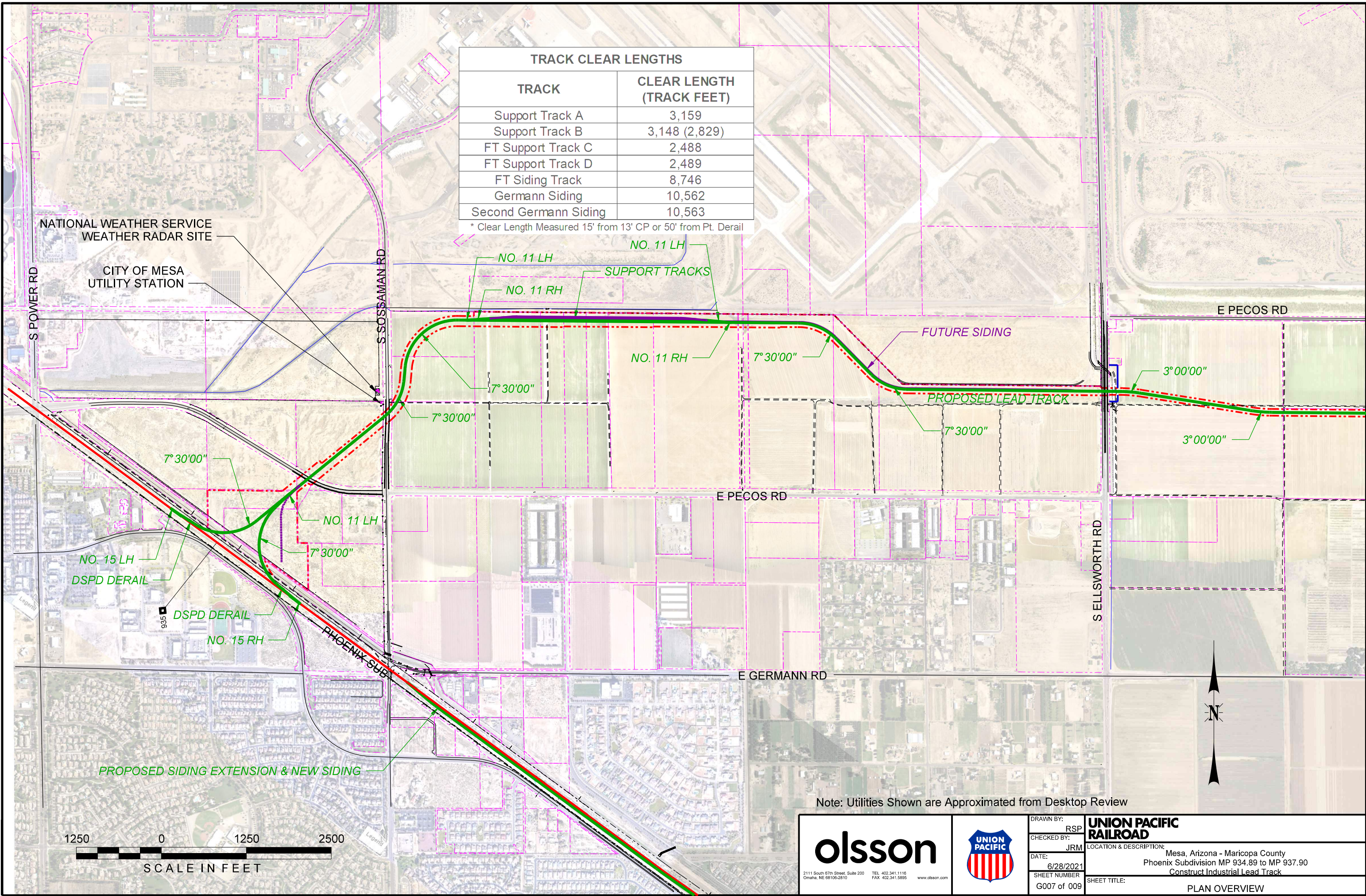


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6/28/2021




TRACK CLEAR LENGTHS	
TRACK	CLEAR LENGTH (TRACK FEET)
Support Track A	3,159
Support Track B	3,148 (2,829)
FT Support Track C	2,488
FT Support Track D	2,489
FT Siding Track	8,746
Germann Siding	10,562
Second Germann Siding	10,563


* Clear Length Measured 15' from 13' CP or 50' from Pt. Derail



Note: Utilities Shown are Approximated from Desktop Review



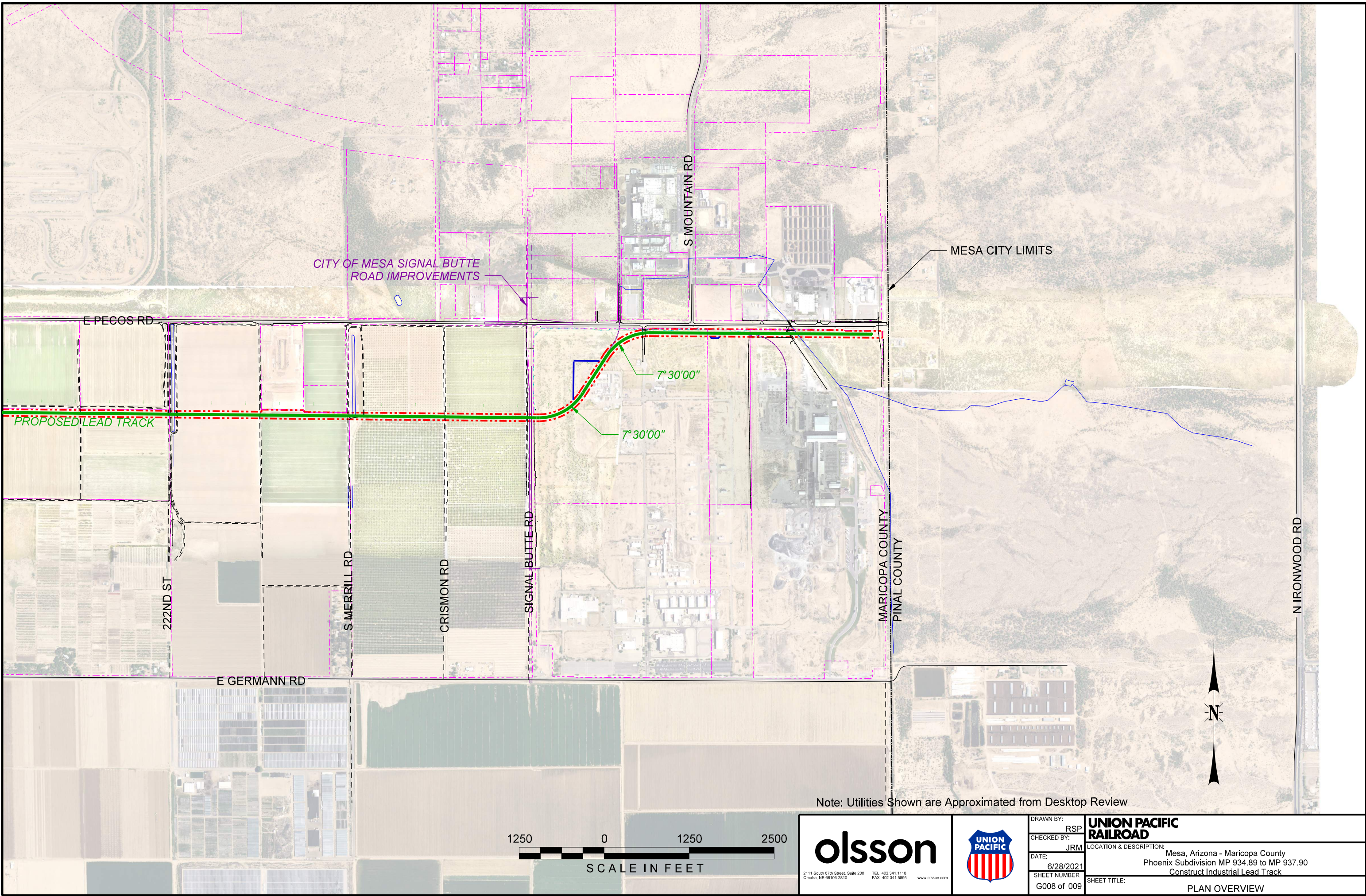
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CHECKED BY: JRM
DATE: 6/28/2021
SHEET NUMBER: G007 of 009

UNION PACIFIC RAILROAD
LOCATION & DESCRIPTION: Mesa, Arizona - Maricopa County
Phoenix Subdivision MP 934.89 to MP 937.90
Construct Industrial Lead Track
SHEET TITLE: PLAN OVERVIEW

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6/28/2021



Note: Utilities Shown are Approximated from Desktop Review



 2111 South 87th Street, Suite 200 Omaha, NE 68108-2810 TEL 402-341-1116 FAX 402-341-5895 www.olsen.com		DRAWN BY: RSP	UNION PACIFIC RAILROAD LOCATION & DESCRIPTION: Mesa, Arizona - Maricopa County Phoenix Subdivision MP 934.89 to MP 937.90 Construct Industrial Lead Track SHEET TITLE: PLAN OVERVIEW
		CHECKED BY: JRM	
		DATE: 6/28/2021	
		SHEET NUMBER: G008 of 009	



PECOS INDUSTRIAL RAIL ACCESS AND TRAIN EXTENSION PROJECT

2021 RAISE Grant Project Narrative

TABLE OF CONTENTS

I. AN OPPORTUNITY FOR SUSTAINABLE GROWTH	1
II. PROJECT DESCRIPTION	1
A. Project History and a Growing Need	2
B. Transportation Challenges Addressed	3
C. Economic Development Opportunities	4
i. Supports Existing Economic Activity	4
ii. Enables Future Growth	6
iii. Drives Promising Economic and Fiscal Impacts	7
D. Broad Public and Private Support	7
III. PROJECT LOCATION	9
A. Parcels Needed for Development	9
B. Federal Opportunity Zone.....	10
C. Mesa Gateway Area	11
D. Pecos Advanced Manufacturing Zone	13
E. Employment Opportunity Floating Zone and Foreign Trade Zone.....	13
F. Area of Persistent Poverty	14
IV. GRANT FUNDS, SOURCES, AND USE OF PROJECT FUNDING	14
A. Sources and Uses Summary	15
B. Detailed Construction Costs	16
V. PROJECT MEETS OR EXCEEDS ALL SELECTION CRITERIA.....	16
A. Primary Selection Criteria	16
i. Safety	16
ii. State of Good Repair	17
iii. Economic Competitiveness	18
iv. Environmental Sustainability	22
v. Quality of Life	24
B. Secondary Selection Criteria	25
i. Innovation	25
ii. Partnership	25
VI. ENVIRONMENTAL RISK REVIEW	25
A. Schedule	26
B. Required Approvals	26
C. Assessment of Project Risks and Mitigation Strategies.....	27
VII. BENEFIT-COST ANALYSIS	28
VIII. READY TO BUILD AND DESTINED FOR SUCCESS	30

I

AN OPPORTUNITY FOR SUSTAINABLE GROWTH

The Pecos Industrial Rail Access and Train Extension (PIRATE) Project is a public/private opportunity to invest in American high-skilled manufacturing jobs while reducing greenhouse gas emissions and local air pollution by taking over 29,000 truckloads off U.S. highways and local roadways each year. The City of Mesa, local manufacturing businesses, Union Pacific Railroad, the City of Phoenix, and a full suite of other public and private entities have joined together to help make this project a reality. This project will enable the Pecos Advanced Manufacturing Zone (PAMZ) to become a global leader in high-skilled technical manufacturing while concurrently providing far-reaching public benefits by transferring hazardous and semi-hazardous materials away from public roadways and onto rail. Locally, the project will drive economic growth, expand high-skilled manufacturing job creation, and reduce congestion associated with long-haul trucking in Maricopa County, Arizona.

The PIRATE Project is an initiative to fund, engineer, design, and construct a six-mile industrial rail branch in southeast Mesa, Arizona adjacent to the former Williams Air Force Base – part of the 1993 Base Realignment and Closure Process. This rail branch will serve the transportation and logistics needs of existing businesses in the PAMZ and open up competitive advantages to new businesses looking to (re)locate to the area. The project will provide far-reaching public benefits through the reduction of greenhouse gas emissions, local air pollution, highway maintenance costs, and congestion.

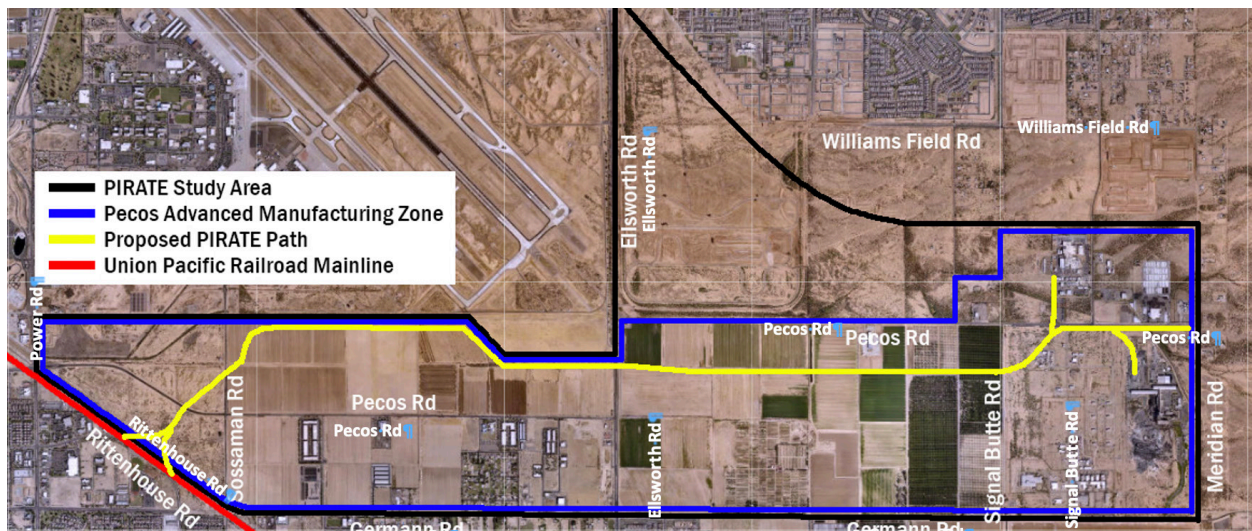
II

PROJECT DESCRIPTION

The PIRATE Project area, shown in Figure 1 below, encompasses approximately 4,800 acres of industrial land adjacent to the Phoenix-Mesa Gateway Airport. The proposed PIRATE rail

FIGURE 1 Project PIRATE Study Area

SOURCE: PIRATE Project; City of Mesa; Google Maps



branch connects existing and future manufacturing companies in this area directly to the Union Pacific Railroad mainline, which runs just west of the project area. The proposed path of the PIRATE rail line extends eastward with a terminus at the border between Maricopa County and Pinal County.

This industry rail branch will intersect with the Union Pacific Railroad Phoenix Subdivision mainline from approximately milepost 934.65 to milepost 935.06. The branch will consist of an industrial lead track with a wye connection from the mainline, two support tracks, and potential future track expansion for a siding track, additional support tracks, and future industries. These proposed improvements also include associated grading, utility alignments, at-grade roadways/crossings, drainage improvements, permitting, and property acquisitions.



A | PROJECT HISTORY AND A GROWING NEED

Even without existing direct rail access, the project area has seen remarkable growth and is home to companies involved in the manufacturing of chemicals, metals, plastics, rubber, and electrical equipment. In addition to the heavy industrial and manufacturing uses already underway, the area features over 3,000 acres of undeveloped land that is shovel-ready with existing infrastructure such as power, water, sewer, natural gas, and zoning entitlements. The rail line expansion will bring market advantages for the existing businesses and increase the opportunity for new development on vacant industrially zoned land.

Local government representatives and business owners have been considering rail expansion as a method to mitigate transportation challenges, increase the safety of chemical transport, and



grow capacity. The project concept solidified in the fall of 2019 when Union Pacific Railroad evaluated market conditions and expressed support in owning and operating the rail line. This was a significant milestone in the project and garnered additional support amongst project partners.

Since summer 2020, Union Pacific Railroad has been working with the property owners along the PIRATE route to secure and acquire the necessary land and rights-of-way for the construction of the project. Over seventy percent of the land is under purchase/right-of-way agreement, with the remainder currently under negotiation. All parcels are on track to be secured and acquired by September 2021. Union Pacific Railroad is also performing extensive due diligence, environmental work, soil borings, engineering, design, and more to further advance the readiness of this project.

B | TRANSPORTATION CHALLENGES ADDRESSED

The PIRATE Project seeks to sustainably support the dynamic growth of high-skilled manufacturing while reducing the impacts of transporting materials and final products by truck. By eliminating tens of thousands of truck trips annually from local and interstate roadways, this project addresses a wide range of transportation challenges including highway safety, greenhouse gas emissions, congestion, and road maintenance.

Currently, all of the existing industrial companies in the PAMZ rely on trucks to transport both manufacturing inputs and final products. Over 6,100 trucks come and go from the area each month, carrying heavy recycled steel, recycled rubber, and isotainers holding toxic inhalation hazard chemicals. Many of these trucks travel on local surface streets to state highways and on to Interstate 10 to reach their final destinations throughout the United States.

Additionally, over 400 trucks per month travel to and from rail trans-loading facility in downtown Phoenix because there is no closer or easier access to rail. These trucks contribute to local air pollution, greenhouse gas emissions, congestion, and increased roadway wear and tear. Existing congestion on interstates I-17 and I-10¹ already causes unnecessary idling, emissions, and time lost. The switch from truck to rail can ensure that the economic growth in Mesa does not come at a cost to the region as a whole.

FIGURE 2 Project Benefits Summary

SOURCE: ECONorthwest, Baseline Growth (10.2%) and High VMT; High Growth (18.2%) and Low VMT Scenarios.

CATEGORY	BENEFITS	PRESENT VALUE
Greenhouse Gas Emissions	1,234,000 – 2,657,000 MT CO2	\$44 - 94 Million
Local Air Pollution	949 – 1,713 MT NOx, 7 – 13 MT SO2, 81 – 145 MT VOCs, 14 – 25 MT PM2.5	\$6 - 11 Million
Road Safety	16 – 29 Avoided Fatalities and 346 - 623 Avoided Injuries	\$60 - 109 Million
Highway Wear and Tear	Reduction in 868 – 1,941 Million Truck Miles	\$135 - 244 Million
Operating Cost Savings	Switch 868 – 1,941 Million Truck Miles to Rail	\$166 - 299 Million
TOTAL		\$412-755 Million

The PIRATE Project is expected to remove an average of 29,166 truck trips off roadways in its first year of operations producing public benefits that in present value are likely to range between \$412 and \$757 million.² This includes a likely reduction of between 1.2 and 2.7 million metric tons of CO2 equivalent greenhouse gases valued between \$44 and \$94 million, improvements in road safety resulting in benefits of between \$60 and \$109 million in avoided crash fatality and injury costs, and a reduction of heavy truck wear and tear on highways with road maintenance cost savings of between \$135 and \$244 million.

¹. American Transportation Research Institute (ATRI) Top Truck Bottlenecks 2021.

Retrieved from: <https://truckingresearch.org/wp-content/uploads/2021/02/bn071-2021.pdf>

². Analysis over a thirty-year time horizon. Additional details are described in the attached Benefic Cost Analysis.

This project will additionally have a broader regional impact on transportation challenges by supporting the ongoing Sky Harbor project in Phoenix. The Sky Harbor project seeks to expand capacity at Phoenix’s busiest airport, potentially to the detriment of adjacent rail-accessible industrial land. However, Sky Harbor Internal Airport and the City of Phoenix are strongly supportive of the PIRATE Project’s ability to allow sustainable regional growth. Both the Sky Harbor project (previously supported through a 2019 U.S. DOT BUILD Grant Award) and the PIRATE Project depend on one another, and the completion of the PIRATE Project will magnify and enable the full success of the Sky Harbor project.



C | ECONOMIC DEVELOPMENT OPPORTUNITIES

I. SUPPORTS EXISTING ECONOMIC ACTIVITY

The PIRATE Project will provide rail access to existing manufacturing firms and is expected to remove over 29,166 round-trip truck trips in its first year. All of the firms in the project area are supportive of the PIRATE Project — many of which are planning to make investments and expand their production capacity as a result of rail access.

One major future project user, CMC Steel, foresees that expanding capacity under the current transportation system would require an infeasible number of trucks, but is possible and sustainable with direct rail access. Other firms expect that rail access will open new areas in their distribution networks. Eliminating the need to truck to Phoenix for trans-loading will save firms time and encourage the expansion of current operations. Other manufacturers supporting industries would also be able to scale up their services to serve the manufacturers that are expanding with rail access.

Arizona and the Greater Phoenix areas have become a hotbed for semiconductor manufacturing, with Taiwan Semiconductor Manufacturing Company (TSMC) announcing the location of a \$12 billion chip plant in North Phoenix and Intel announcing a \$20 billion expansion of their facilities in Chandler. These expansions have brought a wave of significant suppliers and manufacturers requiring rail service who are evaluating the PAMZ for new operations.



The following firms are currently operating in the PAMZ and are expecting to utilize the PIRATE Project to both increase growth and remove trucks off roadways.



The 10-acre Bridgestone Biorubber Process Research Center is the core of Bridgestone's efforts to extract natural rubber from guayule, a shrub native to the southwestern U.S. The Research Center opened in Mesa in 2014 as part of an effort to develop a domestic source of natural rubber. Rubber produced in Mesa is sent to Bridgestone technical centers to be integrated into next-generation tires. The facility employs around 30 top researchers and technicians in the area, contributing to the concentration of high-tech high-wage jobs. Bridgestone Americas is a subsidiary of Bridgestone Corporation, a global tire and rubber manufacturer.



CMC Steel is a metals fabricator and recycler that operates across the U.S. It produces steel, construction products, and is the number one rebar producer in the country. In the PAMZ, CMC pioneered the latest innovation in micro mill technology. Using traditional mini mill efficiencies on another level, it created the continuous process micro mill technology that was first implemented with the commissioning of its Mesa, Arizona, facility in August 2009, the first mill using technology of this type to be successfully operated in the United States. Currently, the facility produces rebar and T-posts. In 2020, CMC Steel announced a \$300 million expansion of their Mesa facility, which will allow for the production of Merchant Bar Quality (MBQ) Products and create 185 new high-paying jobs for the region.



With five manufacturing plants in the United States and Canada, CRM is North America's largest ambient and cryogenic crumb rubber manufacturer. It provides customers with leading-edge technology and specializes in crumb rubber for rubberized asphalt, sports fields and track infill, and rubber-molded products. It routinely sources crumb rubber to the largest asphalt contractors and synthetic turf product companies in North America. CRM contributes to both manufacturing jobs as well as the innovative production occurring in the region.



The FUJIFILM Electronic Materials facility in Mesa produces chemicals that support the semiconductor production process. They operate globally and produces industrial materials such as photoresisters, inkjet printer heads, and key materials for microchip fabrication around the world. This project could reduce FUJIFILM truck traffic on the road by as much as 25%.



Matheson opened a new, large-capacity air separation unit in the PAMZ in 2015 to capitalize on the growing demand for natural and industrial gases in the southwestern part of the U.S. The facility supplies argon, nitrogen, and oxygen to its distribution networks in New Mexico and California. Matheson is the largest subsidiary of the Japanese industrial gas corporation Taiyo

Nippon Sanso, which is one of the top five largest industrial gas suppliers in the world. Matheson processes natural gases for numerous industries including industrial, electronic, and medical uses, and produces equipment for handling, purifying, engineering, generating, and managing natural gases.



MGC Pure Chemicals America, Inc. (MPCA) is a subsidiary of Mitsubishi Gas Chemical Company, Inc. MPCA is the market leader in the production of Ultra-Pure Hydrogen Peroxide and Ammonium Hydroxide. These products are used in the semiconductor industry for applications that require stripping, etching, and cleaning silicon wafers. The Mesa plant serves as the American headquarters for the company and provides customer service and production for North and South American customers.



ZF TRW is a global transportation, technology, and automotive manufacturer and researcher. The plant in Mesa produces products for their active and passive vehicle safety systems, which include airbags, front-end protections, and advanced driver assistance systems. The innovative manufacturing jobs and high-tech nature of the work are key elements of the industry cluster in the PAMZ. Currently, ZF TRW is evaluating the use of rail as an option to reduce costs, improve safety, and cut carbon dioxide emissions. The PIRATE Project would have a significant impact on ZF's progress towards these goals.

ii. ENABLES FUTURE GROWTH

Approximately 1,921 people are employed in the PIRATE study area as of 2020. Currently, there are more than 3,000 acres of vacant and underutilized land available for immediate industrial and businesses development. Employment in the study area is expected to grow from 1,921 in 2020 to 15,939 by 2050 (an increase of 14,018 jobs).

In addition to expanding existing businesses, the new rail access could draw new firms to the region as well. Manufacturers with large, heavy, and non-time-sensitive inputs and outputs may be attracted to an established industrial zone with the opportunity to ship via rail. Much of the other needed manufacturing and industrial infrastructure, like zoning requirements and access roads, already exist, which lowers the barriers to new businesses.

The presence of SkyBridge Arizona, the nation's first inland air cargo hub with built-in customs, is also an enticing partner for transportation via rail. SkyBridge allows importers to process customs at the Gateway Airport, allowing more flight options to smaller airports throughout Mexico that do not have customs. This expands potential distribution networks throughout the Southwestern U.S. and Mexico.

Over the past several years, the City of Mesa has seen an increase in the number of “Mega Projects” interested in large assemblies of land (100 acres or greater) for manufacturing operations that would employ large quantities of highly skilled individuals at above-average wage levels. The rail line extension has the potential to rapidly activate undeveloped industrial-zoned land in the PAMZ, as well as provide increased logistical efficiencies for existing operations that are now considering major expansions due to commercial demands in the area.

Without the rail access, the area is still expected to grow, but will likely be comprised primarily of truck-based warehousing and distribution centers that do not achieve a competitive advantage from rail.

iii. DRIVES PROMISING ECONOMIC AND FISCAL IMPACTS

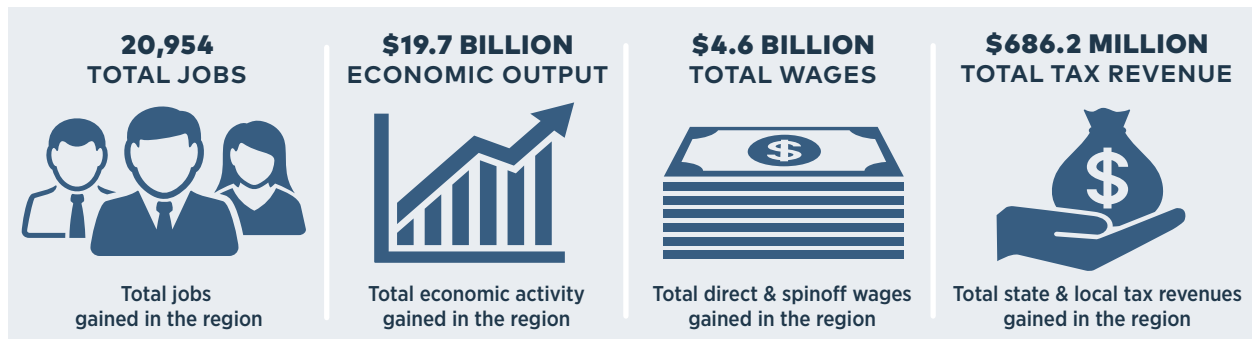
A robust economic analysis of the area shows substantially increased economic growth as a result of the PIRATE Project. Under a baseline no action (status quo) scenario, business development is projected to add approximately 7,420 jobs to the Greater Phoenix region by 2030. In the PIRATE study area alone, 5,064 jobs are expected to be added by 2030.

If the proposed rail line is constructed, the enhanced business development will likely add 10,644 jobs to the PIRATE study area and a total of 20,594 jobs to the Greater Phoenix region by 2030. The regional job estimates include secondary jobs created as a result of the cycle of spending and re-spending within the local economy.

Region-wide, over the 10 years, a total of \$19.7 billion in economic output and \$4.6 billion in wages is expected to be generated by the project. This most likely scenario of the rail expansion generates \$686.2 million in state and local tax revenues by 2030, depicted in Figure 3 below.³

FIGURE 3 10-Year Economic and Fiscal Impact Summary – Most Likely Scenario

SOURCE: IMPLAN; Rounds Consulting Group, Inc.



D | BROAD PUBLIC AND PRIVATE SUPPORT

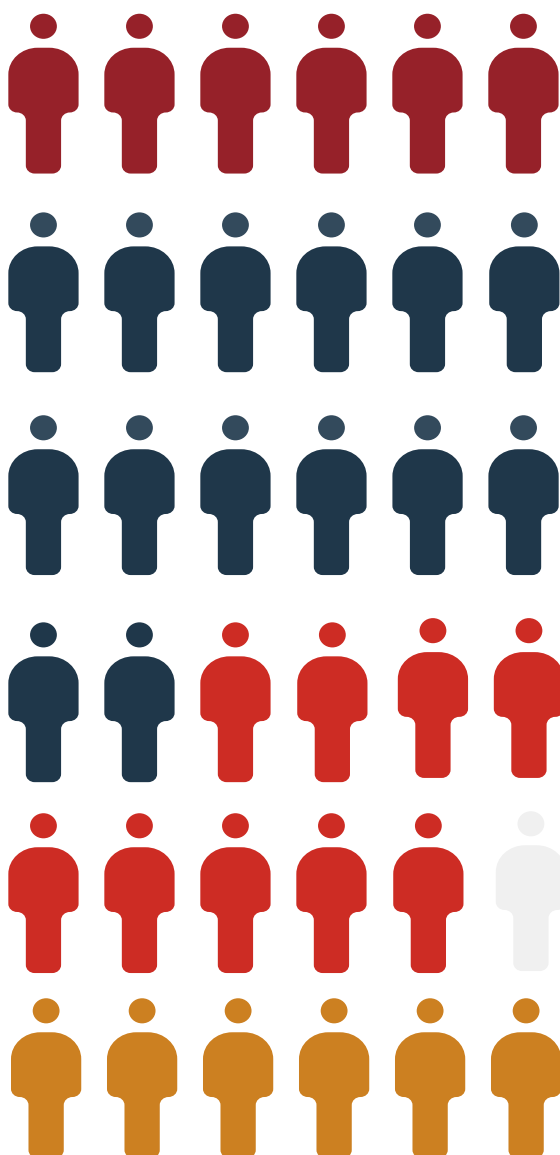
A coalition of elected officials, public agencies, utilities, and private industries are working together to see this project to fruition. This project is an exemplar of public-private partnership and coordination. Public sector support comes from not just the City of Mesa and neighboring

³ A The full economic development model and additional scenarios are identified in the Economic Impact Analysis attachment.

Maricopa and Pinal counties, but also from a bipartisan group of state and federal lawmakers. Representatives Greg Stanton and Andy Biggs and Senators Kyrsten Sinema and Mark Kelly are all supporters of the project, along with state-level representatives for the local districts. State-level organizations such as the Arizona State Land Department and the Arizona Chamber of Commerce have voiced their support. Locally, the Greater Phoenix Economic Council, Mesa Mayor John Giles, and the Mesa Chamber of Commerce are all supportive of the project.

From the private sector, the project has gained the support of all of the main manufacturers in the PAMZ and the support of the Arizona Manufacturing Council. The list of project supporters as of the RAISE Grant application deadline includes the following.

FIGURE 4 PIRATE Project Supporters



PUBLIC SECTOR SUPPORTERS

1. Arizona State Land Department*
2. City of Mesa, Arizona
3. Maricopa Association of Governments
4. Salt River Project
5. Aric Bopp, Executive Director, Arizona State University
6. Arizona Department of Transportation
7. City of Phoenix
8. Phoenix Sky Harbor Airport
9. Phoenix-Mesa Gateway Airport

PRIVATE SECTOR SUPPORTERS

1. Union Pacific Railroad
2. CMC Commercial Metals
3. Fujifilm
4. Bridgestone Americas
5. ZF TRW
6. MGC Pure Chemicals America
7. Crumb Rubber Manufacturers
8. Matheson Tri-Gas

LOCAL, STATE, AND FEDERAL ELECTED OFFICIALS

1. U.S. Senator Kyrsten Sinema
2. U.S. Senator Mark Kelly
3. U.S. House of Representatives Congressman Andy Biggs
4. Arizona Governor Doug Ducey
5. Arizona State Representative Rusty Bowers, Speaker of the House
6. City of Mesa Mayor John Giles
7. City of Mesa District 6 Councilmember Kevin Thompson
8. Supervisor Jack Sellers, Maricopa County Board of Supervisors
9. Supervisor Mike Goodman, Pinal County Board of Supervisors

ECONOMIC DEVELOPMENT ORGANIZATIONS

1. Sandra Watson, Arizona Commerce Authority
2. Chris Camacho, Greater Phoenix Economic Council
3. Glenn Hamer, Arizona Chamber of Commerce and Industry
4. Arizona Association of Economic Development
5. Allison Gilbreath, Arizona Manufacturing Council
6. Sally Harrison, Mesa Chamber of Commerce
7. East Valley Partnership

III PROJECT LOCATION

The PIRATE Project will construct approximately six miles of new freight rail industry track extending from East Rittenhouse Road to South Meridian Road in Mesa, Arizona. This area is ideal for heavy industrial rail expansion, given existing heavy industrial uses and vacant, developable land in the project area. In addition to being located within a Federal Opportunity Zone, the PIRATE Project is located within several zones that are designed to incentivize economic growth and development and to help incentivize industrial development across the nearby 3,000 acres of vacant land.

A | PARCELS NEEDED FOR DEVELOPMENT

There are 28 parcels required to complete the PIRATE Project and establish right of way. Project leaders are actively pursuing, acquiring, or optioning these parcels to prepare for project construction. The table below lists the needed parcels, their size, and owners.

FIGURE 5 Project Parcels

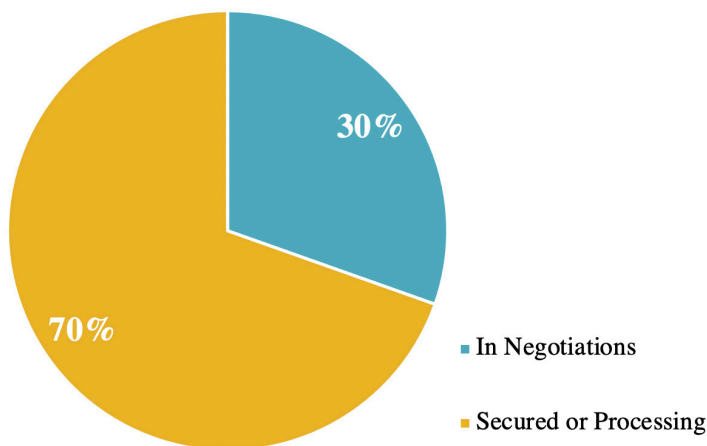
SOURCE: Union Pacific Railroad

PARCEL	PROPERTY OWNER	PROJECT ACRES
A	GILBERT-CHANDLER HEIGHTS L L C	7.00
B	TRIO	1.93
C	GILBERT-CHANDLER HEIGHTS L L C with Trio	0.48
D	ST. GEORGE	0.20
E	City of Mesa	3.10
F	KEB ENTERPRISES LLC	0.30
G	ARMSTRONG DENNIS L & INGEBORG E	1.73
H	TCA Development LLC	3.09
I	Germann Investments No 1/GI 20 LLC/GI 30 LLC/PRO 20 LLC	3.95
J	GI 20 LLC	1.38
K	GI 30 LLC	1.32
L	PR20 LLC	1.29
M	Pecos 2005 LLC/Fiaba Enterprises, Inc. Dadee Enterprises	2.67
N	Skybridge / Gateway South LLC	5.3
O	Sunbelt Investment Holdings, Inc. /Sunbelt Land Holdings, LP	6.07
P	Sunbelt Investment Holdings, Inc. /Sunbelt Land Holdings, LP	5.97
Q	Sunbelt Investment Holdings, Inc. /Sunbelt Land Holdings, LP	10.4
R	Sunbelt Investment Holdings, Inc. /Sunbelt Land Holdings, LP	5.92
S	Sunbelt Investment Holdings, Inc. /Sunbelt Land Holdings, LP	6.02
T	Reeb Capital Group / Williams Gateway Land Inv. LP	6.5
U	Arizona State Land	6.07

V	TRW VEHICLE SAFETY SYSTEMS INC ZF Friedrichshafen AG	7.3
W	TRW VEHICLE SAFETY SYSTEMS INC ZF Friedrichshafen AG	1.58
X	COMMERCIAL METALS COMPANY	4.78
Y	Maricopa County Flood Control District	2.15
Z	Maricopa County Flood Control District	0.35

FIGURE 6 Status of Needed Right of Way Acres

SOURCE: Union Pacific Railroad



Of the 28 total parcels, seventy percent of the needed acreage for the project has been secured as of June 2021. Further negotiations are underway with the remaining unsecured thirty percent, and all acres are anticipated to be secured for the right of way by the end of 2021.

B | FEDERAL OPPORTUNITY ZONE

The entire project sits in a designated federal opportunity zone. This designation is intended to foster job creation and attract private investment to support development in economically distressed areas of the United States and encourage investment in businesses located within the zones. The City of Mesa has four central business opportunity zones, and the project is located in the Gateway zone.

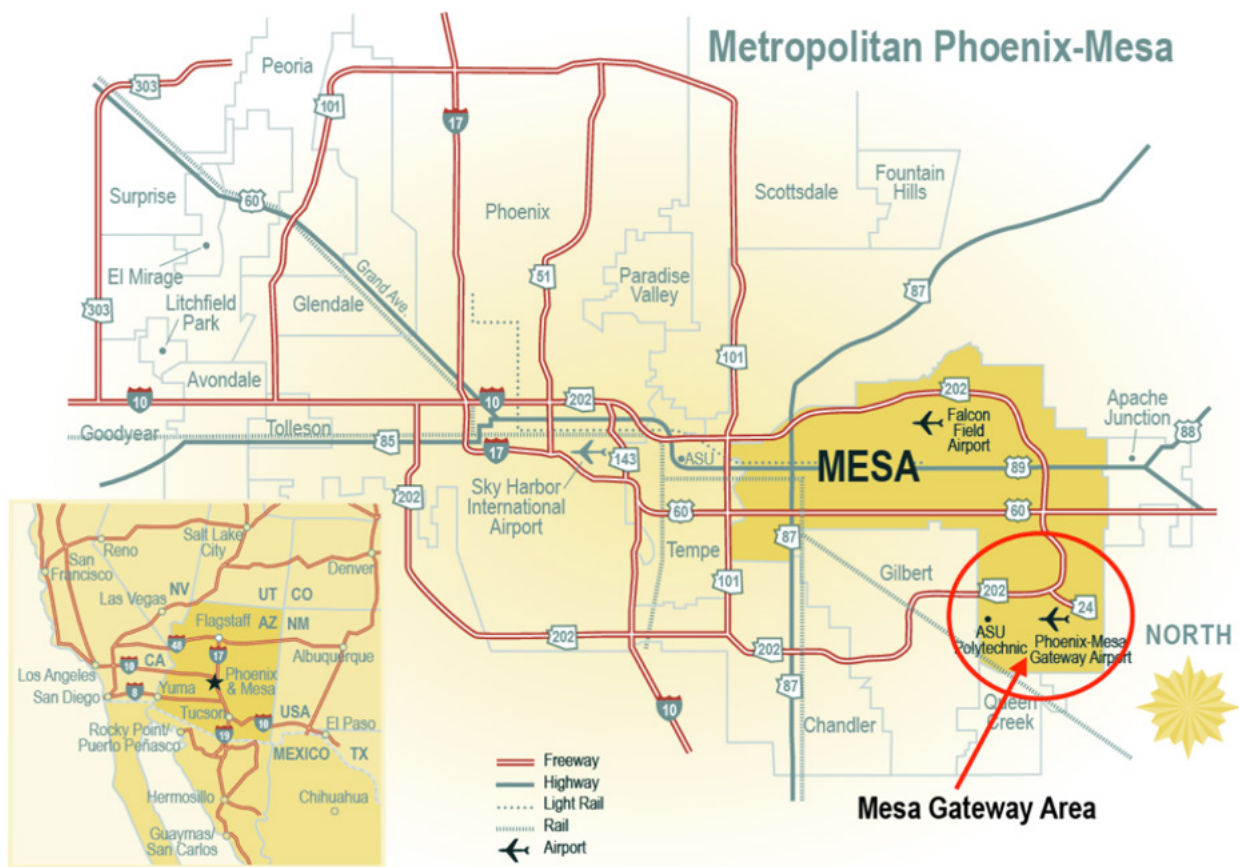
The PIRATE rail line will connect this entire area to the UP main rail line. The PIRATE Project is located within several additional zones designed to incentivize economic growth and development, as described in the sections below.

C | MESA GATEWAY AREA

The Phoenix-Mesa Gateway Airport is the second largest airport serving the greater Phoenix area and was also developed on the former Williams Air Force Base. This effort cleaned up and redeveloped the land into a useful airport, which now serves destinations across the U.S. and Canada. In late 2019 the airport broke ground on a new joint project with SkyBridge to build the nation's first inland air cargo hub with built-in customs. This facility should improve the speed and ease of transporting goods across the U.S.-Mexican border, as well as expand capacity and create jobs associated with the development.

FIGURE 7 Mesa Gateway Area

SOURCE: City of Mesa



In addition to the PAMZ, the Gateway Area is home to several other development areas. For example, the Ray Road Industrial Development Area is a fast-developing industrial corridor at the north end of Gateway Airport with more than four million square feet of industrial speculative space announced and under construction. Most notably, this area is home to Dexcom's 486,000 square-foot medical device distribution center and Electrameccanica's future 500-employee manufacturing center.

Gateway is also home to the Elliot Road Technology Corridor, which has become a mission-critical technology and data center hub, with current and future campuses planned for Apple, Google, CyrusOne, EdgeCore, NTT, EdgeConneX, Comarch, and Able Grid. These campuses will bring billions of dollars in capital investment to the region and generate significant sales tax revenues for the city, county, and state. There are also several million square feet of industrial development available within this corridor for manufacturing, logistics, and distribution uses.

The Mesa Gateway Area is home to a broad range of industry clusters, including:

- **AEROSPACE/AVIATION & DEFENSE** The Mesa Gateway Area hosts world-class players including Embraer, Cessna, Able Aerospace Services, Aerocircular, CAVU Aerospace, and more. Phoenix-Mesa Gateway Airport is also projected to serve 10 million annual passengers by 2030, with Allegiant, WestJet and Swoop, Avelo, and Sun Country Airlines currently offering flights to over 47 locations across the US and Canada.
- **TECHNOLOGY** The Mesa Gateway Area is home to ground-breaking technology institutions such as the Arizona Center for Algae Technology and Innovation, the Cognitive Engineering Research Institute, and companies such as Bridgestone Biorubber Process Research Center, Apple's GlobalCommand Center, and Google's future Mission Critical Campus, ElectraMeccanica, Dexcom, First Solar, and more.
- **HEAVY INDUSTRIAL AND MANUFACTURING** CMC Steel, FUJIFILM, Mitsubishi Gas Chemical, ZF TRW, CRM Rubber, Matheson Tri-Gas, Metso, and Niagara Bottling all have major manufacturing operations in the Mesa Gateway Area.
- **EDUCATION** The PIRATE Project study area is located near three technical universities and colleges that produce new graduates entering the industrial and manufacturing workforce.



- **Arizona State University (ASU) Polytechnic** – Arizona State University (ASU) Polytechnic – The Zone is close to ASU's Polytechnic campus with more than 4,500 students enrolled in science, engineering, management, technology, and education programs.



- **Chandler Gilbert Community College (CGCC)** – Chandler-Gilbert Community College (CGCC) – Also located within a few minutes of the Zone is Chandler-Gilbert Community College's Williams Campus with more than 2,000 students in nursing, aviation, and applied technology programs.



- **East Valley Institute of Technology (EVIT)** – East Valley Institute of Technology (EVIT) – Considered a model for high-quality career and technical education, EVIT provides more than 40 advanced career training programs to more than 5,000 high school students and adults in the East Valley, with financial aid available to those who qualify.

D | PECOS ADVANCED MANUFACTURING ZONE

The PIRATE Project is completely located within the PAMZ, which is located in the southern portion of the Mesa Gateway Area. It is within two of Mesa's Opportunity Zones and is well suited for large, heavy manufacturing operations. The PAMZ is a designation from the City of Mesa to establish a campus-like setting with advanced manufacturing companies and an integrated mixture of ancillary land uses that support the primary manufacturing employment in the area.

The PIRATE Project area is bounded by Phoenix-Mesa Gateway Airport on the north, the Railroad on the west, Germann Road on the south and Ellsworth Road on the east, as displayed in Figure 8 below.

FIGURE 8 Pecos Advanced Manufacturing Zone

SOURCE: City of Mesa



This area has more than 3,000 acres of vacant, available, shovel-ready property for projects large and small, with access to robust infrastructure. Given the proximity to Gateway Airport and the designated flight path for planes leaving the airport, this area is being developed for a variety of general/heavy industrial, light industrial, business park, and commercial uses.

E | EMPLOYMENT OPPORTUNITY FLOATING ZONE AND FOREIGN TRADE ZONE

The City of Mesa created an Employment Opportunity Floating Zone that reduces entitlement risk and greatly expedites the development process. The Floating Zone streamlines the entitlement process for development in the PIRATE Project area. The Floating Zone follows the General Industrial zoning guidelines, while restricting some land uses. When landowners opt in,

they are only required to submit the proper paperwork for administrative approval. No public hearings or further City Council action is required. Projects that might have taken up to six months to go through the entitlement process, can get approval as fast as a few weeks.

A portion of the PIRATE Project rail line will also extend through the City of Mesa's existing Foreign Trade Zone (FTZ #221) boundaries, which provides additional synergies with establishing this area as a manufacturing and logistics hub.



F | AREA OF PERSISTENT POVERTY

The PIRATE Project is located primarily in two census tracts. One of the tracts, census tract 5228.02, meets the definition of an area of persistent poverty with a poverty rate exceeding 20 percent as measured by the 2014-2018 American Community Survey 5-year data series.

IV GRANT FUNDS, SOURCES, & USE OF PROJECT FUNDING

The total expected cost of the PIRATE Project is \$96,300,000. The project team is submitting a RAISE Grant request for \$25,000,000. No other federal funds are being used for this project, and multiple local public and private partners are paying for the remaining costs, including any overages. The local match ratio for this project is 76%. The overall project budget is listed in Figure 9 below.

FIGURE 9 PIRATE Project Budget

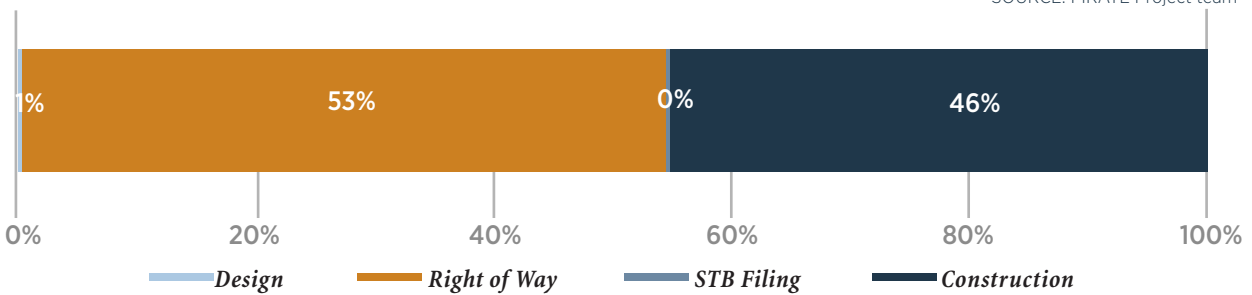
NOTE: In thousands of dollars. SOURCE: PIRATE Project team

CATEGORY	YEAR			TOTAL	LOCAL MATCH RATIO
	2021	2022	2023		
Design	\$400			\$400	1
Permitting	\$300			\$300	1
Right of Way	\$26,295	\$25,000		\$51,295	1
Construction			\$19,000	\$19,000	.76
		\$22,000	3,000	\$25,000	
STB Filing	\$300			\$300	1
Subtotal	\$27,300	\$25,000	\$19,000	\$71,300	
		\$22,000	\$3,000	\$25,00	
Grand Total	\$96,300			\$96,300	
Local Funding Amount				\$71,300	
RAISE Grant Request				\$25,00	

A | SOURCES AND USES SUMMARY

FIGURE 10 PIRATE Project Budget by Type of Cost

SOURCE: PIRATE Project team



Local funding is provided by commitments from an array of public and private partners that will directly benefit from the project. In addition to direct funding of the project components, creative financing mechanisms have also been identified. For example, in 2008, CMC Steel entered into a Development Agreement with the City of Mesa to assist in locating and constructing their new micro mill operation in the PAMZ. This Development Agreement deferred public half-street road improvements for ten years along Pecos Road and Meridian Road, which front CMC Steel's operation on the northern and eastern boundaries. In 2018, this deferral was further extended into 2028. While these are important public improvements, the industrial, and more remote, nature of this area has not necessitated additional public roadway investment. Clauses in this agreement specify that should both parties agree to an alternative project, the required half-street improvements would not need to be constructed by CMC Steel. Thus, in close collaboration with CMC Steel, the City of Mesa has agreed that the PIRATE Project will satisfy the development agreement as an alternative project and will jointly contribute up to the estimated costs of these half-street improvements. These improvements are estimated to cost approximately \$6,689,200. These funds will strictly be applied to the costs of the public road crossings within city-owned Right of Way.



B | DETAILED CONSTRUCTION COSTS

Preliminary construction cost estimates total \$44.3 million and are broken down in Figure 11 below.

FIGURE 11 Design, Utility and Construction Costs

SOURCE: PIRATE Project team

	LABOR	MATERIAL	TOTAL
Engineering	\$1,324,000	\$2,000,000	\$3,324,000
Track Construction – Company	\$7,590,129	\$3,365,407	\$10,955,536
Track Construction – Contract		\$1,390,000	\$1,390,000
Drainage		\$1,650,000	\$1,650,000
Utilities		\$300,000	\$300,000
Environmental		\$2,875,000	\$2,875,000
Signal		\$940,815	\$940,815
Equipment Rental and Material Transportation		\$13,297,860	\$13,297,860
Contract Work	\$1,782,826	\$5,163,816	\$6,946,642
Contingencies (20%)	\$1,766,333	\$5,615,591	\$7,381,924
TOTAL	\$10,597,997	\$33,693,546	\$44,291,542

V

PROJECT MEETS OR EXCEEDS ALL SELECTION CRITERIA

The PIRATE Project performs particularly strongly across all merit criteria for the RAISE Grant, as described in the sections below.

A | PRIMARY SELECTION CRITERIA

i. SAFETY

The PIRATE Project provides immediate enhanced public safety for the area by removing hundreds of large truckloads per month off the roadways. Large industrial companies in the area like CMC Steel, Fujifilm, Mitsubishi Gas Chemical, Zf-TRW, and CRM Rubber currently send hundreds of trucks per month to Central Phoenix transload facilities. The PIRATE Project will bring freight rail directly to their sites, which will remove these truck trips from roads and freeways, reducing traffic and congestion, as well as removing industrial materials from public roadways. The removal of these trucks from the road is estimated to reduce 1-2 large truck-related injury crashes in the first year of operation.

Rail not only reduces the likelihood of fatal or injury vehicle collisions but also has safety benefits for its employees. By using innovative safety technologies like Ultrasonic Wheel-Defect Detection and Wayside Detectors, rail operators have reduced equipment incidents by 5% from 2007 to 2017.⁴ Over the same time, Union Pacific Railroad reported a 54% reduction in the employee injury rate.⁵ This is in part due to their Total Safety Culture and training system. Other safety technologies include remote-controlled locomotives and drones, both of which eliminate the need for an employee to be physically near railcars to operate them or conduct inspections. This can reduce human error and keep employees out of dangerous scenarios. When it comes to addressing public safety, Union Pacific Railroad also commits to improving education and safety awareness around grade crossings and for pedestrians. Union Pacific Railroad expects to implement these safety measures on the rail branch proposed in this project.



Particularly relevant for the several chemical manufacturers in this zone, rail has a record of safely transporting hazardous materials and chemicals. According to UP, 99.99 percent of the industry's freight rail chemicals shipments currently move without incident or loss.⁶

Furthermore, the Phoenix-Mesa metro area consistently ranks among the safest places in the U.S. for high-tech companies to do business because of its low risk of natural disaster. A 2008 study, conducted by SustainLane, ranked Mesa as the safest place in the nation when considering natural disaster risks such as hurricanes, flooding, catastrophic hail, tornado super-outbreaks, and earthquakes.⁷

ii. STATE OF GOOD REPAIR



The PIRATE Project represents the construction of a new industry rail track, which will be constructed for permanent, long-term use to service existing and future industries in the area. This track will be owned, operated, and maintained by Union Pacific Railroad. As a Class 1 railroad operator, Union Pacific Railroad's ownership of this line will ensure a long-term state of good repair for the PIRATE Project. Additionally, the removal of trucks from local, state, and interstate highways will limit roadway wear and tear.

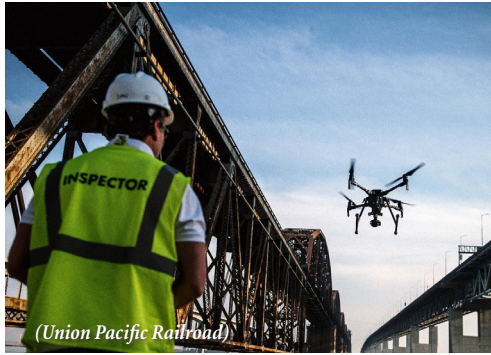
Union Pacific Railroad is committed to meeting the Federal Railroad Administration maintenance requirements and

⁴ Source: Union Pacific Railroad. Commitment to Safety. (2020). Retrieved from: <https://www.up.com/aboutup/community/safety/commitment/index.htm>

⁵ Ibid

⁶ Ibid

⁷ Source: City of Mesa



keeping their tracks in safe operating condition. They continuously inspect their railroad track, locomotives, and equipment. Inspection and regular maintenance of this new track would be absorbed into Union Pacific Railroad's regular maintenance and repair schedules within the Phoenix Subdivision. It would be managed by the Local Manager of Track Maintenance and team. The Subdivision budget would allow for all repairs and maintenance.

Maintenance includes the Federal Railroad Administration's formal inspections once per month and replacement or repair of ties, ballast, and track as needed. Since this will be a brand-new track, maintenance costs will be very minimal in the first 10 years. While it is difficult to project future maintenance costs for the PIRATE Project rail line, in 2019 Union Pacific Railroad spent \$354 million performing rail, ballast, and tie maintenance across more than 41,000 miles of track. This had an average cost per mile of \$8,470. Using this average, the six-mile PIRATE Project rail line would see about \$51,000 in maintenance costs per year.

In addition, Union Pacific Railroad is taking advantage of advancements in technology that enable them to maintain and inspect their railroads more efficiently and more effectively. Union Pacific Railroad utilizes unmanned geometry measuring systems to assess the condition of the track in real-time. This technology can be attached to any boxcar, is powered by solar panels, and records and reports track abnormalities. Gathering big data on past incidents also helps Union Pacific Railroad to predict and prioritize high-risk areas and maintain them before incidents occur. Union Pacific Railroad also uses drones to help complete some of their more dangerous and trickier site inspections, like rail bridges, to ensure those sites get the ongoing maintenance they require.

iii. ECONOMIC COMPETITIVENESS

The PIRATE Project will generate an estimated 20,954 new jobs and \$19.7 billion in economic activity⁸ over the first 10 years. This will be a significant driver of private investment and further enhance the Gateway area as a major job center for the region. Providing multi-modal transportation options is key for any major logistics and manufacturing hub. The addition of rail will help attract new industries to the East Valley, further diversifying the economy and driving job growth in the region.

Development of the PIRATE Project included conducting a robust economic impact analysis to evaluate the economic competitiveness of the Project. The analysis included the development of four projections to quantify and compare various scenarios



⁸ Rounds Consulting Group Report, Most likely scenario, direct and secondary jobs.

including a plan of no action and plans that enhanced economic gains directly tied to the rail expansion over 10 years. It also forecasts potential growth derived from a review of current business activity, current business trajectories, and projected business development opportunities directly tied to rail.

The following summarizes the methodology and employment projections for each of the four forecast scenarios.

- **THE FIRST SCENARIO**, the status quo, is a forecast based on the current business trajectory for the PIRATE study area under a plan of no action or not expanding the rail line. The 10-year MAG projections for the area were used as a baseline. This baseline was adjusted to account for expansion efforts of current businesses that will occur with or without the rail line. Under this scenario, employment in the PIRATE study area is projected to increase from 1,921 in 2020 to 5,064 in 2030 – a 10.2% average annual increase.
- **THE SECOND SCENARIO**, the most likely scenario, is a forecast based on economic gains assuming the rail line is expanded, allowing for additional business development. The status quo projections were enhanced based on the likely business expansions and new business developments related to the new rail opportunities. Under this most likely scenario, employment is projected to increase to 10,644 by 2030 in the PIRATE study area – an 18.7% average annual increase.
- **THE THIRD SCENARIO**, the optimistic scenario, is a forecast based on enhanced economic gains resulting from aggressive business expansions initiated from the rail development and an accelerated build-out timeline. This projection assumes expansion and economic opportunities are maximized. Under the optimistic scenario, employment is projected to increase to 15,755 in 2030 – a 23.4% average annual increase.
- **THE FOURTH SCENARIO**, the pessimistic scenario, is a forecast based on a decline in the status quo trajectory as a result of decays in economic gains from development barriers and businesses relocating. This assumes current businesses leave the PIRATE study area to relocate to areas because the current site is not suitable for planned expansions. Under the pessimistic scenario, employment is projected to increase to 3,444 in 2030 – a 6.0% average annual increase.

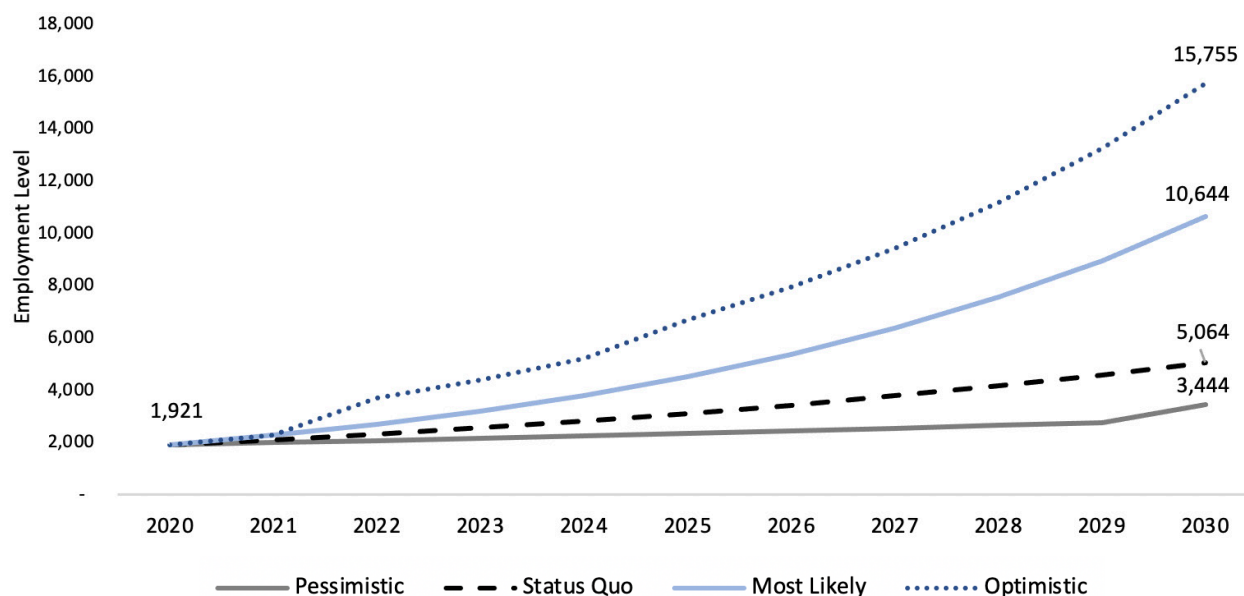
FIGURE 12 10-Year Employment Forecast Scenarios for the PIRATE Study Area

NOTE: Employment projections for the PIRATE study area. SOURCE: Maricopa Association of Governments; Rounds Consulting Group, Inc.

YEAR	2020	2030			
SCENARIO	ACTUAL	PESSIMISTIC	STATUS QUO	MOST LIKELY	OPTIMISTIC
Employment Level	1,921	2,892	4,253	8,874	12,328
Net Growth	-	971	2,332	6,953	10,407
Annual % Growth	-	4.2%	8.3%	16.5%	20.4%

FIGURE 13 10-Year Employment Forecast Scenarios for the PIRATE Study Area

NOTE: Employment projections for the PIRATE study area. SOURCE: Maricopa Association of Governments; Rounds Consulting Group, Inc.



ECONOMIC AND FISCAL IMPACT SCENARIO COMPARISONS

Figure 14, Figure 15, and Figure 16 below compare the results of the four scenarios evaluated. The pessimistic scenario is a forecast based on a decrease in the status quo trajectory that results from decays as business expansions are hindered and businesses relocate from the area. The status quo is a forecast based on the current business trajectory under a plan of no action (no rail line expansion). The most likely scenario is a forecast assuming the rail line is expanded allowing for enhanced business development. The optimistic scenario is a forecast based on aggressive business expansions resulting from the rail line expansion.

FIGURE 14 10-Year Economic and Fiscal Impact Scenario Comparisons

SCENARIO	TOTAL JOBS (1)	TOTAL WAGES (2)	TOTAL ECONOMIC OUTPUT (3)	TOTAL TAX REVENUES (4)
Pessimistic	3,596	\$973,798,000	\$4,152,996,000	\$145,565,000
Status Quo	7,420	\$1,886,175,200	\$8,044,046,800	\$281,474,300
Most Likely	20,594	\$4,612,745,100	\$19,672,159,600	\$686,220,200
Optimistic	32,661	\$7,726,073,200	\$32,949,694,600	\$1,144,952,500

NOTE: May not sum to total due to rounding.

SOURCE: IMPLAN; Rounds Consulting Group, Inc.

¹⁾ Primary, or direct, impact generated from the PIRATE study area;

²⁾ Secondary, or indirect and induced impact generated for the region from activity in the PIRATE study area;

³⁾ Number of jobs over 10-years;

⁴⁾ Total wages earned over 10-year;

⁵⁾ Total economic output generated over 10-years;

⁶⁾ Total state and local tax revenues generated over 10-years.

FIGURE 15 10-Year Impact Scenario Comparisons - Economic Output & Wages

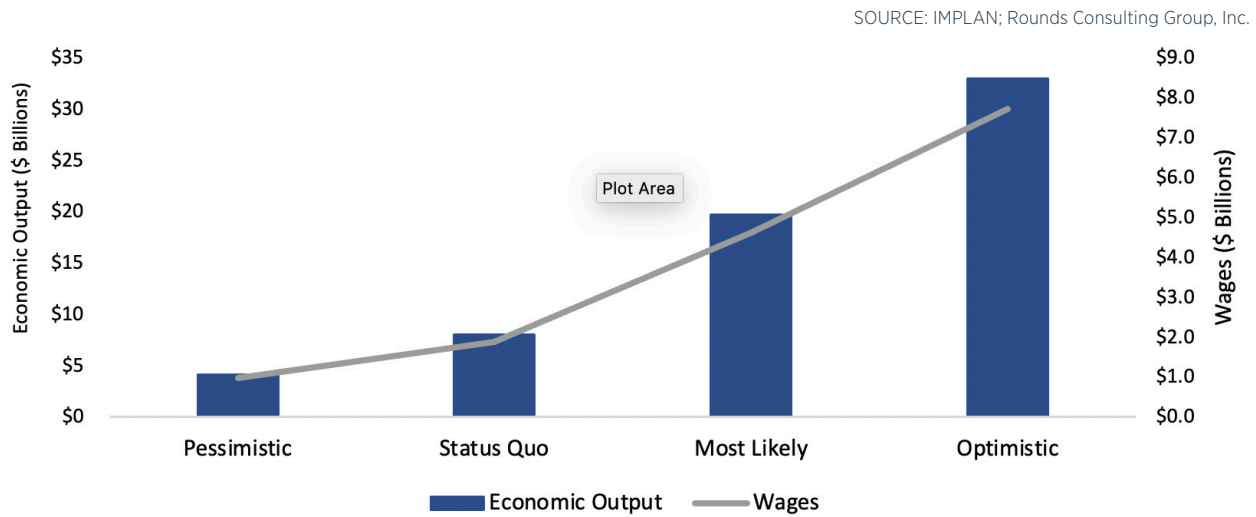
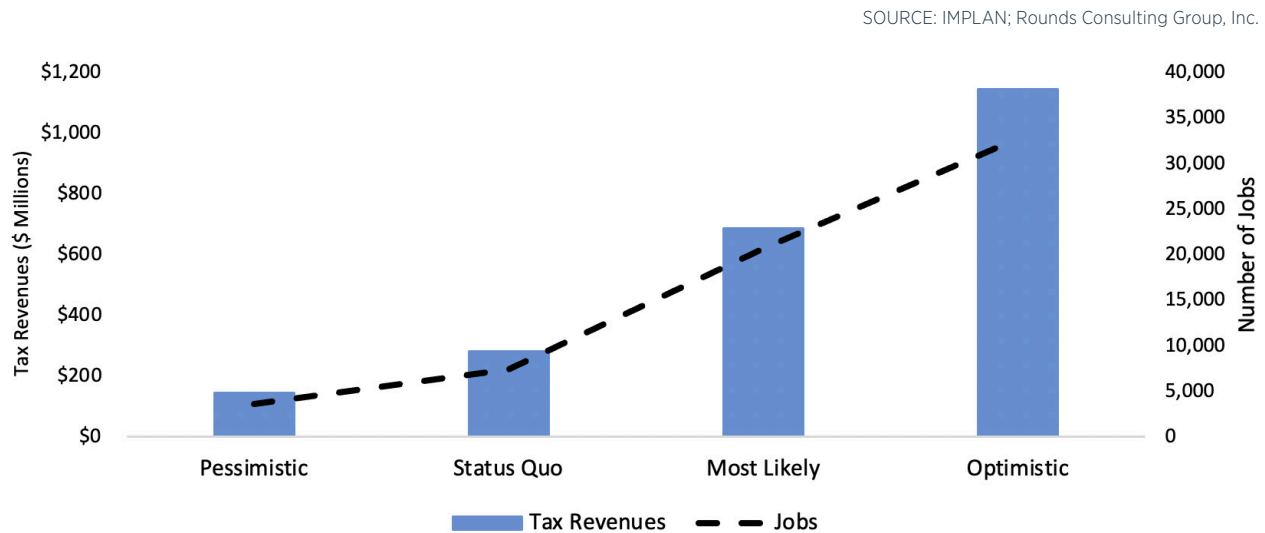


FIGURE 16 10-Year Impact Scenario Comparisons - Tax Revenues & Jobs



The PIRATE Project has strong potential for long-term job creation and economic opportunity. Based on information from MAG, the City of Mesa, and the local business owners, approximately 1,921 persons are employed in the PIRATE study area as of 2020. Currently, there are over 3,000 acres of vacant and underutilized land that are shovel-ready with existing infrastructure such as power, water, sewer, natural gas, and zoning entitlements for additional industrial and businesses development. According to MAG, employment in the study area is expected to grow from 1,921 in 2020 to 14,252 in 2050 (increasing by 12,331 jobs, not including rail expansion) when the area approaches complete build-out.

Some businesses may not expand or add many new jobs without this rail branch. Businesses that do expand would result in an increase in trucks on the road without this rail branch. This project

would eliminate this increasing number of trucks over time as that growth occurs. Additionally, the introduction of rail gives the PAMZ a competitive advantage over trucking as a result of the many efficiencies of rail. Shipping by rail allows a manufacturer to ship the same weight of the product as they would by truck, but with significantly lower fuel costs and operating costs. The fuel efficiency and high capacity of rail make it a more affordable option than trucking for manufacturers, allowing them to use their savings to invest in expansion and jobs.

iv. ENVIRONMENTAL SUSTAINABILITY

Rail provides several advantages over trucking when it comes to fuel efficiency and emissions reductions. It has a higher load capacity, better mileage per gallon per ton, and, therefore, less fuel consumption and resulting emissions. By weight, a rail car can contain up to four truckloads, meaning that for the same shipment weight, shipping by rail requires a quarter of the engines (hence emissions) that trucking would. The engine that operates the train is also significantly more energy-efficient, as it's able to transport one ton 470 miles per gallon compared to one ton 150 miles per gallon on a diesel truck.⁹ This requires less diesel fuel and releases greenhouse gases at a much smaller volume per ton-mile. In fact, in 2009, the Texas Transportation Institute (TTI) estimated railroads produce one ton of GHG per 47,308 ton-miles while trucks produce one ton of GHG per 5,802 ton-miles.¹⁰ The switch from trucking to rail by existing industry on the PIRATE industry track has the potential to significantly reduce Greenhouse Gas (GHG) emissions from thousands of trucks, at an estimated reduction of approximately 5,400 metric tons of GHG avoided in just the first year by switching to rail, which is roughly equivalent to the total energy use for 650 homes for one year.¹¹

Information from the leading manufacturers and producers in the project area indicates that multiple companies are shipping thousands of truckloads of material in and out of the project area every month. Several of these manufacturers are trucking their products to transload facilities in Phoenix and Tucson. Many are also sending truckloads over much longer distances to destinations mostly in the western portion of the U.S. This represents millions of miles traveled each year, hundreds of thousands of gallons of fuel consumed, and therefore tons of emissions that contribute to the greenhouse effect and pollution of the air. The introduction of rail to the industrial park presents the opportunity to eliminate many of these emissions by switching to more fuel-efficient rail and ending the need to truck to transload facilities.

Over time this project will also prevent further environmental impact from the growth of production and increased shipping via truck. With rail, instead of expanding capacity by putting more trucks on the road, increased capacity can be easily managed by more fuel-efficient rail. This switch prevents future increased environmental impact from growth.

⁹ Association of American Railroads. Retrieved from <https://www.aar.org/article/freight-rail-moving-miles-ahead-on-sustainability/>

¹⁰ Texas Transportation Institute "A MODAL COMPARISON OF DOMESTIC FREIGHT TRANSPORTATION EFFECTS ON THE GENERAL PUBLIC: 2001-2009". Retrieved from <https://static.tti.tamu.edu/tti.tamu.edu/documents/TTI-2012-5.pdf>

¹¹ EPA Equivalency Calculator

¹² Alotaibi, Raed; Bechle, Mathew; Marshall, Julian; Ramani, Tara; Zietsman, Joe; Nieuwenhuijsen, Mark; Khreis, Haneen, 2019, "Traffic Related Air Pollution and the Burden of Childhood Asthma in the Contiguous United States in 2000 and 2010", CARTEEH DATA:HUB, <http://carteethdata.org/library/webapp/trap-asthma-usa> (accessed Apr. 17, 2020)

This project also has the potential to affect air pollution in the areas positively. A 2019 study¹² estimates that in 2010, approximately 25% of childhood asthma cases were attributable to air pollution from NO₂, and 49% (around 5,000 cases) were due to pollution from PM₁₀ in Maricopa County where the project is located. Over the ten years from 2000 to 2010, the number of cases attributable to air pollution has decreased significantly. Still, the values in Maricopa County remain some of the highest in the country. Further reduction in truck emissions could help to further reduce air pollution by reducing harmful substances like NO₂ and PM_{2.5}. The health cost savings analysis in the emissions reduction benefits section shows that the project has the potential to reduce the costs of these pollutants between \$3.3 million to \$22 million over 30 years by switching trucks to rail. This represents a reduction in air pollution that could help to reduce health costs and illness risk in the area.

This project has the potential to eliminate thousands of truck trips from highways every year, which contribute to substantial bottlenecks and highway intersection slowdowns. All of the time that these trucks spend idling contributes to not only GHG emissions but also to the pollution of our air. Allowing these shipments to be carried out over rail has the potential to reduce congestion emissions and improve travel speed and efficiency.

The American Transportation Research Institute releases a list of America's top truck bottlenecks each year. For 2020, two of the most congested bottlenecks in the country existed in nearby Phoenix. One bottleneck, (ranked 30th in 2020) at the intersection of I-17 and I-10, has experienced an 11% decrease in average peak speed from 2018 to 2019. This intersection congestion likely impacts current shipments destined for a northwest Phoenix transload facility and destinations farther west like Los Angeles. It is also the intersection with the highway that leads north from Phoenix to locations like Flagstaff, AZ, and east to Albuquerque, NM. Essentially any destination northwest of Mesa is likely to have its shipments impacted by this severe bottleneck in Phoenix.

Another bottleneck, (ranked 69th in 2020), is at the intersection of I-10 and U.S. 60, which is on one of the direct highway routes between Mesa and Phoenix. Both of the shortest routes between the project site and Phoenix are currently impacted by this bottleneck. Any shipments being sent to a Phoenix transload facility or farther northwest are contributing to congestion and idling-related emissions. This project has the potential to reduce the number of trucks on the road contributing to this congestion by the hundreds per month and would, therefore, reduce



truck idling and emissions from fuel consumption, at least from those vehicles.

The project also has the potential to provide conservation benefits in the same way, by developing already industrial use land. This site is likely unsuitable habitat for endangered species considering its proximity to the airport, residential neighborhoods, and major highways. In this way, the development of

this land could mean no loss in habitat for endangered species and could prevent the development of potentially suitable habitats.

v. QUALITY OF LIFE

This project could improve the quality of life for those nearby the site, and for those who live near highways throughout the region by reducing congestion, improving highway safety, and bringing high-paying, low-barrier to entry jobs to the area.



Reducing commuter congestion in the immediate area could provide measurable travel time savings for passenger vehicles. This project also has the potential to increase the quality of life by improving connectivity between workers and jobs by creating new manufacturing, construction, and management jobs. For the residential neighborhoods near the project location, this represents an opportunity to work closer to home. A wide range of jobs related to manufacturing are anticipated to become available as a result of the PIRATE Project, accommodating employees of all skill levels. These jobs are high paying and high skill, but represent an opportunity for job seekers of all education levels.

As mentioned above, the thousands of trucks leaving the PAMZ each year contribute to existing severe bottlenecks in the Phoenix-Mesa area. Replacing these trucks with rail not only provides benefits by reducing congestion-related emissions, but it also creates benefits for commuters who may have shorter travel times if truck traffic and congestion were to decrease.

Faster travel times due to reduced congestion have associated travel time savings, which can be valued at up to \$27.10 per person-hour depending on the purpose of travel.

Personal trips to grocery stores, clinics, and banks could all be made more feasible by reduced travel times and costs. Additionally, it enhances connectivity between citizens and jobs by making it faster and easier to travel and to go farther, for available work. A long commute is often a barrier between qualified workers and available jobs, but reducing congestion and shortening travel times may open up additional housing options.

This project has the potential to increase the quality of life by increasing job opportunities in the region. The construction of new rail, along with the operation of it and the anticipated expanded capacity of existing and new producers in the area, should create hundreds of new jobs. For the residential neighborhoods near the project location, this represents an opportunity to work closer to home, and a new employment source. A wide range of jobs related to manufacturing is expected to become available as a result of the project, from low to high skill, accommodating a variety of potential employees.

This creates an opportunity for a growing community, where workers have access to good jobs, and reduced congestion improves their access to the other essentials in their area. Over time, as capacity increases due to the project along with jobs, residential neighborhoods could expand as well, making use of nearby residentially-zoned land.

B | SECONDARY SELECTION CRITERIA

i. INNOVATION

The PIRATE Project is innovative in its forward-thinking planning. Synergies between rail and airports provide enhanced economic benefits to regions that can accommodate multi-modal freight and cargo options. The Phoenix-Mesa Gateway Airport and the Gateway region around it are growing rapidly. By planning for and constructing rail today, the region will see significant safety and economic benefits in the future due to innovative thinking today.



Remote-controlled locomotive and drone technologies represent an opportunity to automate, streamline, and improve existing rail operations and inspections. Union Pacific Railroad has been a leader in implementing these technologies and in driving innovations in drone capabilities, like the development of Perceptive Navigation Technology, which enables drones to fly in locations without GPS coverage.¹³

ii. PARTNERSHIP

The PIRATE Project represents a true public-private partnership with multiple government entities as well as multiple private entities providing time and resources to move this project forward. The City of Mesa has served as a central point-of-contact for the effort, however, SRP, Union Pacific Railroad, Pinal County, City of Phoenix, GoRail, CMC Steel, Fujifilm, Zf-TRW, Arizona State Land Department, and many other private property owners have been involved since the beginning. For example, SRP and Pinal County collaborated to assist in funding the entire economic impact analysis for the PIRATE Project.

Local businesses have agreed to partner with the other main manufacturers in this zone to jointly invest in this project, which will help the region grow and expand its business capacity. This has drawn the support of both the Mesa Chamber of Commerce as well as the Arizona House Representatives for these districts. Collaboration has occurred on the local, city, state, and federal levels to help move this project forward, using the synergy of private-public cooperation.

VI ENVIRONMENTAL RISK REVIEW

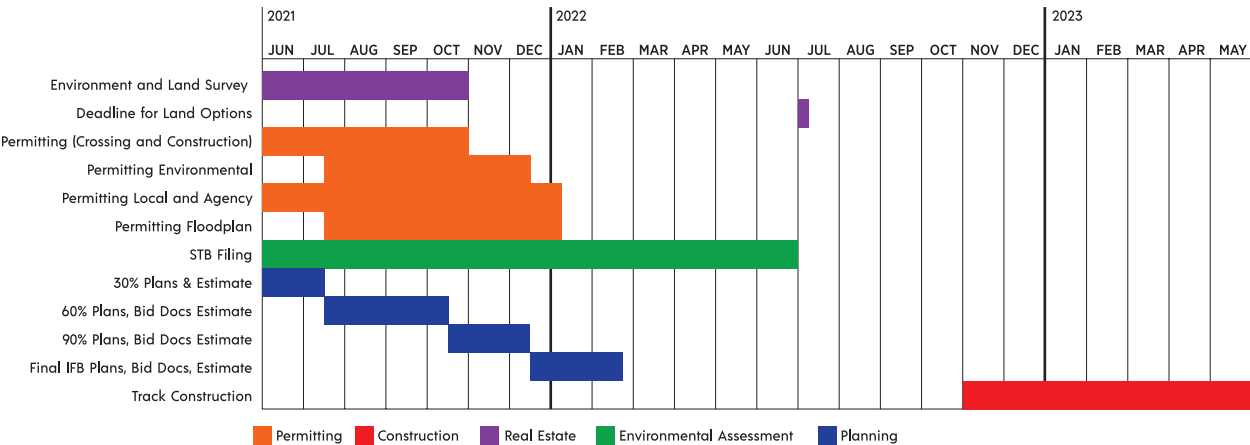
The PIRATE Project has included extensive planning conducted since its inception. These efforts are accelerating as the project nears construction. All assessments are conducted on the proposed rail corridor, which ranges from 75 to 225 feet wide and is approximately 6 miles long. This corridor spans 28 parcels in both Maricopa and Pinal County. A detailed schedule of ongoing environmental assessments and engineering tasks is listed in Figure 17 below.

¹³ Union Pacific Railroad. How America's Top Railroad Learns to Fly. (2017). Retrieved from: https://www.up.com/aboutup/community/inside_track/railroad-learns-to-fly.htm

A | SCHEDULE

The schedule below displays the real estate timeline for right-of-way acquisitions, engineering permitting, and construction tasks, as well as the Surface Transportation Board environmental assessment process schedule to satisfy the National Environmental Protection Act (NEPA).

FIGURE 17 PIRATE Project Schedule Source: Union Pacific Railroad



B | REQUIRED APPROVALS

The PIRATE Project Team is actively engaged in the environmental review and permitting for the PIRATE Project. Currently, the Project Team has also provided notice of intent to file for a petition for construction authority with the Surface Transportation Board (STB). This includes a scheduled Environmental Assessment. Approval will satisfy all NEPA requirements. It is expected that this petition will be filed in the Fall.

NEPA went into effect in 1970 and established requirements for federal agencies to consider environmental effects in their project planning. Intending to reduce environmental harm done from federal projects, NEPA created a framework for evaluating the potential environmental outcomes of different types of work. It requires that for federally funded projects, either a categorical exclusion (CE) must be issued, or an environmental assessment conducted, or an environmental impact statement must be made. When the likely impacts of a project are well known based on previous projects and considered negligible, the project is often categorically excluded. If the potential environmental effects of a project are unknown, NEPA requires an environmental assessment (EA) to determine the potential outcomes. In the case that the EA determines an environmental impact, or that the project has an anticipated impact, NEPA describes the environmental impact statement (EIS) process. This assesses environmental impacts as well as determines alternatives and mitigation methods.

This project will have an environmental assessment conducted by a contractor to satisfy both NEPA and STB requirements for project approval. This is expected to be completed by June 2022.

ENVIRONMENTAL & FLOODPLAIN PERMITTING

A desktop review of environmental, floodplain, and local permitting requirements has been completed. National Wetlands Inventory (NWI), USGS mapping, and FEMA information were reviewed against the preliminary design to evaluate environmental impacts and impacts to Waters of the U.S. (including wetlands). Environmental impacts and permitting efforts will be relatively minimal. Several unnamed tributaries are located within this region, including one east of the intersection of S Mountain Rd and Pecos Rd. There are also two semi-permanent ponds between Ellsworth Rd and S Signal Butte Rd. However, limited exposure and impacts are anticipated with the proposed improvements. Impacts to wetlands and Waters of the U.S. are estimated at less than 0.10 acres with the overall project falling under a Nationwide Permit (NWP). Should there be a need for mitigation, it appears that an in-lieu fee program is in place to accommodate.

Based on a review of available information, the proposed industrial lead project crosses both the Rittenhouse Road Drain and Ellsworth Road Channel are maintained by the Flood Control District of Maricopa County. The flood control projects were designed to convey the 100-year runoff event. Additionally, several of the sites cross natural drainage ways, which may also be under the jurisdiction of the county. The project is located within both the Queen Creek and Suburban Irrigation Districts, with a network of existing laterals and drains that will be bisected as part of the proposed industrial lead. As such, the proposed drainage structures were recommended at existing irrigation crossings to maintain irrigation water rights. The following table provides a high-level summary of anticipated permitting requirements for the project.

HYDROLOGY & HYDRAULICS

A desktop-office-level hydrologic and hydraulic (H&H) review and summary of anticipated floodplain impacts and permitting requirements have also been completed. Detailed H&H modeling and analysis were not performed; however, preliminary calculations were performed to provide anticipated drainage structure sizes to meet hydraulic design criteria, minimize the increase of backwater, and comply with regulatory conditions.

C | ASSESSMENT OF PROJECT RISKS & MITIGATION STRATEGIES

The PIRATE Project will require the acquisition of easements from private property owners and right-of-way from the City for public road crossings. The easements will vary in width depending on the location of support tracks, and other necessary rail infrastructure. The existing public road crossings will be at-grade crossings. The new industry track will also accommodate drainage in the appropriate areas. The industry track will be owned, operated, and maintained by Union Pacific Railroad. The new industry track will connect to the existing Union Pacific Railroad mainline in East Rittenhouse Road and will extend east between Pecos Road and Germann Road to South Meridian Road.

Several properties adjacent to the subject property constitute an environmental risk to the project. These manufacturers are either former (MCG Pure) or current (Fujifilm, Bridgestone, CRM) Resource Conservation and Recovery Act (RCRA) large quantity or small quantity hazardous waste producers. This could be considered an environmental risk, but all of the manufacturers

FIGURE 18 Permitting Requirements for Mesa Gateway PIRATE Project

SOURCE: Union Pacific Railroad

AGENCY	PERMIT	REQUIREMENTS	ANTICIPATED PERMIT ISSUANCE DATE
FEDERAL			
U.S. Army Corps of Engineers (USACE)	Section 404 - NWP #14	Any loss of wetlands requires submittal	60-120 days after submittal
U.S. Fish and Wildlife Service (USFWS)	Coordination with USACE	TBD	
Federal Aviation Administration	Notice Criteria	Project must be filed with the FAA	45 days after application is received
Tribal			
STATE			
Arizona Department of Environmental Quality	Individual Section 401 Water Quality Certification		60-120 days after submittal, in conjunction with 404 permit
Arizona Department of Environmental Quality	Section 402 Stormwater Permit/NPDES	If >1 acre ground disturbance	Contractor will obtain
Arizona State Historic Preservation Office	Coordination with USACE	TBD	Coordination with USACE if deemed necessary by USACE Archaeologist
LOCAL			
Maricopa County	Floodplain Use Permit	Permit Required in FEMA floodplain and/or Q100>50 cfs	Typically, Preemption, obtaining the permit after the fact
Queen Creek Irrigation District	Coordination / Permit	Required for irrigation lateral crossings	60 days after application is received
Suburban Irrigation District	Coordination / Permit	Required for irrigation lateral crossings	60 days after application is received

are in compliance with RCRA, and rail is considered a very safe mode of transportation for hazardous waste that they may produce.

Other than the manufacturers supporting this project, there are relatively few landowners not involved with the planning of the project. Most of the land is vacant and unused. This indicates that the risk of substantial change to the environment is relatively low.

VII BENEFIT-COST ANALYSIS

The benefits analysis conducted for this grant application considers five categories of quantified benefits and four categories of benefits described qualitatively. The decision to analyze a section of benefits qualitatively or quantitatively was largely dependent on the amount of available data regarding existing traffic patterns and anticipated changes due to the project. Most of the assumptions made rely on information provided by stakeholders in the PAMZ that anticipate utilizing the proposed rail branch.

Many of the benefits that were quantified are calculated using an estimate of vehicle miles traveled (VMT) by truck trips that will be eliminated with the introduction of rail. This is derived from statements about the number of eliminated truck trips, as well as some assumptions about a set of destinations. Since many benefits and cost savings are calculated on a per-mile basis,

converting truck trips to VMT avoided is critical to quantifying benefits. This analysis assumes that trips to both nearby destinations like Phoenix, and farther destinations like California, will be eliminated. The range of destination distances and potential future growth rates creates four different scenarios that are analyzed over 30 years to calculate potential benefits.

The first category of quantified benefits is operation cost savings that accrue to manufacturers who will no longer have to transport all of their shipments by truck. These private benefits are so large because shippers save approximately one dollar per mile of travel avoided. In comparison, rail operational costs are anticipated to be significantly lower. At present value the operation cost savings are between \$87 million and \$575 million, depending on the scenario.

Next in cost savings are the avoided road maintenance costs saved by taking thousands of heavyweight trucks off the road every year. Maintenance cost savings come from a reduced need to repave and resurface public roads as a result of fewer heavy truck miles driven. These benefits range from \$70.6 million to \$469 million in 2021 dollars, as a result of 30 years of savings.

These are followed by safety benefits, which represent the value of preventing fatal and injury crashes by reducing the number of large truck miles driven. Using the value of a statistical life, and the national rate of accidents for large trucks, calculations on the project show that 1-2 injury crashes may be avoided in the first year by switching to rail. Over the 30 years, up to an estimated 55 lives could be saved. These are savings of an estimated \$31.5 million to \$210 million, that accrue to the public through the value of a saved life, as well as avoided emergency and health care costs.

Benefits are also quantified from reducing greenhouse gas emissions, as well as health cost savings from reducing air-polluting emissions. Converting the VMT avoided by the project to fuel consumption, and assessing the emissions associated with that level of diesel use shows that the project could reduce GHG emissions for the 30-year analysis period. The value of these social cost of carbon savings is estimated to be between \$23 million and \$181 million. Health cost savings from reducing air pollution are also estimated for this project. These are the costs avoided by eliminating air-polluting emissions like NO₂ and PM_{2.5} through the switch to rail. Health cost savings range from \$3.3 million to \$22 million of savings in present value.

Finally, the analysis also qualitatively discusses the project benefits to congestion reduction, potential travel time savings, noise pollution, and property values. These categories are more difficult to monetize and require more data to be discussed quantitatively. However, the research available indicates that there could be net benefits from the switch from truck to rail for each of these sectors.

For example, while noise pollution from trucks is lower, the fact that there would be fewer train trips needed to move the same amount of product indicates that overall noise pollution and disruption should be less with rail. The project is also likely to be beneficial for property values considering that many properties immediately adjacent to the rail branch will increase in value due to their proximity and availability as industrially zoned land and that residential land nearby will increase in value due to the proximity to new jobs. There is also a strong indication that the

switch to rail would help reduce congestion in the area by removing thousands of trucks from the road each year. Since this area of Arizona had two of the U.S.'s top 100 bottlenecks in 2020, any reduction in truck traffic could help to mitigate the congestion issue. The potential decrease in congestion also means there could be travel time savings for commuters and personal trips on the main highways in the area. If it takes less time to get somewhere, there are opportunity cost savings that accrue to the public.

In total, the quantified benefits of the project include private and public cost savings from keeping trucks off the road of approximately \$215 million to \$1.5 billion over the next 30 years. There are also anticipated benefits to congestion, the nearby neighborhoods through reduced noise pollution, and increased property values. All of these benefits stem from the opportunity to replace millions of truck miles with rail service; a more fuel-efficient, higher capacity, and cost-effective shipping method than trucking.

Costs associated with this project include construction costs, right-of-way acquisition, and maintenance costs. As described in Section III: Grant Funds, Sources, and Uses of Project Funding, construction costs including the cost of labor, equipment, and transportation of inputs for the six-mile track are expected to total \$44.3 million. Right-of-way acquisition is expected to total \$51.2 million. As described in Section IV.A.II: State of Good Repair, maintenance costs are expected to total \$51,000 per year. In present value, these total \$466,000 through 2051. Total project costs in present value come to a total of \$96.3 million. When compared to present value benefits across the same time horizon, the PIRATE project has a maximum benefit-cost ratio range, depending on VMT and growth assumptions between 2.2 and 15.1, with a likely range between 4.3 and 7.9 and produces substantial returns on investment.

VIII READY TO BUILD AND DESTINED FOR SUCCESS

The PIRATE Project is key to improving Arizona's industrial transportation network. It will remove heavy industrial trucks from roadways and highways, provide critical jobs, and enable economic growth. Multiple private and public entities stand to benefit from this project, and the combination of their letters of support and substantial financial commitments signal the importance of this project to the region.

The impressive economic and population growth in Maricopa County has increased the need for transportation infrastructure funding statewide. The businesses currently in the proposed rail extension site have indicated rail access will alleviate the sizable commercial truck traffic that is required to import and export their products.

Engineering and economic analysis has shown that the project is feasible, the economic impacts are widespread, and the public benefits substantially exceed the requested grant funding. This project is an excellent opportunity to serve a growing region, increase connectivity to consumers and business supply chains, and support Arizona's growing high-skilled technological manufacturing industries.



PECOS INDUSTRIAL RAIL ACCESS AND TRAIN EXTENSION PROJECT

2021 RAISE Grant Application



Date: May 26th, 2021

To: PIRATE Team

From: Rounds Consulting Group, Inc.

Re: Updated Economic Impact Analysis of Project PIRATE

Introduction

This memo serves as an update to a previous report by Rounds Consulting Group (RCG) that analyzes the potential economic and fiscal implications related to the Project PIRATE (Pecos Industrial Rail Access and Train Extension) rail expansion in Mesa, Arizona.

That report was utilized as a part of a larger effort to submit a BUILD (Better Utilizing Investments to Leverage Development) Transportation Discretionary Grant application. Similarly, this updated analysis will be used to supplement a RAISE (Rebuilding American Infrastructure with Sustainability and Equity) Discretionary Grant application.

To review, Project PIRATE is a collaborative effort to construct approximately 7 miles of shortline railroad and various rail spurs that would provide rail access to the Pecos Advanced Manufacturing Zone located in southeast Mesa, Arizona.

In order to quantify the potential impact that rail can have on the rate and quality of economic growth in the region, an economic model was developed to measure the economic and fiscal impacts of the study area under four different scenarios. These scenarios include:

- 1) A scenario of no action, in which rail is not built and no other investment in infrastructure is made.
- 2) A scenario that includes the most likely gains that result from infrastructure investment (such as the development of rail).
- 3) A scenario that predicts an optimistic trajectory of growth resulting from enhanced development opportunities tied to the rail expansion.
- 4) A pessimistic scenario depicting a slight decay in economic activity.

The projections for each scenario occur within a 10-year timeline as this is the timeframe typically used by government planning organizations when analyzing the estimated impacts of potential investment decisions. Forecasts were derived from a review of current business activity, current business trajectories, projected business development opportunities directly tied to the rail, and extensive research.



Projected impacts were derived from a review of current business activity and trajectories, potential business development opportunities directly tied to the rail, and extensive research as well as interviews with local business and community leaders. These estimates are summarized in the following section. A review of the methodology and assumptions used in this analysis can be found in Appendix A.

Economic and Fiscal Impacts of Projected Growth Scenarios

Based on information from the Maricopa Association of Governments (MAG), the city of Mesa, and the local business owners, approximately 1,921 persons were employed in the PIRATE study area as of 2020. According to MAG, employment in the study area will grow from 1,921 to 15,939 by 2050 when the area approaches build-out, without the investment in additional infrastructure (such as the PIRATE project rail line).

The following summarizes the methodology and employment projections for each of the four forecast scenarios.

- The first scenario, the status quo, is a forecast based on the current business trajectory for the PIRATE study area under a plan of no action or not expanding the rail line. The 10-year MAG projections for the area were used as a baseline. This baseline was adjusted to account for expansion efforts of current businesses that will occur with or without the rail line. Under this scenario, employment in the PIRATE study area is projected to increase from 1,921 in 2020 to 5,064 in 2030 – a 10.2% average annual increase.
- The second scenario, the most likely scenario, is a forecast based on economic gains assuming the rail line is expanded, allowing for additional business development. The status quo projections were enhanced based on the likely business expansions and new business developments related to the new rail opportunities. Under this most likely scenario, employment is projected to increase to 10,644 by 2030 in the PIRATE study area – an 18.7% average annual increase.
- The third scenario, the optimistic scenario, is a forecast based on enhanced economic gains resulting from aggressive business expansions initiated from the rail development and an accelerated build-out timeline. This projection assumes expansion and economic opportunities are maximized. Under the optimistic scenario, employment is projected to increase to 15,755 in 2030 – a 23.4% average annual increase.
- The fourth scenario, the pessimistic scenario, is a forecast based on a decline in the status quo trajectory as a result of decays in economic gains from development barriers and businesses relocating. This assumes current businesses leave the PIRATE study area to relocate to areas because the current site is not suitable for planned expansions. Under the pessimistic scenario, employment is projected to increase to 3,444 in 2030 – a 6.0% average annual increase.

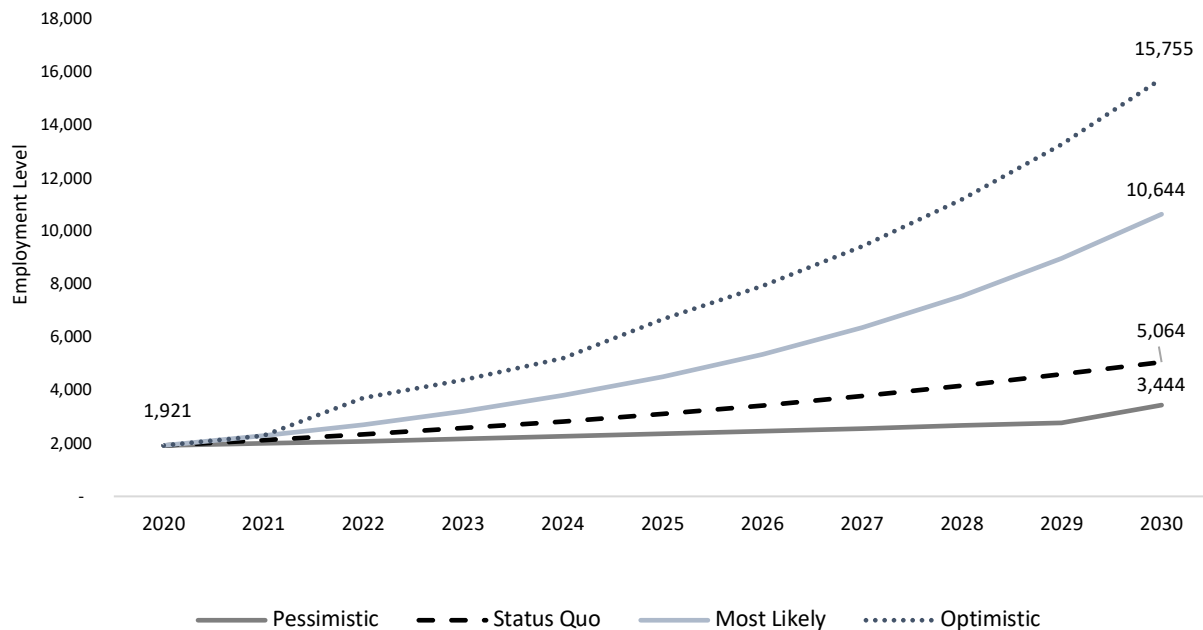


10-Year Employment Forecast Scenarios for the PIRATE Study Area					
Year	2020	2030			
Scenario	Actual	Pessimistic	Status Quo	Most Likely	Optimistic
Employment Level	1,921	3,444	5,064	10,644	15,755
Net Growth	-	1,523	3,143	8,723	13,834
Annual % Growth		6.0%	10.2%	18.7%	23.4%

Note: Employment projections for the PIRATE study area.

Source: Maricopa Association of Governments; Rounds Consulting Group, Inc.

10-Year Employment Forecast Scenarios for the PIRATE Study Area



Note: Employment projections for the PIRATE study area.

Source: Maricopa Association of Governments; Rounds Consulting Group, Inc.

Under the status quo scenario, without the rail proposed by the PIRATE project, employment in the study area is expected to reach 5,064 by 2030, an increase of 3,143 jobs from current levels. These new direct jobs support an additional 4,277 jobs in supplier businesses and tangential industries.

In this scenario, a total of 7,420 direct and secondary jobs generate \$1.9 billion in wages and produce a total of \$8.0 billion in economic output throughout the Greater Phoenix region over ten years. State and local governments will collect \$281.5 million in tax revenues over the 10-year period.

Under the most likely scenario, the rail proposed by the PIRATE project will enhance business expansion and encourage new business development in the study area. This is expected to increase the number of jobs in the study area from 5,064 under the plan of no action to 10,644 by 2030. This represents an 8,723 job increase from current levels.



These direct jobs support an additional 11,870 jobs in supplier businesses and tangential industries. In total, under the most likely scenario, 20,594 direct and secondary jobs produce \$4.6 billion in wages and \$19.7 billion in economic output. State and local governments will collect \$686.2 million in tax revenues over the 10-year period from the most likely scenario.

The optimistic scenario assumes that the PIRATE project initiates aggressive economic development efforts and accelerates the area's build-out. Under this scenario, employment in the study area increases by 13,834 new jobs by 2030, compared to current levels.

These direct jobs support an additional 18,826 jobs in supplier businesses and tangential industries. In total, the 32,661 new direct and secondary jobs produced under the optimistic scenario generate \$7.7 billion in wages and \$32.9 billion in economic output. State and local governments will collect \$1.1 billion in tax revenues over the 10-year period.

Under the pessimistic scenario, without the rail proposed by the PIRATE project, it is possible that prospects for business expansion in the area are hindered and businesses relocate from the area. Under this scenario, employment in the area increases to 3,444 by 2030. This represents an increase of 1,523 jobs from current levels, but a 32.0% decline in employment compared to the status quo scenario.

These direct jobs support an additional 2,073 jobs in supplier businesses and tangential industries. In total, the 3,596 direct and secondary jobs produced under the pessimistic scenario generate \$973.8 million in wages and \$4.2 billion in economic output. State and local governments will collect an estimated \$145.6 million in tax revenues over the 10-year period under the pessimistic scenario.

10-Year Economic and Fiscal Impact Totals				
Scenario	Total Jobs ¹⁾	Total Wages ²⁾	Total Economic Output ³⁾	Total Tax Revenues ⁴⁾
Pessimistic	3,596	\$973,798,000	\$4,152,996,000	\$145,565,000
Status Quo	7,420	\$1,886,175,200	\$8,044,046,800	\$281,474,300
Most Likely	20,594	\$4,612,745,100	\$19,672,159,600	\$686,220,200
Optimistic	32,661	\$7,726,073,200	\$32,949,694,600	\$1,144,952,500

¹⁾ Total primary and secondary jobs supported over 10-years.

²⁾ Total wages earned over 10-years.

³⁾ Total economic output generated over 10-years.

⁴⁾ Total state and local tax revenues generated over 10-years.

Note: May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



Appendix A: Model Methodology & Assumptions

Economic and fiscal impact models are an effective way to demonstrate regional implications of a particular project, policy, business, development, or other activities in a given area. The study area can range from a single neighborhood or city to an entire state or country. Typically, the level of effects resulting from the activity is estimated in terms of output, earnings, employment, and tax revenues.

RCG developed an economic and fiscal impact model to analyze the effects resulting from various growth scenarios. These are a scenario of no rail investment (status quo), a most likely scenario, which assumes the rail is installed, an optimistic scenario and a pessimistic scenario related to the Project PIRATE rail line expansion. The RCG model employs an input-output methodology commonly used by economists to determine impacts. This method was used to estimate the “multiplier” effects caused by the activities being analyzed.

Economic Impact Model Methodology

An economic impact model provides a quantifiable method to estimate the economic effects of a particular activity in a given area. Impacts can be used to measure existing activity and to measure potential expansions/contractions of an area’s economy resulting from changes in economic activity. In general, the level of economic effects resulting from the activity is estimated in terms of output, earnings and employment. These are defined as:

- *Output* captures the broader level of economic activity, or the total value of goods and services produced in the region, similar to how statistics like Gross Domestic Product (GDP) capture economic volume in individual states and across the country.
- *Earnings*, a component of output, represents income to employees. The earnings component is used to measure the total change in income throughout the economy due to economic or business activity.
- *Employment* is the job count on an annualized basis.

The economic effects occurring as a direct consequence of an initial activity create additional activity in a regional economy, forming the relationship known as the multiplier effect. The basis for multiplier effects (or spinoff effects) is the interdependencies between industries, how one industry impacts other sectors, and the cycle of spending and responding within the regional economy.

An input-output model is used to generate these multipliers. The multipliers quantify relationships among industries and estimate the extent to which the area being analyzed can capture sales, earnings and job impacts within the region.

Input-output models measure impacts based on their source. Direct effects are the result of the initial activity being analyzed. The multiplier effects, or secondary effects, are measured as either indirect or induced. These are defined as:



- *Direct effects, or primary impacts*, measure business activity at an individual site or the initial change in the economy attributed to the development under consideration. For example, if a manufacturing facility is under construction, the impacts would include the workers that construct the facility and the manufacturing employees that later occupy the building on a regular basis.
- *Indirect impacts* capture additional output, earnings and employment changes generated as a result of increased demand in the industries that supply services or products to the direct business or development under consideration. For example, when the direct manufacturing facility purchases goods for the production of its products, the supplier must respond to the increased demand by hiring new employees to support its operations.
- *Induced impacts* capture additional output, earnings and employment changes generated as a result of increased spending in the local economy made by the households of both the direct and indirect employees. These induced companies respond by hiring, increasing payroll hours, and increasing wages.

A common input-output model used to generate economic multipliers is IMPLAN (short for “impact analysis for planning”). Originally developed by the United States Forest Service in the 1970s, the responsibility for developing IMPLAN data sets shifted to the University of Minnesota as demand grew for regional models. Currently, IMPLAN runs as its own private organization and is the leading provider of nationwide economic impact data and analytical software.

The RCG custom economic impact model employs this input-output methodology and uses area-specific IMPLAN multipliers.

Fiscal Impact Model Methodology

Fiscal impact models provide estimates of the government revenues that are generated by a particular project, policy, business, development, or activity in a given area. Typically, fiscal impacts examine revenues that are likely to result from a project or activity and are determined by the study area’s tax structure. Fiscal impacts are categorized similarly to economic impact studies and are broken down at the direct, indirect and induced levels in which they are created. These revenues are expressed as either primary or secondary based on their source.

In general, primary (direct) revenues can be estimated by definable sources such as sales taxes calculated from construction expenditures. For example, when a contractor builds a manufacturing facility, 65% of the contractor’s gross receipts are subject to Arizona’s state and local construction sales taxes. Those taxes are paid to the state, county and city where the construction was performed.

Secondary (indirect and induced) revenues are generated by the wages, residency, and spending of those indirect and induced employees who are supported by the business or economic activity. For example, this would include sales tax revenues generated when the indirect and induced employees purchase dinner on their way home from work.



The RCG custom fiscal impact model employs this methodology. The model was designed to produce revenue information for municipal and county governments within Greater Phoenix and for the State of Arizona.

Model Assumptions

Economic and fiscal implications of an activity are determined by the interaction of a number of factors, including business characteristics (e.g., type of businesses, number of employees), location and study area characteristics (e.g., state and local tax structure), taxable activity (e.g., area retail sales), and by the nature of any economic or demographic effects resulting from the activity (e.g., new employment/population added to the area). Typical analyses include the short-term (e.g., effects from construction) and the ongoing (operational) regional economic impacts of a particular project or activity.

Short-term impacts are typically analyzed as construction impacts. Effects related to construction impacts are generally produced by on- and off-site construction employment and the other industries that support construction.

Ongoing impacts typically analyze the annual operational impacts. Effects related to ongoing impacts are generally produced by the day-to-day operations of a particular activity or business. Inputs needed to calculate operational impacts vary by the type of activity. In general, impacts can be derived from employment counts and annual salaries, as well as the type of business or industry the activity is in.

Impacts were calculated based on the assumptions derived from industry standards. These estimates were based on currently available information and tax structures. Such information was compiled from a number of sources and is subject to uncertainty and variation. Therefore, actual impacts may vary, and some impacts may not materialize due to unanticipated events, locations and changing circumstances.

PIRATE PROJECT

ECONOMIC ANALYSIS CASE STUDIES BUSINESS REVIEW

April 2020

Prepared by:



Rounds Consulting Group, Inc.
Economic and Policy Analysis



Table of Contents

ECONOMIC ANALYSIS EXECUTIVE SUMMARY	2
INTRODUCTION	4
MODEL METHODOLOGY & ASSUMPTIONS	4
Economic Impact Model Methodology	4
Fiscal Impact Model Methodology	6
Model Assumptions	6
ECONOMIC AND FISCAL IMPACTS	7
Study Area and Forecast Scenarios	7
Scenario 1: Status Quo/Plan of No Action	10
Scenario 2: Most Likely	11
Scenario 3: Optimistic Scenario	12
Scenario 4: Pessimistic Scenario	13
Economic and Fiscal Impact Scenario Comparisons	14
APPENDIX – A	16
APPENDIX – B	18
APPENDIX – C	20
APPENDIX – D	22
CASE STUDIES EXECUTIVE SUMMARY	24
Introduction	25
Pecos Advanced Manufacturing Zone	26
Humboldt Industrial Park	27
N.C. Industrial Center	31
Hugo Industrial Park	33
BUSINESS OVERVIEW	35
Businesses in the Pecos Advanced Manufacturing Zone	36

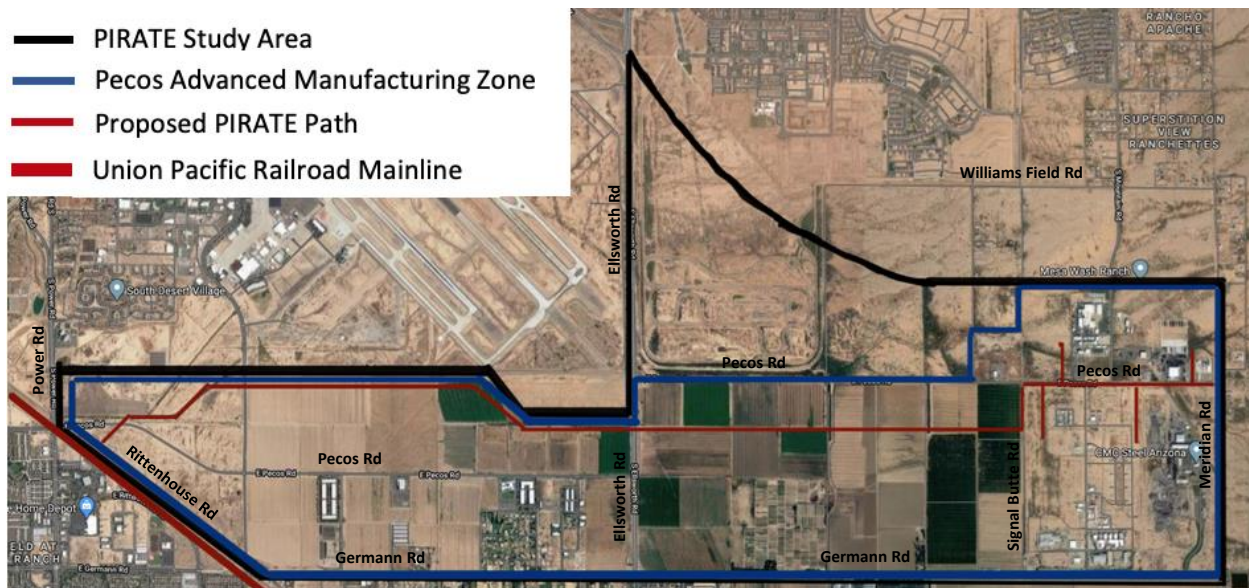


ECONOMIC ANALYSIS EXECUTIVE SUMMARY

Rounds Consulting Group, Inc. (RCG) was tasked with developing an economic analysis to provide perspective on the potential economic and fiscal implications related to the Project PIRATE (Pecos Industrial Rail Access and Train Extension) rail expansion in Mesa, Arizona. This analysis is part of a larger effort to complete and submit a BUILD (Better Utilizing Investments to Leverage Development) Transportation Discretionary Grant application.

Project PIRATE is a collaborate effort to construct approximately seven miles of shortline railroad and various rail spurs that would provide rail access to the Pecos Advanced Manufacturing Zone located in southeast Mesa, Arizona. The following is a depiction of the PIRATE project study area, which encompasses approximately 4,800 acres, and the proposed path of the rail line crossing through the Pecos Advanced Manufacturing Zone, connecting to the Union Pacific Railroad mainline.

Project PIRATE Study Area



Source: PIRATE Project; City of Mesa; Google Maps

An economic model was developed to quantify and compare various scenarios including a plan of no action (i.e., no rail expansion) and plans that include enhanced economic gains directly tied to the rail expansion. Impacts are estimated as either primary or secondary impacts. Impacts were derived from a review of current business activity, current business trajectories, projected business development opportunities directly tied to rail, and extensive research.

Activity that is directly generated within the PIRATE study area are considered primary impacts. This includes the direct businesses located within the study area and all of their employees. These impacts create additional regional activity outside of the PIRATE study area. These secondary impacts include the

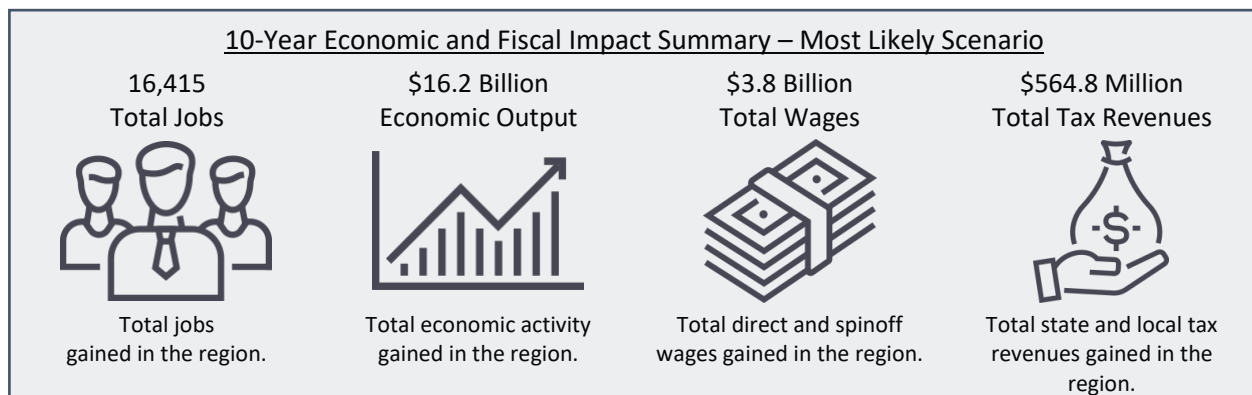


suppliers and other industries that supported by the primary businesses throughout the Greater Phoenix region.

Under a plan of no action, or the status quo, current businesses and new business development is projected to add approximately 5,506 jobs to the Greater Phoenix region by 2030. In the PIRATE study area alone, 2,332 jobs are estimated to be added by 2030.

If the rail line is constructed, the enhanced business development will likely add 6,953 jobs to the PIRATE study area and 16,415 jobs to the Greater Phoenix region by 2030. The regional job estimates include multiplier, or spinoff, jobs created as a result of the cycle of spending and re-spending within the local economy.

Regionwide, using the most likely scenario over the 10-year period, a total of \$16.2 billion in economic output and \$3.8 billion in wages are generated. This most likely scenario of the rail expansion generates \$564.8 million in state and local tax revenues by 2030.



Source: IMPLAN; Rounds Consulting Group, Inc.

With even more aggressive economic development efforts to help maximize rail and business opportunities, the region could add up to 24,571 jobs by 2030. While the extent of economic growth and the number of jobs added ultimately depends on various factors – such as the exact rail line location, expansion timeframe, and cooperation between stakeholders, policymakers, landowners, and business leaders, among others – the most likely scenario is estimated to add 16,415 jobs. Therefore, the most likely scenario would add 10,910 more jobs in the region than the 5,506 jobs currently being projected as the status quo scenario.



INTRODUCTION

Rounds Consulting Group, Inc. (RCG) was tasked with performing an economic analysis to provide perspective on the potential economic and fiscal implications related to the Project PIRATE (Pecos Industrial Rail Access and Train Extension) rail expansion in Mesa, Arizona. This analysis is part of a larger effort to complete and submit a BUILD (Better Utilizing Investments to Leverage Development) Transportation Discretionary Grant application.

Project PIRATE is a collaborate effort to construct approximately 7 miles of shortline railroad and various rail spurs that would provide rail access to the Pecos Advanced Manufacturing Zone located in southeast Mesa, Arizona. The PIRATE project study area encompasses approximately 4,800 acres.

An economic model was developed to quantify and compare economic impacts (including tax revenue potential) under four different scenarios. A scenario of no action, a scenario that includes the most likely gains that result from infrastructure investment (such as the development of rail), a scenario that predicts an optimistic trajectory of growth resulting from enhanced development opportunities tied to the rail expansion and a scenario depicting slight decay in economic activity. Impacts were derived from a review of current business activity, current business trajectories, projected business development opportunities directly tied to rail and extensive research.

MODEL METHODOLOGY & ASSUMPTIONS

Economic and fiscal impact models are an effective way to demonstrate regional implications of a particular project, policy, business, development or other activities in a given area. The study area can range from a single neighborhood or city to an entire state or country. Typically, the level of effects resulting from the activity are estimated in terms of output, earnings, employment, and tax revenues.

RCG developed an economic and fiscal impact model to analyze the effects resulting from various scenarios comparing a plan of no action, enhanced economic opportunities, and a decay in economic activity related to the Project PIRATE rail line expansion. The RCG model employs an input-output methodology commonly used by economists to determine impacts. This method was used to estimate the “multiplier” effects caused by the activities being analyzed.

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The RCG custom fiscal impact model employs this methodology. The model was designed to produce revenue information for municipal and county governments within Greater Phoenix and for the State of Arizona.

Model Assumptions

Economic and fiscal implications of an activity are determined by the interaction of a number of factors including business characteristics (e.g., type of businesses, number of employees), location and study area characteristics (e.g., state and local tax structure), taxable activity (e.g., area retail sales), and by the nature of any economic or demographic effects resulting from the activity (e.g., new employment/population added to area). Typical analyses include the short-term (e.g., effects from construction) and the ongoing (operational) regional economic impacts of a particular project or activity.

Short-term impacts are typically analyzed as construction impacts. Effects related to construction impacts are generally related to on- and off-site construction employment and the other industries that support construction.

Ongoing impacts typically analyze the annual operational impacts. Effects related to ongoing impacts are generally related to the day-to-day operations of a particular activity or business. Inputs needed to



calculate operational impacts vary by the type of activity. In general, impacts can be derived from employment counts and annual salaries, as well as the type of business or industry the activity is in.

Impacts were calculated based on the assumptions derived from industry standards. These estimates were based on currently available information and tax structures. Such information was compiled from a number of sources and is subject to uncertainty and variation. Therefore, actual impacts may vary, and some impacts may not materialize due to unanticipated events, locations and changing circumstances.

ECONOMIC AND FISCAL IMPACTS

In order to analyze and compare the potential economic opportunities related to the rail expansion, various employment and business statistics for the study area were gathered and assessed. This included information on current business operations, population and employment projections from the Maricopa Association of Governments (MAG), land availability from the Maricopa County Assessor's Office, land use and zoning designations from the city of Mesa, stakeholder interviews and various other industrial standards.

Based on the aforementioned information, four economic projections for the study area were developed to provide perspective on the economic opportunities each scenario presents and to compare the different economic and fiscal implications resulting from the various scenarios. The four scenarios are: 1) a plan of no action or the status quo, 2) the most likely economic gains resulting from the rail line expansion, 3) an optimistic trajectory resulting from enhanced development opportunities tied to the rail expansion, and 4) pessimistic projections if economic gains decay due to development barriers and businesses relocating elsewhere.

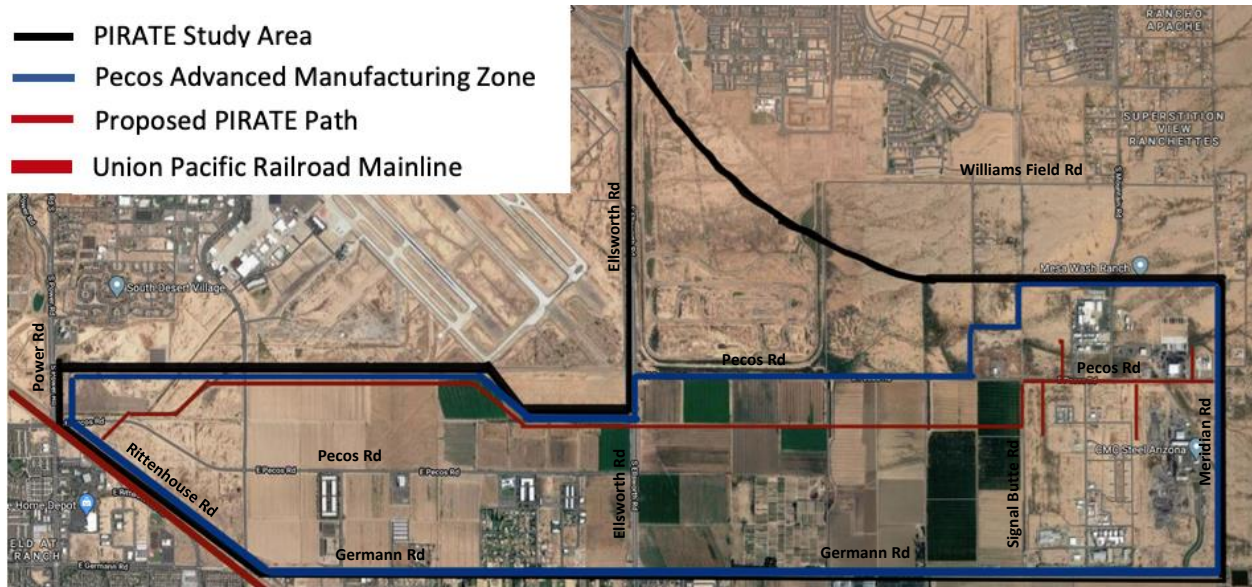
The scenarios were then modeled to estimate the various economic and fiscal impacts. The model primarily calculates impacts based on the projected employment in the various scenarios. These projections and the economic and fiscal impacts are summarized in the following sections.

Study Area and Forecast Scenarios

Project PIRATE is a collaborate effort to construct approximately seven miles of shortline railroad and various rail spurs that would provide rail access to the Pecos Advanced Manufacturing Zone located in southeast Mesa, Arizona. The following is a depiction of the PIRATE project study area, which encompasses approximately 4,800 acres, and the proposed path of the rail line crossing through the Pecos Advanced Manufacturing Zone, connecting to the Union Pacific Railroad mainline. The study area is strategically located near the Phoenix-Mesa Gateway Airport and the Loop 202 Santan Freeway.



Project PIRATE Study Area



Based on information from MAG, the city of Mesa, and the local business owners, approximately 1,921 persons are employed in the PIRATE study area as of 2020. Currently, there is more than 1,000 acres of vacant and underutilized land available for immediate industrial and businesses development. According to MAG, employment in the study area will grow from 1,921 in 2020 to 14,252 in 2050 (increasing by 12,331 jobs) when the area approaches build-out.

When analyzing economic and fiscal impacts, governments and organizations typically utilize a 10-year timeframe. Four projections were developed to quantify and compare various scenarios including a plan of no action and plans that include enhanced economic gains directly tied to the rail expansion over a 10-year period. Forecasts were derived from a review of current business activity, current business trajectories, projected business development opportunities directly tied to rail and extensive research.

The following summarizes the methodology and employment projections for each of the four forecast scenarios.

- The first scenario, the status quo, is a forecast based on the current business trajectory for the PIRATE study area under a plan of no action or not expanding the rail line. The 10-year MAG projections for the area were collected and adjusted in accordance with feedback from local businesses in the study area. Under this scenario, employment in the PIRATE study area is projected to increase by 2,332 from 1,921 in 2020 to 4,253 in 2030 – an 8.3% annual increase.
- The second scenario, the most likely scenario, is a forecast based on economic gains assuming the rail line is expanded allowing for additional business development. The status quo projections



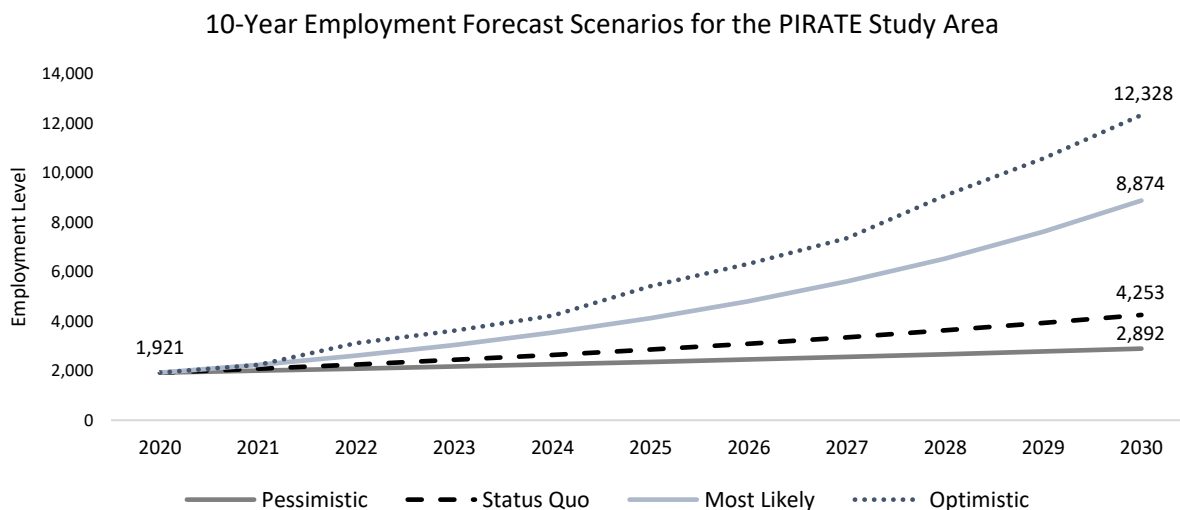
were enhanced based on the likely business expansions and new business developments related to the new rail opportunities. Under this most likely scenario, employment is projected to increase by 6,953 from 1,921 in 2020 to 8,874 by 2030 in the PIRATE study area – a 16.5% annual increase.

- The third scenario, the optimistic scenario, is a forecast based on enhanced economic gains resulting from aggressive business expansions initiated from the rail development and an accelerated build-out timeline. This projection assumes expansion and economic opportunities are maximized. Under the optimistic scenario, employment is projected to increase by 10,407 in the PIRATE study area from 1,921 in 2020 to 12,328 in 2030 – a 20.4% annual increase.
- The fourth scenario, the pessimistic scenario, is a forecast based on a decline in the status quo trajectory as a result of decays in economic gains from development barriers and businesses relocating. This assumes current businesses leave the PIRATE study area because their current site is not suitable for planned expansions or relocate to areas with enhanced rail access. Under the pessimistic scenario, employment is projected to increase by 971 in the study area from 1,921 in 2020 to 2,892 in 2030 – a 4.2% annual increase.

10-Year Employment Forecast Scenarios for the PIRATE Study Area					
Year	2020	2030			
Scenario	Actual	Pessimistic	Status Quo	Most Likely	Optimistic
Employment Level	1,921	2,892	4,253	8,874	12,328
Net Growth	-	971	2,332	6,953	10,407
Annual % Growth		4.2%	8.3%	16.5%	20.4%

Note: Employment projections for the PIRATE study area.

Source: Maricopa Association of Governments; Rounds Consulting Group, Inc.



Note: Employment projections for the PIRATE study area.

Source: Maricopa Association of Governments; Rounds Consulting Group, Inc.



Scenario 1: Status Quo/Plan of No Action

Under the status quo scenario, employment in the PIRATE study area is projected to increase by 2,332 by 2030 – an 8.3% annual increase. Over 10 years, the 2,332 direct jobs will generate \$623.9 million in wages and produce \$3.6 billion in economic output. State and local governments will collect \$96.8 million in tax revenues from the forecasted growth in the study area.

Another 3,174 jobs, \$816.7 million in wages, and \$2.5 billion in economic output is generated from indirect and induced activities over 10 years throughout the region. State and local governments will collect \$118.3 million in secondary tax revenues over the same 10-year period. These secondary impacts are generated as a result of the multiplier effect as primary businesses increase their utilization of local supply chains, and as direct and indirect employees spend on local goods and services.

In total, the Greater Phoenix region is forecasted to add 5,506 jobs under the status quo scenario. The direct, indirect, and induced wages earned by these employees total \$1.4 billion over the 10-year period. The status quo scenario produces a total of \$6.1 billion in economic output throughout the region over 10 years.

The following table summarizes the 10-year total impacts of the status quo. Annual estimates are found in the [Appendix – A](#).

10-Year Impact of the Status Quo/Plan of No Action			
Economic & Fiscal Impacts	Primary ¹⁾	Secondary ²⁾	Totals
Jobs ³⁾	2,332	3,174	5,506
Wages ⁴⁾	\$623,902,000	\$816,701,100	\$1,440,603,200
Economic Output ⁵⁾	\$3,611,259,700	\$2,532,538,800	\$6,143,798,500
Tax Revenues ⁶⁾	\$96,834,200	\$118,312,600	\$215,146,800

¹⁾ Primary, or direct, impact generated from the PIRATE study area.

²⁾ Secondary, or indirect and induced, impact generated for the region from activity in the PIRATE study area.

³⁾ Number of jobs over 10-years.

⁴⁾ Total wages earned over 10-years.

⁵⁾ Total economic output generated over 10-years.

⁶⁾ Total state and local tax revenues generated over 10-years.

Note: May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



Scenario 2: Most Likely

Under the most likely scenario, the rail line expansion would increase the number of jobs in the PIRATE study area from 2,332 expected under the status quo to 6,953 by 2030. Over 10 years, the 6,953 direct jobs projected for the study area will generate \$1.6 billion in wages and \$9.5 billion in economic output. State and local governments will collect \$253.2 million in tax revenues from primary activities over the 10-year period.

The economic effects occurring as a direct consequence of the initial activity create additional secondary activity in the regional economy. Over 10 years, an additional 9,462 indirect and induced jobs are created throughout Greater Phoenix in the most likely scenario. These jobs are created as supplier companies hire new employees to meet the new demand from primary businesses; and as businesses hire new employees to work in local grocery, restaurant, retail, etc. stores where direct and indirect employees shop.

In total, \$2.2 billion in wages are earned by the 9,462 indirect and induced jobs over 10 years. The economic output produced by the secondary activities totals \$6.7 billion. By 2030, state and local governments collect \$311.6 million in tax revenues from the indirect and induced activities.

Overall, 16,415 jobs (direct, indirect and induced) are created within the PIRATE study area and throughout Greater Phoenix in the most likely scenario resulting from the rail expansion. Over 10 years, \$3.8 billion in wages and \$16.2 billion in economic output is produced throughout the region. State and local governments collect \$564.8 million in tax revenues from direct, indirect and induced activities resulting from the rail expansion over the 10-year period.

The following table summarizes the 10-year total impacts of the status quo. Annual estimates are found in the [Appendix – B](#).

10-Year Impact of the Most Likely Scenario			
Economic & Fiscal Impacts	Primary ¹⁾	Secondary ²⁾	Totals
Jobs ³⁾	6,953	9,462	16,415
Wages ⁴⁾	\$1,642,970,900	\$2,150,683,300	\$3,793,654,500
Economic Output ⁵⁾	\$9,509,815,900	\$6,669,134,800	\$16,178,950,600
Tax Revenues ⁶⁾	\$253,216,200	\$311,561,800	\$564,778,000

¹⁾ Primary, or direct, impact generated from the PIRATE study area.

²⁾ Secondary, or indirect and induced, impact generated for the region from activity in the PIRATE study area.

³⁾ Number of jobs over 10-years.

⁴⁾ Total wages earned over 10-years.

⁵⁾ Total economic output generated over 10-years.

⁶⁾ Total state and local tax revenues generated over 10-years.

Note: May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



Scenario 3: Optimistic Scenario

Under the optimistic scenario, employment in the PIRATE study area is projected to increase by 10,407 versus the 2,332 projected under the status quo scenario and 6,953 projected under the most likely scenario. Over 10 years, the 10,407 direct jobs will generate \$2.5 billion in wages and produce \$14.4 billion in economic output. State and local governments will collect \$380.1 million in tax revenues from the forecasted growth in the study area.

Another 14,163 spinoff jobs, \$3.3 billion in wages, and \$10.1 billion in economic output is generated from indirect and induced activities over 10 years throughout the region. State and local governments will collect \$471.3 million in secondary tax revenues over the same 10-year period. These secondary impacts are generated as a result of the multiplier effect.

In total, the Greater Phoenix region is projected to add 24,571 jobs by 2030 under the optimistic scenario. The direct, indirect, and induced wages earned by these employees totals \$5.7 billion over the 10-year period. The optimistic scenario produces a total of \$24.5 billion in economic output throughout the region over 10 years.

The following table summarizes the 10-year total impacts of the status quo. Annual estimates are found in the [Appendix – C](#).

10-Year Impact of the Optimistic Scenario			
Economic & Fiscal Impacts	Primary ¹⁾	Secondary ²⁾	Totals
Jobs ³⁾	10,407	14,163	24,571
Wages ⁴⁾	\$2,485,318,000	\$3,253,333,700	\$5,738,651,700
Economic Output ⁵⁾	\$14,385,474,800	\$10,088,383,400	\$24,473,858,500
Tax Revenues ⁶⁾	\$380,063,800	\$471,299,000	\$851,362,800

¹⁾ Primary, or direct, impact generated from the PIRATE study area.

²⁾ Secondary, or indirect and induced, impact generated for the region from activity in the PIRATE study area.

³⁾ Number of jobs over 10-years.

⁴⁾ Total wages earned over 10-years.

⁵⁾ Total economic output generated over 10-years.

⁶⁾ Total state and local tax revenues generated over 10-years.

Note: May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



Scenario 4: Pessimistic Scenario

Under the pessimistic scenario – a decrease in the status quo trajectory as a result of decays in economic gains from development barriers and businesses relocating – employment in the PIRATE study area is projected to increase by 971 by 2030. Over 10 years, the 971 direct jobs will generate \$276.5 million in wages and produce \$1.6 billion in economic output. State and local governments will collect \$43.1 million in tax revenues from the forecasted growth in the study area.

Over the 10-year period, another 1,321 secondary jobs will be added throughout Greater Phoenix under the pessimistic scenario. The economic output and wages produced by the secondary activities sum to \$1.1 billion and \$362.0 million, respectively. Over 10 years, state and local governments collect \$52.4 million in tax revenues from the indirect and induced activities.

Overall, 2,292 jobs (direct, indirect, and induced) are created in the pessimistic scenario. Over 10 years, \$638.5 million in wages and \$2.7 billion in economic output is produced throughout the region. State and local governments collect \$95.5 million in tax revenues from direct, indirect and induced activities resulting from the pessimistic scenario over the 10-year period.

The following table summarizes the 10-year total impacts of the status quo. Annual estimates are found in [Appendix – D](#).

10-Year Impact of the Pessimistic Scenario			
Economic & Fiscal Impacts	Primary ¹⁾	Secondary ²⁾	Totals
Jobs ³⁾	971	1,321	2,292
Wages ⁴⁾	\$276,513,300	\$361,961,800	\$638,474,900
Economic Output ⁵⁾	\$1,600,509,300	\$1,122,420,600	\$2,722,929,900
Tax Revenues ⁶⁾	\$43,070,300	\$52,436,500	\$95,506,800

¹⁾ Primary, or direct, impact generated from the PIRATE study area.

²⁾ Secondary, or indirect and induced, impact generated for the region from activity in the PIRATE study area.

³⁾ Number of jobs over 10-years.

⁴⁾ Total wages earned over 10-years.

⁵⁾ Total economic output generated over 10-years.

⁶⁾ Total state and local tax revenues generated over 10-years.

Note: May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



Economic and Fiscal Impact Scenario Comparisons

Again, the pessimistic scenario is a forecast based on a decrease in the status quo trajectory that results from decays as business expansions are hindered and businesses relocate from the area. The status quo is a forecast based on the current business trajectory under a plan of no action (no rail line expansion). The most likely scenario is a forecast assuming the rail line is expanded allowing for enhanced business development. The optimist scenario is a forecast based on aggressive business expansions resulting from the rail line expansion.

10-Year Economic and Fiscal Impact Scenario Comparisons				
Scenario	Total Jobs	Total Wages	Total Economic Output	Total Tax Revenues
Pessimistic	2,292	\$638,474,900	\$2,722,929,900	\$95,506,800
Status Quo	5,506	\$1,440,603,200	\$6,143,798,500	\$215,146,800
Most Likely	16,415	\$3,793,654,500	\$16,178,950,600	\$564,778,000
Optimistic	24,571	\$5,738,651,700	\$24,473,858,500	\$851,362,800

¹⁾ Primary, or direct, impact generated from the PIRATE study area.

²⁾ Secondary, or indirect and induced, impact generated for the region from activity in the PIRATE study area.

³⁾ Number of jobs over 10-years.

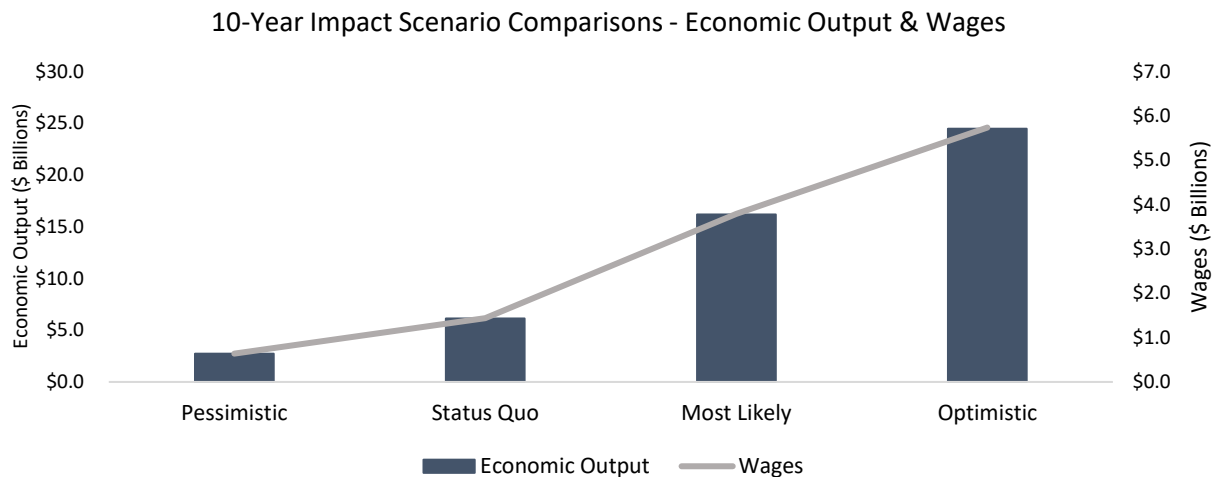
⁴⁾ Total wages earned over 10-years.

⁵⁾ Total economic output generated over 10-years.

⁶⁾ Total state and local tax revenues generated over 10-years.

Note: May not sum to total due to rounding.

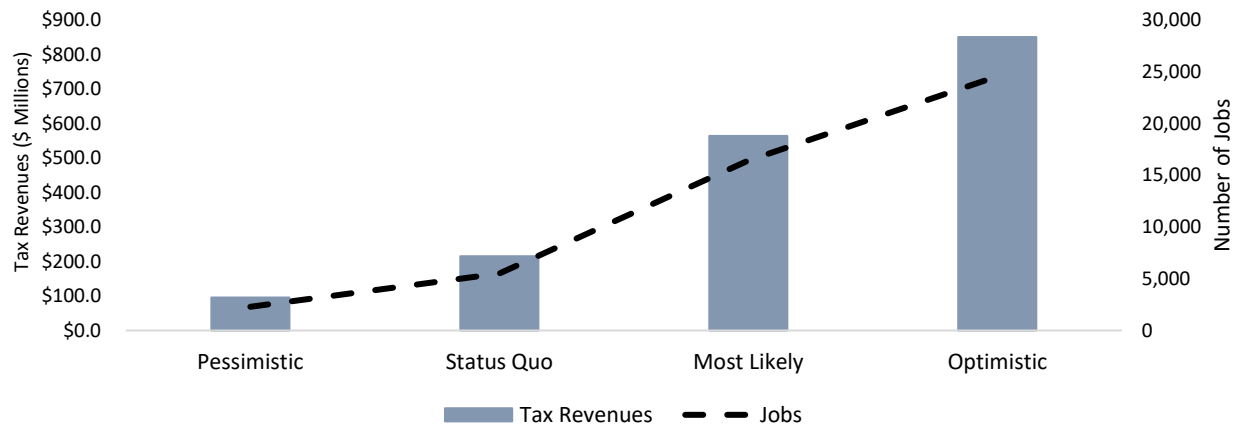
Source: IMPLAN; Rounds Consulting Group, Inc.



Source: IMPLAN; Rounds Consulting Group, Inc.



10-Year Impact Scenario Comparisons - Tax Revenues & Jobs



Source: IMPLAN; Rounds Consulting Group, Inc.



APPENDIX – A

10-Year Impact of Status Quo Scenario - Primary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	159	\$8,763,700	\$50,725,900	\$1,370,500
2022	331	\$18,252,300	\$105,647,800	\$2,851,400
2023	517	\$28,525,900	\$165,113,100	\$4,451,500
2024	719	\$39,649,300	\$229,497,300	\$6,180,500
2025	937	\$51,692,800	\$299,207,600	\$8,048,500
2026	1,174	\$64,732,600	\$374,684,400	\$10,066,200
2027	1,430	\$78,851,100	\$456,404,700	\$12,244,400
2028	1,707	\$94,137,500	\$544,885,100	\$14,597,300
2029	2,007	\$110,688,400	\$640,684,700	\$17,138,800
2030	2,332	\$128,608,400	\$744,409,100	\$19,885,100
Total	2,332	\$623,902,000	\$3,611,259,700	\$96,834,200

Note: Direct impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.

10-Year Impact of Status Quo Scenario - Secondary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	216	\$11,471,900	\$35,573,600	\$1,661,800
2022	450	\$23,892,700	\$74,089,700	\$3,461,100
2023	704	\$37,341,000	\$115,792,000	\$5,409,500
2024	978	\$51,901,700	\$160,944,100	\$7,518,900
2025	1,276	\$67,667,000	\$209,831,100	\$9,802,800
2026	1,597	\$84,736,400	\$262,762,300	\$12,275,300
2027	1,946	\$103,217,800	\$320,071,900	\$14,952,800
2028	2,323	\$123,228,000	\$382,122,300	\$17,851,600
2029	2,731	\$144,893,400	\$449,305,500	\$20,990,300
2030	3,174	\$168,351,200	\$522,046,300	\$24,388,500
Total	3,174	\$816,701,100	\$2,532,538,800	\$118,312,600

Note: Indirect and Induced impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



10-Year Impact of Status Quo Scenario - Totals				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	375	\$20,235,600	\$86,299,400	\$3,032,300
2022	781	\$42,145,000	\$179,737,600	\$6,312,500
2023	1,221	\$65,866,900	\$280,905,100	\$9,861,000
2024	1,697	\$91,551,000	\$390,441,400	\$13,699,400
2025	2,213	\$119,359,800	\$509,038,700	\$17,851,300
2026	2,771	\$149,469,000	\$637,446,600	\$22,341,500
2027	3,376	\$182,068,900	\$776,476,600	\$27,197,200
2028	4,030	\$217,365,500	\$927,007,400	\$32,448,900
2029	4,738	\$255,581,900	\$1,089,990,300	\$38,129,100
2030	5,506	\$296,959,600	\$1,266,455,400	\$44,273,600
Total	5,506	\$1,440,603,200	\$6,143,798,500	\$215,146,800

Note: Sum of direct, indirect, and induced impacts. May not sum to total due to rounding.
Source: IMPLAN; Rounds Consulting Group, Inc.



APPENDIX – B

10-Year Impact of Most Likely Scenario - Primary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	318	\$17,518,300	\$101,399,200	\$2,740,800
2022	688	\$37,933,400	\$219,565,600	\$5,919,100
2023	1,119	\$61,724,300	\$357,271,600	\$9,608,500
2024	1,622	\$89,449,200	\$517,748,400	\$13,892,000
2025	2,208	\$121,758,600	\$704,761,200	\$18,866,500
2026	2,891	\$159,410,700	\$922,698,000	\$24,645,500
2027	3,686	\$203,288,700	\$1,176,672,400	\$31,359,200
2028	4,613	\$254,422,400	\$1,472,643,300	\$39,162,200
2029	5,694	\$314,011,400	\$1,817,555,200	\$48,234,800
2030	6,953	\$383,453,900	\$2,219,501,000	\$58,787,600
Total	6,953	\$1,642,970,900	\$9,509,815,900	\$253,216,200

Note: Direct impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.

10-Year Impact of Most Likely Scenario - Secondary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	432	\$22,931,800	\$71,110,200	\$3,322,200
2022	936	\$49,655,700	\$153,979,100	\$7,193,500
2023	1,523	\$80,798,400	\$250,550,800	\$11,705,000
2024	2,207	\$117,090,900	\$363,091,600	\$16,962,400
2025	3,005	\$159,384,600	\$494,241,700	\$23,089,600
2026	3,934	\$208,671,900	\$647,078,500	\$30,229,500
2027	5,016	\$266,109,200	\$825,188,100	\$38,550,300
2028	6,278	\$333,044,200	\$1,032,749,400	\$48,246,900
2029	7,749	\$411,047,500	\$1,274,632,500	\$59,546,900
2030	9,462	\$501,949,100	\$1,556,512,900	\$72,715,500
Total	9,462	\$2,150,683,300	\$6,669,134,800	\$311,561,800

Note: Indirect and Induced impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



10-Year Impact of Most Likely Scenario - Totals				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	750	\$40,450,100	\$172,509,400	\$6,063,000
2022	1,624	\$87,589,100	\$373,544,700	\$13,112,600
2023	2,642	\$142,522,700	\$607,822,400	\$21,313,500
2024	3,829	\$206,540,100	\$880,840,000	\$30,854,400
2025	5,212	\$281,143,200	\$1,199,002,900	\$41,956,100
2026	6,824	\$368,082,600	\$1,569,776,500	\$54,875,000
2027	8,702	\$469,397,900	\$2,001,860,500	\$69,909,500
2028	10,891	\$587,466,600	\$2,505,392,700	\$87,409,100
2029	13,442	\$725,058,900	\$3,092,187,700	\$107,781,700
2030	16,415	\$885,403,000	\$3,776,013,900	\$131,503,100
Total	16,415	\$3,793,654,200	\$16,178,950,700	\$564,778,000

Note: Sum of direct, indirect, and induced impacts. May not sum to total due to rounding.
Source: IMPLAN; Rounds Consulting Group, Inc.



APPENDIX – C

10-Year Impact of Optimistic Scenario - Primary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	318	\$17,518,300	\$101,399,200	\$2,740,800
2022	1,188	\$65,508,100	\$379,173,000	\$10,065,400
2023	1,702	\$93,858,700	\$543,271,300	\$14,445,900
2024	2,301	\$126,897,300	\$734,504,600	\$19,532,700
2025	3,499	\$192,973,700	\$1,116,967,100	\$29,589,300
2026	4,395	\$242,401,700	\$1,403,065,300	\$37,147,200
2027	5,440	\$300,003,000	\$1,736,472,000	\$45,930,300
2028	7,157	\$394,703,800	\$2,284,617,500	\$60,286,100
2029	8,658	\$477,489,300	\$2,763,795,500	\$72,852,400
2030	10,407	\$573,964,100	\$3,322,209,300	\$87,473,700
Total	10,407	\$2,485,318,000	\$14,385,474,800	\$380,063,800

Note: Direct impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.

10-Year Impact of Optimistic Scenario - Secondary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	432	\$22,931,800	\$71,110,200	\$3,322,200
2022	1,616	\$85,751,500	\$265,910,100	\$12,422,300
2023	2,316	\$122,863,000	\$380,990,500	\$17,798,600
2024	3,131	\$166,111,200	\$515,100,400	\$24,064,000
2025	4,762	\$252,606,700	\$783,317,300	\$36,594,200
2026	5,981	\$317,309,000	\$983,955,100	\$45,967,400
2027	7,403	\$392,710,200	\$1,217,769,700	\$56,890,700
2028	9,740	\$516,675,500	\$1,602,178,400	\$74,849,100
2029	11,783	\$625,043,600	\$1,938,221,000	\$90,547,800
2030	14,163	\$751,331,200	\$2,329,830,700	\$108,842,700
Total	14,163	\$3,253,333,700	\$10,088,383,400	\$471,299,000

Note: Indirect and Induced impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



10-Year Impact of Optimistic Scenario - Totals				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	750	\$40,450,100	\$172,509,400	\$6,063,000
2022	2,804	\$151,259,600	\$645,083,100	\$22,487,700
2023	4,018	\$216,721,700	\$924,261,800	\$32,244,500
2024	5,432	\$293,008,500	\$1,249,605,000	\$43,596,700
2025	8,261	\$445,580,400	\$1,900,284,400	\$66,183,500
2026	10,377	\$559,710,700	\$2,387,020,400	\$83,114,600
2027	12,843	\$692,713,200	\$2,954,241,700	\$102,821,000
2028	16,897	\$911,379,300	\$3,886,795,900	\$135,135,200
2029	20,441	\$1,102,532,900	\$4,702,016,500	\$163,400,200
2030	24,571	\$1,325,295,300	\$5,652,040,000	\$196,316,400
Total	24,571	\$5,738,651,700	\$24,473,858,200	\$851,362,800

Note: Sum of direct, indirect, and induced impacts. May not sum to total due to rounding.
Source: IMPLAN; Rounds Consulting Group, Inc.



APPENDIX – D

10-Year Impact of Pessimistic Scenario - Primary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	80	\$4,424,100	\$25,607,700	\$691,600
2022	164	\$9,033,000	\$52,284,900	\$1,411,300
2023	251	\$13,834,400	\$80,076,000	\$2,160,700
2024	342	\$18,836,300	\$109,027,800	\$2,940,800
2025	436	\$24,047,000	\$139,188,500	\$3,752,500
2026	534	\$29,475,400	\$170,608,800	\$4,596,400
2027	637	\$35,130,400	\$203,341,100	\$5,474,100
2028	744	\$41,021,600	\$237,440,400	\$6,386,400
2029	855	\$47,158,800	\$272,963,700	\$7,334,700
2030	971	\$53,552,300	\$309,970,400	\$8,321,800
Total	971	\$276,513,300	\$1,600,509,300	\$43,070,300

Note: Direct impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.

10-Year Impact of Pessimistic Scenario - Secondary				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	109	\$5,791,300	\$17,958,400	\$839,200
2022	223	\$11,824,400	\$36,666,900	\$1,713,100
2023	341	\$18,109,600	\$56,156,500	\$2,623,400
2024	465	\$24,657,000	\$76,460,100	\$3,572,000
2025	593	\$31,478,100	\$97,611,400	\$4,560,200
2026	727	\$38,583,900	\$119,646,100	\$5,589,500
2027	867	\$45,986,500	\$142,601,100	\$6,661,800
2028	1,012	\$53,698,100	\$166,514,500	\$7,779,200
2029	1,164	\$61,731,900	\$191,426,600	\$8,942,800
2030	1,321	\$70,101,000	\$217,379,000	\$10,155,300
Total	1,321	\$361,961,800	\$1,122,420,600	\$52,436,500

Note: Indirect and Induced impacts. May not sum to total due to rounding.

Source: IMPLAN; Rounds Consulting Group, Inc.



10-Year Impact of Pessimistic Scenario - Totals				
Year	Jobs	Wages	Economic Output	Tax Revenues
2021	189	\$10,215,400	\$43,566,100	\$1,530,800
2022	387	\$20,857,400	\$88,951,800	\$3,124,400
2023	592	\$31,944,000	\$136,232,500	\$4,784,100
2024	806	\$43,493,300	\$185,487,900	\$6,512,800
2025	1,029	\$55,525,100	\$236,799,900	\$8,312,700
2026	1,262	\$68,059,300	\$290,254,900	\$10,185,900
2027	1,504	\$81,116,900	\$345,942,200	\$12,135,900
2028	1,756	\$94,719,700	\$403,954,900	\$14,165,600
2029	2,019	\$108,890,700	\$464,390,300	\$16,277,500
2030	2,292	\$123,653,300	\$527,349,400	\$18,477,100
Total	2,292	\$638,475,100	\$2,722,929,900	\$95,506,800

Note: Sum of direct, indirect, and induced impacts. May not sum to total due to rounding.
Source: IMPLAN; Rounds Consulting Group, Inc.



CASE STUDIES EXECUTIVE SUMMARY

The Pecos Industrial Rail Access and Train Extension (PIRATE) project is a collaborative effort from business professionals, government agencies, and private consultants. PIRATE aims to construct approximately seven miles of short line railroad and various rail spurs that will provide rail access to the Pecos Advanced Manufacturing Zone located in Mesa, Arizona. Extensive research and analysis from this effort show that the PIRATE project provides significant economic benefits to the Pecos Advanced Manufacturing Zone and the surrounding region.

This report includes research into existing areas around the United States that have benefited from rail access. The research and subsequent analysis provide context to the impact the PIRATE project will have on the Pecos Advanced Manufacturing Zone, the economic development of the surrounding region, the ability for existing businesses to expand operations, and the area's ability to attract and retain high wage jobs.

This report summarizes three developments: the Humboldt Industrial Park in Luzerne County, Pennsylvania; the N.C. Industrial Center in Alamance County, North Carolina, and the Hugo Industrial Park in Hugo, Minnesota. Each of these developments were originally designed and constructed without an operational rail line. The separate developments each experienced significant growth following the establishment of rail.

The Humboldt Industrial Park (HUMBOLDT) currently consists of over 3,000 developed acres, more than double the size since first opening. Beginning with 1,140 acres in 1972, the HUMBOLDT saw moderate development growth until 1996 when seven and a half miles of rail line was constructed. This is approximately the same amount of rail as proposed in the PIRATE project. Since adding the rail, the amount of developed land has grown 108.3%. Presently, there are more than 60 companies that have operations in HUMBOLDT, employing more than 10,000 people.

The N.C. Industrial Center (NCIC) in Alamance County, North Carolina consists of over 600 acres. The NCIC's area is smaller than the Pecos Advanced Manufacturing Zone; however, the effects of rail access at the NCIC have been considerable. In 2014, Cambro, a California based manufacturer of storage and transport equipment for the food services industry, began construction of a 220,000 square foot facility in the NCIC. A section of rail was completed that gave Cambro and several other parcels rail access in 2016. In the three years following the completion of the rail, Cambro announced intentions to expand operations at the NCIC. In 2019, Cambro began construction of an additional 250,000 sq. ft. building at the NCIC. This effectively doubles their physical presence in the NCIC and demands a larger workforce. It is anticipated that Cambro will hire for new jobs to accommodate the increased production in upcoming years.

An analysis of the Hugo Industrial Park (HIP) in Hugo, Minnesota shows how an operating rail service can prevent expanding manufacturers from leaving the region. The HIP had originally been developed with



6.3 miles of rail; however, it was only partially operational. Low rail traffic and high costs prevented repairs from being made. The Minnesota Commercial Railway Company, the owner of the rail, also announced they were abandoning that section of rail in 2015.

Concerned the absence of rail could harm Hugo's economy, leadership from various companies in the park – in partnership with city, county and state officials – secured the funds to repair and restore the rail to full operating capacity. This proved significant, as it was later discovered that two major local employers, JL Schwieters Construction and Loadmaster Lubricants, were considering expansion. Without restoration of the rail, the two companies would have had to locate elsewhere.

Instead, both JL Schwieters Construction and Loadmaster Lubricants, who together employ over 520 people, have announced plans to expand. JL Schwieters Construction is completing a \$14M, 140,000 sq. ft. manufacturing facility and plans to hire nearly 100 additional employees. Loadmaster Lubricants is anticipating an expansion within five years due to the reduced shipping costs offered by the rail line.

Introduction

The Pecos Industrial Rail Access and Train Extension (PIRATE) project is a collaborative effort from area businesses, municipal and county governments, and private consultants. The PIRATE project aims to construct approximately seven miles of short line railroad and various rail spurs that will provide rail access to the Pecos Advanced Manufacturing Zone located in Mesa, Arizona. Extensive research and analysis from this effort show the PIRATE project provides significant economic benefits to the Pecos Advanced Manufacturing Zone and the surrounding region.

As part of the larger effort to support the PIRATE project, extensive research was conducted to find existing industrial areas that have benefited from rail access. The purpose of this research was to find various developments that have similar characteristics to the Pecos Advanced Manufacturing Zone and can provide context to the realistic growth the PIRATE project can bring to the region.

This report summarizes three such developments; the Humboldt Industrial Park in Luzerne County, Pennsylvania, the N.C. Industrial Center in Alamance County, North Carolina, and the Hugo Industrial Park in Hugo, Minnesota. These developments were all originally designed and constructed without operating rail access. Each development realized significant growth in the years following the establishment of rail.

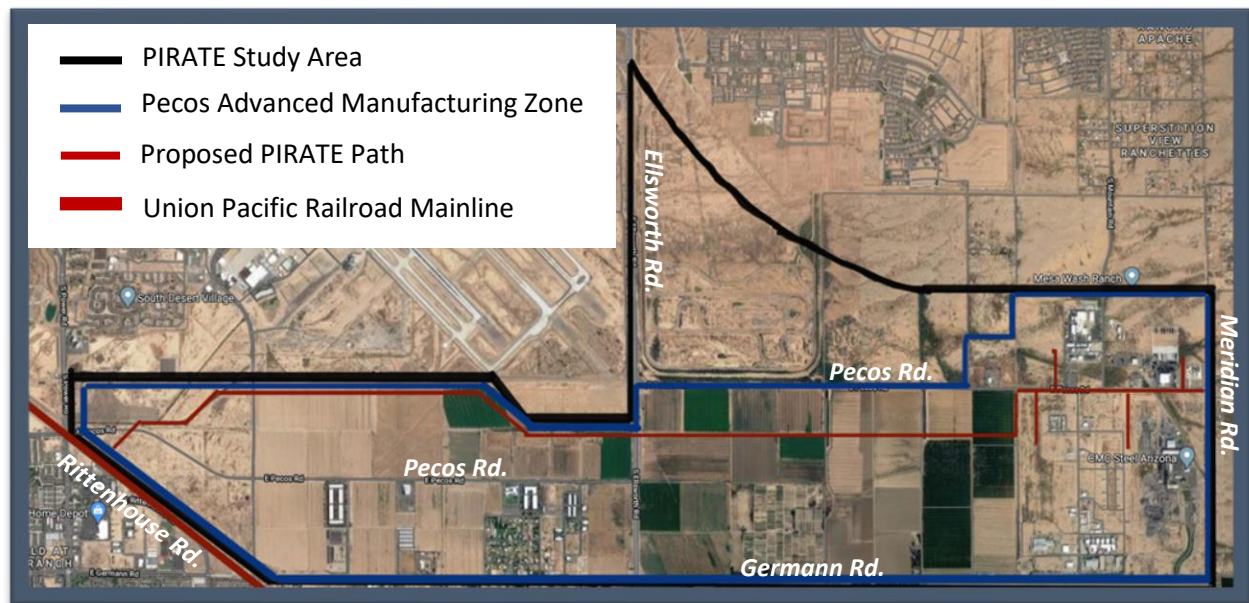
An overview of each development, beginning with the Pecos Advanced Manufacturing Zone, is discussed, highlighting various expansions to each development. In particular, this report highlights expansions experienced after the establishment of rail access. The current business operations in each development are examined to show industry composition that can be expected as the Pecos Advanced Manufacturing Zone expands and how the PIRATE project can supplement local regional economic growth.



Pecos Advanced Manufacturing Zone

The Pecos Advanced Manufacturing Zone (Pecos Zone), located in Mesa, Arizona, contains approximately 3,800 total acres. This area has been designated by the city of Mesa and is intended to attract businesses involved in the manufacturing industry that would bring high skilled and high wage jobs to the region.

This section provides an overview of the Pecos Zone and highlights similarities on how the PIRATE project can provide significant impacts to the development potential of the Pecos Zone. The map below shows the Pecos Zone boundaries, the PIRATE project study area, and the proposed path for the PIRATE project rail line through the Pecos Zone.



Source: City of Mesa; PIRATE Project

The city of Mesa, Arizona has directed focused efforts towards the increased development of the area. The Maricopa Association of Government estimated the eight businesses currently located within the Pecos Zone employed approximately 1,640 people in 2018. Ranging from steel and industrial chemical manufacturing to high tech research and development facilities, the Pecos Zone possesses significant economic development potential. The table below shows the various businesses and the industries in which they operate.



Current Pecos Advanced Manufacturing Zone Tenants and Industries	
Company Name	Industry
CMC Steel	Manufacturing
Bridgestone Americas	Research and Development
CRM Rubber	Industrial Supplier
Fujifilm	Manufacturing
Matheson TriGas	Manufacturing/Distribution
Metso	Industrial Supplier
MGC	Manufacturing
TRW Vehicle Safety Systems	Manufacturing

Source: City of Mesa

While the Pecos Zone currently provides a large impact to the regional economy, it has not yet reached its full potential. There are currently over 1,000 acres that are available for immediate industrial or manufacturing development with over 500 additional acres that can be made available for industrial development. Various businesses in the Pecos Zone report desires for expansion, but the lack of rail infrastructure make expansion an unlikely reality. The analysis of the various industrial areas in this report shows that the PIRATE project alleviates the prohibitive costs of expansion, accelerates development inside the Pecos Zone, advances additional manufacturing business procurement opportunities, and brings high skill and high wage jobs to the region. This will further economic development.

Humboldt Industrial Park

The Humboldt Industrial Park (HUMBOLDT) originally opened in 1972. It is owned and controlled by CAN DO Inc., an economic development group that serves the Greater Hazelton Area in Pennsylvania. Recognizing the potential impact development of HUMBOLDT could have on the regional economy, CAN DO Inc. has invested greatly to expanding the park.

This report discusses a historical overview of the park, highlighting the various expansions throughout the park's history. In particular, an expansion in 1996 in which developers constructed seven and a half miles of railroad connecting existing and future parcels to the Reading and Northern Railway is examined. The report then considers how rail access accelerated HUMBOLDT's rate of growth and expansion. The park's current tenants and industry profile is also reviewed.

The park currently contains five sections: Humboldt, Humboldt West, Humboldt North, Humboldt East and Humboldt Northwest.

The original area, Humboldt, contained 1,140 acres and opened in 1972. Current tenants include Amazon, The Hershey Company, The Nature's Bounty Co. and American Eagle Outfitters, which operates the largest facility in HUMBOLT.

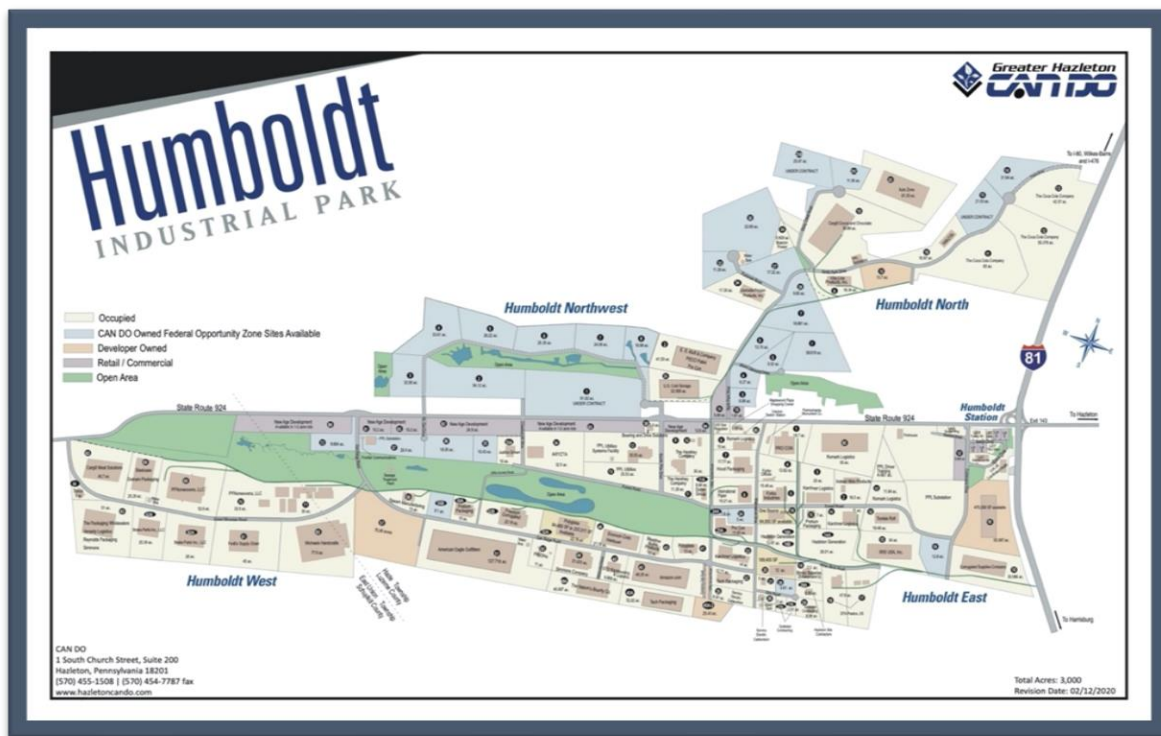


The first expansion occurred in 1996 into what is now Humboldt West. Humboldt West contains 300 acres of rail-served industrial property that quickly gained attention from developers. Companies such as Cargill Meat Solutions, Michaels Handcrafts, and FedEx Supply Chain have operations in this section.

Humboldt North was under development as a 400-acre, rail-served tract adjacent from the original Humboldt Park in the late 1990s. Soon after development, this section started filling up with companies such as AutoZone, Gonnella Frozen Products, Cargill's Cocoa and Chocolate, U.S. Cold Storage, and ES Kluff & Company.

Humboldt East was developed in 2003. Tootsie Roll Industries, Corrugated Supplies Company and IRIS USA all call this section home.

In 2008, approximately 370 acres was acquired to develop Humboldt Northwest. This section was developed to accommodate larger manufacturing and distribution projects. The picture below shows the current layout of HUMBOLDT.

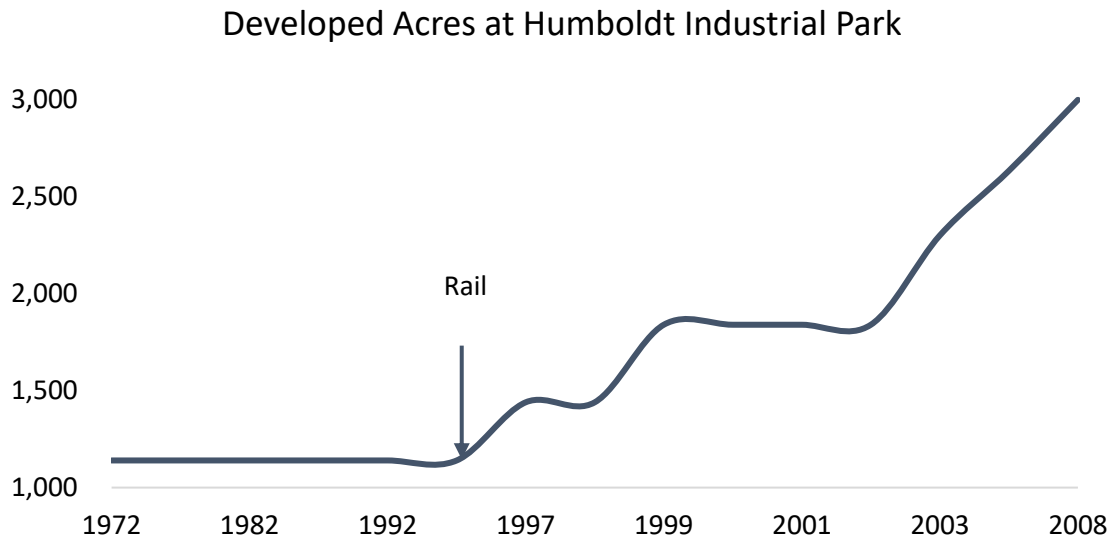


Source: CAN DO, Inc.

Currently, HUMBOLDT consists of over 3,000 developed acres, more than doubling in size since first opening. The park is approximately five miles long and two and a half miles wide. There are over 60 companies that have operations in HUMBOLDT employing over 10,000 people. According to the Bureau of Labor Statistics (BLS), HUMBOLDT employs approximately 8.0% of the total workforce in Luzerne County.



The chart below shows the developed acres at HUMBOLDT since it first opened. Developing rail access appears to have accelerated the rate at which business operations were established at HUMBOLDT.



Source: CAN DO, Inc.

From 1972 to 1996, HUMBOLDT had approximately 1,140 acres of land developed for business activity. Beginning in 1996, approximately 300 acres with rail access were developed. Those sites created a significant increase in demand, and two to three years later an additional 400 rail served acres were developed. This represents a 70.2% increase in total developed land. The most recent expansion was completed in 2008, bringing HUMBOLDT to its current size of over 3,000 developed acres.

From 1996, when rail access was established, to 2008, the amount of developed land at HUMBOLDT has increased 108.3%. The rail access continues to be a significant driver of business activity, with over 25% of firms in HUMBOLDT relying on rail access for daily operations. The most recent data reports that 4,300 rail cars pass through HUMBOLDT each year.

Approximately 45% of the companies in HUMBOLDT are in the manufacturing and distribution industries. In 2018, the BLS reported workers in the manufacturing sector in Luzerne County, PA earned a median wage of \$51,640. This is 21.4% higher than the median annual wage for all industries in Luzerne County.

The following table displays the various businesses and corresponding industries that have operations at HUMBOLDT. Companies that require rail access generally also have a large network of supporting businesses to maintain efficient operations. Incorporating rail access anchors these businesses and creates an incentive for additional businesses to locate near the anchored businesses.



Current HUMBOLDT Tenants and Industries			
Company Name	Industry	Company Name	Industry
Amazon	Distribution	Forbo Linoleum	Distribution
American Eagle Outfitters	Distribution	Freedom Corrugated	Manufacturing
Aryzta, LLC	Manufacturing	Gonnella Frozen Products, Inc.	Manufacturing
Auto Zone	Distribution	Gottstein Contracting Corporation	Other/Miscellaneous
Bearings and Drives Unlimited II Inc.	Other	Graham Packaging	Manufacturing
Bimbo Bakeries USA (Entenmann's)	Manufacturing	GTS Warehousing & Logistics	Distribution
Brake Parts Inc. LLC	Distribution	Hantover	Distribution
Cargill Cocoa & Chocolate	Manufacturing	Hershey Company	Manufacturing
Cargill Meat Solutions	Manufacturing	Insteel Wire Products	Manufacturing
Coordinated Health	Other	International Paper	Manufacturing
Corrugated Supplies Company	Manufacturing	IRIS USA	Manufacturing
Dober Group	Manufacturing	Karchner Logistics	Distribution
Dressel Welding Supply, Inc.	Other	Meadow Burke Products	Manufacturing
E.S. Kluft & Co.	Manufacturing	Michaels Stores	Distribution
EB Brands	Distribution	PECO Pallet	Distribution
Econoco	Distribution	Pennsylvania Monument Company	Manufacturing
EFS Plastics US, Inc.	Manufacturing	PFNonwovens	Manufacturing
FedEx Supply Chain	Distribution	Pitt-Ohio	Distribution
Polyglass USA	Manufacturing	Steelcase	Distribution
PPL	Other	TC Transcontinental	Manufacturing
Pretium Packaging	Manufacturing	Tech Packaging, Inc.	Distribution
Pretium Packaging	Manufacturing	The Nature's Bounty Co.	Distribution
PRO CON	Manufacturing	The Packaging Wholesalers	Distribution
Reynolds Packaging	Distribution	Tootsie Roll Industries	Distribution
Romark Logistics	Distribution	Tosca	Other
Simmons Company	Manufacturing	US Cold Storage	Distribution
Spears Manufacturing	Manufacturing	Vita Line Products	Manufacturing

Source: CAN DO, Inc.



Much like establishing rail access at HUMBOLDT accelerated the rate of development and expansion, it is likely that the completion of the PIRATE project will accelerate development of vacant land and expedite the expansion of current business operations in the Pecos Advanced Manufacturing Zone.

Furthermore, the various industries that primarily utilize rail generally pay wages well above the median wage. Assuming future industry composition at the Pecos Zone aligns with that of the industry base at HUMBOLDT, it holds that nearly half of all future business activity in the Pecos Advanced Manufacturing Zone will be in the manufacturing industry.

In 2018, the BLS reported the annual median wage paid within the manufacturing industry in Maricopa County was \$77,200. That is approximately 42.7% higher than the median annual wage for all industries in Maricopa County in 2018, which was \$54,100.

Considering the Pecos Zone is similar in size to HUMBOLDT, the PIRATE project has the potential to create similar expansion opportunities at the Pecos Zone as occurred at HUMBOLDT after rail access was established. This can produce significant economic impacts to the Pecos Zone, not only to the existing businesses but to the regional and state economy as well. Availability of rail access will attract high paying and high skilled jobs, increasing the availability of diverse workforce opportunities. The analysis of HUMBOLDT further indicates that it would be likely for the number of businesses at the Pecos Zone to double or triple in the years following completion of the PIRATE project.

N.C. Industrial Center

The N.C. Industrial Center (NCIC) is located in Alamance County, North Carolina and consists of 600 developed acres. In 2014, Cambro, a California-based manufacturer of storage and transport equipment for the food services industry, became interested locating operations to the NCIC because the potential the location has for rail access.

The Alamance County Department of Economic Development, in partnership with the surrounding municipalities, coordinate NCIC development and expansion. Recognizing the economic development potential rail access would have on the rate of expansion of the NCIC and rate of economic growth in the region, an agreement was made to begin construction of a lead track and short line rail with a spur leading to the Cambro facility. Cambro, in turn, began construction on a 220,000 square foot facility in NCIC. Furthermore, additional investment was made to expand the rail to provide other rail served parcels for future businesses of various industries and capacity.

Since the completion of the rail in 2016, NCIC has realized significant growth and land values have greatly increased. The map below shows the area of NCIC (red borders). The newly constructed rail line is depicted by the black line. In addition to the spur leading to Cambro Manufacturing, there are three other spurs leading to three different vacant parcels.



Source: N.C. Industrial Center; Google Maps

Currently, there are more than 12 companies with operations in the NCIC, occupying a total of over 2.5M sq. ft. The majority of those firms operate within the manufacturing industry. According to the BLS, the median annual wage paid to workers in the manufacturing industry in Alamance County was \$49,800 in 2018. This is 21.0% higher than the median annual wage (\$41,200) paid for all industries in 2018. The following table shows the various companies with operations in the NCIC and the corresponding industry in which they operate.

Current NCIC Tenants and Industries			
Company Name	Industry	Company Name	Industry
Cambro Manufacturing	Manufacturing	Ford Motor Co.	Manufacturing/ Distribution
GKN Driveline	Manufacturing	Bonded Logistics	Other
Ferraro Foods	Distribution	CBC Americas	Distribution
Kidde	Manufacturing	Trivantage	Distribution
Badcock Furniture	Distribution	Becton Dickinson	Manufacturing
Nypro	Manufacturing	Sports Endeavors	Distribution

Source: The Times-News

In 2019, a mere three years following the completion of the NCIC rail line, Cambro began construction of a second 250,000 sq. ft. facility. This expansion represents an additional \$10M private investment to NCIC and doubles Cambro's business operations in the region.

The rail access also increased the value of the land within and immediately surrounding the NCIC. Establishing rail access attracts businesses that operate in high skilled and high value industries. As the value of their operations increase, so do the properties that surround them. For example, the Alamance County Assessor's Office most recent appraisal estimated that the rail served property occupied by



Cambro at NCIC was appraised approximately 84% higher per acre than similar properties that lack rail access.

The PIRATE project will facilitate the expansion of the various existing businesses in the Pecos Advanced Manufacturing Zone, incentivize additional high skill and high value industries to locate operations to the region and increase the value of the land surrounding the rail.

Hugo Industrial Park

The Hugo Industrial Park (HIP) is located in Hugo, Minnesota, which is in the northern part of Washington County, Minnesota. The park contains the facilities and operations of various companies from a variety of industries. JL Schwieters Construction (Schwieters), the city's largest employer, employs approximately 500 people, which represents 6.0% of the Hugo workforce. The park includes other major regional employers and contains a partially operating short line rail system that stretches 6.3 miles, giving each parcel in the park rail access.

In 2015, the Minnesota Commercial Railway Company, the owner of the rail line, announced they were abandoning the section of rail that traveled through the HIP. Worried this would harm Hugo's economy, leadership from the various companies in the park, in partnership with city, county and state officials, found the funds to repair and restore the rail to full operating capacity. A map below shows the Hugo Industrial Park.



Source: City of Hugo; Google Maps

That decision likely retained more than 500 jobs in Hugo and has created significant opportunities to attract additional businesses. Schwieters' representatives stated in the *Twin Cities Pioneer Press* news journal that the restoration of the rail was the principle reason the company has remained in Hugo, and had the rail been abandoned, the company would have had to locate elsewhere.



Since the restoration of the rail was completed, Schwieters has announced they are expanding their operations. In 2019, they estimated shipping 120-150 rail cars via the newly restored rail line, which is more than double the amount from 2018. To accommodate the increased production, Schwieters is constructing an additional \$14M, 140,000 sq. ft. manufacturing facility and plans to hire an additional 100 employees.

In addition to Schwieters expanding their operations, Loadmaster Lubricants, a plastics manufacturer, is also planning an expansion. The company, which specializes in manufacturing high-grade lubricants for mining, agriculture and other industries, receives approximately 28,000 gallons of base oil each week via rail and employs approximately 20 people.

Transporting material via trucks is approximately five times more expensive than by rail. Loadmaster Lubricants leadership stated had the rail been abandoned, the cost of shipping would have forced them to relocate. Instead, company leadership is anticipating an expansion within the next five years.

JL Schwieters Construction and Loadmaster Lubricants are not the only businesses to benefit from the restored rail access. The following is a list of businesses that, as of 2018, are expanding in the Hugo Industrial Park:

- Western Spring constructed a 35,000-square-foot building on a 4.71-acre vacant lot;
- Xcel Energy plans a 12,000-square-foot addition as well as a 0.91-acre expansion to the Training Center's outdoor training area for gas training and emergency response; and
- TGK Automotive is proposing to build a 14,000-square-foot motor vehicle repair

The investment made to repair the short track at the Hugo Industrial Park made it possible for over 500 jobs to remain in the region and also enhanced the possibility for other businesses to expand operations, thus increasing employment opportunities. The PIRATE project is expected to provide a similar benefit to the Pecos Advanced Manufacturing Zone. Existing companies will be able to expand their operations while other businesses will be more likely to bring operations to the Pecos Advanced Manufacturing Zone.



BUSINESS OVERVIEW

Located in the southeast valley of metro Phoenix, the city of Mesa is the third largest city in the state of Arizona. With a population slightly under half a million residents, Mesa is known as for its family-friendly community, and a strong business community.

With an emphasis on aerospace and defense, and technology industries, the city of Mesa is an attractive market for large scale enterprises, particularly manufacturing. The Pecos Advanced Manufacturing Zone is situated next to the Phoenix Mesa Gateway Airport, an area that provides significant economic impact to the region and the state.

The area is a prime location for industrial activity, ranging from light to heavy industrial manufacturing businesses, as well as commercial uses. The availability of talent is an attractive draw for businesses in the area as both Arizona State University (Polytechnic Campus) and Chandler Gilbert Community College have campuses nearby.

Recognizing the significant benefits that come from procuring businesses in these industries, the city of Mesa has created an Employment Opportunity Floating Zone (Floating Zone). This designation was put in place in order to facilitate development within the Pecos Advanced Manufacturing Zone by streamlining the entitlement process.

The Floating Zone is intended to encourage industrial development by giving preference to industrial land uses and restricting other land uses altogether. In the end, the Floating Zone designation decreases the time to complete the entitlement process from months to a few weeks.

In addition, the city of Mesa focuses on several business districts and development areas, with a focus on growing a diverse and sustainable economy for growing and attracting businesses. The priorities for the economic development department focus on what the city of Mesa has deemed as “Mesa’s Industries of Opportunity,” and aligns with the regional economic development strategies of attracting high-growth industries and high-wage jobs in aerospace and defense, technology and advanced manufacturing.

The Arizona Commerce Authority (ACA), the statewide organization dedicated to growing and creating business and employment opportunities for the state, focuses on 6 key sector opportunities, including manufacturing. Arizona is a geographically diverse state and a large concentration of the state’s population and economic activity takes place in metro Phoenix, leading the ACA to work closely with its regional and local partners.

The Greater Phoenix Economic Council (GPEC), the regional economic development organization, also lists manufacturing and logistics as one of the target industries for the region. A number of pro-business



qualities make the metro Phoenix region a prime location for growth and expansion of manufacturing operations. These include having the third largest talent pool in the west, and the ability to serve 35+ million consumers within a one-day truck haul.

Rail service is an option for positioning maximum business efficiencies in the region, with multiple rail lines from Union Pacific and BNSF. However, companies in the region generally rely on truck loads to transport materials to and from the transload and intermodal centers, rather than having the ability to load directly to rail at their facility for increased connectivity.

The proposed Pecos Industrial Rail Access Train Extension offers an opportunity for increased business activity for manufacturing and related industries in the Pecos Advanced Manufacturing Zone, while opening the door to additional opportunities for future business growth, and expansions and relocations. This leads to sizeable job growth, capital improvements, as well as direct and indirect economic impacts.

Rail access is a significant consideration for manufacturing businesses searching for locations to house potential expansion operations. It is unknown how many potential opportunities for business expansion were missed in the Pecos Advanced Manufacturing Zone due to the lack of rail served parcels. Site selectors – consultants who narrow down potential sites for companies considering expansions or relocations– are often familiar with metro Phoenix, and the lack of direct rail access to manufacturing sites is a considerable factor. The extension will be a valuable asset for business attraction in the region.

Metro Phoenix and the cities within the region, particularly Mesa, are often considered for business growth and expansion. This is largely because of the pro-business policies at the state and local levels, having one of the largest university and community college systems in the nation, and offering a strong quality of life that is attractive to companies and their employees.

The various scenarios and related outcomes detailed in this and other analyses provide an optimistic outlook for the immense economic impacts the rail extension can have on the region. Further adding to the positive economic impacts will be the opportunity for the city of Mesa, along with GPEC and the ACA, to promote the Pecos Advanced Manufacturing Zone for additional development and investment.

Businesses in the Pecos Advanced Manufacturing Zone

As part of the effort to show the overall impact of the PIRATE project, a series of meetings were held either in person or via teleconference for the purposes of gathering additional information from businesses in the area.

The businesses in the Pecos Advanced Manufacturing Zone largely operate in the advanced manufacturing industry, including electronic materials production, steel production, industrial gas line supply and distribution, and a research and innovation center for a global auto parts manufacturer.



The size of the companies ranges considerably by operations and scope, with the smallest company employing fewer than 10 full time employees, and the largest company employing more than 550 full time employees. Production of products by the companies in the area also varies by product and business model.

The meetings were held to gather as much information, to the extent possible, about current business activity, direct and indirect employee headcounts, import/export activity and production, and to gain a sense of how the businesses would see positive impacts from the proposed rail line extension.

In total, half a dozen businesses were interviewed, and the common thread was the sentiment that the rail extension will lead to increased business operations and significant economic impacts in the area. One company in particular is a true multiplier – its largest customer is a neighboring business – and any growth the other company experiences would be a complementary impact to theirs, and they anticipate large scale impacts from investments in equipment and increases in workforce.

The range of impacts the businesses were able to forecast varied from reduction in business costs to increased operations to fully scaling business models. A common thread was the extent to which commercial truck traffic would be reduced, an impact that would be realized regionally through a reduction in traffic, wear and tear on the roads and environmental impacts.

To that extent, one of the businesses interviewed indicated the difficulty of transporting certain materials, and the uncertainty with relying on the availability of hazmat drivers. The opportunity for rail service would give the business consistency in operations for both importing and exporting of products safely.

One business, which currently operates as a research and development facility, indicated the extension of the rail line would allow their facility to scale to full commercialization, with the possibility to expand their employee headcount tenfold, and allow for expanded operations they have not been able to consider without the possibility of rail access.

The extension of the rail line will also lay the groundwork for another company to execute plans for doubling their operations – the prospect of which is not possible without the rail extension. The business anticipates beginning construction to expand their footprint once the process begins for the rail extension.

The outcome of such an expansion is sizable, and leads to considerable economic impacts through increased direct and indirect jobs, capital investments and increased revenues. Additionally, impacts will be realized by neighboring businesses, and will contribute to increases in local, regional and state revenues.

Overall, the information collected from the interviews provided evidence that businesses in the Pecos Advanced Manufacturing Zone will be able to experience strong financial impacts to their businesses while making even bigger impacts to the local and regional economies.



The addition of the Pecos Industrial Rail Access Train Extension provides the city of Mesa and the region with an added benefit to tout for business expansions and relocations, making the Pecos Advanced Manufacturing Zone a critical business district for the state, and thereby firming up the manufacturing industry as a key sector for Arizona's economy.