadband	100.0%	98.7%	99.0%

† **Note from Nick:** The most important number in the list above is the "population under-served" metric. This is the number of people that only have access to 0 or 1 wired broadband provider leaving them without a competitive market and no option to switch if they are dissatisfied with their service.

Yuma's Broadband Competition in Detail

Large Providers:

- Time Warner Cable: offering cable to 82.1% of Yuma County with 21% of customers saying they would recommend their service to a friend.
- CenturyLink: offering DSL to 76.7% of Yuma County with 26% of customers saying they would recommend their service to a friend.

Alternative Providers

Alternative providers are smaller providers, wireless providers, business only providers, or providers covering only a small percentage of Yuma County.

- BeamSpeed: offering fixed wireless to 90.6% of Yuma County.

Note from Nick: For consumers looking to compare providers, we've done a detailed comparison of each at http://broadbandnow.com/Arizona/Yuma

An Overview of Arizona's Broadband

- Arizona is the 20th most connected state
- Average statewide speed: 28.0 MBPS
- 10+ MBPS coverage: 91.4%

Government Funding for Arizona:

Since 2010, Digital Arizona Program has been awarded $6,358,179 in federal grants for Arizona's Broadband Initiative.

Another $71,464,944, accounting for 2.1% of all federal infrastructure grants, was awarded to broadband infrastructure projects in Arizona.

Since 2011, access to a wired connection of at least 10mbps has improved from 90.1% to 91.4% of Arizonans.

Legal Barriers to Municipal Broadband

Many mayors and city representatives ask us what they can do to bring faster broadband to their area.

The unfortunate reality is that many municipalities have few options besides asking the local providers to expand/upgrade their network or building their own infrastructure if it is allowed by the state legislature.

Fortunately Arizona is one of the 31 states that don't put heavy barriers to entry on municipalities from building their own fiber networks.

If you're interested in the process of bringing municipal broadband to Yuma, here are a few case studies. We have no relation to any of them and don't endorse them, they are just provided as a resource:

- Broadband at the Speed of Light: A 75 page report from the Institute for Local Self-Reliance dissecting how Chattanooga, TN, Bristol, VA, and Lafayette, LA built robust municipal networks.
    - Found at: http://www.ilsr.org/wp-content/uploads/2012/04/muni-bb-speed-light.pdf
- Fast Internet Is Chattanooga's New Locomotive: A recent article in the NYT about Chattanooga's municipal broadband.
    - Found at: http://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html

As you're probably already aware, a resolution was introduced at the U.S. Conference of Mayors in June that calls for the FCC to preempt state barriers to municipal broadband service. For more information on this resolution, see http://muninetworks.org/content/us-conference-mayors-passes-resolution-end-state-barriers.

Resources

Below is a quick list of resources and organizations that may be relevant to bringing faster broadband to Yuma.

Digital Arizona Program

Digital Arizona Program is the state broadband initiative (as setup by the NTIA) who's purpose is to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services that community institutions use.
http://www.digitalarizona.gov/

Overview of Broadband Grants in Arizona

Here is a list of all of the grants awarded in state as maintained by the NTIA.
http://www2.ntia.doc.gov/arizona

Other Resources in Arizona

This guide by the FTTH Council is also a great resource for all things broadband in Arizona.
http://www.ftthcouncil.org/p/cm/ld/fid=99

Appendix C: State and local incentives

State and local incentives with a potential manufacturing connection are listed below, under relevant jurisdictional headings with the program name, general nature of the incentive, and the key incentive elements of each program.

Additional Manufacturing-related Economic Development Resources for Yuma

Incentive	General Purpose of Incentive	Key Incentive Elements	Documented By
Local/State			
City of Yuma Economic Development Incentive Fund (Funds granted to GYEDC from ACA through Rural Economic Development Grant Program)	Performance based fund designed for business development, business expansions and relocations.	Fund can provide up to $500 per new hire, given to the company in an upfront cash grant award.	GYEDC Description http://www.greateryuma.org/site-selection/incentives/ ACA Program Initiation http://www.azcommerce.com/news-events/press-releases/arizona-commerce-authority-awards-economic-development-funds-to-rural-organizations
Arizona Commerce Auth. (ACA) and Yuma Private Industry Council - Arizona Job Training Grant	Job specific reimbursable grant that supports design and delivery of customized training plans for employers for the creation of new jobs or increasing skill and wage levels of current employees.	Award amounts range from $2,000 to $8,000 per position depending upon company size and location. Under a "Net New Grant," an employer creating new jobs can apply for a grant to be reimbursed for up to 75% of eligible training expenses. Under an "Incumbent Grant," an employer seeking to supplement its current training plan and increase the skill level of its employees may apply for a grant to be reimbursed for up to 50% of eligible training expenses.	GYEDC http://www.greateryuma.org/site-selection/incentives/ Arizona Commerce Authority http://www.azcommerce.com/incentives/job-training
Local/State/Federal			
Yuma Workforce Salary and Training Grant	Programs cover the costs of employee training.	Programs can cover entire costs of employee training, including teaching, materials, equipment and other expenses. Companies can additionally qualify for reimbursement of 50% employee salaries paid during training for up to 6 months.	http://www.greateryuma.org/site-selection/incentives/

Incentive	General Purpose of Incentive	Key Incentive Elements	Documented By
State			
Quality Jobs Tax Credit	Provides per-employee tax credits that focus on capital investment and new job creation.	Provides per-employee tax credits of $3,000 per year for up to three years. Credits may be carried forward for five years. (5 new jobs – rural/25 new jobs metro).	http://www.azcommerce.com/incentives/quality-jobs?referrerId=1310
Arizona State Corporate Income Tax Rates	Decrease in State Income Tax Rates.	Arizona will be decreasing rates from 6.97 % down to 4.9% during the time period of 2014 to 2017. This new 30% lower rate makes Arizona's rate one of the five lowest in the country.	http://www.greateryuma.org/site-selection/incentives/
Qualified Facilities Program	Promote location and expansion of manufacturing facilities, including manufacturing-related research & development or headquarters facilities.	Credit offers a refundable income tax credit equal to the lesser of: • 10% of the qualifying capital investment or • $20,000 per net new job at the facility or $30,000,000 per taxpayer per year.	GYEDC http://www.greateryuma.org/site-selection/incentives/ Arizona Commerce Authority http://www.azcommerce.com/incentives/qualified-facility
Arizona State Commercial Property Tax Assessments	Decrease in commercial property tax assessments.	The Arizona commercial property assessment ratio is being reduced by 10% down to 18% by 2017. This continues a 10-year trend of reducing property taxes in Arizona.	http://www.greateryuma.org/site-selection/incentives/
Accelerated Depreciation Schedules Research and Development Refundable Income Tax Credits	Five-year accelerated depreciation schedules have been increased to help companies recover their investments even faster.	• Based on the Arizona Department of Revenue standard valuation tables and under the Arizona Competiveness Package, the Assessment Ratio of Class One (commercial and industrial) real and personal property is currently 19% (reduced from 20% in 2012) and will decrease to 18% in increments by 2016, thereby ultimately reducing tax liability for property by 10%.	http://www.azcommerce.com/incentives/additional-depreciation
Research and Development Refundable Income Tax Credits	Refundable income tax credits are available for investments in research and development activities conducted in Arizona.	The tax credit starts at 22% of the qualified R&D expenses for amounts in excess of expenditures from the previous year. Recent legislation enhances the tax credit amount up to 34% if increased R&D expenditures are made in conjunction with an Arizona public university.	http://www.greateryuma.org/leading-industries/aerospace-defense/incentives/

Incentive	General Purpose of Incentive	Key Incentive Elements	Documented By
Quality of Jobs through Renewable Industries	Program is designed to stimulate new investments in manufacturing and headquarter operations of renewable energy companies, including solar, wind, biofuel, geothermal and other renewable technologies. It is designed to generate net new revenue to the state.	• Transferable corporate income tax credit. • Real and personal property tax reduction.	http://www.greateryuma.org/leading-industries/renewable-energy/incentives/
Commercial/Industrial Solar Energy Tax Program	Program subsidizes the initial cost of solar energy devices.	The tax credit is equal to 10% of the installed cost of the solar energy device not to exceed $25,000 in credits for one building in a single tax year and $50,000 total credits per business per tax year. Tax credits can be used to offset Arizona income tax liability; any unused credit amounts can be carried forward for a five-year period.	http://www.greateryuma.org/leading-industries/renewable-energy/incentives/
Energy Equipment Property Tax Exemption	Decrease in business property taxes	Tax exemption can be used for solar energy devices and any other device or system designed for the production of solar energy for on-site consumption. It can also be used to include other renewable energy technologies, as well as combined heat and power systems, and energy efficient building components.	http://www.greateryuma.org/leading-industries/renewable-energy/incentives/
Renewable Energy Property Assessment	Decrease in business property assessment for taxes.	Renewable energy equipment owned by utilities and other entities operating in Arizona is assessed at 20% of its depreciated cost for the purpose of determining property tax.	http://www.greateryuma.org/leading-industries/renewable-energy/incentives/
Small Business Capital Investment Incentive (Angel Investment)	Expand early stage investments in targeted Arizona small businesses.	Expand early stage investments in targeted Arizona small businesses. Provides tax credits to investors who make investments in targeted small businesses certified by the Arizona Commerce Authority (ACA).	http://www.azcommerce.com/incentives/angel-investment

Incentive	General Purpose of Incentive	Key Incentive Elements	Documented By
Multi-state Corporations Electable Sales Factor	Provides businesses with the opportunity to reduce their tax burden	Increases the electable sales factor for multi-state corporations from 80 % to 100% between FY2014 and FY2017.	http://www.greateryuma.org/leading-industries/agribusiness/incentives/
Federal/FTZ 219			
Veterans Workforce Opportunity Tax Credit	Federal tax credit offered to employers who hire veterans of military service.	The credit ranges from $2,400-$5,600 per new hire.	http://www.greateryuma.org/leading-industries/%EF%BF%BC logistics-distribution/incentives/
New Market Tax Credits	Below market interest loans guaranteed by federal government for the purpose of stimulating development in rural communities.	Companies utilizing New Market Tax Credits pay on the interest only of the loan for seven years. After the 7th year, the loan is forgiven and the company is awarded the principal and equity of the loan.	http://www.greateryuma.org/leading-industries/%EF%BF%BC logistics-distribution/incentives/
Foreign Trade Zone #219	Designed to promote competitiveness by encouraging companies to maintain and expand their operations in the United States. Essentially, reducing tariffs, minimizing processing fees and expediting the transport of goods from the Port of Entry.	• Allows businesses to defer, reduce or eliminate duty on goods imported into the U.S. • Provides services similar to a bonded warehouse, but with greater flexibility and benefits. • Permits businesses to manipulate goods prior to going through Customs. • Affords storage of imported goods on site for an indefinite period of time. • Supports site specific subzones for qualified businesses to locate anywhere within Yuma County. • Businesses located in a zone or sub-zone are eligible for up to a 72.9 percent reduction in state real and personal property taxes as long as they operate in the FTZ.	FTZ Benefits http://www.greateryuma.org/foreign-trade/benefits/

Local Utility			
Renewable Incentive Program	Arizona Public Service offers customers who install various renewable energy sources the opportunity to sell the credits associated with the energy generated to APS.	• Grid-tied non-residential PV: $2.50/watt DC; or commercial customers may opt for a production-based incentive (PBI) on a 10-, 15- or 20-year contract. • Off-grid non-residential PV: $1.50/W or PBI	http://www.greateryuma.org/leading-industries/renewable-energy/incentives/