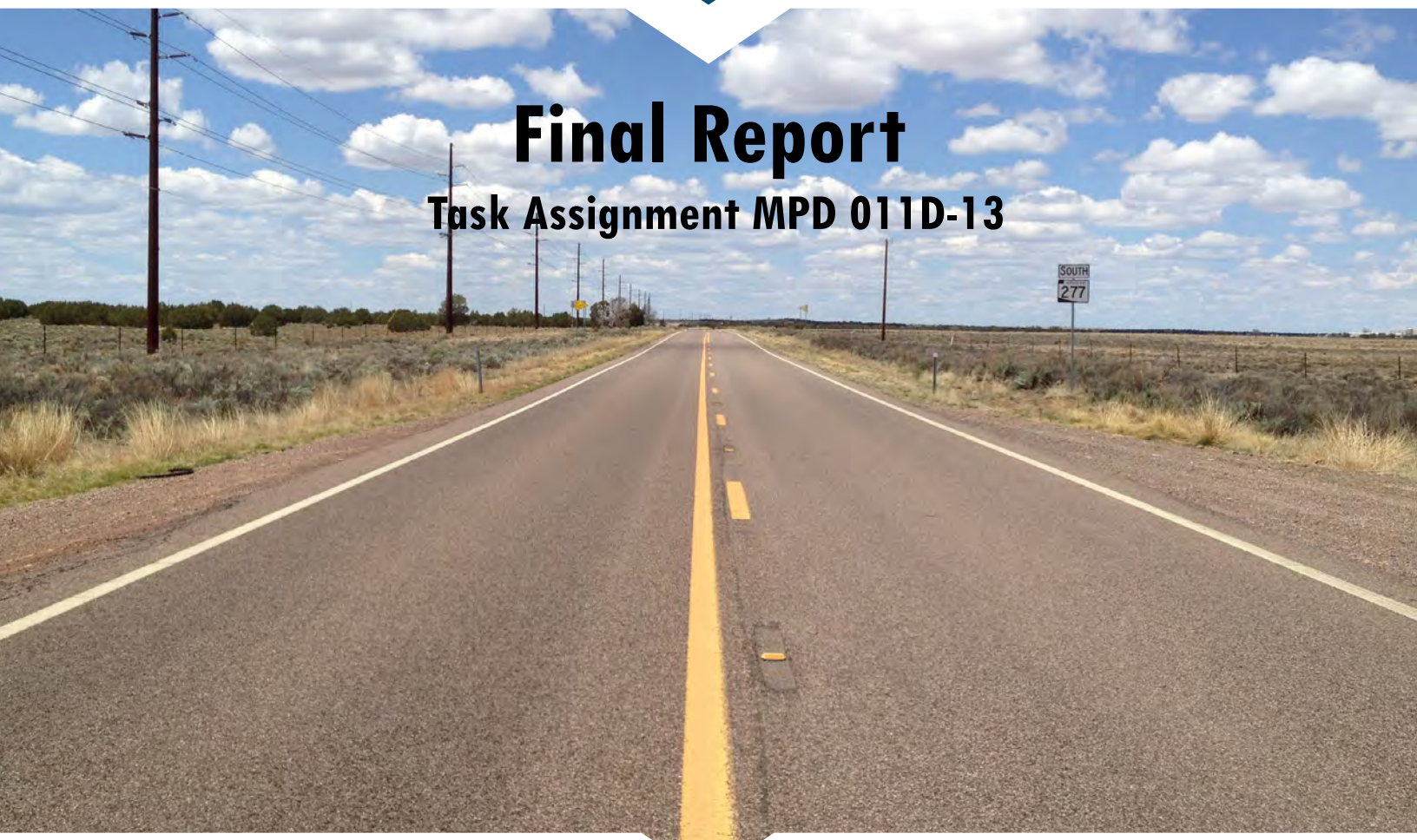
Second Knolls Development
REGIONAL TRANSPORTATION STUDY



Final Report

Task Assignment MPD 011D-13

Prepared for:

Town of SNOWFLAKE ARIZONA

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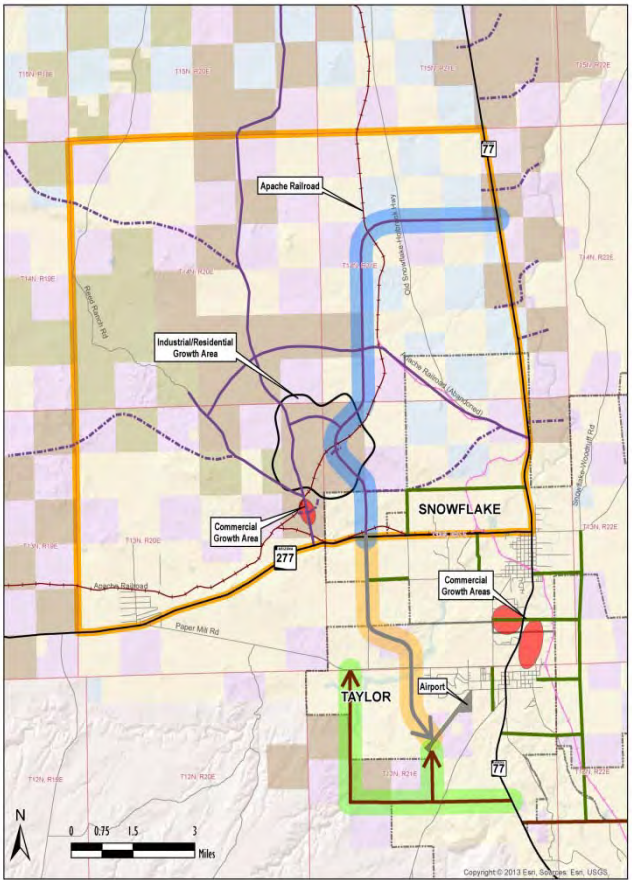
Executive Summary

The purpose of the Second Knolls Development Regional Study is to identify transportation infrastructure investments that may help leverage the economic potential of the study area and foster future land development. This document describes the study area's existing and future transportation conditions and presents transportation framework recommendations based on planning by Aztec Land & Cattle Company, the Town of Snowflake and Taylor, and Navajo County. It presents findings from case studies on inland ports and rural industrial developments and discusses possible funding sources and strategies for infrastructure investment.

Transportation System

The existing and future transportation system analysis showed that ample capacity remains on the current state highway system to accommodate background traffic growth through 2035. Furthermore, there would be sufficient remaining capacity on both SR 77 and SR 277 in 2035 to support initial development within the Second Knolls study area without needing to add new lanes to the road.

The transportation framework, shown at right, identifies a scalable system to accommodate growth through the 2035 planning horizon. Snowflake, Taylor, and Navajo County should incorporate the transportation framework concepts from into their general and comprehensive plans. As development occurs in the region, transportation plans should be updated to ensure that the regional transportation system is optimized to accommodate demand for all modes of travel. This would include evaluating the trip making characteristics of the evolving land uses and planning for adequate road, transit, and non-motorized facilities to ensure mobility.



The Second Knolls transportation framework is a scalable system to accommodate growth through 2035.

Development Case Studies

With the Second Knolls development, the towns of Snowflake, Taylor, and central Navajo County have an opportunity to reinvent their economies. Abundant land, natural resources, energy, a quality labor force, existing road and rail transportation links to national markets, and successful public-private partnerships are all assets that can attract new jobs and industry.

The case studies considered rural industrial centers, inland ports, transload facilities, and forest products. Lessons learned from the industrial case studies showed that the region should play to its strength and focus on wood product handling and manufacturing facilities. The closed paper mill is served by SR 277 and the Apache Railway and could serve either a wood product handling or manufacturing purpose. In addition, Snowflake and Taylor have a workforce experienced in wood products manufacturing that will be attractive to such an industry.

While the case studies demonstrate that conditions are not ideal at this time for an inland port at the Second Knolls site, the existing paper mill site could serve as an initial transload facility for the Apache Railway. Transload facilities transfer goods between truck and rail modes and require some warehousing and storage facilities. Beginning initially with the forest products industry, it could eventually support many different kinds of goods. The studies suggest that the key to revitalizing the region's economy and developing the Second Knolls area is building first on existing infrastructure through continued careful planning and collaboration among public and private sector stakeholders.

Funding

Funding infrastructure investment is complex and requires extensive planning and collaboration between public and private sectors. A variety of traditional and non-traditional sources are available for funding transportation projects in the Second Knolls area. There are public and private grants opportunities that can be used to leverage the region's economic development efforts to attract new investment.

Next Steps

The Second Knolls Development Regional Study identifies a variety of multimodal transportation improvements that may be leveraged to attract new economic development opportunities the Snowflake-Taylor region. These improvements include the construction of new roads serving both the community and study area specifically, evaluation of existing transportation infrastructure (bridges, roadways) to ensure sufficient capacity and structural integrity given higher traffic and freight volumes, and the incorporation of non-motorized transportation systems into future . The following next steps are identified to help advance this project and set the stage for economic development in the Snowflake-Taylor region:

- Identify a business development consultant or applicable local, regional, or state commerce authority to develop a targeted marketing campaign to potential businesses based on the current skillsets of area labor and community assets.
- Evaluate land use development and growth management policies to ensure compatibility with the needs of targeted industries to help fast-track development and compete regionally.
- Work with stakeholders to prioritize infrastructure investments to demonstrate a commitment to leveraging needed improvements that meet the needs of future businesses for economic growth.

1.0 Introduction

Located on the northern edge of Arizona's Mogollon Rim and the world's largest ponderosa pine forest, the wood products industry has long been an important part of the economy for the central Navajo County towns of Snowflake and Taylor. For many years, the communities depended on the Catalyst Paper Corporation mill, located on State Route (SR) 277 west of Snowflake, to anchor the local economy. However, the global decline in newsprint prices shuttered the paper mill in September 2012. The resulting loss of over 300 jobs was a significant setback for the communities.

In a process started before the paper mill closed, the Town of Snowflake received an Arizona Department of Transportation (ADOT) Planning Assistance for Rural Arizona (PARA) grant to plan the transportation infrastructure needed to expand industrial activity in the Snowflake region. The focal point of the original Second Knolls Development Regional Study grant application was a 100-square-mile area located northwest of Snowflake along the short-line Apache Railway between SR 77 and SR 277.

With the economic setback, the scope of the study widened. The Town of Taylor was included to provide a regional perspective to the planning framework. With the Apache Railway and the paper mill idled, the inquiry focused more on identifying new industries that could use the existing transportation infrastructure.

The Second Knolls Development Regional Study identifies existing transportation infrastructure assets, deficiencies, and necessary investments that may help leverage the economic potential of the study area and foster future land development. This document describes the public outreach effort and study process and presents its recommendations. After this introduction, it includes sections on existing conditions, future conditions, and development case studies. It concludes with recommendations for a regional transportation framework to support economic growth development in the Second Knolls region.

1.1 Geographic Setting

Central Navajo County, skirting along the northern edge of Arizona's Mogollon Rim region, is characterized by scenic, gently rolling hillsides and rocky outcropping slopes that provide texture to a largely undisturbed landscape. As a region rich with natural resources including clean air and abundant water resources, the region's lands have traditionally been used for agrarian purposes including cattle ranching and farming. Settled in 1878, the long-standing Towns of Snowflake and Taylor, along with the nearby Cities of Holbrook and Show Low, are regional anchors.

The Town of Snowflake is leading a regional effort to expand industrial activity in the Second Knolls region. (Photo credit: HDR)

Study Area

The study area is more than 100 square miles. Characterized by rolling, rocky hillside terrain with vast expanses of flat and open land areas, the area is sparsely populated, with residential development typically averaging less than one dwelling unit per acre on large tracts of open land. The majority of the study area remains undisturbed and is used for farming and ranching purposes. Figure 1 shows the Second Knolls Development Regional Transportation Study area. The study area is bordered on the south side by SR 277 and SR 77 to the east. The northern and western edges of the study follow township and range section lines.

Figure 1 Second Knolls Development Regional Study Area

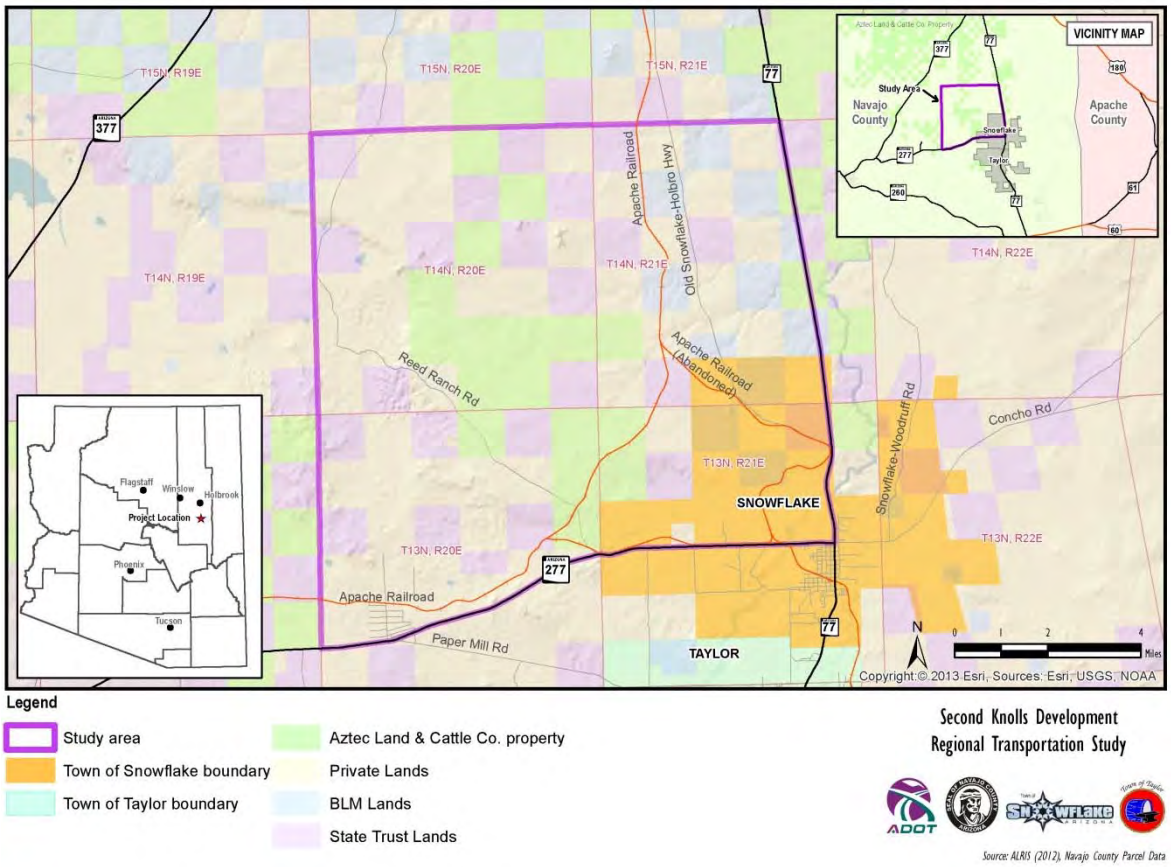


Table 1 provides a breakdown of the existing land cover types by acreage and the percentage of total acreage. The availability of land use data is limited to land cover data that does not provide detail on specific land use types. As such, detailed information for specific land cover categories (e.g. "Medium-High Intensity") is generally unavailable. In order to provide greater specificity with regard to land uses within and surrounding the study area, residential, commercial, and industrial developments were confirmed through field visits to the study area and neighboring communities.

Table 1 Study Area Land Cover

Land Cover Category	Acreage	Percentage
Open/Undisturbed Lands (1)	65,533	98
Agricultural Lands	796	1
Developed (Open Space - Low Intensity)	364	<1
Developed (Medium - High Intensity)	207	<1
Open Water	34	<1
Total	**66,934**	**100**

Source: U.S. Geological Survey, 2010.

Note: (1) The U.S. Geological Survey provides specific land cover typologies based on a variety of geologic conditions. Within the study area, lands such as Inter-Mountain Basin, Colorado Plateau, and Southern Colorado Plateau lands are found.

As shown in Table 1, open and undisturbed lands comprise the majority of the study area. Much of this land is used for cattle grazing and ranching. Lands designated as agricultural land areas account for the second largest proportion of all land areas. Agricultural lands may include lands used for seed-based farming, livestock, and include farming facilities. In addition to agrarian land uses, sparse areas of forested land cover exist along the southern edge of the study area.

Developed lands account for less than 1percent of the total study area. A small number of industrial developments are found within the study area, clustered along SR 277 and SR 77. Small single-family residential developments are located along SR 277. More recently, single-family residential subdivisions have been platted for development. Some access roads have been constructed, with large lots being marked for future housing locations.

A visual survey of these lots suggests that many of these future residencies will be built on large lots at densities greater than one dwelling unit per acre. Regional and community-scale commercial developments are typically located within the communities of Snowflake and Taylor. Other land uses, including professional office buildings, schools, religious institutions, public facilities and governmental buildings are found within the developed areas of Snowflake and Taylor, and are completely absent from the remaining portion of the study area.

Development plans of the county and local municipalities suggest that growth will extend west of both Snowflake and Taylor along established transportation corridors including SR 277 and Paper Mill Road. Large tracts of land are advertised as being zoned for future residential and commercial uses. The Town of Snowflake General Plan identifies a series of future roads, many of which are located on the west side of town where planned residential and commercial development is forecast. Commercial businesses may locate along Paper Mill Road, particularly at the intersection with SR 277.

Socioeconomic Characteristics

Navajo County ranks as Arizona's seventh most populated county, with a 2010 population of 107,447 persons. From 2000 to 2010 the county population grew by 10.2 percent. Locally, the

Towns of Snowflake and Taylor were collectively home to just over 9,700 residents. The census data shows that between 2000 and 2010, the Town of Snowflake grew by 25.3 percent, while the Town of Taylor grew by 29.9 percent. Census 2010 counted 1,531 households in Snowflake and 1,294 households in Taylor. The nearby communities of Holbrook and Show Low also experienced growth between 2000 and 2010. Show Low experienced a growth rate of 38.5 percent, adding nearly 3,000 people, while the City of Holbrook experienced a more modest growth rate of 2.8 percent, adding just over 130 people.

The employment base of the central Navajo County region and the Second Knolls study area is predominantly service industry and industrial jobs. The Navajo County Travel Demand Model contains estimates of employment by basic industry classification. Table 2 provides a summary of the employment base for the study area and surrounding region.

Table 2 Employment Estimates

Geography	Industrial	Service	Retail	Total Employment[1]
Second Knolls Study Area[2]	68	74	356	498
Town of Snowflake[2]	673	1,041	224	1,938
Town of Taylor[2]	577	729	182	1,488
Navajo County	8,508	22,431	4,818	35,757

Source: Navajo County Travel Demand Model, 2006.

Notes: (1) It is important to note that employment figures reflect data from the Navajo County Travel Demand Model prepared prior to the recent economic fluctuations, and therefore may be higher than actual totals.
(2) The Transportation Analysis Zone (TAZ) geography of the Navajo County Travel Demand Model is not consistent with the municipal boundaries of either Snowflake or Taylor. Therefore, the TAZ geographies include some areas of unincorporated Navajo County.

The Bureau of Labor Statistics reported 26,300 jobs in Navajo County in 2012.[1] More than one-third worked in federal, state, or local government positions. More than half of the private sector jobs were in a service industry. Manufacturing and construction jobs accounted for about five percent of the workforce.

Key employers in Snowflake and Taylor include:

- Navajo County
- Pigs For Farmer John Farms
- Snowflake Power Plant
- Snowflake Unified School District #5

[1] *Bureau of Labor Statistics Quarterly Census of Economics and Wage. Accessed October 22, 2013 at http://data.bls.gov/pdq/querytool.jsp?survey=en.*

Other resources

Completed in 2009, over 30 turbines in the Dry Lake Wind Power Project capitalize on the region's typically clear, windy-weather conditions. High-voltage electrical transmission lines extend throughout the study area. At locations along U.S. 180 southeast of Holbrook, Navajo County is working with mining companies on exploratory studies for potash mining and processing. These mines may utilize the Apache Railway for access to the Burlington Northern Santa Fe (BNSF) Railway and East and West Coast ports. The Apache-Sitgreaves and Coconino National Forests offer numerous outdoor recreation activities. Restoration activities on the forests are another economic growth opportunity.

Headquartered in Holbrook, the Northland Pioneer Community College has campuses spread throughout central and southern Navajo County. A challenge confronting many rural communities in landing new industry is a lack of technical knowledge in skilled industrial trades. The community college provides an asset to the communities of central Navajo County that could be used to help attract potential industries and employers by enhancing the workforce skills through current and future academic programs.

Finally, Snowflake and Taylor are situated near the White Mountains and resort areas located within or near Show Low, Arizona. Recreational trails and amenities are located near these towns, and the recreational economy has been a traditional source of revenue for the region. In the mid-2000's, the construction and sale of second homes for residents of Arizona's populated urban areas and out-of-state visitors was popular, particularly given the nearby recreational and natural amenities. With typically favorable seasonal weather conditions, year-round outdoor recreational opportunities are available to visitors, second homeowners, and local residents, helping to bolster the local and regional economy.

The nearest large urban areas are at least 100 miles from Snowflake and Taylor.

2.0 Planning Context

This section establishes the planning context for the Second Knolls Development Regional Study. It included a public outreach effort that involved stakeholders from the public and private sectors. The study team also reviewed both regional and local plans and previous transportation and land use planning studies. Site visits were also conducted to document existing conditions. It also includes a review of population and employment growth projections for the region. This knowledge base served as the foundation toward understanding where future growth may occur, and where investments in transportation or other public infrastructure may be necessary to support and foster this development.

2.1 Public Outreach

The outreach effort for this community-based planning process included two public meetings to give stakeholders an opportunity to provide input for the planning process and review the planning recommendations. The first meeting was held in March 2013. The second is scheduled for November 12, 2013.

The first public meeting was held on March 21, 2013, at the Snowflake Town Hall. It was a visioning workshop that brought together public and private stakeholders at the local, regional, county, state and federal level to identify a transportation vision for the area. Participants were asked to identify economic development opportunities to take advantage of the region's assets and develop supporting transportation scenarios. The public involvement summary report is in Appendix C.

The second meeting in the Second Knolls Development Regional Study public outreach process is planned for November 12, 2013, at the Town Council chambers. The improvement plans will be presented to the public for consideration.

2.2 Previous Plans and Studies

A review of the local and regional plans was conducted to identify planned and programmed improvements to transportation facilities within and surrounding the project study area. Only published studies were considered. This analysis did not include individual lot or site plans specific to individual developments.

Southern Navajo/Apache County Sub Regional Transportation Plan (2007)

Adopted by Navajo County in September 2007, the Southern Navajo/Apache County Sub Regional Transportation Plan establishes the regional vision for transportation improvements. The plan, which consists of a series of alternative transportation improvement scenarios, addresses anticipated population and employment growth, growth in traffic volumes, and forecasted travel patterns based on future development plans in the region.

According to the plan, year 2030 travel forecasts suggest that SR 77 and SR 277 will operate at Levels of Service (LOS) A through C north and west of Snowflake, which are generally considered acceptable LOS grades for traffic operations. Within the communities of Snowflake and Taylor, the plan identifies long range improvements that would expand Paper Mill Road from 2-lanes to 4-

lanes. Paper Mill Road is identified on the 2030 functional classification map as a minor arterial. Available land use plans have identified Paper Mill Road as a candidate corridor for future commercial development. Along with capacity improvements to Paper Mill Road, the plan identifies the need for widening SR 77 from two lanes to four lanes between the Snowflake-Taylor area and the City of Show Low to the south by 2030.

Navajo County Central Region Transportation Study (2010)

Navajo County, in association with the cities of Holbrook and Winslow, developed the Navajo County Central Region Transportation Study with assistance from the Arizona Department of Transportation (ADOT). This study sought to develop a transportation plan for the central Navajo County region that prioritized future transportation investments over a 20 year timeframe, with particular attention to multi-modal transportation enhancements. The study identified transportation assets, deficiencies, and opportunities to forecast future transportation needs of the county and surrounding communities.

Some of the key findings of the study have direct relevance to the Second Knolls study area:

- The central Navajo County study area is projected to grow by more than 13,400 households and 5,200 jobs by 2030. Most employment growth is projected to occur in the service sectors. The study also identifies growth from development of the Aztec Land & Cattle Company land. This growth projection does not include southern Navajo County.
- SR 77 is the primary direct route for southern Navajo County residents to access I-40.
- The principal north-south routes providing connectivity with communities between the northern and southern portions of the travel region are forecast to be approaching, at, or exceeding their capacity by 2030.
- Freight traffic is a large percentage of the overall traffic on SR-377 and SR 77.
- The functional classification on SR-277 between SR-260 and SR-377 should be upgraded from Rural Major Collector to a Rural Minor Arterial.
- The growth forecasted for southern and central Navajo County will degrade mobility and safety within Holbrook along Navajo Boulevard, particularly between the Little Colorado River and I-40.
- There is an opportunity to convert the restored Amtrak station in Holbrook to a multi-modal hub servicing Amtrak, Greyhound and the White Mountain Connection.
- There are opportunities to expand upon the successful regional White Mountain Connection transit service between Holbrook and Show Low.[2]

Specific to the Second Knolls study area, the plan highlights the need for basic improvements to SR 77 in the form of an additional passing lane or striped passing opportunities that can help to improve traffic flow and travel times. The plan notes that the design of SR 77 affords drivers with clear lines of sight for extended distances, attributes that can help improve traffic operations and travel times by allowing vehicles to pass safely that involve low-cost improvements. The study recommends consideration of future passing areas along SR 77 and proper traffic safety improvements.

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[2] *ADOT is currently managing the Show Low Trails and Transit Connectivity Study that considers regional connections to the White Mountain Connection system.*

Additionally, the study supports the findings of the 2008 Arizona Rural Transit Needs Study that recommended greater transit service between the communities of Holbrook and Show Low along the SR 77 corridor. The study also recommended the evaluation of potential transit connections with the Heber-Overgaard community. The multimodal element of the plan suggests that current opportunities for multimodal travel (bicycling) are generally limited.

The plan suggests that consideration of a multimodal center or transit facility in Holbrook at the existing train station could be beneficial to the central and southern Navajo County regions. This station could serve as a regional transit node, given its connections to I-40, links with the Amtrak Southwest Chief railway, and freight rail connections to the BNSF transcontinental railway line.

Snowflake-Taylor Multi-Jurisdictional Transportation Plan (2011)

Through ADOT's PARA program, the Snowflake-Taylor Multi-Jurisdictional Transportation Plan made recommendations for the creation of a multi-modal transportation system that balances local and regional multi-modal transportation needs with available investment funds, along with addressing environmental and area goals for growth and development. The plan seeks to prioritize investments in transportation infrastructure along existing corridors to support growth within the communities of Snowflake and Taylor.

Among the plan's recommendations is the establishment of new road facilities within the Second Knolls study area, including a new east-west road branching from SR 77 that connects with SR 277 at Harvest Valley Road. The long-range transportation network vision outlined in the plan identifies an urban minor arterial ring-road system encircling the Towns of Snowflake and Taylor, bisected north-south by SR 77 classified as an Urban Principal Arterial (Freeway), with SR 277 and Paper Mill Road as Urban Principal Arterials.

Specific to the Second Knolls study area, the plan states the following:

> "As the Future Land Use Plans are refined, and as the communities actively anticipate activities associated with the proposed Aztec developments in the immediate vicinity, additional roads providing connectivity to SR-277 and SR-77 will be planned. These new roads may provide additional refinements to those future roads in this Plan. As such, ultimately the transportation system and the proposed area land uses must coincide with each other so that road functional classification properly accommodates the type and amount of traffic from future proposed development plans."

For the future transportation network specified by the plan a series of cross-sections were produced for each functional classification type. Each cross-section includes multi-use paths, helping to advance multi-modal travel within the region.

Navajo County Comprehensive Plan (2011)

The Navajo County Comprehensive Plan, updated in 2011 pursuant to state requirements, outlines the county's vision, goals, and policies for land use and transportation for a 40 year planning-horizon timeframe. Included in the plan are projections of population for several communities in the county, based on past population growth trends. Table 3 illustrates the past, present, and projected populations for communities along the SR 77 corridor in central Navajo County.

Table 3 Navajo County Population Projections

City/Town	2000	2010	2050	Percentage Change (2010-2050)
Holbrook	4,917	5,503	7,951	45
Snowflake	4,460	5,590	6,700	20
Taylor	3,176	4,112	5,565	35
Show Low	7,695	10,660	13,353	25
Navajo County	97,470	107,447	147,269	37

Source: Navajo County Comprehensive Plan, 2011.

Given that land planning is the responsibility of individual municipalities, the Navajo County Comprehensive Plan discusses future development and transportation network improvements in general terms. The plan notes that the dominant mode of transportation in Navajo County is the private automobile, given the size of the county, distances between communities, and development patterns within incorporated areas. The plan specifies that the anticipated growth of the county will most likely parallel existing transportation corridors.

Aztec Area Plan (2011)

Adopted as part of the Navajo County Comprehensive Plan, the Aztec Area Plan identifies the future site planning efforts of the Aztec Land and Cattle Company, with particular attention to blocks of property owned along SR 277. The plan places special emphasis on the incorporation of existing transportation assets within the study area as key elements toward fostering future growth and development, particularly for economic development and job growth.

The area has direct linkages to the interstate and state highway systems, access to a major national freight railroad corridor, a centralized location to neighboring communities and an abundance of natural resources. The Aztec Area Plan identifies a set of Land Use Character Area definitions that provide a general framework for the type of development sought in specific planning areas. For example, the Second Knolls study area is identified in the plan as supportive of the Community Village character type. These definitions range from rural agrarian land uses to intensified developments for heavy industrial areas (the most intensified land use type).

The plan identifies a series of new roads from SR 277 extending into the central Aztec land area to support more urban development. The plan specifies the use of this land as a master planned community village, including lands for residential, commercial, and industrial developments. The plan suggests that this land area can accommodate between 4,500 and 8,900 housing units, with room for commercial and industrial enterprise. The Apache Railway line is seen as a key transportation asset in this area capable of leveraging future industrial and commercial development.

2.3 Population and Employment Projections

In an effort to plan for future development, population and employment projections are generated based on historic growth trends. While there are no certainties that growth and development will occur within the study area or local region in the immediate or distant future, it remains important to plan for infrastructure investments, system preservation, and maintenance needs. Table 4 shows the projections of population and employment growth for the study area, the Towns of Snowflake and Taylor, and Navajo County between 2010 and 2035. These projections are based on ADOT's Arizona Statewide Travel Demand Model. The model uses county population projections prepared by the Arizona State Demographer's Office.

Table 4 Study Area Population and Employment Projections, 2010-2035

Geography	Population (1)			Employment (1)		
	2010	2035	Compounded Annual Growth (%)	2010	2035	Compounded Annual Growth (%)
Second Knolls Study Area	1,500	1,900	1.0	498	2,213	6.3
Town of Snowflake[2]	5,590	6,700	0.7	1,938	5,450	4.2
Town of Taylor[2]	4,112	5,600	1.2	1,488	4,125	4.2
Navajo County	107,398	134,832	0.9	35,757	78,500	3.2

Source: Arizona Department of Transportation, Arizona Travel Demand Model, 2010.

Notes: (1) It is important to note that forecasts of population and employment were prepared prior to the recent economic fluctuations, and therefore reflect a higher-end projection of forecast population and employment.
(2) The Transportation Analysis Zone (TAZ) geography of the Navajo County Travel Demand Model is not consistent with the municipal boundaries of either Snowflake or Taylor. Therefore, the TAZ geographies include some areas of unincorporated Navajo County.

The large increase in employment forecast for the Second Knolls area means that it may be a major activity center. Snowflake and Taylor may become net importers of jobs.

3.0 Existing and Future Transportation Conditions

This section of the report first describes the existing road network in the Second Knolls study area, including a discussion of current and future traffic operations, and next introduces a future transportation network plan. After the road network discussion, this section discusses freight rail and goods movement, airports, and non-motorized transportation.

3.1 Road Network

The few existing roads within the Second Knolls study area are dirt roads that provide access to ranches and the Dry Lake Wind Power Project. SR 77 and SR 277 provide the main transportation linkage between these local access roads and the towns of Snowflake and Taylor.

State Route 77

SR 77 is a state highway that serves as the primary connection between Holbrook, Snowflake, Taylor and Show Low. Within the incorporated limits of Snowflake and Taylor, SR 77 is identified as Main Street, with four travel lanes, and a shared center left turn lane between signalized intersections, and sidewalks. On-street parking is available along portions of the corridor.

Within Snowflake and Taylor, the posted speed limit is 35 mph. North of Snowflake the posted speed limit is 55 mph. The SR 77 corridor is identified in several transportation plans and studies as a key commercial corridor for Navajo County. Table 5 shows the 2011 average daily traffic volumes together with the truck percentage for study area segments.

State Route 277

SR 277 is a two-lane state highway connecting Snowflake and Taylor with Heber-Overgaard to the west. Posted speed limits on the segment of this road within the Second Knolls Development Regional Study area ranges from 35 mph to 55 mph. Table 5 shows the 2011 average daily traffic volumes together with the truck percentage for study area segments.

SR 277 connects Snowflake and Taylor with the Second Knolls area and Heber-Overgaard. (Photo credit: HDR)

Table 5 Existing and Future State Highway Traffic Conditions

From	To	2011			2035		Travel Lanes	Area Type (3)
		ADT	Truck %	LOS (2)	ADT (1)	LOS (2)		
SR 77								
Pinedale Rd	100 North - Taylor	13,500	14.3	C	19,600	C	4	D
100 North - Taylor	Snowflake Jr High School entrance	14,700		C	21,500	C	4	D
Snowflake Jr High School entrance	SR 277 / Snowflake Blvd	14,400		C	21,000	C	4	D
SR 277 / Snowflake Blvd	Despain Ave	4,100		B	5,900	B	2	R
Despain Ave	SR 377	2,700		B	4,000	B	2	R
SR 277								
SR 377	SS 277 (Paper Mill Rd)	1,300	15.8	B	1,800	B	2	R
SR 277S (Paper Mill Rd)	Pulp Mill Rd	1,900		B	2,600	B	2	R
Pulp Mill Rd	Red Hill Rd	900		B	1,300	B	2	R
Red Hill Rd	SR 77 - Snowflake	4,600	14.3	B	6,100	B	2	D

Source: ADOT Traffic Counts, 2011.

Notes: (1) Population growth projections from the Arizona Statewide Travel Demand Model, Second Generation, were applied to 2011 ADT to forecast 2035 daily traffic volumes.
(2) Table 3, FDOT Generalized Annual Daily Volume's for Florida's Rural Undeveloped Areas and Developed Areas Less than 5,000 Population.
(3) D – developed; R – rural, undeveloped.

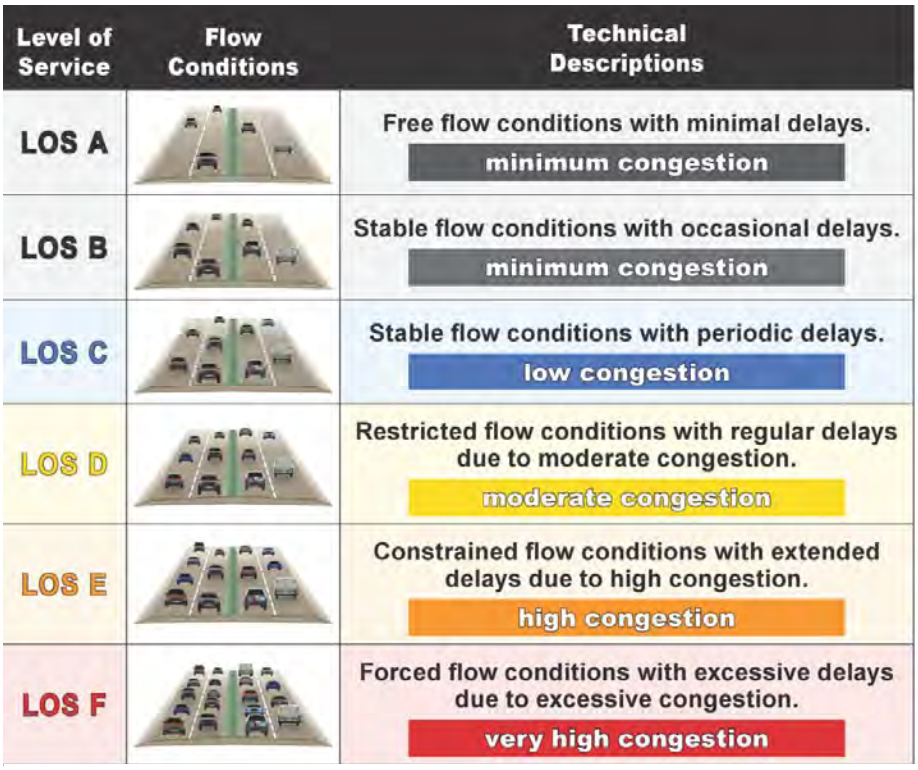
3.2 Traffic Operations

Segment level of service analysis was conducted for study using the volume thresholds identified in the Florida Department of Transportation's 2013 Quality/Level of Service Handbook. Shown in Appendix A, these volume thresholds are based on planning methods described in the 2010 Highway Capacity Manual. Table 5 shows 2011 ADOT traffic counts for SR 77 and SR 277 together with 2035 traffic forecasts.

Level of Service

LOS is a qualitative measurement of operational characteristics of traffic and the perception of traffic conditions by both motorists and passengers. The *Highway Capacity Manual* (HCM) defines six LOS conditions. Each LOS is given a letter designation from A to F, with A representing the optimal or best condition and F the worst (Transportation Research Board 2010). Road segment LOS is characterized by the HCM as follows:

- LOS A: Best, free flow operations (on uninterrupted flow facilities) and very low delay (on interrupted flow facilities). Freedom to select desired speeds and to maneuver within traffic is extremely high.
- LOS B: Flow is stable, but presence of other users is noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within traffic.
- LOS C: Flow is stable, but the operation of users is becoming affected by the presence of other users. Maneuvering within traffic requires substantial vigilance on the part of the user.
- LOS D: High density but stable flow. Speed and freedom to maneuver are severely restricted. The driver is experiencing a generally poor level of comfort and convenience.
- LOS E: Flow is at or near capacity. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within traffic is extremely difficult. Comfort and convenience levels are extremely poor.
- LOS F: Worst, facility has failed, or a breakdown has occurred.



Level of service is a qualitative measurement of operational characteristics and the perception of traffic conditions. (Image credit: HDR)

LOS A, B, and C are generally considered to be satisfactory service levels, while the influence of congestion becomes more noticeable at LOS D. LOS E is undesirable and is considered by most agencies to be the limit of acceptable delay, and LOS F conditions are considered to be unacceptable. For this study, LOS C will be designated as the minimally acceptable LOS for the analysis of road segments.

Analysis Results

Projected population growth in Navajo County and Arizona will increase traffic on both SR 77 and SR 277. However, the 2035 traffic forecasts shown in Table 5 do not include any additional traffic generated by development in the Second Knolls study area. While the Aztec Area Plan identifies potential uses for the Aztec Land & Cattle Company property, the traffic impact of development on the state routes will depend on many variables. These include the size and location of development and the eventual mix of residential, commercial, and industrial uses.

Under this background traffic growth scenario, both SR 77 and SR 277 will continue to operate at level of service C or better through 2035. Traffic impact analysis studies should be prepared to identify the impact of proposed developments on the road network.

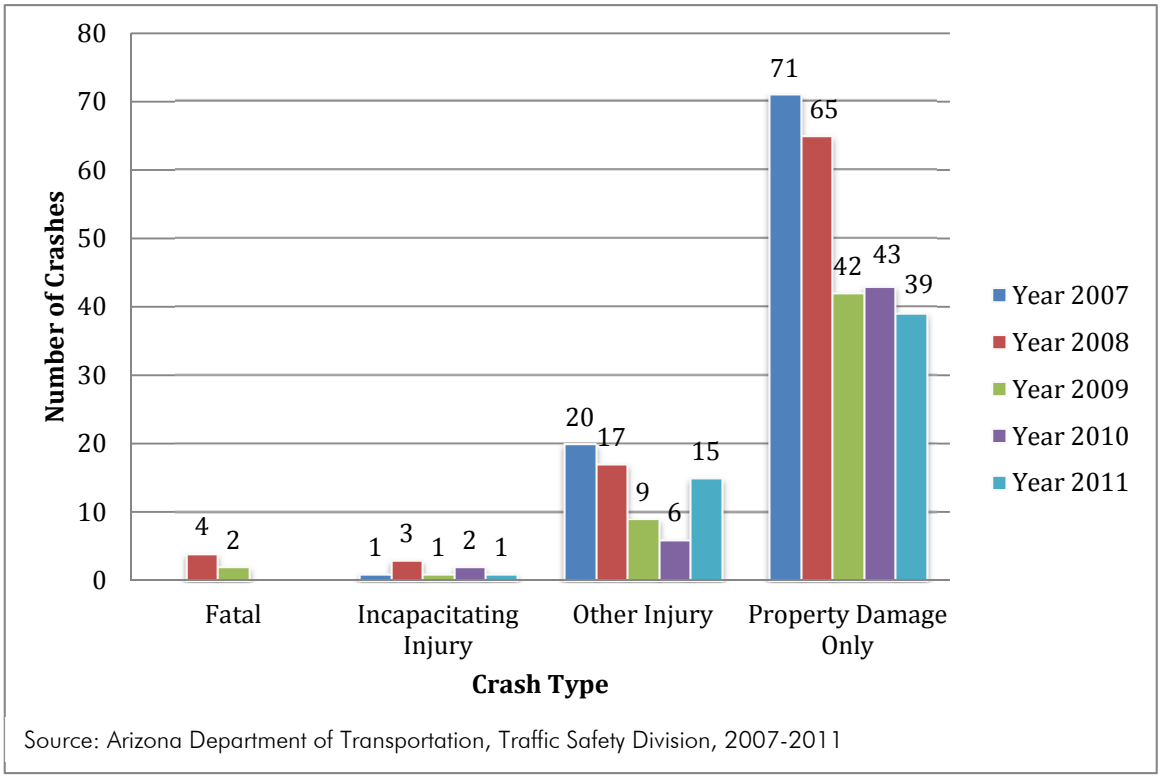
3.3 Traffic Safety

An analysis of vehicle crashes on SR 77 and SR 277 was conducted to identify crash patterns, trends and types using the data provided by ADOT's Traffic Safety Division. The five year crash analysis period used data collected between January 1, 2007 and December 31, 2011.

A total of 341 crashes involving 563 vehicles were reported on roads adjacent to the study area during the five year analysis period. There were 6 fatal crashes (2 percent) and 75 crashes involving injuries (22 percent).[3] The remaining 260 crashes (76 percent) were non-injury, property damage only, or unreported type. Figure 2 illustrates the yearly crash trend and severity for between 2007 and 2011.

[3] *Injury crashes can include incapacitating, non-incapacitating, and possible injury crashes.*

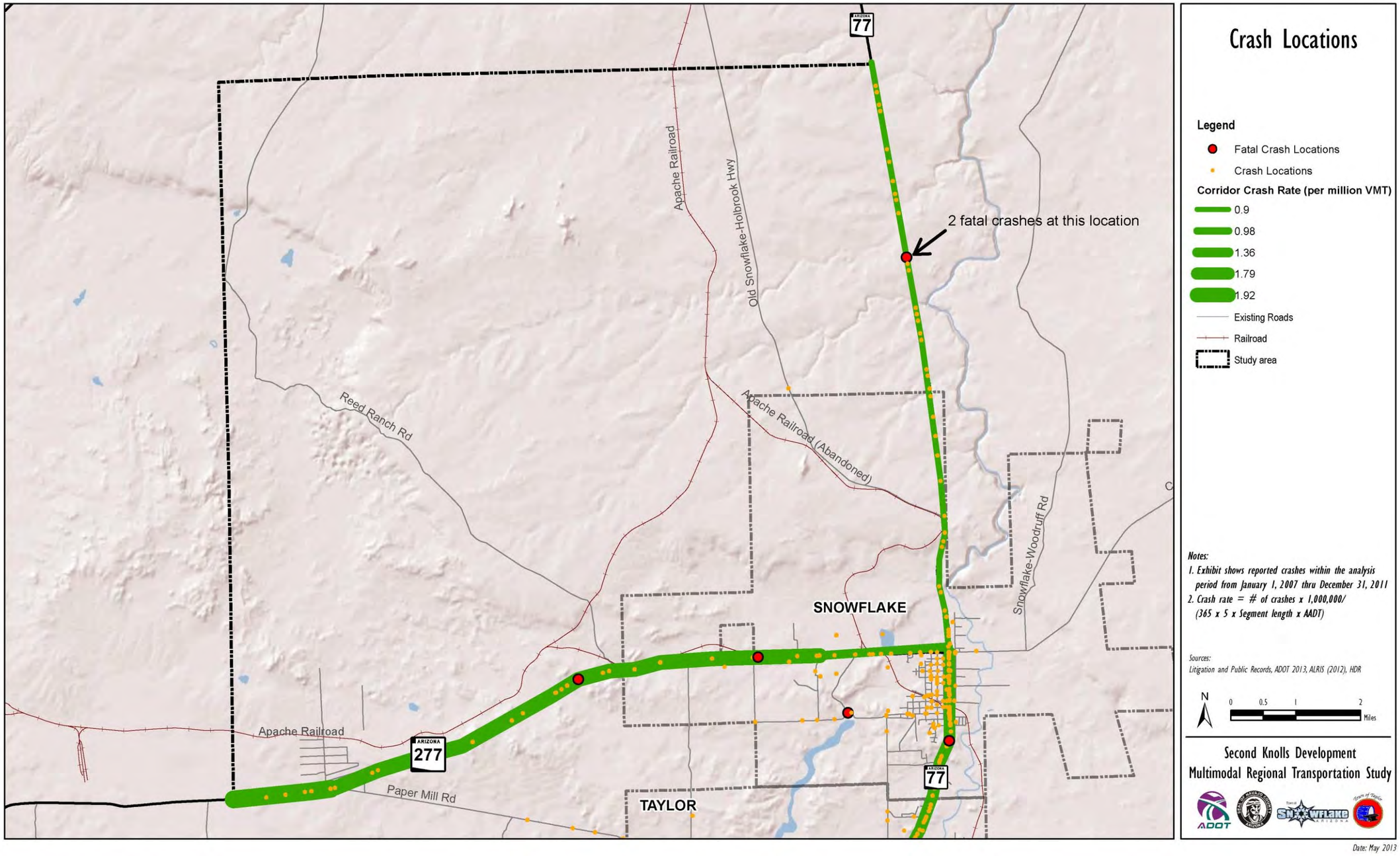
Figure 2 Total Vehicle Crashes by Crash Type and Severity



Source: Arizona Department of Transportation, Traffic Safety Division, 2007-2011

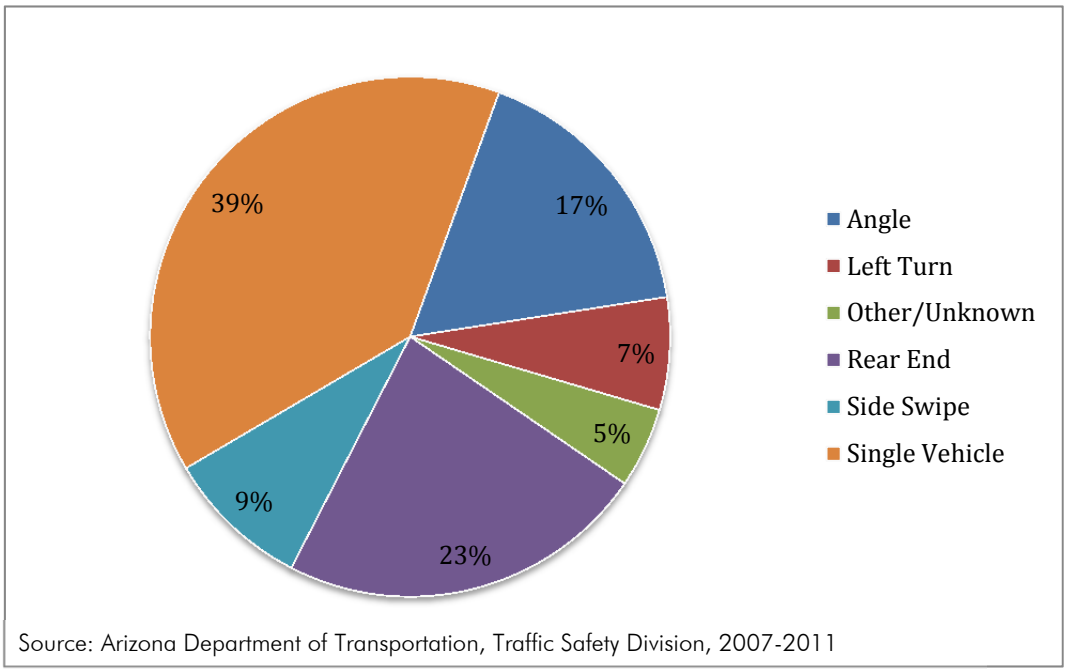
The data shows a decline in the number of crashes beginning in 2009. This trend remained generally constant through 2011. This corresponded to a decrease in traffic volumes that is attributable to the economic downturn. Across Arizona the number of vehicle trips and vehicle miles of travel declined during this period, which resulted in lower crashes. Figure 3 displays the location and volume of crashes along major roads surrounding the study area.

Figure 3 Vehicle Crash Locations, Volumes of Crashes, and Crash Types



Among the various crash types that occurred during the analysis period, single vehicle crashes accounted for the greatest proportion of all crashes (133 crashes, 39 percent), while rear-end crashes accounted for the second highest percentage of crashes (78 crashes, 23 percent). Angle crashes, referred to as "T-bone" crashes accounted for 17 percent of all crashes evaluated for this period (58 crashes), while sideswipe crashes accounted for 9 percent of all crashes (31 crashes). Left turn crashes accounted for 7 percent (24 crashes) of the total crashes followed by other/unknown crashes (17 crashes, 5-percent). Figure 4 describes the crashes by type.

Figure 4 Vehicle Crashes by Type of Crash



Source: Arizona Department of Transportation, Traffic Safety Division, 2007-2011

Among all crashes, there were six fatal crashes reported within the five year period. Four of these crashes involved only single vehicles. Fatal crash characteristics are documented in Table 6. The primary cause of fatal crashes was inattentiveness while driving. The majority of fatal crashes occurred during normal daylight hours under clear weather conditions.

Table 6 Fatal Crash Characteristics

Date	Location	Time	Collision Manner	Lighting	First Harmful Event	Weather	Primary Violation
9/2/08	SR 77	10am	Angle	Daylight	Other vehicle	Clear	Speeding
9/12/08	SR 277	11am	Single vehicle	Daylight	Overturn	Clear	Inattentive driving
9/28/08	SR 77	9pm	Single vehicle	Dark	Overturn	Clear	Inattentive driving
2/23/08	SR 77	2pm	Single vehicle	Daylight	Overturn	Clear	Inattentive driving
2/22/09	7th Street	10pm	Single vehicle	Dark not lighted	Fixed pole	Cloudy	No data
11/3/09	SR 77	4pm	Other	Daylight	Pedestrian	Clear	Inattentive driving

Source: Arizona Department of Transportation, Traffic Safety Division, 2007-2011.

Most crashes occurred along SR 77 and SR 277. There were 166 crashes (49 percent of all crashes) on SR 77 between Paper Mill Road and Milepost 370 (near Reidhead Avenue, a dirt road). There were 50 crashes (15 percent of all crashes) along SR 277 between Milepost 325 (near Paper Mill Road) and the junction with SR 77. The reported crashes included both segment and intersection related crashes. The remaining 125 crashes took place along other corridors and intersections within the study area. Table 7 shows the crashes along these corridors by type.

Table 7 Vehicle Crashes by Type, Severity, and Location

Description	Crashes on SR 77 (%)	Crashes on SR 277 (%)	Crashes on Other Corridors (%)
Crash Type			
Single Vehicle	54 (33)	29 (58)	49 (39)
Angle	36 (22)	2 (4)	21 (17)
Left Turn	16 (10)	3 (6)	6 (5)
Rear End	33 (20)	10 (20)	35 (28)
Sideswipe	22 (13)	2 (4)	7 (6)
Other	5 (2)	4 (8)	7 (5)
Severity			
Fatal	3 (2)	2 (4)	1 (1)
Injury	40 (24)	12 (24)	23 (18)
Property Damage	123 (74)	36 (72)	101 (81)
5-Year Total	166 (100)	50 (100)	125 (100)

Source: Arizona Department of Transportation, Traffic Safety Division, 2007-2011.

By crash type, single vehicle and rear-end crashes were the major crash types followed by left-turn and angle crashes. On SR 277, 58 percent of crashes were single vehicle crashes. Out of the six fatal crashes, three were along SR 277, two were along SR 77, and one was on another road.

Single vehicle crashes mostly occurred along mid-block sections of the roads evaluated, where vehicles traveling at excessive speeds and a lack of visibility would be potential issues. Rear-end crashes are more likely to occur at or near crossing roads where a greater number of vehicles are turning during peak traffic times and in daylight conditions. Large intersection turning volumes, short yellow phases, restricted sight distance, lack of exclusive traffic signal phases are the leading cause of angle and left-turn crashes.

Crash rates per million vehicles per year were calculated for the evaluated segments of SR 77 and SR 277. Table 8 shows the number of crashes and calculated crash rates for the five-year analysis period. The crash rate shown is a function of the number of crashes, the average daily traffic volume on a segment, and the length of the segment. The segment on SR 277 between milepost 325 and Paper Mill Road has the highest crash rate.

Table 8 Five-Year Crash Rates

Route	Segment	5 Year Total Crashes	5 Year Average Daily Traffic Volume	Segment Length (mile)	Crash Rate (1)
SR 77	Paper Mill Road to SR 277/Snowflake Boulevard	108	13,600	3.2	1.36
	Snowflake Boulevard to milepost 325	58	3,850	9.2	0.90
SR 277	Milepost 325 to Paper Mill Road	7	1,250	1.6	1.92
	Paper Mill Road to Red Hill Road	36	1,000	11.0	1.79
	Red Hill Road to SR 77- Snow Flake	7	4,900	0.8	0.98

Source: Arizona Department of Transportation, Traffic Safety Division, 2007-2011.

Note: (1) Crashes per million vehicle miles of travel.

Overall, 55 percent of the total 341 crashes were a result of collisions with other vehicles. Other crashes were a result of overturning vehicles, hitting wild animals and fixed objects and or unknown causes. About 83 percent crashes took place under clear weather conditions. The remaining 17 percent crashes occurred in cloudy, rainy or other weather conditions. Approximately 75 percent crashes were in daylight and 25 percent crashes were in dawn, dusk or dark conditions.

No clear patterns emerge from this crash analysis. As development occurs in the Second Knolls area and traffic volumes increase, crash history should monitored regularly to identify any emerging trouble spots.

3.4 Public Transportation

The White Mountain Connection, a service of Navajo County, provides weekday fixed-route bus service along SR 77 between Pinetop-Lakeside, Show Low, Snowflake, Taylor and Holbrook. This year-round services makes three round-trips Monday through Friday between 6:30 AM and 6:30 PM, with stops at designated bus stops including key community facilities and regional shopping centers. No other fixed-route local bus services are offered within the study area or adjacent communities. Regionally adopted transportation plans do not include transit service within the study area, but acknowledge the success of existing regional services and promote their continued use. The plans identify funds for transit service, potential future service expansion opportunities, but none of which include parts of the study area. It is foreseeable that should the study area develop, a connecting transit service may be warranted to link populations living in centralized locations with the employment opportunities in the study area.

3.5 Airports

The Taylor Municipal Airport is a general aviation airport that could support growth in the Second Knolls region. (Photo credit: HDR)

The Taylor Municipal Airport is a general aviation airport located approximately two miles south of the center of Taylor on Airport Road, west of SR 77. Air travel to and from this airport is primarily recreational, made via private aircraft (ultralight and single-engine planes) and there are no commercial passenger services, although charter service is available. The airport has an onsite mechanic, fuel depot, and courtesy car for visitors. In the near future, ADOT has programmed several improvements to the facility including the installation of a chain link fence for large animal control, improvements to the access road, the relocation and upgrades to the fuel servicing system capable of accommodating jet engine fuel, crack and seal treatments to the runway, and improvements to the runway apron. While these improvements will upgrade the airports existing features, it will be necessary to evaluate what additional investments are needed in order to attract corporate jet traffic or handle cargo traffic, depending on how the study area and planned industrial park develop. Vacant land surrounding the airport is available for hanger construction or other airport expansion activities.

Other regional airports near the study area include the Holbrook Municipal Airport in Holbrook, the Show Low Regional Airport in Show Low, and the Winslow-Lindbergh Regional Airport in Winslow. A collection of small, privately operated airports and fields are also located in Navajo and Apache counties. Of the public airports identified, the Show Low Regional Airport is the largest facility with two runways and a passenger terminal building. Great Lakes Airlines offers scheduled passenger air service between Show Low and Phoenix.

3.6 Goods Movement

Goods movement within the Second Knolls study area is served by both commercial trucks and freight rail.

Truck

Table 5 shows that trucks represent up to 16 percent of the daily traffic moving on SR 77 and SR 277. The truck traffic reflects local and regional goods movement in eastern Arizona between the Holbrook, Show Low, and Payson, and Snowflake and Taylor.

Rail

Perhaps the most important transportation asset for the Second Knolls area is the Apache Railway. This railroad is a 38-mile short line with track that connects the closed Catalyst Paper Corporation mill with the Burlington Northern Santa Fe (BNSF) mainline in Holbrook. BNSF is a Class I transcontinental railroad that provides a freight rail connection to the Ports of Long Beach and Los Angeles in California and markets in the Midwest and East Coast.

Several spur lines are available within the study area, paralleling both SR 77 and SR 277 serving existing industrial sites and businesses along these corridors. The Apache Railway serves the Pigs for Farmer John Farms hog farm north of Snowflake. The railroad has few at-grade road crossings, meaning trains can travel at higher speeds to reach the BNSF railway in Holbrook. Incorporated in 1917, the Apache Railway Company offered a mixture of freight and passenger rail service until the mid-1950s. Following a brief stint serving tourist passenger rail service, the railway focused on freight transportation exclusively for over five decades primarily serving the paper mill and the Pigs For Farmer John Farms (PFFJ) feed mill.

With the closure of the Catalyst Paper Corporation mill, the railway is facing an uncertain future. Local interests including the Town of Snowflake and the Aztec Land & Cattle Company purchased the Apache Railway to maintain it to support potential new users in the Second Knolls area, including a proposed potash mine. The railroad continues to haul feed for PFFJF and store rail cars.[4]

An Apache Railway train leaves Holbrook in 2010 on its way to Snowflake and the Second Knolls study area. The Apache Railway provides a freight rail connection to the BNSF transcontinental railway.
(Photo credit: Wikipedia/Drew Jacksich)

3.7 Non-Motorized Transportation

In general, non-motorized transportation facilities are confined to the developed areas within the communities of Snowflake and Taylor. Pedestrian sidewalks line town streets nearest the town centers and in some residential neighborhoods. However, the further out one is from each town's center, or where more recent development has occurred, the presence of sidewalks is more limited. Designated trail systems do not exist within the study area. An extensive network of non-motorized trails are identified in the future development plans for the Town of Snowflake, linking existing and future neighborhood areas, and following natural amenities such as Cottonwood Wash and town recreation sites and facilities.

3.8 Future Conditions

Adequate capacity exists on the current state highway system around the Second Knolls study area to accommodate anticipated background traffic growth through the 2035 planning horizon. Even with this background traffic growth, enough capacity remains on rural, undeveloped portions of SR 277 to accommodate up to 5,800 additional vehicle trips per day in 2035. Rural, undeveloped portions of SR 77 could accommodate up to 2,500 additional vehicle trips per day.

One example of what SR 277 could look like after more development occurs at Second Knolls is SR 89 between Prescott and Chino Valley. Portions of this two-lane highway have been upgraded

[4] *Au_Wire.com. Accessed October 22, 2013 at http://www.au-wire.com/apache-railway-is-one-key-to-passports-future-success/*

with passing lanes, but operates overall as a two-lane highway. It carried 20,000 vehicles per day in 2010.

Based on Institute of Transportation Engineers (ITE) trip rates, traffic from the following developments may be accommodated on rural, undeveloped portions of SR 277 at LOS C:

- 600-unit single-family detached subdivision
- 1,700-employee industrial park

Traffic impact analysis studies should be prepared for new developments to determine any improvements needed to accommodate additional traffic.

3.9 Summary

The existing and future transportation system analysis showed that ample capacity remains on the current state highway system to accommodate background traffic growth through 2035. Furthermore, there is enough remaining capacity forecast on SR 277 in 2035 to support initial development within the Second Knolls study area without needing to add new lanes to the road.

4.0 Development Case Studies

The central Navajo County economy has traditionally relied on forest products manufacturing, agriculture, and recreation. The closing of the Catalyst Paper Corporation mill in 2012 was a blow to the region's economy. The Arizona Republic reported that the paper mill employed 308 and generated another 1,000 spin-off jobs in Navajo County[5]. While the re-opening of the Snowflake Power Plant in August 2013 helped ease the loss by adding back 35 jobs, the paper mill closure left a huge gap in the employment base.

With the Second Knolls development, the towns of Snowflake, Taylor, and central Navajo County have an opportunity to reinvent the local economy. Abundant land, natural resources, energy, a quality labor force, existing road and rail transportation links to national markets, and successful public-private partnerships are all assets that can attract new jobs and industry.

The main question addressed by this section of the Second Knolls Development Regional Study is what industries should the region target? To answer this question, the consultant team looked at case studies from other communities for insight into what the region could do to attract certain types of development.

Included in Appendix B, the case studies are meant to help the Second Knolls region target industries that can take advantage of the transportation and industrial infrastructures idled by the paper mill closing and build a foundation for economic growth. The case studies considered industrial clusters, inland ports, transload facilities, and forest products. The lessons learned from these case studies may offer insight into how each industry might fit into the Second Knolls region, and what the region could do to attract new development.

4.1 Industrial Clusters

Case studies in industrial clusters and asset-oriented economic strategies show how some rural communities have leveraged their local assets to create sustainable manufacturing industries. Recreational vehicles makers in northern Minnesota and the auto industry in Mississippi provide examples of rural industrial centers that have flourished in part by supporting competition between local businesses to improve the workforce.

In rural northern Minnesota, recreational vehicle maker Arctic Cat has flourished through local efforts to support this core manufacturing interest. (Photo credit: Arctic Cat)

These industrial centers produce value-added products that compete in a global marketplace. This evolution came from an asset-oriented economic development strategy that focused on strengthening connections within regions and building capacities within communities. This included building the specialized worker skills that are already unique to a region as well as

[5] *http://www.azcentral.com/business/articles/20120925snowflake-plant-closure-imminent-out-work.html*

building on existing natural and built environment amenities, such as access to the Interstate highway system, and regional airports with commercial passenger service.

The case studies also show that the local regulatory framework is important for enhancing the existing industrial base while attracting complimentary businesses and industries. These policy-oriented actions include establishing a foreign trade zone, infrastructure development, land development regulations, and property tax incentives.

Workforce

The industrial case studies suggest the Snowflake-Taylor region should focus on forest products industries. The region has a skilled workforce experienced in the manufacture of a variety of wood products. Some of the workers idled by the paper mill closing have been re-employed by the copper mining industry in Gila, Graham, and Greenlee Counties. However, stakeholders report that these workers are ready to return to their homes in central Navajo County if work were available.

The region also has a long tradition of farming and ranching. Both the hydroponic tomato greenhouses and the industrial hog farm in the study area are examples of how skills in agriculture and animal husbandry can be transformed into industrial jobs. The workers at these two industrial agricultural operations have skillsets that could be used to attract new agribusiness.

Site Suitability

With large parcels of developable land, ample supplies of natural gas, electric power, freight rail service, and water, the Second Knolls region could accommodate many different types of industry.

Regulatory Incentives

The State of Arizona offers regulatory incentives to support job creation, including:

- Arizona Quality Jobs Tax Credit that offer corporate tax credits up to $9,000 for each qualifying new job
- Arizona Job Training Fund that provides up to $9,000 per employee to companies creating permanent new jobs
- Research & Development Income Tax Credit for investments in research and development in excess of expenditures from the previous year. Through 2017, the R&D tax credit will be equal to 24 percent of the first $2.5 million in qualifying expenses, plus 15 percent of qualifying expenses in excess of $2.5 million. The credit is lower after 2018.[6]
- Foreign Trade Zone Program that offers up to a 75 percent reduction in state real and personal property taxes

These incentives could be in addition to any other incentives negotiated by a developer at the county or municipal level.

[6] *Arizona Commerce Authority. Accessed on October 22, 2013 at http://www.azcommerce.com/research-development/.*

4.2 Inland Ports

As the Port of Los Angeles and the Port of Long Beach become more congested, there is an opportunity for inland sites to prepare and process shipments for transport across the country. With the Apache Railway's connection to the BNSF, state highway access to I-40 and the nearby Taylor Municipal Airport, stakeholders have commented that Second Knolls may be a suitable site for an inland port.

The Alliance Global Logistics Hub in Alliance, Texas, and the Virginia Inland Port in Front Royal, Virginia, are two examples of the kind of inland port that interests Second Knolls stakeholders. These case studies, presented in Appendix C, show that location is a key factor for inland port sites. The Virginia Inland Port is 200 miles from the Norfolk, Virginia, seaport and approximately 70 miles from Washington, D.C. The Alliance Global Logistics Hub is located in a suburb 40 miles from Dallas. This proximity to metropolitan areas provides both ready access to large markets and a source of skilled labor to operate facilities and equipment.

The case studies showed that location is a key factor for successful inland ports such as the Virginia Inland Port in Front Royal, Virginia. (Photo credit: Virginia Inland Port)

The Alliance Global Logistics Hub and the Virginia Inland Port case studies identified some key characteristics of a successful inland port, including:

- Market proximity to at least 3 million people within 200 miles
- Major, direct connection an American seaport via a Class I railroad
- Foreign Trade Zone status and privileges
- Abundance of reasonably priced labor and commercial real estate
- Overall governing body with cohesive management plan
- Strong state and local government participation and incentives

These characteristics help illuminate the suitability of the Second Knolls site for an inland port.

Market Proximity

In 2010, the Phoenix-Mesa-Glendale Metropolitan Statistical Area, which includes Maricopa County and portions of Pinal County, was the 14th largest metropolitan area in the United States with a population of nearly 4.2 million. The minimum driving distance between Second Knolls and most of the Phoenix metropolitan area is 150 miles. The Second Knolls site is connected to the Phoenix area via SR 277, SR 260, and SR 87. SR 87 is a four-lane divided highway as are portions of SR 260. SR 277 is a two-lane road. The route does cross mountainous topography with long, steep grades that slow down trucks and extend the normal three-hour drive time. The driving distances to other nearby metropolitan areas such as Albuquerque and Las Vegas are outside the 200-mile driving distance.

Class I Railroad Connection

While the Apache Railway's connection to the Class 1 BNSF transcontinental rail network potentially makes an inland port feasible at Second Knolls, BNSF has told stakeholders that the site is not viable at this time. One explanation provided by BNSF officials is that the Second Knolls is not close enough to the Ports of Los Angeles and Long Beach to gain the efficiencies needed to warrant the infrastructure investment.

Foreign Trade Zone

While the Second Knolls area does not currently have Foreign Trade Zone (FTZ) status, it presents a unique option that may be considered as part of any future economic development strategy. A foreign trade zone is a dedicated land area where goods may be unloaded from a shipping vehicle, repackaged or modified, and re-exported without customs review. Foreign trade zones are especially useful to firms that import components in order to manufacture finished products for export. There are several economic benefits to FTZs including streamlined customs paperwork and oversight needs, or reduced financial charges (duties or quotas) for imports or exports, among other benefits. The Arizona Foreign Trade Zone program offers up to a 75 percent reduction in state real and personal property taxes.

Labor and Real Estate

The labor requirements for an inland port would vary by its size. Based on the current population of Snowflake and Taylor, there would be an adequate employment base to support a starter facility. Stakeholders have noted there is a workforce ready and willing to return to the Second Knolls region if jobs are available. In terms of commercial real estate development, the Second Knolls study area is relatively undeveloped. Some progress in commercial real estate development would be needed to support an inland port.

Management Plan

While public and private stakeholders are enthusiastic about development at Second Knolls, there is no formal governing body or management plan currently established. Formalizing a governing body and a management plan would establish the authority needed to develop and administer a possible inland port site.

Regulatory Incentives

State and local government stakeholders are very active in protecting the Second Knolls assets. The Arizona Commerce Authority leads the state's effort to bring in new industry, and has worked closely with local stakeholders. An inland port that creates new jobs could take advantage of state tax incentives.

Environmental Conditions

The Catalyst Paper Mill, located immediately west of the Second Knolls study area, has several assets in place currently that help make the site attractive for redevelopment. Roads, electricity lines, sewer and water systems, and a direct rail connection provide basic access and utilities to the site. However, as an industrial site, it will likely be necessary to evaluate what environmental issues exist should the site be repurposed to a new use. Brownfield industrial sites require environmental remediation to resolve past environmental problems prior to their reuse.

4.3 Transload Facility

The inland port case studies suggest that transload facility could be a first step for the Second Knolls region. Transload facilities focus on the transfer of goods between truck and rail modes. While it requires warehousing and storage facilities, a starter transload facility could use the existing paper mill site and Apache Railway infrastructure. Beginning initially with the forest products industry, it could eventually support many different kinds of goods.

Prineville, Oregon

Located in central Oregon northeast of Bend, the City of Prineville built its shortline railroad in 1916 after being bypassed by the Oregon Trunk and Union Pacific railroads. The oldest municipally built and operated railroad in the United States, the City of Prineville Railway profited until the timber from the nearby Ochoco National Forest ran out and the last lumber mills closed. However, in 2003, the Prineville opened a freight transfer and warehousing facility at an abandoned sawmill site. In 2004, the Prineville Freight Depot gave the railroad new life as a Louisiana-Pacific laminates factory and the Les Schwab Tire Company started using it for shipping. The Louisiana-Pacific mill has since closed, but the transloading facility continues to provide a lifeline for the shortline railroad.[7]

Since 2006, the City of Prineville Railway has received Connect Oregon I and Connect Oregon II grants totaling $5.5 million to upgrade the transload facility. The railroad also received a $1 million American Recovery and Reinvestment Act grant to rehabilitate the 18-mile rail line. The redevelopment created 62 construction jobs. The freight depot itself supports 19 direct and indirect permanent jobs.[8]

[7] *Trainweb.org. City of Prineville Railroad. Accessed on October 21, 2013 at http://www.trainweb.org/highdesertrails/cop.html.*

[8] *Prineville Freight Depot. Accessed on October 21, 2013 at http://www.prinevillefreightdepot.com/.*

The Prineville (Oregon) Freight Depot was built on the site of an old sawmill. It provides freight transfer and warehousing services for a variety of commodities. It is served by the City of Prineville Railway and the local and state highway system. (Photo credit: Google Maps)

The 40-acre Prineville Freight Depot is served by both the BNSF Railway and Union Pacific Railway. Road access to the site is through the state highway system. It handles bricks, crushed stone, gypsum wallboard, insulation and siding, lumber, machinery, oriented strand board, paper waste and scrap, particle board, pipe, plywood, poles and posts, printing paper, rail equipment, railroad ties, roofing materials, and saw logs. A stimulus to growth, the freight depot acquired an anchor-tenant that makes de-icing and dust-abatement products. Other potential tenants include a wood pellet manufacturer.

While the railroad continues to rebuild, the Prineville economy has diversified since the days when it depended heavily on the lumber mills for its livelihood. Bureau of Land Management and U.S. Forest Service jobs have become the new anchors for the local economy. It is also the site for Facebook and Apple, Inc. data centers. The Census Bureau reported a population of 9,253 in 2010.[9]

Comparison to Second Knolls Region

This case study demonstrates how the investment in the Prineville Freight Depot attracted new shippers to the City of Prineville Railway. There are many similarities in this case study between

[9] *Wikipedia. Prineville, Oregon. Accessed on October 21, 2013 at http://en.wikipedia.org/wiki/Prineville,_Oregon.*

Prineville, Oregon, and the Second Knolls region starting with the shortline railroads serving historic forest products industries. Like the Second Knolls region, Prineville struggled to find a way to keep its rail connection viable. It re-purposed a brownfield lumber mill into a freight depot that serves a variety of different shippers. This transload facility has become the anchor for new industrial growth, including a potential wood pellet manufacturer. This case study shows how one rural community has leveraged its historic capabilities with alternative funding sources, including federal grants, to diversify and remain competitive in the regional marketplace.

Recently, the Fort Apache Timber Company has re-opened a local sawmill in Whiteriver, Arizona, and started logging operations, thanks in part to a $10 million loan from the federal government. The sawmill will play a key role in restoring the forest's health and serve as a regional economic development generator as the Four Forest Restoration Initiative (4FRI) continues to evolve.

4.4 Forest Products

The biggest economic bright spot for central Navajo County is the forest products industry. The 4FRI is public-private collaboration to restore forest ecosystems on portions of the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests along the Mogollon Rim in Northern Arizona. Ponderosa pine forests stretch from the south rim of the Grand Canyon in north-central Arizona to the White Mountains of eastern Arizona and into the mountains of southwestern New Mexico. More than a century of logging and wildfire suppression has resulted in forest stands with small trees that are prone to intense fires that can climb into the crowns and kill even older trees. These dense forests have fewer plants in the understory and provide poor wildlife habitat.

The 4FRI will open 800,000 acres of ponderosa pine forest along the Mogollon Rim for thinning. Lumber from the thinning operations can be used for wood chips for power generation, exported as whole logs, or cut into lumber. This steady source of forest products could eventually anchor the northern Arizona rural economy.

These cases show how communities similar to Snowflake and Taylor capitalized on their existing forest products infrastructure and knowledge base to establish more sustainable industries. As shown by the John Day, Oregon, case study, opportunities exist to expand the use of forest biomass fuels into sustainable municipal wood heating projects. The case studies further show experiences with redeveloping brownfield mill sites as wood pellet mills, biomass power projects, or industrial parks.

John Day, Oregon, Thermal Biomass

In eastern Oregon, communities are taking advantage of forest stewardship projects to build sustainable wood heating projects for their municipal facilities.[10] Working with business and non-profit interests, John Day and Burns, Oregon, are using wood-based fuels generated by forest restoration to heat local schools and municipal buildings. Malheur Lumber Company expanded its mill to integrate the production of wood pellets and bricks. Municipal buildings in John Day and Burns retrofitted their heating systems to wood-fired boilers.

[10] *Oregon Forest Resources Institute. Woody Biomass Offers Potential for Heat, Electricity and Fuel. Accessed October 21, 2013 at http://oregonforests.org/sites/default/files/publications/pdf/OFRI_woody-biomass-report_WEBsinglepgs.pdf*

This effort was seeded by an American Recovery and Reinvestment Act grant administered by the Forest Service. A combination of tax credits and private equity lending gave the Malheur Lumber Company in John Day the financing needed for improvements. A state energy program provided funding to seed the construction of a pellet boiler at the local hospital. The wood pellets and bricks from the wood heating project are expected to reduce energy costs as combined heat and power facilities can capture between 70 and 90 percent of energy in the fuel. [11] This type of distributed, renewable energy generation may qualify for energy credits that provide an incentive for the installation and operation of renewable energy systems.

Brownfield Redevelopment

Many communities across North America have been affected by paper mill closings. These abandoned, idle, or underused mill sites are being transformed into new economic development projects. Unlike an undeveloped 'greenfield' site, a brownfield location – such as the Catalyst Paper Corporation mill – generally has roads, water, sewer, power, and rail already in place. States, including Arizona, have assistance programs[12] to assist with any required remediation. These programs have made brownfield site redevelopment more cost effective.

Oakridge, Oregon

Oregon has at least one redevelopment example of a forest products brownfield site that may interest the Second Knolls region. In his 1999 paper "Brownfields Approach to Redevelopment of Forest Products Facilities in Oregon: Update" Mark Winters provided case studies on three brownfield projects in Oakridge, Eugene, and Springfield.[13] Of the three case studies presented by Winters, Oakridge is most comparable to the Second Knolls region. Located 40 miles east of Eugene with a population of 3,200, it is similar to Snowflake and Taylor in size and rural setting. After environmental remediation, the city developed a former lumber mill site as an industrial park using federal grant funding aimed at aiding displaced timber workers. The industrial park now employs approximately 100 workers. A 2009 newspaper article reports that most of the town's livelihood comes from a growing tourist trade.[14]

Berlin, New Hampshire

On the other side of North America in Berlin, New Hampshire, a closed 150-year-old paper mill site is being redeveloped as a new biomass power plant. When operational, the $275 million Burgess BioPower biomass power plant will provide 40 new permanent jobs and reuse portions of the old

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[11] *Sustainable Northwest. Local Energy Development in John Day. Accessed October 21, 2013 at http://www.sustainablenorthwest.org/what-we-do/success-stories/a-regional-strategy-for-wood-based-energy*

[12] *Arizona Department of Environmental Quality. Accessed October 21, 2013 at http://www.azdeq.gov/environ/waste/cleanup/brownfields.html*

[13] Winters, M. B. (1999). BROWNFIELDS APPROACH TO REDEVELOPMENT OF FOREST PRODUCTS FACILITIES IN OREGON: UPDATE. In *TAPPI International Environmental Conference: Proceedings*. TAPPI Press. Accessed October 21, 2013 at http://www.tappi.org/Downloads/unsorted/UNTITLED-ENV99357pdf.aspx

[14] *The Oregonian. Accessed October 21, 2013 at http://www.oregonlive.com/opinion/index.ssf/2009/10/oakridge_a_mill_town_on_the_me.html*

paper mill. One key to the financial success of this project was state renewable energy credits. However, the project has encountered a number of obstacles, including local opposition and petitions for intervention in the power purchase agreements. Power purchase agreements with the local utility company provided a stable market for power from the redevelopment site. Intervention by state's governor and legislature helped find a funding solution that allowed the project to go forward.[15]

Comparison to Second Knolls Region

These case studies show several examples of how other rural communities have built on forest restoration projects to establish more sustainable industries. With existing infrastructure to build from, the paper mill site could also host a wood pellet mill, an expanded biomass power project, or other industrial or warehousing use.

4.5 Other Case Studies

The Second Knolls Development Regional Study stakeholders identified potential economic development strategies and emerging industries that fit the assets of the Second Knolls area and region's goals. Working with the stakeholders, the consultant team chose case studies that focused on inland ports and industrial manufacturing. Other case study options considered but not selected include power and energy, solid waste disposal and recycling, potash mining, and water products.

Power and Energy

Part of the emerging trend toward clean energy, the Dry Lake Wind Power Project opened in 2009 northwest of Snowflake bringing a boost to the local economy. In addition to the 200 temporary construction jobs it generated, the wind farm also supports Navajo County through property tax revenues. However, the wind power industry is facing near term uncertainty related to factors such as the expiration of federal tax incentives, low natural gas prices, and modest growth in electricity demand. While declining prices in the cost of wind energy have boosted growth

Plans to expand the Dry Lake Wind Power Project, located partially within the Second Knolls study area, are on hold due to uncertainty in the wind power industry. (Photo credit: HDR)

[15] *Biomass Magazine. Accessed October 21, 2013 at http://biomassmagazine.com/articles/5757/nhs-berlin-station-biomass-power-project-gets-new-life*

prospects, what these trends mean in the medium and long term remains to be seen. Future natural gas prices, fossil plant retirements and policy decisions will all play a part in determining demand for new wind power.[16] Due to these market factors, and the region's already extensive experience with wind power and biomass energy production at the Snowflake Power Plant, this industrial sector was not selected for a case study.

Solid Waste Disposal and Recycling

The Second Knolls region has ample land located far from major population centers that could be suitable for use as a potential sanitary land fill. The Apache Railway could be used to import solid waste for disposal from urban areas. A recycling center may be another potential use. Since these possible uses to do not align with the stakeholders' goals for the region, no solid waste or recycling case studies were selected.

Potash Mining

Several mining companies have been exploring the potential of potash mines along US 180 southeast of Holbrook. While outside of the Second Knolls study area, these mines could potentially be served by the Apache Railway. This could lead to some mining-related industries located along the Apache Railway in the Second Knolls region. Due to the speculative nature of the potash mining proposals, and the distance of the mineral deposits from the Second Knolls area, this industry was not selected for a case study.

Water Products

The Coconino Aquifer runs beneath the Second Knolls study area. The closed Catalyst Paper Corporation mill relied on this underground river for its paper production. While this water source is an important asset for the region, the Second Knolls stakeholders did not identify any water-related industries for case studies.

Data Processing Facilities

As railroads were supplanted by highways for leisure travel and goods transport, the evolution of computing and telecommunication technologies in the past 30 years has dramatically changed our needs for travel and transport of people and materials. The "information superhighway" – or the Internet – has increased our personal and professional access to information and services that previously would have required the transfer or materials across the country via our roads and rails.

Residents of the Snowflake and Taylor region identified data processing and call centers as another potential option for bringing jobs and development to the Second Knolls study area and greater central Navajo County region. Data processing facilities and call centers often employ a large number of people. Strategic investments in telecommunications technology to bring high speed, high-capacity data lines to the study area can attract computing and digital technology firms. Additionally, Northland Pioneer Community College could also be leveraged as a local institution to provide technical training to workers on computing systems and technology-related data processing

[16] *U.S. Department of Energy, 2012 Wind Technologies Market Report (August 2012). Accessed on September 13, 2013 at http://emp.lbl.gov/sites/all/files/lbnl-6356e.pdf*

center needs. An initial question is whether there is sufficient infrastructure available to support a data processing facility or call center.

Fiber optic wiring is typically installed with high-voltage transmission lines between substations as a means for energy utilities to communicate with substation facilities. Depending on the utility's ownership, right-of-way legalities, and the capabilities of existing infrastructure, it maybe possible to provide the study area with some form of high speed, high-capacity fiber optic wiring connection. The Towns of Snowflake and Taylor also may provide fiber optic wiring as part of town improvement programs such as roadway expansions, sewer and water utilities, or natural gas lines. Additionally, the Apache Railroad Company has indicated a willingness to locate fiber optic wiring within or adjacent to the railroad right-of-way, providing the study area with a high-speed data connection.

The Arizona Department of Administration, Arizona Strategic Enterprise Technologies Office (ADA-ASET), is responsible for the development and implementation of the State's information technology strategy, and provides capabilities, services and infrastructure to ensure the continuity of mission critical and essential systems for the state of Arizona. The goal of ADOA-ASET is to transform Arizona into a nationwide leader of advanced IT strategies, methodologies, services and business processes. By leveraging technology as a catalyst for state reform ADOA-ASET enables efficient, innovative and sustainable services.

Additionally, regional agencies such as the Northern Arizona Council of Governments (NACOG) are working to expand computing technologies in northeast Arizona through the creation of plans and programs intended to specify investments in technology systems and broadband capabilities. In March 2013, NACOG published the Broadband Local Planning Assistance to Arizona Communities plan as a Business Case Analysis (BCA) focused on digital capacity needs and opportunities for enhanced digital capabilities within the NACOG region (identified as the counties of Apache, Coconino, Navajo, and Yavapai.

Examples of "big data" in rural areas include Chanute, Kansas, a community of 9,000 residents in southeast Kansas. In the mid-1980s, the city made several investments in local fiber optic cabling to link local utilities and transfer information to a centralized hub regarding electricity usage. Overtime, the city expanded this investment to link local institutions such as government offices, the local community college, school district, and hospital to their growing high-speed network. Subsequently, the city is now employing wireless internet technology throughout the city, available to residents and businesses. Today, businesses including Chanute Manufacturing, Post Rock Energy, MagnaTech, and others are connected to the city's network, and in 2012, Spirit AeroSystems, a manufacturer of structures for commercial aircraft, opened a new manufacturing facility employing over 150 people. While this case study shows the power of community investments in technology and helping to attract local, regional, and nationwide manufacturing firms, the Second Knolls study area represents a land area that could be used for housing large servers and data processing facilities, and with the right connections, help attract data and technology firms to the region.

4.6 Summary

Many of the key themes and desirable attributes discussed in the case studies are found in the Second Knolls study area and in Snowflake and Taylor. Open, relatively level land is abundantly available, and the study area is served by a rich mixture of transportation and public utility resources.

Strong local governance and institutions are present in nearby communities, along with a coordinated group of agency and private stakeholders.

Industry Clusters

The summary shown in Table 9 confirms that Second Knolls is an attractive site for development. One limitation for the site is the lack of direct access to a major metropolitan market. The minimum driving distance to the Phoenix metropolitan area is 150 miles over mountainous roads and can take three hours.

Table 9 Key Attributes of Economic Development Efforts

Attribute	Northern Minnesota	Tupelo, Mississippi	Second Knolls
Availability and price of open land	X	X	X
Direct access to large metropolitan markets	X	X	
Connections with major transportation networks	X	X	X
Availability of public roads and utilities	X	X	X
Understanding of community assets and liabilities	X	X	X
Public-private partnerships	X	X	X
Supportive zoning and land development regulations	X	X	X
Interagency coordination and involvement	X	X	X
Strong local leadership	X	X	X
Skilled labor force	X	X	X

Inland Port

According to a report first published by the Heitman Real Estate Investment Management Firm and reproduced by The Allen Group, a leading real estate development firm specializing in the creation of inland port and logistics hub facilities, several key attributes should be evaluated when considering future locations for inland port or logistics hub facilities. As summarized in Table 10, the Second Knolls site is missing several key attributes. While foreign trade zone status and potential labor pool issues could be overcome, the site's distant location from West Coast ports and 150-mile driving distance to the Phoenix area is fixed. This fact, paired with competition from sites closer to Phoenix and Tucson, suggests that an inland port is not viable for Second Knolls at this time.

Table 10 Key Attributes of Locating Inland Port Facilities

Attribute	Alliance, Texas	Virginia Inland Port	Second Knolls
Connection to major container seaport		X	
Connections to Class I railroad	X	X	X
Minimum of 1,000 acres of land	X	X	X
Foreign trade zone status (1)	X	X	
Access to major metropolitan area	X	X	
Access to major interstate highway(s)	X	X	X
Strong local labor pool (2)	X	X	

Source: Heitman, LLC, in The Allen Group, *Inland Ports: Solving the Logistics Puzzle of Growth in Global Trade*, 2008.

Notes: (1) The U.S. Department of Homeland Security, Customs and Border Protection Agency is responsible for regulation of Foreign Trade Zones (FTZ). Information on establishing a new FTZ is available at http://www.cbp.gov/xp/cgov/trade/cargo_security/cargo_control/ftz/about_ftz.xml.

(2) The strength of the local labor pool refers to the skills necessary for operating an inland port facility specifically. Because no such facility currently exists in the Snowflake-Taylor region, an assessment of the skills and abilities of the local workforce toward achieving the functions necessary to operate such a facility would be necessary. The technical development of skills could be coordinated working through local institutions, but also depends on the type of port facility envisioned or implemented, and the requirements imposed by oversight agencies.

Transload Facility

While an inland port is not viable, the case studies suggest that a freight transfer and warehousing facility housed at the shuttered Catalyst Paper Corporation mill could help to revitalize industry in the region. Table 11shows that Second Knolls site has characteristics similar to Prineville, Oregon, which operates the Prineville Freight Depot transload facility.

Table 11 Key Attributes for Transload Facilities

Attribute	Prineville, Oregon	Second Knolls
Shortline connection to Class I railroad	X	X
Brownfield site for redevelopment	X	X
State highway access	X	X
Interstate highway access		X
Access to regional shippers	X	X

Forest Products

The Four Forest Restoration Initiative will provide a steady source of forest products in northern Arizona that could be used for power generation, exported as whole logs or cut into lumber. The case studies show examples of other rural communities that have used forest restoration projects to develop wood-based fuels industries. The case studies also show how existing infrastructure at the under-utilized mill sites can be repurposed to house a wood pellet plant, an expanded biomass power generation plant, a freight transfer transload facility, or other industrial or warehousing use.

Table 12 Key Attributes for Forest Products Development

Attribute	Berlin, New Hampshire	John Day, Oregon	Oakridge, Oregon	Prineville, Oregon	Second Knolls
Reliable supply of forest products	X	X			X
Existing mill site for redevelopment	X	X	X	X	X
State highway access	X	X	X	X	X
Interstate highway access					X
Shortline connection to Class I railroad	X			X	X

4.7 Conclusions

With the Second Knolls development, the Towns of Snowflake, Taylor and central Navajo County have an opportunity to reinvent their economies. Abundant land, natural resources, energy, a quality labor force, existing road and rail transportation links to national markets, and successful public-private partnerships are all assets that can attract new jobs and industry.

The case studies considered rural industrial clusters, inland ports, transload facilities, and forest products. Lessons learned from the industrial clusters case studies showed that the region should play to its strength and focus on wood product handling and manufacturing facilities. The closed paper mill is served by SR 277 and the Apache Railway and could function with either a wood product handling or manufacturing purpose. In addition, Snowflake and Taylor have a workforce experienced in the wood products manufacturing that will be attractive to the industry.

While the case studies showed that conditions are not ideal for an inland port at the Second Knolls site, the existing paper mill site could serve as an initial transload facility for the Apache Railway. Transload facilities transfer goods between truck and rail modes and require some warehousing and storage facilities. Beginning initially with the forest products industry, it could eventually support many different kinds of goods.

The case studies suggest that the key to revitalizing the region's economy and developing the Second Knolls area is building first on existing infrastructure through continued planning and collaboration among public and private sector stakeholders.

5.0 Improvement Plan

Recommendations for improving the transportation system in the Second Knolls study area are based on previous plans and studies and input from the study's Technical Advisory Committee and stakeholders.

The Aztec Area Plan identified an initial transportation framework for the Second Knolls area. Figure 5 shows this framework integrated with the regional road system together with corridors identified by the Town of Snowflake and Town of Taylor general plans. This framework concept includes a loop road that when completed will provide congestion relief to SR 77 through Snowflake and Taylor. This transportation framework concept also identifies new connections to improve access to the Taylor Municipal Airport.

While the final placement of roads will be determined during future planning and engineering phases, Figure 5 provides a point of reference based on current plans for the study area, neighboring municipalities, and Navajo County, along with input received from Second Knolls stakeholders.

Figure 6 shows a series of potential road cross-section designs that could be adapted to serve the study area and future community roads to link regional assets, such as the Taylor Municipal Airport. These cross-sections are based on a 200-foot right-of-way footprint that can accommodate a four-lane road with a center turn lane and bicycle lanes. The graphic shows how an initial two-lane section could be expanded to a wider section as warranted by travel demand.

Figure 5 Future Transportation Network Concepts

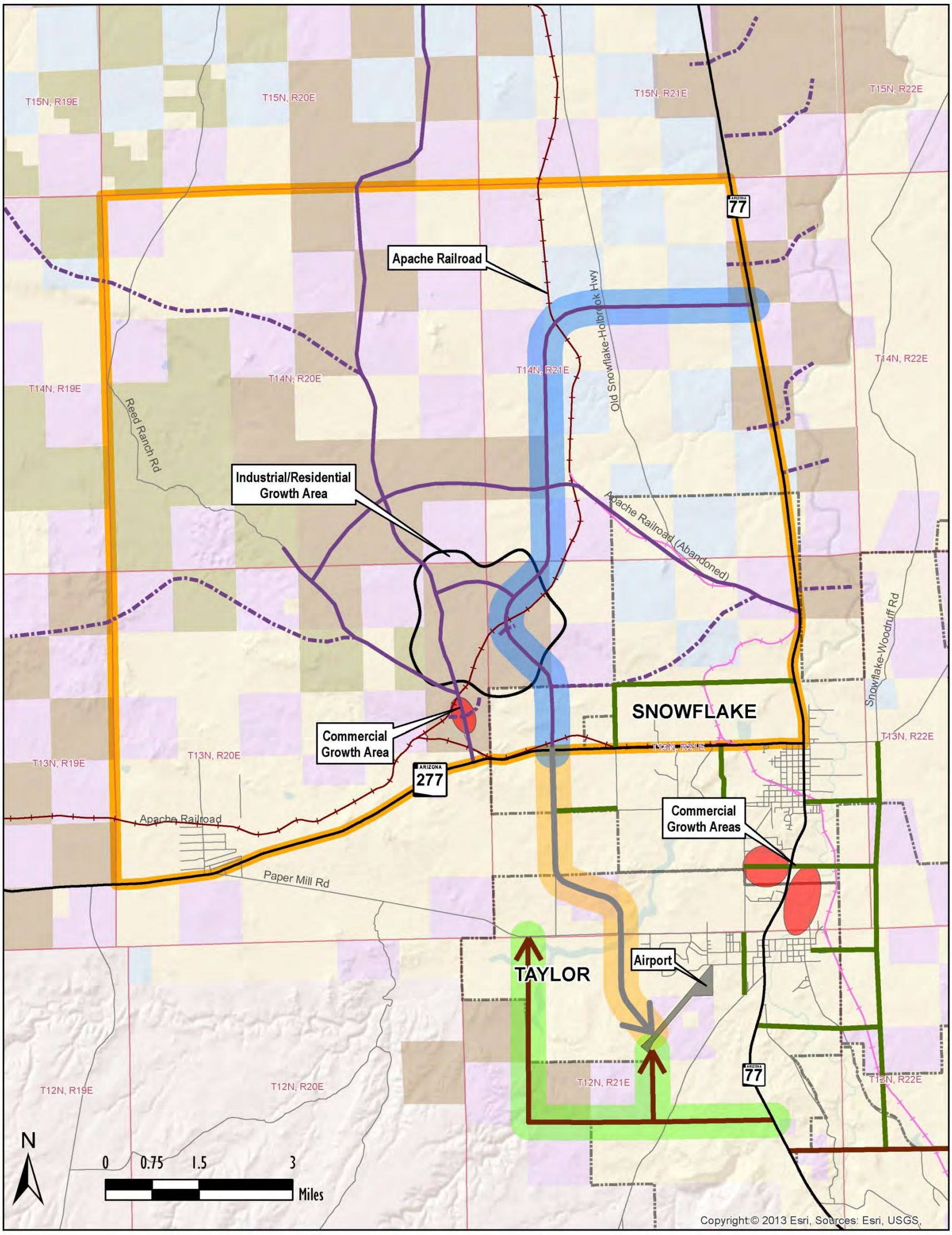
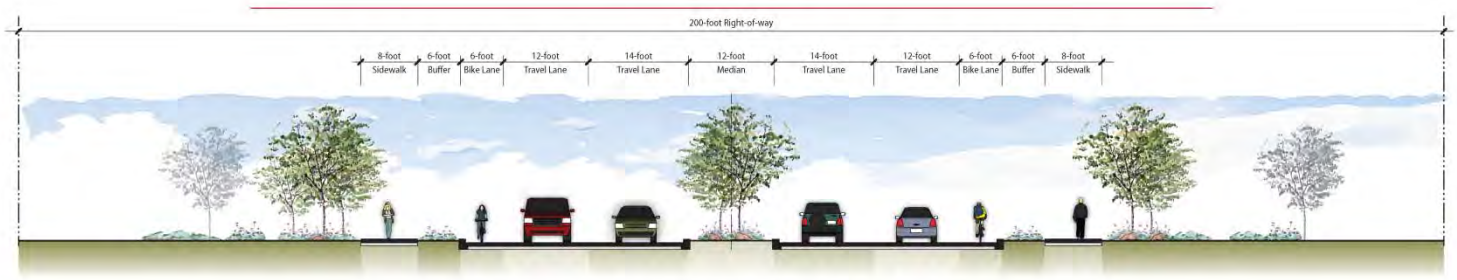


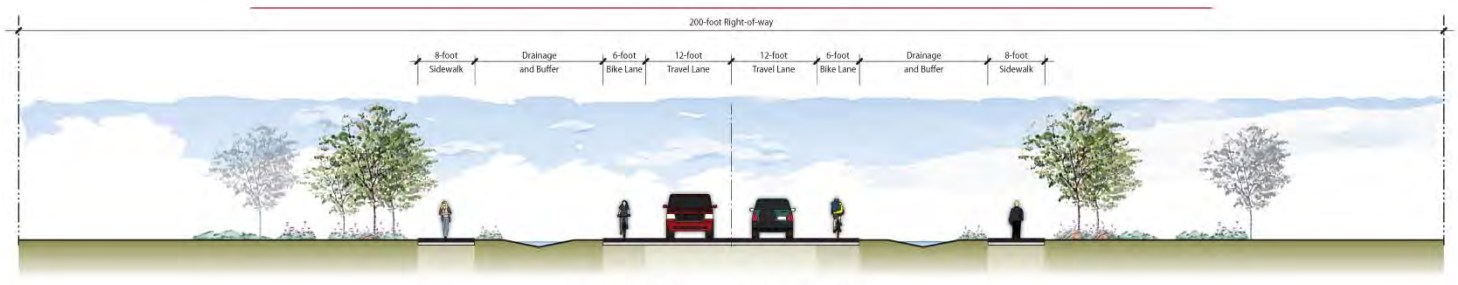
Figure 6 Second Knolls Road Cross Sections

4-lane rural arterial no bike lanes

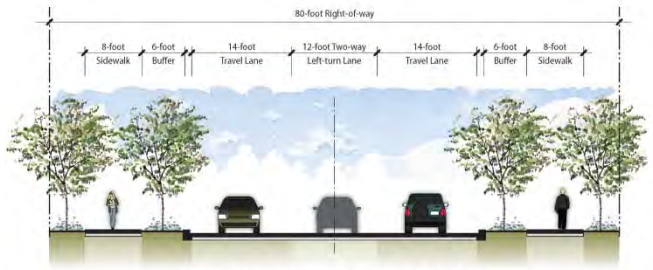
4-lane rural arterial w/ bike lanes



4-lane urban arterial w/ bike lanes

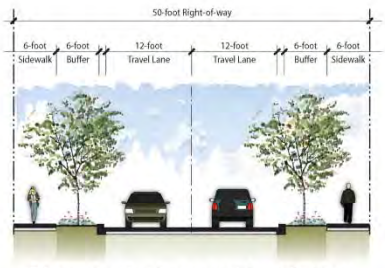


2-lane rural minor collector w/ bike lanes

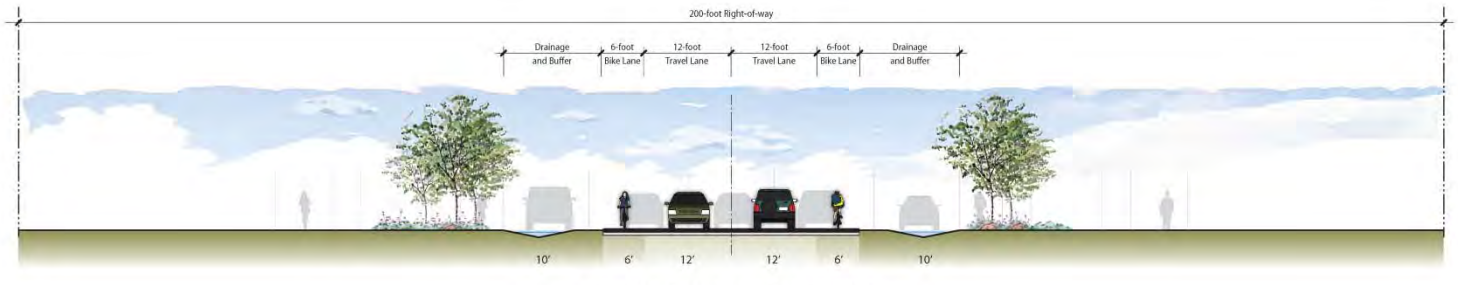


2-lane urban major collector no bike lanes

2-lane urban local residential no bike lanes



2-lane urban local commercial no bike lanes



Interim rural arterial w/ bike lanes (200')

Title VI and Environmental Justice Populations

The Environmental Protection Agency and FHWA define environmental justice as the "fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies." Environmental justice principles and procedures are followed to improve all levels of transportation decision making. Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin. Executive Order 12898 on environmental justice addresses minority and low-income populations. Executive Order 12898 falls under the umbrella of Title VI.

There are three fundamental environmental justice principles applicable to the transportation project development process:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

Effective transportation decision-making depends on understanding and properly addressing the unique needs of different socioeconomic groups. Properly implemented, environmental justice principles and procedures improve all levels of transportation decision making. The five minority groups addressed by Title VI and Executive Order 12898 include:

- Black (a person having origins in any of the black racial groups of Africa)
- Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race)
- Asian American (a person having origins in any of the original peoples of the Far East,
- Southeast Asia, the Indian subcontinent, or the Pacific Islands)
- American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition)
- Some other race, or persons of more than one race

A member of the low-income population is defined as "a person whose household income is at or below the Department of Health and Human Services poverty guidelines." The Department of Health and Human Services poverty guidelines state that the poverty level for a family of four in 2012 is $23,050 (note, however, that this income level cannot be compared directly with current income levels because the value of money changes year to year).

The protected populations for the Second Knolls study area are shown in Table 13.

Table 13 Title VI and Environmental Justice Populations

Race/Ethnicity	Percentage of Population
White	84.6
Black or African American	0.1
American Indian/Alaska Native	6.5
Asian	0.2
Native Hawaiian	0.2
Persons of Two or More Races	2.4
Persons of Hispanic or Latino Origin[1]	11.8

Source: U.S. Census Bureau, 2013.

Note: 1) Hispanics may be of any race, and are included in applicable race categories. Therefore, the total percentage may not add up to 100%.

In general, the Snowflake-Taylor municipal area displays many of the same socioeconomic and demographic characteristics of rural Arizona communities. Non-Hispanic whites, Hispanic, and Native American populations are the predominant racial and ethnic groups of both communities. Approximately 14.4 percent of the population lives below the poverty level, as compared to 16.2 percent for the State of Arizona. The median household income is above Arizona's median at $53,400 (measured between 2007 and 2011). And homeownership rates are notably higher in the region as compared to the state, with approximately 83.7 percent of the population in Snowflake and Taylor owning a home as compared to 66.6 percent for Arizona.

5.1 Summary

The future transportation framework concepts shown in Figure 5 and Figure 6 identify a scalable system that can be expanded to accommodate growth in the area through the 2035 planning horizon. Snowflake, Taylor, and Navajo County should incorporate these future transportation framework concepts into their general and comprehensive plans. As development occurs in the region, transportation plans should be updated to ensure that regional mobility is optimized to accommodate demand for all modes of travel.

At this time the study area is sparsely populated and the impact of these future developments to Title VI and Environmental Justice populations is unknown. Future public outreach efforts should make every effort to engage minority and low-income populations within the Second Knolls study area.

6.0 Funding Opportunities

The following section summarizes revenue sources that are currently available for funding road transportation projects in the Second Knolls area. It should be noted that in the current environment, the funding of significant transportation projects is complex and, in most cases, requires multiple sources. Innovation in this dynamic environment has become the mainstay of successful transportation funding. In addition to more traditional funding sources, this section also presents the results of grants research directed at the Second Knolls region economic development efforts.

6.1 Federal Funding Sources

Community Development Block Grant

Funds are provided by the U.S. Department of Housing and Urban Development. A transportation improvement project must benefit and be located in a census tract or block group with at least 51 percent of the population in low- and moderate-income groups. Projects that address an urgent need such as natural disaster may be eligible.

Highway Safety Improvement Program

The Highway Safety Improvement Program aims to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Each state's apportionment of Highway Safety Improvement Program funds is subject to a set-aside for construction and operational improvements on high-risk rural roads. High-risk rural roads are roads functionally classified as rural major or minor collectors or rural local roads with a fatality and incapacitating injury crash rate above the statewide average for those functional classes of roads, or likely to experience an increase in traffic volume that leads to a crash rate in excess of the average statewide rate.

National Highway System Program

The program provides funding for improvements to rural and urban roads that are part of the National Highway System, including the Interstate System, and designated connections to major intermodal terminals. Under certain circumstances, these funds may also be used to fund transit improvements in National Highway System corridors.

Safe Routes to School Program

The purpose of the federal Safe Routes to School Program is to make walking and bicycling to school a safe and routine activity. The program provides reimbursable funds for elementary and middle schools to implement projects that encourage children to walk and bicycle to school.

Surface Transportation Program

The Surface Transportation Program provides flexible funding that may be used by states and localities for projects on any Federal-aid highway classified as a major collector or above, including the National Highway System, bridge projects on any public road, transit capital projects, and intra-city and intercity bus terminals and facilities. For projects programmed with Surface Transportation Program funds from a Council of Governments TIP, local project sponsors may exchange Surface Transportation Program funds for a reduced amount of Highway User Revenue Fund (HURF) funds from ADOT, enabling the project sponsor to assume greater control over project development and

implementation. The exchange program is currently on hold by ADOT until the HURF gains are shown for the revenue stream.

6.2 State Funding Sources

Arizona Gaming Sources (Proposition 202)

Proposition 202 was passed in November 2002 and set the stage for new gaming compacts between the State of Arizona and the respective tribes. A provision of Proposition 202 was the sharing of gaming revenues with the State and local governments. Proposition 202 requires an Indian tribe to make 12 percent of its total annual contribution to cities, towns, or counties for government services that benefit the general public, including public safety, mitigation of the impacts of gaming, or promotion of commerce and economic development.

Economic Strength Project Program

The Arizona Commerce Authority in collaboration with ADOT administers the Economic Strength Project Program. This joint program for local governments provides grants for road projects that result in economic development and meet three primary goals: create and retain a significant number of jobs in Arizona, lead to significant capital investment in Arizona, and make a significant contribution to the economy of Arizona. The Economic Strength Project Program has a continuous funding source through ADOT. Annually, there are two funding rounds in which at least $500,000 is available for new road construction, upgrading existing roads, turn lanes, acceleration or deceleration lanes, and reconstruction and paving.

Greater Arizona Development Authority

The Greater Arizona Development Authority (GADA) was created by the Arizona State Legislature to assist local and tribal governments and special districts with the development of public infrastructure. GADA leverages its funds to lower the costs of financing and help accelerate project development for public facilities owned, operated, and maintained by a political subdivision, special district, or Indian tribe. GADA has both financial and technical assistance programs.

Highway Extension and Expansion Loan Program

House Bill 2488, enacted into law on August 21, 1998, established a comprehensive loan and financial assistance program for eligible highway projects in Arizona. The program, designated as Highway Extension Expansion and Loan Program (HELP), provides communities in Arizona a new financing mechanism to stretch limited transportation dollars and bridge the gap between the needs and available revenues. HELP provides the State and its communities with an innovative financing mechanism to accelerate the funding of road construction projects and has proven to be a significant tool for financing the construction of highway projects throughout the State. Similar to bond funds, the HELP is a loan, hence there are payback obligations. The major advantage is there are no application fees and the rate under statute is "below market." Currently, HELP loan applications are not being accepted due to state budget issues.

Highway User Revenue Fund

HURF represents the most significant source of transportation funds in the State of Arizona. Funds are derived primarily from motor vehicle fuel taxes and vehicle license taxes. HURF funds are shared

with and allocated through ADOT and distributed as an entitlement to cities, towns, and counties based on population.

Transportation, Community, and System Preservation Program

The Transportation, Community, and System Preservation Program is intended to address the relationships among transportation, community, and system preservation plans and practices and identify private sector-based initiatives to improve those relationships. States, metropolitan planning organizations, local governments, and tribal governments are eligible for Transportation, Community, and System Preservation Program discretionary grants to plan and implement strategies that improve the efficiency of the transportation system, reduce environmental impacts of transportation, reduce the need for costly future public infrastructure investments, ensure efficient access to jobs, services, and centers of trade, and examine development patterns and identify strategies to encourage private sector development patterns that achieve these goals.

Transportation Enhancement Program

The Transportation Enhancement Program's purpose is to strengthen the cultural, aesthetic, and environmental aspects of the nation's intermodal transportation system. Funding is derived from the State's annual Surface Transportation Program apportionment. The program provides funding for facilities such as pedestrian walkways and bicycle paths, acquisition of scenic easements, restoration of scenic or historic sites, and landscaping and other scenic beautification.

For example, each year ADOT Transportation Enhancement and Scenic By-ways division provides approximately four million dollars for state projects, and eight million dollars for local projects for the enhancement and beatification of state highway, and local functional classified roadways. Some enhancement projects are; bicycle and pedestrian pathways, historic preservation projects, downtown main street beautification, way-finding signage/monuments, landscaping, and other roadway enhancement activities.

NACOG provides technical assistance to its member entities and tribes in preparing the grant application, which is highly competitive throughout the state. Once the applications are submitted to NACOG for review and ranking by the NACOG TAC, they are submitted through NACOG to ADOT.

The application process starts in November-December each year through NACOG.

6.3 Local Funding Sources

Development Impact Fees

An increasing number of growing Arizona communities are relying on transportation development impacts fees for both residential and commercial development. Development impact fees are one-time payments for public facilities based on a pro-rata share of costs incurred for facilities needed to accommodate new development. Development fees relate to only capital facility expansions benefiting new development and are not to be used for rehabilitation efforts or operating expenses.

General Fund

The Navajo County, Town of Snowflake, and Town of Taylor general fund monies can be used for improvements, operations, and maintenance.

Improvement Districts

Improvement districts are authorized by the State legislature for the construction of a wide range of public works facilities. They are formed to fund repaving projects, construction of roads or sidewalks, installation of landscaping, and other public improvements within a defined geographic area. The districts are initiated by property owners who combine resources with the county and towns to finance the improvements. Property owners are assessed over a several-year time frame to repay their share of the cost of the improvement.

Revenue Bonds

The issuance of bonds against county or town revenues can be used to accelerate project construction. While not a direct funding source, bonding can be used to mitigate the immediate impacts of significant capital improvement projects and spread the costs over the useful life of the project.

6.4 Transit Funding Assistance

Transit services are funded through a variety of federal, state, and local programs, as well as farebox revenue, advertising, and other nongovernmental sources. Most local government funding for transit service is provided by general fund revenues of municipalities and/or counties. Sources of potential transit funding include:

Section 5311 Formula Funds

Section 5311 supports the maintenance, development, improvement, and use of public transportation systems in rural areas. This funding supports capital expenditures (based on an 80/20 match with the municipality or other entity), operating expenses (50/50 match), and administrative expenses (80/20 match). The funding is allocated through an annual competitive application process. Its goals are to enhance access to health care, shopping, education, employment, public services and recreation.

Surface Transportation Program Flex Funds

Surface Transportation Program flex funds are available through ADOT in support of the Section 5311 Program. Typically these funds are used to augment the capital procurement process. Surface Transportation Program funding levels for local governments are determined annually by the State Transportation Board.

6.5 Public-Private Partnerships

A public-private partnership refers to the contractual agreement between a public agency and a private sector entity that allows the private sector entity to have greater participation in the delivery of a transportation project. House Bill 2396, signed into law in 2009, allows ADOT to use public-private partnerships as a tool to address Arizona's transportation requirements. This law grants ADOT broad authority to partner with the private sector to build or improve Arizona transportation facilities. Under the law, public-private partnerships include any project in which the private partner takes on risk and responsibility for transportation improvements that would have previously been borne solely by ADOT.

Public-private partnerships include new contracting concepts such as design-build, which allows a single proposer to both design and build a facility rather than the traditional approach of bidding out one contract for design and another for construction. It also allows for the possibility that the private sector may design, build, maintain, and operate a new facility, leaving ADOT in an oversight role only. In that scenario, the private proposer could be paid for its work with public funds, through tolls or fees from users, or some combination of the two.

6.6 Other Funding Opportunities

Innovation is at the heart of successful transportation infrastructure funding. The fact that the Second Knolls Development Regional Study is part of a broader rural community economic development effort presents stakeholders with opportunities to leverage other funding sources more specific to regional planning.

The primary regional planning categories investigated include transportation, economic growth, economic development, and community planning. Within these categories, the team focused on programs related to transportation infrastructure, railroads, non-motorized transportation, workforce development, industrial growth, and conservation. Additionally, the team canvassed funding programs offered by federal, state, and local government agencies, private grant-making organizations, and national, local, and corporate foundations offering grants, loans, or other funding methods.

The canvassing process initially yielded 287 funding opportunities that potentially matched the anticipated activities that will come out of the Second Knolls Development Regional Study. Funding programs related to mass transit, and mass transit development and planning were excluded.

Finally, the team developed a list of top prospects based upon a match between the intent and purpose of the funding program and the types of projects that are likely to emerge from the study. These prospects hold the most promise for the types of funding avenues project partners would want to pursue to help fund the design and construction of future activities.

Results

The original query utilized over 30 search terms and returned 287 unique federal, state, and private funding programs. After an exhaustive screening of all programs identified, the research team pared down the full canvass to a two-tiered list of potential funding options that could be considered for various phases of the Second Knolls development efforts. Tier I contains 22 funding programs to consider, and the second Tier has a total of 56.

Although programs identified in both lists are viable options to consider for future funding, the Tier I group are the ones that should be initially considered the priority over the programs listed as Tier II prospects. A summary of the Tier I prospects is provided below, and more detailed lists of both groups are attached.

The Tier I prospects have been divided into three primary categories: Transportation Planning, Community Planning, and Economic Development. As expected, the majority of funding sources in Tier I are government grants, with an even split between state and federal programs.

Table 14 Tier I Transportation Planning Funding Opportunities

Funder	Funding Program	Purpose
Arizona Department of Transportation	Coordinated Mobility Program - Elderly Individuals and Individuals with Disabilities Program - Section 5310 Grants	Provides vans, radios, and related program equipment for qualifying agencies. Funds projects providing transportation services to persons who are elderly (age 60 and over) and persons with disabilities for who mass transportation services are unavailable, insufficient or inappropriate. Eligible projects provide capital assistance and mobility management to agencies providing specialized transportation to the elderly and people with disabilities.
	Coordinated Mobility Program - Job Access and Reverse Commute (JARC) Program - Section 5316 Grants	Funds are provided to assist states and localities in developing new or expanded transportation services that connect welfare recipients and other low-income persons to jobs and other employment related services. JARC funds provide capital, operating, and planning assistance for services, equipment, facilities, and associated mobility management projects; which provide access to jobs.
	Coordinated Mobility Program - New Freedom Program - Section 5317 Grants	Provides funds for services and facility improvements that address the transportation needs of persons with disabilities. Funds are available to support capital, operating expenses, and mobility management functions related to new public transportation services targeted to people with disabilities and public transportation alternatives that go beyond those required by the Americans with Disabilities Act (ADA).
	Metropolitan Planning Program (MPP) (FTA Section 5303)	Provides funds for services and facility improvements that address the transportation needs of persons with disabilities. Funds are available to support capital, operating expenses, and mobility management functions related to new public transportation services targeted to people with disabilities and public transportation alternatives that go beyond those required by the Americans with Disabilities Act (ADA).
	Planning Assistance for Rural Areas (PARA)	Provides federal funds to non-metropolitan communities for the purpose of conducting transportation planning studies PARA funds are limited to planning applications, and may not be used for the design or construction of transportation facilities.
	Statewide Planning – Rural (FTA Section 5304)	Funds for use in rural planning and research for rural agencies. Other eligible uses, at the state's discretion, include statewide planning and other technical assistance activities, planning support for non-urbanized areas, research & development, demonstration projects, university research, and human resource development.
	Surface Transportation Program (STP) Flexible Funding	The funds provide flexible funding that may be used by States and localities for projects on any Federal-aid highway, including the National Highway Safety, bridge projects on any public road, transit capital projects, and intra-city and intercity

Funder	Funding Program	Purpose
		bus terminals and facilities. Designed to meet the needs for rural and specialized transportation.
Department of Homeland Security	Freight Rail Security Grant Program (FRSGP)	FRSGP provides funding to freight railroad carriers, owners and offerors of railroad cars, and owners of rail bridges to protect critical surface transportation infrastructure from acts of terrorism and to increase the resilience of the freight rail system.
Department of Transportation (DOT) – Federal Transit Administration	Metropolitan & Statewide Planning (5303, 5304, 5305)	Eligible for funding under the FY2013 Requested Budget Livable Communities Program. Supports cooperative, continuous, and comprehensive planning for making transportation investment decisions.
	Major Capital Investments (New Starts & Small Starts) (5309(b)(1))	Construction of new or extensions to existing fixed guideway systems.
Department of Transportation (DOT) – Federal Highway Administration	Innovative Bridge Research and Deployment Program	Funds to promote, demonstrate, evaluate, and document the application of innovative designs, materials, and construction methods in the construction, repair, and rehabilitation of bridges and other highway structures.
	National Scenic Byways Program (NSBP)	The NSBP provides funding to States and Indian tribes to implement projects on highways designated as National Scenic Byways; All-American Roads; America's Byways®; State scenic byways; or Indian tribe scenic byways; and to plan, design, and develop a State or Indian tribe scenic byway program. NSBP funding supports projects that manage and protect these intrinsic qualities, interpret these qualities for visitors, and improve visitor facilities along byways.
	Transportation, Community, and System Preservation (TCSP) Program	Funds for planning, development, and implementation of strategies to integrate transportation, community and system preservation plans and practices. A comprehensive initiative of research and grants to investigate the relationships between transportation, community, and system preservation plans and practices and identify private sector-based initiatives to improve such relationships.

Table 15 Tier I Community Planning Funding Opportunities

Funder	Grant Program	Grant Purpose
Department of Housing and Urban Development (HUD)	Capacity Building for Sustainable Communities Program	To provide capacity building support for communities engaged in planning efforts that support community involvement and integrate housing, land use, land cleanup and preparation for reuse, economic and workforce development, transportation, and infrastructure investments.
	Sustainable Communities Regional Planning Grant	Supports metropolitan and multijurisdictional planning efforts that integrate housing, land use, economic and workforce development, transportation, and infrastructure investments in a manner that empowers jurisdictions to consider the interdependent challenges of: (1) economic competitiveness and revitalization; (2) social equity, inclusion, and access to opportunity; (3) energy use and climate change; and (4) public health and environmental impact.
US Department of Agriculture (USDA) – Rural Development	Pre-development Planning Grants	Pre-development planning grants may be available, if needed, to assist in paying costs associated with developing a complete application for a proposed project.
National Center on Senior Transportation	Senior Transportation Grant Opportunity	For senior transportation projects that demonstrate innovative and effective solutions to enhance the mobility of older adults. Funding may be used to create comprehensive mobility management systems, increase mobility in urban and rural areas and improve public transit access for older persons.
Burlington Northern/Santa Fe (BNSF) Railway Foundation	Civic Programs Grant	To support the communities we serve and in which our employees live, BNSF supports many causes including civic services including organizations which are concerned with the environment, as well as local community issues such as crime prevention, parks and recreation, diversity and community development.

Three of the five grant programs in the Community Planning category focus on the development of sustainable and environmentally responsible communities.

Table 16 Tier I Economic Development Funding Opportunities

Funder	Grant Program	Grant Purpose
Department of Commerce – Economic Development Administration (EDA)	Public Works and Economic Adjustment Assistance Programs Opportunity	EDA supports development in economically distressed areas of the United States by fostering job creation and attracting private investment. EDA will consider construction, non-construction, and revolving loan fund investments under the Public Works and Economic Adjustment Assistance programs. Grants made under these programs will leverage regional assets to support the implementation of regional economic development strategies designed to create jobs, leverage private capital, encourage economic development, and strengthen America's ability to compete in the global marketplace.
	Planning and Local Technical Assistance Programs	For planning, the program assists eligible recipients in creating regional economic development plans designed to stimulate and guide the economic development efforts of a community or region. Also helps support planning organizations with Short Term and State Planning investments designed to guide the eventual creation and retention of higher-skill, higher-wage jobs, particularly for the unemployed and underemployed in the Nation's most economically distressed regions. For technical assistance, the program strengthens the capacity of recipients to undertake and promote effective economic development programs through projects such as feasibility analyses and impact studies.
Arizona Department of Tourism	Rural Tourism Development Grant Program (RTDGP)	To provide coordinated funding for rural economic development through tourism to strengthen the regional and local economies and expand tourism in rural communities throughout Arizona. Grant funds are intended to stimulate economic development through tourism. Fundable projects include visitor centers and kiosks; improvements of downtown, local parks, event grounds, historic attractions; public infrastructure; and the purchase of new or existing attractions.

The secondary list of Tier II funding opportunities that emerged from our research includes opportunities that could be viable options for peripheral activities related to the implementation of the regional study. Although these prospects hold potential as viable prospects, it is difficult to prioritize these opportunities until further planning commences. The Tier II opportunities are presented in Appendix E.

Recommendations to Consider

Many opportunities exist for partnering entities to pursue project funds as defined by this research. The following section provides suggestions for how to leverage project activities, maximize the regional committee's competitiveness, and tap into alternative sources of funding. These suggestions

were made based upon our evaluation of both prospect lists, and our knowledge of the current funding trends for government grant-making agencies.

Emphasize economic development impact

Demonstrating the potential impact on employment will not only help increase the competitiveness of the grant application, but also open up funding from the Economic Development Administration. For example, an application to develop a possible freight transfer facility should mention that it could support up to 20 direct and indirect permanent jobs.

Consider incorporating trails and parkways into the transportation design

Not only will this approach open up parks and recreation grant opportunities, it also lends itself well to a corporate sponsorship strategy.

Emphasize the mobility of "vulnerable populations"

Populations such as low-income workers, military veterans, and senior citizens are very "fundable" in today's funding climate, especially in rural areas of states like Arizona that have a higher than average proportion of elderly residents.

Further, if Affordable Housing is a priority, consider focusing on senior housing for your grant pursuits. In Arizona, an affordable senior housing project would have a better chance of getting water and transportation infrastructure expenses paid for with grants than another type of residential development.

Emphasize the regional impact of the project

Government funders are more likely to fund a project with regional impact on jobs, tax revenues, etc. than a project with local impact only (unless the funder is a local government agency). Highlighting that this project will yield regional benefits will make it more appealing to funders. Therefore, be sure to include specifics about the economic development efforts that Snowflake, Navajo County, and the Town of Taylor are planning to advance.

Collaboration between multi-disciplinary agencies – especially between public and private entities) is a characteristic that appeals to funders. Highlight the technical advisory committee, which demonstrates collaborative efforts with various municipalities, government departments, and local businesses. Consider strengthening the committee representation, by inviting individual citizens or a Citizen Advisory Board (CAB) to participate in planning activities.

Consider incorporating pollution control technologies into the design

Bioretention installations, vegetative technologies, and best management practices take advantage of the availability of government funds to pay for water quality interventions.

This tactic is most effective when engineering and design teams work in tandem, especially if the design is flexible and can be altered based on what's most fundable. Incorporating this type of strategy would allow the project team to pursue Arizona 319 funds. For example, the 319 grant could potentially fund the design and construction of a wetland area next to new roads and highways, which will not only help mitigate potential water contamination but also help pay for some of the capital costs associated with constructing the new roads and highways.

Corporate sponsorship options

Implementing a corporate funding strategy will not only help raise capital funds, it will also help build relationships that could continue to yield ongoing annual support. For example, a corporation that sponsors the construction of a new park named after the corporation may be likely to create an Endowment Fund that supports the ongoing maintenance and improvements of the park.

For example, a station attraction at the rail spur that connects the Santa Fe Railway to the Burlington-Northern line may be good opportunity for a corporate sponsorship (i.e., a public park or space named after the company), or an appeal to the company's foundation. The Burlington Northern/Santa Fe Railway Foundation also has a Civic Programs Grant intended to support communities they serve.

Remain open to leverage opportunities

If the community has wastewater infrastructure needs (replacement or new installation), and a revenue stream (e.g., projected sewer fees), the project team may want to consider a low-interest loan through the Clean Water State Revolving Fund (CWSRF). These low-interest (1-3% APR) financing options can sometimes allow you to leverage revenue streams to gain zero-interest funding when constructing the project -- funds that don't need to be paid back until construction is completed (even if five years from now). This strategy has been effective in a coastal community in Oregon (City of Newport), where the City received zero-interest financing for five years, for $10 million, with an interest rate of .89% for a five-year payback, or 1.3% interest for a ten-year term.

Further, some CWSRF programs are required to allocate 20% of their federal funds to support rural or green infrastructure projects by awarding "principal forgiveness funds" (which results in free monies) to qualifying CWSRF applicants. This strategy has proven effective in the City of Cheyenne, where 90% of a $2 million bioretention project was awarded principal forgiveness funds, similar to a grant.

Limitations

The results and recommendations provided in this section have several limitations worth mention. First, due to budget and time limitations, the funding prospects list does not represent an exhaustive inventory of ALL funding programs. The primary focus was on state and federal programs with less attention given to private grantmakers. Government funding programs tend to offer higher overall funding amounts. In addition, private foundations more frequently focus on funding non-profit organizations.

The research focused primarily on grant programs and, to a slightly lesser extent, loan programs as opposed to other funding options such as incentive, bond, and rebate programs.

Funding program priorities and criteria can be very dynamic, and updated information about these programs is often not available in a timely or consistent manner. Currently, some funding agencies haven't yet responded to our inquiry for more information; thus, some data may be missing.

Appendix D provides a time-sensitive snapshot of opportunities and program details that were available in 2013, but that might change prior to implementing the recommendations provided in the regional study. However, most of the top prospects are for programs that are relatively stable and less vulnerable to funding cuts than others often found in this type of research.

6.7 Summary

Funding infrastructure investment at Second Knolls will be complex and require innovation and collaboration between public and private sectors. A variety of potential sources are available for funding transportation projects. Research revealed public and private grants that can take advantage of the region's economic development efforts to seed investment. This information is included in this report for the Second Knolls region's continued use and reference.

Appendix A: Level of Service Thresholds

TABLE 3

Generalized **Annual Average Daily** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	*	12,900	14,200	**
4	Divided	*	29,300	30,400	**
6	Divided	*	45,200	45,800	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	1,300	2,000	3,200
50-84%	1,000	2,100	3,200	10,600
85-100%	2,600	3,900	18,500	>18,500

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,300	4,900	15,600
50-84%	1,700	4,500	13,300	18,500
85-100%	5,900	18,500	>18,500	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,700	9,200
50-84%	*	1,500	8,400	14,900
85-100%	3,600	10,200	16,700	>19,200

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	28,800	43,000	52,300	60,000
6	43,000	64,000	78,300	92,500
8	57,500	85,400	104,400	123,500

Freeway Adjustments

Auxiliary Lanes Present in Both Directions + 20,000

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
2	Undivided	4,700	8,400	14,300	28,600
4	Divided	25,700	40,300	51,000	57,900
6	Divided	38,800	60,400	76,700	86,800

Developed Areas

Lanes	Median	B	C	D	E
2	Undivided	8,700	16,400	23,100	31,500
4	Divided	25,900	40,700	52,400	59,600
6	Divided	38,800	61,000	78,400	89,500

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

TABLE 3
(continued)

Generalized **Annual Average Daily** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials		Bicycle		Pedestrian
ROADWAY CHARACTERISTICS										
Area type (ru, rd)	rural	ru	ru	rd	rd	rd	rd	ru	rd	rd
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	65	50	55	45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (n, nr, r)		n	r	n	r	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	14	10	10	5	5	1.9	2.2	4	2	2
Number of basic segments	4									
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.550	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,300	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	4.0	4.0	3.0	3.0	6.0	3.5	3.0
Local adjustment factor	0.84	0.88	0.73	0.97	0.82					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways				
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	Arterials	Bicycle	Pedestrian
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

Appendix B: Case Studies

Industry Clusters and Asset-Oriented Economic Strategies

Across the country, rural communities compete with one another and with large urban areas for jobs and economic prosperity. Despite the challenges facing rural communities, new methods and policy tools have emerged to promote rural industrial manufacturing and economic prosperity. Having adequate transportation infrastructure is fundamental to the survival of communities hoping to lure private investment and enhance their economic base and potential.

Industry clusters have emerged as an innovative concept and valuable tool for attracting industries to rural areas. Industry clusters refer to groupings of existing or emerging industries located in geographic proximity to one another that support one another—similar to the agglomeration economies discussed previously. Businesses or industries may be located in neighboring or nearby communities, but can still form a cluster based on their geography and capability to support one another.

Industry clusters that are self-sustaining offer a competitive advantage to rural areas seeking to attract businesses by demonstrating the local workforce skills and availability of infrastructure to support a variety of different industry types. Agglomeration economies are especially important in the manufacturing sector because most manufacturing businesses depend on the expedient delivery of raw materials and the quick maintenance and repair of machinery to continue production.

The localization of economic activity enables firms to benefit from cost savings associated with the concentration of business activities that support one another. Furthermore, industry clusters have been shown to increase competition among businesses located within a cluster, spawning innovation and entrepreneurship. Such clusters can also support local educational assets such as community colleges and technical trade academies to train the future local workforce. Industries can keep local academic institutions appraised of their needs, while institutions can benefit from continuous technology improvements, helping to advance training of a region's future workforce.

The concept of industry clusters is in part associated with the notion of "asset-oriented economic development," where communities promote and leverage a wide range of social, economic, environmental, and governmental assets to attract industry and economic development. Asset-oriented economic development strategies focus on strengthening connections with regions and building capacities within communities. Assets can include local institutions, amenities, or specific/specialized worker skills that are unique to a region and can be leveraged to foster economic development.

The following case studies focus on successful applications of industry clusters and asset-oriented economies. Asset-oriented economic development relies on partnerships that enable the sharing of resources and the building of trust among stakeholders. These case studies were selected to highlight how knowledge-based clusters can help create competitive entrepreneurial economies and how investments in community assets can create places where industries want to locate.

Polaris Industries and Arctic Cat – Roseau and Thief River Falls, Minnesota

Tucked away in Minnesota's far northwestern corner are the communities of Roseau and Thief River Falls — the home of two internationally recognized recreational vehicle manufacturers, Polaris Industries and Arctic Cat. Employing over 3,000 workers from both communities and neighboring communities, each company produces a variety of off-road vehicles and snowmobiles.

Roseau and Thief River Falls, Minnesota, support an industrial cluster focused on snowmobile, watercraft, and all-terrain vehicle manufacturing. (Photo credit: LakenWoods.com)

Polaris Industries, founded in the mid-1950s, evolved from the need for practical, reliable transportation during the long, snowy winters in northern Minnesota. Polaris has manufacturing facilities in Roseau, and Wyoming, Minnesota; Osceola, Wisconsin; and Spirit Lake, Iowa. More than 200 suppliers provide parts used to manufacture the company's products.

As an offshoot enterprise of Polaris, Arctic Cat emerged in the early 1960s, when the former founder of Polaris left the company to begin Arctic Cat. Similar to Polaris, Arctic Cat manufacturers snowmobiles, watercraft, and all-terrain vehicles. The presence of both companies in northern Minnesota and across the upper Midwest resulted in the creation of a competitive entrepreneurial industry cluster that continues to draw on the local knowledge base, given the wealth of centralized experience among current and past industry employees.

Rural Knowledge Clusters and Economic Development

In the 1980s and 1990s, increased pressure from foreign competitors including Yamaha, Kawasaki, and Honda began to take market share away from these companies. In response to increased global competition, both Polaris and Arctic Cat responded by focusing on the creation and production of innovative, high performance machinery for the most demanding of customers — the snowmobile racing circuit. The ability to satisfy this market in turn enhanced their ability to compete on a high level within the broader snowmobile market. The strong support for snowmobile and off-road recreation, particularly demonstrated by the use of these vehicles in competitive racing, has boosted both companies.

Past research into rural knowledge clusters suggests that local rivalries encourage innovation and productivity growth for economic development. Innovation occurs at the microeconomic level but produces macroeconomic benefits. The primary source of global competitive advantage for both Polaris and Arctic Cat is local and regional customer demand that in turn creates a local knowledge base. Both Polaris and Arctic Cat use a network of local suppliers throughout the state and upper Midwest region to produce their vehicles. By identifying the specialized regional knowledge that propels innovation and helps to create successful enterprises, clusters of similar industry firms or product lines are created that share a common history or underlying technology. In effect, understanding what distinguishes a local community economy will help in discovering its current and potential sources of competitive advantage, and help establish a list of potential businesses or expanding industries that may wish to locate a facility

in a given region. Also, this can help with creating entrepreneurial economies of local producers and spin-off businesses that locate in a similar region to support an anchor tenant or industry.

Interestingly, local institutions and assets have played only a limited role in the success of both Polaris and Arctic Cat. However, local technical colleges such as Northland Community and Technical College in Thief River Falls have become key partners in advancing the skills of existing and future industry workers.

Actions to Support Industry

While much of the success both Polaris and Arctic Cat have enjoyed has resulted from their continued innovation and dominant market share for outdoor recreational vehicles, the communities of Roseau and Thief River Falls—along with neighboring communities in northern Minnesota and the State of Minnesota—have helped to support both the companies. The communities recognize the regional economic importance of both manufacturers in terms of local tax revenues, employment, and businesses and industries that have developed to provide additional support to each company. The State of Minnesota has also provided support to both industries, recognizing the value added.

In 2009, the Minnesota Department of Transportation published the Western Minnesota Regional Freight Study that produced several recommendations related to transportation investments intended to support industry and economic development. One recommendation was for the restoration and expanded intermodal capabilities of the Dilworth Intermodal Terminal in Dilworth, Minnesota. This facility connects the region directly with ocean port terminals in Seattle, Washington, via the railroads. Another recommendation of the study was the identification of truck corridors, super-haul corridors, and an investment prioritization strategy for commercial trade corridors that link local industries with major commercial transportation corridors. Given the location of both companies in relatively remote, outstate areas of Minnesota, employees and local suppliers rely heavily on regional roads for parts and product shipments, linking their businesses with the global market place.

Together with Polaris, Arctic Cat is an industry leader in the research, design, and development of recreation vehicles. (Photo credit: ArcticCat.com)

Polaris and Arctic Cat are both industry leaders in the research, design, and development of recreational vehicles, having branched out beyond the snowmobiles to create summer and seasonal off-road all-terrain vehicles used for a variety of applications including farming and hunting. Both companies recognize that competition demands continuous innovation, which has been beneficial to their companies, the region, and the State of Minnesota in keeping a competitive edge with foreign manufacturers. Investing in machines that could be used in competitive racing helped garner attention from everyday users. Both firms and the communities of Roseau and Thief River Falls are working with state and regional partners in the identification of regional transportation investments to connect manufacturing and finished products with markets across the U.S., Canada, and across the globe.

Comparison to Second Knolls Region

The focus of this case study was to highlight the rural knowledge cluster economic development strategy as a potential approach toward the creation of a self-sustaining agglomeration economy in the Snowflake-Taylor region. Changes in the global economy have forced both urban and rural places to focus increasingly on innovation and competitiveness, and look for creative niches and specializations. This development has posed a dilemma for rural development practitioners and policy makers looking to update their economic base to the changing contours of a knowledge-based economy.

This aerial image shows the transportation system serving the Polaris factory in Roseau. (Photo credit: Google Maps)

The rural knowledge cluster approach to economic development, like the industry cluster model, is fundamentally about learning from successful regional economies. A continuing challenge to local economic development strategies is that these strategies often remain locally focused. Even with evidence that points to the strength of increasing regional awareness when crafting an economic growth strategy, and the importance of working together to be effective, there is often a tendency to remain focused on a localized economy. For a rural knowledge cluster economic development approach to be successful, planners and stakeholders must recognize the need to develop a regional vision to guide local activities. This is important on a practical level, since the firms that comprise a rural knowledge cluster may be scattered throughout a given area (especially in sparsely populated areas) and draw from a specialized labor pool that is regional in nature. In addition, institutions that may be most instrumental to promoting rural knowledge clusters are typically regional in scope. This does not mean that local initiatives cannot play an important role in promoting rural knowledge clusters, but that capitalizing on regional interdependencies can yield local and regional economic benefits and create jobs.

Are there businesses or industries that are growing or expanding in the communities of Holbrook and Show Low that need support? What role does the Snowflake-Taylor region's historical knowledge base play in creating economic opportunities for the future? What conditions are necessary for this adaptation and evolution to take place? How can local institutions help catalyze this process? Understanding the existing economic assets of a community can help specify the firms or industries that may wish to locate in a region given the skills of the local labor force, or conversely identify what skills are necessary in order to attract a desired firm or industry.

Additional Information and Resources

University of Minnesota, State and Local Policy Program

[http://www.hhh.umn.edu/img/assets/9140/rkc_EDA.pdf]

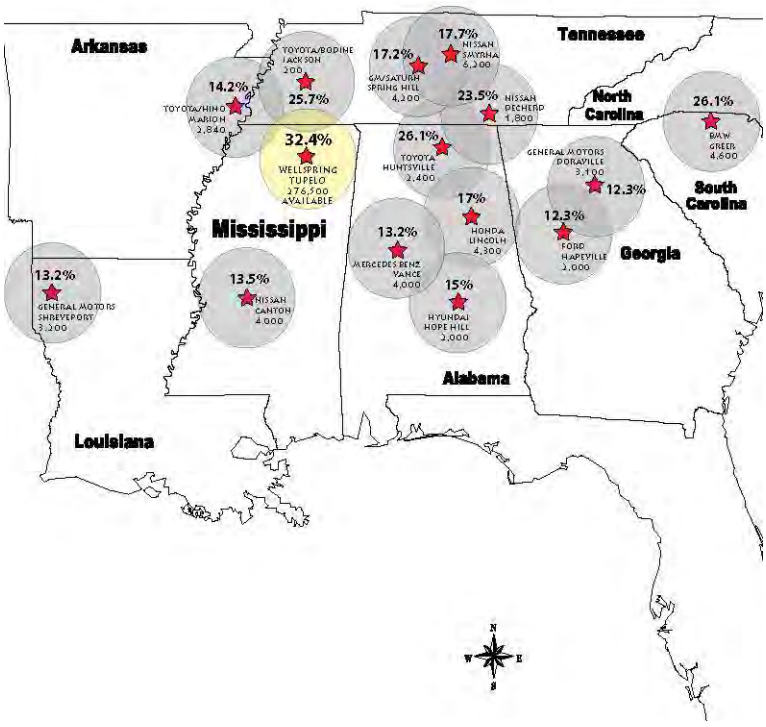
Toyota Motor Company – Tupelo, Mississippi

Tupelo, Mississippi, located in the northeast corner of Mississippi, is the seventh largest city in the state, home to more than 34,000 residents, and the county seat of Lee County. Best known as the birthplace of Elvis Presley, Tupelo historically has been a regional transportation hub, primarily due to the confluence of railroads intersecting within the city. As a result, the surface transportation connections available within the city have made it a modern day haven for industrial manufacturing in the southeastern United States.

Economic Development Strategy

In late 2001, the Mississippi legislature authorized counties to form multi-county entities to share the costs and benefits of major industrial development. Recognizing the opportunity created by the law, the Three Rivers Planning and Development District (PDD) formed the PUL Alliance, representing Pontotoc, Union and Lee counties. The new alliance was governed by a nine-member board comprised of two supervisors from each county plus the mayors of each county's largest city. The Three Rivers PDD provided administrative support to the PUL Alliance.

Furniture-making and forest products manufacturing had been the dominant industries of northeast Mississippi for generations. However, over time these industries eroded, with al three counties losing roughly 8,000 furniture-making and related wood products jobs between 1990 and 2000. In response, several studies were commissioned by the PUL Alliance to evaluate potential industries based on the capabilities of the local workforce. The results of these studies showed that only two U.S. manufacturing sectors showed a net increase in employment during the 1990s: food processing and automotive manufacturing. Large-scale food processing plants require significant amounts of water and wastewater disposal capacities that the Tupelo area could not provide. But states across the South and southeast had been highly successful in attracting major automotive plants. Honda, Hyundai, Mercedes Benz and Toyota have plants in Alabama, while Nissan, GM/Saturn and Toyota have plants in Tennessee. The graphic displays the locations of existing automotive manufacturing facilities in the southeast United States, with the grey circles reflecting a 60 mile radius consider the average commute shed for each facility.



Automotive Manufacturing in the Southeast United States. (Graphic credit: Community Development Foundation, NADO)

The PUL Alliance decided to shoot for attracting a major automotive assembly plant within five to seven years. If unsuccessful, a second option would be to try and lure one

or more major automotive parts suppliers to the region. Thus was the beginning of the Wellspring Project.

Transportation and Public Infrastructure

A crucial component of the Wellspring Project was the re-designation of U.S. Highway 78 as an Interstate highway. Highway 78 was constructed to Interstate highway standards, and included a four travel lanes, with links to existing Interstate highways connection Memphis, Tennessee, and Birmingham, Alabama. Working with the Mississippi Congressional Delegation, project partners were able to brand Highway 78 as "Interstate 22 – Designated," a temporary roadway classification that ensured the highway would receive federal designation as an interstate within a specified period of time (at the time the case study was originally developed, it was anticipated that all engineering and construction work necessary to upgrade the facility to an Interstate highway would be complete by 2010).

At the top of this Google Maps image, the highway access from U.S. 78 to the Tupelo Toyota plant is visible. The BNSF spur is on the south of the factory.

Additionally, railroad access was paramount to the decision to locate a facility outside Tupelo. The Kansas City Southern Railroad runs north-south while the Burlington Northern Santa Fe (BNSF) runs east-west through the Tupelo region. This BNSF track is the same track that passes through central Navajo County, connecting ocean port facilities in California and Florida. Imported vehicle parts are

offloaded in Long Beach, California, and can be shipped straight to Tupelo without changing trains. Extending a spur line to the Toyota plant required building a bridge across the future Interstate 22. The Mississippi legislature passed a $20 million incentive package (approximate total) to help pay for the construction of the bridge. According to Toyota representatives, the extension of a spur railroad line to the facility, coupled with improvements to the regional roadway network, and the proximity of the Memphis International Airport (approximately 90 miles northwest of Tupelo) are vital to the "just-in-time" parts supply system for manufacturing.

The Mississippi legislature also approved a $294 million incentive package for construction activities including site clearing and grading, extension of water and sewer service, and other infrastructure improvements, primarily road and railroad bridge construction.

Results

In February 2007, the Toyota Motor Corporation announced plans to assemble the Highlander SUV at a $1.3 billion plant to be built on a 1,730-acre tract near Tupelo. Similar to northern Minnesota, a key reason Toyota selected Tupelo was the skilled labor force available locally that had a long history in the industrial manufacturing trades. Also, the presence of academic institutions near the Tupelo region, ranging from local community colleges to major academic institutions (such as the University of Mississippi and the University of Memphis) was critical to attracting highly educated, skilled employees in fields such as mechanical engineering and design. Today, the Tupelo plant employs about 2,000 workers.

Strategic leadership and partnerships between governmental agencies, economic development organizations, and private stakeholders played an enormous role in the completion of the site and opening of the facility. Coordination among three counties, state and federal elected officials, and staff at all levels was essential. Identifying a group of public and private champions for the project was also important in terms of carrying political weight and leveraging political capital. All the necessary studies, addressing engineering and environmental issues, were completed in an orderly and timely manner. Project sponsors were strategic in their approach to issues they knew might take time to complete. For example, project leaders filed for wetland protection certifications with the U.S. Corps of Engineers (the Corps) knowing that these requests would be denied without submittal of a site development plan. But they also knew that familiarizing reviewers with their site data would save months off review time once the actual plans were filed.

The presence of a highway built to Interstate standards was essential, as was rail transport connecting the Wellspring Project to major markets in all directions were considered essential for this kind of development. Also, an additional $30 million will be available to Tier 1 businesses (those contracting directly with Toyota) who provide at least 50 jobs. Toyota has pledged $50 million over the next decade to support local public schools to be administered by a local foundation, reinforcing its reputation as a good corporate citizen.

Comparison to Second Knolls

Several similarities exist with between the physical locations of the Toyota manufacturing facility in Tupelo and the Second Knolls study area, but several differences are also seen. Both regions have strong connections to the surface transportation facilities, including a shared connection to the BNSF trackway in Holbrook. With connections to the Interstate highway system, both locations are able to access major commercial markets in their respective regions. A plus for the Second Knolls region is that

land development is likely much easier as compared to the land development that was required in Mississippi. Project partners there identified that significant land preparation and acquisition was necessary prior to the construction and opening of the facility.

The southeastern United States has a strong network of existing automotive manufacturing centers in Mississippi, Alabama, and Tennessee, all with a coordinated network of regional suppliers. While some parts may be shipped from overseas, the network was already in place for the Tupelo region to capitalize on, similar to the case study of Polaris Industries and Arctic Cat.

Additional Information

National Association of Development Organizations

[http://www.nado.org/tag/publications/]

Toyota Motor Company

[http://www.toyota.com/about/our_business/engineering_and_manufacturing/tmmms/]

Toyota Motor Company

[http://www.toyota.com/about/news/manufacturing/2007/02/27-1-tema.html]

Inland Ports and Logistics Parks

During the past 25 years, the landscape of freight movement and logistics has changed dramatically in the United States. Past models and methods of moving goods across the country have yielded to modern, more efficient practices, particularly as the country has trended toward centralization in urbanized areas. This growth of urbanized areas has necessitated the quick and efficient movement of goods across long distances. Advances in technology, engineering, and supply chain management have enabled producers and consumers to track and locate their goods in transit in real time, and have dramatically improved efficiencies in shipment handling and delivery.

Despite these and other advancements, capacity limitations at traditional ports of entry (air, sea, and land) have become a persistent problem—constraining freight movement across the country. As the American economy has shifted toward a consumption-oriented economy over the past 40 years, the United States has experienced extraordinary growth in the volume of international trade and the shipment of raw materials and finished goods. The steady increase in trade volumes illustrates the increased role of economic globalization and the interdependency of national economies. The rise of the global marketplace and the interdependencies of modern economies have necessitated more sophisticated practices and new approaches to moving freight across the country.

Inland Ports

In response to capacity constraints at existing ports, inland ports have emerged to expedite and efficiently process shipments. Aided by public policies enabling free trade zones or designated areas for international commerce, inland ports primarily function as places to prepare and process shipments for transport across the country, redistributing the cargo-handling functions from congested ports to inland locations where more land is available and the transportation network is less constrained. Typically, these facilities are connected to major ports through railway connections, but highways capable of handling large volumes of truck traffic at heavy loads are also necessary for the shipment and distribution of freight to destinations not served by rail.

Logistics Parks

Logistics parks are a relatively new concept in industry that have gained popularity and appeal in markets large and small across the country. Sometimes referred to as logistics zones because of their trade zone status, logistics parks are typically created through regional development policies advanced by industry firms, intermodal freight operators, regional and local government authorities, and business advocacy groups such as local or regional chambers of commerce.

Typically designed as master-planned developments, logistics parks generally consist of distribution centers and light to heavy manufacturing facilities. They provide strategic geographic advantages with respect to access, land availability, and the presence of existing infrastructure (for example, power and water utilities). They provide operational advantages to businesses in the form of favorable development and zoning regulations. Perhaps most importantly, they encourage agglomeration economies, where complimentary businesses and industries locate close to one another to provide neighboring businesses and industries with localized services. These logistics parks often emerge following the construction of a transportation facility as developers look to capitalize on the access, availability, and affordability of open land suitable for industrial development.

While several inland ports have been developed around the country, their presence in western states is still relatively nascent. The following two case studies represent different approaches to inland port-type facilities, shipping, and distribution. While these two case studies share several commonalities, they also highlight very different approaches to freight movement and logistics that can have cost implications.

Virginia Inland Port – Front Royal, Virginia

Front Royal is located in Virginia at the junction of Interstates 66 and 81, nestled in the Shenandoah Mountains. The town is approximately 1.5 hours from Washington, D.C., along the Shenandoah River. Front Royal is the home of the Virginia Inland Port (VIP), a facility located on a 160-acre site. The primary role of the VIP is to transfer inbound and outbound freight between trucks and rail vehicles, although the port also offers an extensive set of services that include (but are not limited to):

Railroad classification yard at the Virginia Inland Port. (Photo credit: Virginia Inland Port)

- Warehousing
- Mechanical repairs
- U.S. Department of Agriculture inspections
- U.S. Customs inspection services (as a result of its designation as a Foreign Trade Zone)

The range of services offered—coupled with on-site or nearby private-sector freight management and logistics facilities—has made the VIP a successful venture for the State of Virginia and its partners. Freight from seaport facilities is transferred to VIP by way of a secure rail connection and then is transferred to trucks for distribution across the mid-Atlantic region and points beyond.

Planning and Development

In 1983, the Virginia General Assembly created Virginia International Terminals, Incorporated, to operate and maintain the Virginia Port Authority's marine seaports and terminals. As Virginia's maritime ports became backlogged, freight carriers sought relief at ports in Maryland and the Carolinas, particularly at the Port of Baltimore.

The VIP created a competitive economic advantage, representing a strategic supply chain investment for Virginia. Recognizing the potential for greater losses to competing port markets, the VIP was envisioned as an intermodal terminal where freight carriers could quickly transfer cargo for shipment farther west to locations not served by rail.

Site Selection

Selection of the VIP facility location was driven by several key needs, as determined by the Virginia Port Authority. Among the physical site needs, the port authority wanted a facility:

- Within 200 miles of a seaport and with open space for construction of the facility and railroad tracks
- With railroad connection for efficient transportation of containers between the seaport

Road access to the Virginia Inland Port is by US 340 on the left. Norfolk Southern provides rail access on right. (Photo credit: Google Maps)

Cost

The purchase of land and development of the facility cost approximately $13.3 million in 1987. Of this amount, land acquisition costs totaled $7.3 million, with site development costs accounting for $5.3 million. The additional $700,000 was attributed to terrain and soil condition issues that necessitated additional engineering and specialty construction. The land acquisition and development costs were covered by the Virginia Transportation Trust Fund. According to the most recent operations and maintenance cost information, the VIP has generated a net profit since 1994 and covers all operating and maintenance costs through fees collected on a per-container basis.

Results

The establishment of a public-private partnership between the Virginia Port Authority, railroads, local communities, and economic development authorities was strategically important for creation of the VIP, and for ensuring the port is economically viable and successful in the future. Currently, Virginia International Terminals, Incorporated, operates the port, and the volume of shipments received and processed generates sufficient revenue to cover all operating costs of the facility.

According to data provided in NCFRP Project 23, nearly 24,500 international containers moved through the port in 2009. While this number was down from the previous year's total

Nearly 24,500 shipping containers moved through the Virginia Inland Port in 2009. (Photo credit: Virginia Inland Port)

(33,600 containers processed in 2008), this drop was attributed to the global economic climate. Another telling indicator of the VIP's success is the volume of truck traffic moved off of Virginia's highway system, reducing truck traffic and vehicle loads on highways, saving on maintenance costs, and reducing VMT emissions.

Project planners and developers identified several elements they would change given the opportunity to "redo" the project. Among the changes identified were additional acreage to provide more space for logistics and future private investment. Zoning and land regulatory changes were also identified as a need, along with greater separation between the VIP facilities and nearby homes.

Comparison to Second Knolls Region

Comparatively, the Second Knolls region shares several similar attributes to the desired characteristics for an inland port facility, as evidenced by the experience of the Virginia Inland Port. The Second Knolls region has a substantial amount of open space for an inland port facility that is capable of supporting the substantial sustained weight of trains, trucks, cargo containers, lift machines, office structures, and mobile equipment. The Apache Railway offers a direct connection to the BNSF transcontinental railway, which affords the study area with a unique connection to the deep water ocean ports of Los Angeles and Long Beach, and points along the western coastline. Direct connections to the interstate highway system and state highway system enable connections throughout the southwest region, the Midwest, and points further east. The Virginia Inland Port is approximately 200 miles east of the ports in Norfolk, Virginia, is served by Norfolk Southern railway, and has immediate access to Interstate 66 which intersects directly with Interstate 81. What the Virginia Inland Port does not have that the Second Knolls study area does have is suitable space to grow. A challenge port officials identified was the limited expansion capabilities of the port to expand without substantial engineering and parcel acquisition costs.

A challenge to locating an inland port facility within the Second Knolls study area is the distance between the ocean port facilities and the study area. The study area is located over 500 miles from the deep water port facilities of the west coast, a distance that may be too far to transport cargo before needing to be processed for entry, inspected, or transferred between modes. Additionally, cargo processing facilities closer to these ocean ports are being considered or are already being implemented, resulting in additional competition. A question that must be considered early in the planning process for an inland port facility is what type of facility is desired, or what are the unmet needs of the supply chain, and what value-added would exist from the implementation of a port facility in Snowflake.

Additional Information and Resources

National Association of Development Organizations
[http://www.nado.org/wp-content/uploads/2011/10/Inland_report_FINAL.pdf]

National Cooperative Freight Research Project
[http://www.freightlocation.org/]

Alliance Global Logistics Hub – Alliance, Texas

The Alliance Global Logistics Hub, located in Alliance, Texas was developed in the mid-1990s through a public-private partnership involving local, state, and federal agency partners, along with private capital investors. Considered by the inland port industry as the "grandfather" of U.S. inland ports, the port is a 17,000-acre master-planned community and facility north of Fort Worth, Texas.

The Alliance Global Logistics Hub is considered the "grandfather" of inland ports. (Photo credit: Alliance Global Logistics Center)

The facility is anchored by the Alliance Global Logistics Center, encompassing over 11,600 acres that include the Fort Worth Alliance Airport and the Burlington Northern Santa Fe (BNSF) Alliance Intermodal Facility. The remaining land was developed as corporate office space, but also includes residential space. The facility also has an on-site U.S. Customs and Centralized Examination Station, Triple Freeport Inventory Tax Exemption, and a Foreign Trade Zone designation.

Planning and Development

As the Dallas-Fort Worth metropolitan region expanded in the late 1980s and early 1990s, it became clear that air traffic at the Dallas-Fort Worth International Airport was becoming increasingly congested. The movement of freight through the airport conflicted with the increasing number of passenger flights using the airport.

The Federal Aviation Administration and the North Central Texas Council of Governments completed a series of planning studies on how to address this issue. These studies culminated in the recommendation for the construction of new reliever airports (or upgrades to existing area airports) to accommodate additional passenger and air freight transportation. A prime location for a future reliever airport was Alliance, Texas, northwest of the Dallas-Fort Worth metropolitan region.

In Alliance, a contiguous set of parcels were owned by H. Ross Perot, Jr., and the Hillwood Development Company (Hillwood). These parcels were offered as the local equity match to the Federal Aviation Administration through the City of Fort Worth, on the condition that an airport facility be constructed on these parcels for exclusive use for cargo/industrial purposes. The Federal Aviation Administration agreed to this condition, and the City of Fort Worth agreed to provide the water, gas, sewer, and electrical infrastructure to support the airport.

When the airport began operations in 1989, Hillwood had negotiated agreements with BNSF to establish an intermodal off-loading facility. Another agreement was negotiated with American Airlines to establish a maintenance and engineering facility on the grounds. The Alliance Air Trade Center, a 99,000-square-foot air cargo facility, has direct access to the airport runway. Subsequently, Hillwood and the State of Texas created a separate public-private partnership to construct State Highway 170, linking the Alliance freight hub directly with the Dallas-Fort Worth International Airport. Within 3 years of the facility's opening, FedEx relocated its Southern Sorting Facility to the Alliance facility.

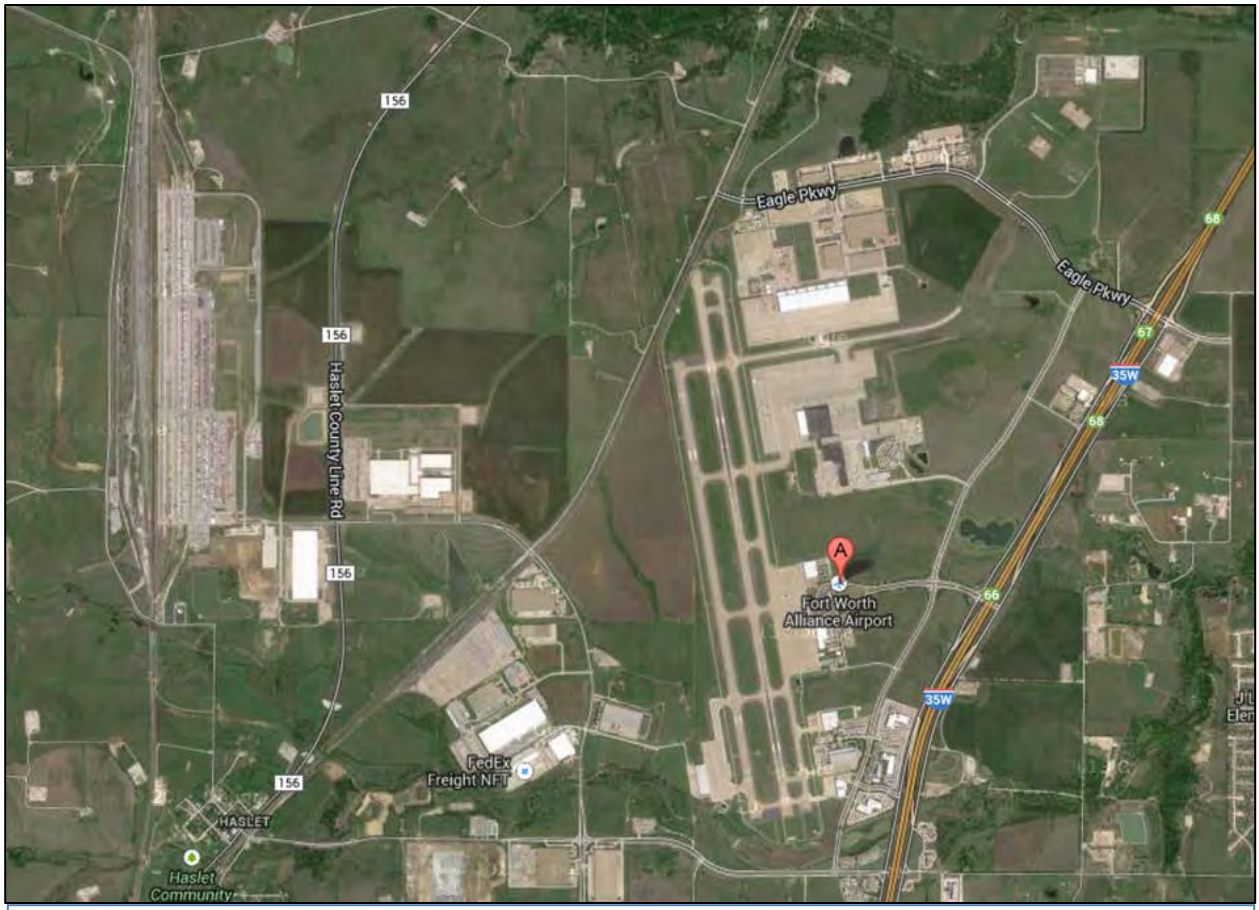
Site Selection

The location of the Alliance Global Logistics Hub was driven by:

- availability of large, undeveloped tracts of land
- proximity to the Dallas-Fort Worth metropolitan region
- proximity and existing transportation connections to major southern markets including Austin, Houston, San Antonio, and northern Mexico and to major markets northeast of the Dallas-Fort Worth metropolitan region

Hillwood coordinated with the City to annex the parcels and subsequently install public infrastructure to support the facility. Today, the port is served by both BNSF and Union Pacific Railroad, with connections to major seaports in the Gulf Coast, New Orleans, Alabama, the Florida Panhandle, and as far west as Los Angeles and Long Beach.

The Alliance Global Logistics Hub also benefits from connections to major east-to-west and north-to-south state highways and Interstate highways. These highway connections—along with the proximity of the Dallas-Fort Worth International Airport and service by two Class I railroads—results in the efficient movement of freight across the country.



The Alliance Global Logistics Hub includes the Fort Worth Alliance Airport on the right and with the intermodal rail terminal on the left. (Photo credit: Google Maps)

Cost

Construction of the Alliance Global Logistics Hub, from 1990 to 2008, cost $7.2 billion. Most of this cost was borne by private enterprise, with some support from the public sector for roads, public utility infrastructure, and public amenities serving residential areas of the development.

Results

The Alliance Global Logistics Hub is now home to over 200 businesses, including telecommunications, pharmaceutical, financial, aerospace, and automotive companies (Figure A-4). According to statistics compiled in 2008, over 28,000 people are employed at the Alliance facility. According to NCFRP Project 23, the facility and property development generated over $105 million in tax revenue in 2008. Hillwood charges $1 for every 2 square feet of property as a Common Area Maintenance fee to help pay for property improvements and routine maintenance.

Comparison to Second Knolls Region

The Alliance Global Logistics Hub is a case study in timing. The vision for the facility emerged as the result of several factors that converged simultaneously. Benefited by the confluence of railroads and major highway facilities, on the edge of a major metropolitan region, with an airport facility at maximum capacity for cargo shipments, and large quantities of available land located near the now constructed facility, the timing was perfect for a facility of its type. Additionally, sufficient land was available for expansion of the facility over time, and an aggressive business plan for expansion of anchor tenant clients contributed to the facility's success. As with the Alliance Global Logistics Hub, a phased approach to the growth of an inland port or logistics facility may be wise to consider in the Snowflake-Taylor region. Understanding local and regional port and logistics competition will enable project planners to identify weak links in the supply chain and means to capitalize on potential improvements offered.

The Second Knolls study area shares the benefit of open space for construction, and regional surface transportation connections. However, one critical aspect that made the Alliance Global Logistics Hub successful was proximity to a major metropolitan region with a rapidly growing population. The Second Knolls region is much more isolated by comparison, and while this aspect has its own benefits that may be attractive to businesses and industry, the Alliance Global Logistics Hub has clearly benefited from its proximity to major commercial markets throughout Texas.

Like the Alliance Global Logistics Hub, the presence of the Taylor Municipal Airport can be an asset to the region if leveraged appropriately. The planning, zoning, and infrastructure investments being made to support an industrial park facility near the airport could be a strong asset for businesses requiring land for manufacturing, materials processing, and/or administrative functions. However, an assessment of the airport's maximum weight capacity will be necessary to accommodate planes larger than those currently using the field for general aviation purposes. While the Show Low Municipal Airport is located within 25 miles of the Snowflake-Taylor region, an airport that is capable of receiving corporate jet or light cargo flights gives the local region one more competitive marketing tool. For example, located in southwest Minnesota, the City of Granite Falls (population 2,900) is home to Granite Falls Energy, one of the United States leading ethanol production companies. The city's single runway airport is very similar to the Taylor Municipal Airport, but has been retrofitted over time, with expansion plans developed, in order to accommodate small passenger jet traffic when shuttling corporate leadership across the upper Midwest.

Additional Information and Resources

Alliance Global Logistics Hub

[http://www.alliancetexas.com/AllianceGlobalLogisticsHub.aspx]

National Cooperative Freight Research Project

[http://www.freightlocation.org/]

Granite Falls Airport

[http://www.granitefalls.com/airport.html]

Transload Facilities

Transload facilities are smaller scale intermodal terminals where goods are transferred between truck and rail. These facilities require some warehousing and storage facilities. They require a connection to a Class I railroad and state highway and Interstate system access. Providing customers a carload-based distribution solution, there are numerous examples of transload locations across the United States. Both the BNSF Railway and Union Pacific Railway have sites located throughout their systems.

Prineville, Oregon

Located in central Oregon northeast of Bend, the City of Prineville built its shortline railroad in 1916 after being bypassed by the Oregon Trunk and Union Pacific railroads. The oldest municipally built and operated railroad in the United States, the City of Prineville Railway profited until the timber from the nearby Ochoco National Forest ran out and the last lumber mills closed. However, in 2003, the Prineville opened a freight transfer and warehousing facility at an abandoned sawmill site. In 2004, the Prineville Freight Depot gave the railroad new life as a Louisiana-Pacific laminates factory and the Les Schwab Tire Company started using it for shipping. The Louisiana-Pacific mill has since closed, but the transloading facility continues to provide a lifeline for the shortline railroad.[1]

The Prineville (Oregon) Freight Depot was built on the site of an old sawmill. It provides freight transfer and warehousing services for a variety of commodities. It is served by the City of Prineville Railway and the local and state highway system. (Photo credit: Google Maps)

[1] *Trainweb.org. City of Prineville Railroad. Accessed on October 21, 2013 at http://www.trainweb.org/highdesertrails/cop.html.*

Since 2006, the City of Prineville Railway has received Connect Oregon I and Connect Oregon II grants totaling $5.5 million to upgrade the transload facility. The railroad also received a $1 million American Recovery and Reinvestment Act (ARRA) grant to rehabilitate the 18-mile rail line. [2] A stimulus to growth, the freight depot acquired an anchor-tenant that makes de-icing and dust-abatement products. Other potential tenants include a wood pellet manufacturer.

The Prineville Freight Depot is served by both the BNSF Railway and Union Pacific Railway. It handles bricks, crushed stone, gypsum wallboard, insulation and siding, lumber, machinery, oriented strand board, paper waste and scrap, particle board, pipe, plywood, poles and posts, printing paper, rail equipment, railroad ties, roofing materials, and saw logs. Road access to the site is through the state highway system.

While the railroad continues to rebuild, the Prineville economy has diversified since the days when it depended heavily on the lumber mills for its livelihood. Bureau of Land Management and U.S. Forest Service jobs have become the new anchors for the local economy. It is also the site for Facebook and Apple, Inc. data centers. The Census Bureau reported a population of 9,253 in 2010.[3]

Comparison to Second Knolls Region

This case study demonstrates how the investment in the Prineville Freight Depot attracted new shippers to the City of Prineville Railway. There are many similarities in this case study between Prineville, Oregon, and the Second Knolls region starting with the shortline railroads serving historic forest products industries. Like the Second Knolls region, Prineville struggled to find a way to keep its rail connection viable. It re-purposed a brownfield lumber mill into a freight depot that serves a variety of different shippers. This transload facility has become the anchor for new industrial growth, including a potential wood pellet manufacturer. This case study shows how one rural community has leveraged its historic capabilities with alternative funding sources, including federal grants, to diversify and remain competitive in the marketplace.

Additional Information and Resources

Prineville Freight Depot

[http://www.prinevillefreightdepot.com/]

City of Prineville Railway

[http://www.cityofprinevillerailway.com/]

[http://www.trainweb.org/highdesertrails/cop.html]

BNSF Railway

[http://domino.bnsf.com/website/premtransloader.nsf/sbdest?Open]

Union Pacific Railroad

[http://www.uprr.com/customers/transload.shtml]

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[2] *Prineville Freight Depot. Accessed on October 21, 2013 at http://www.prinevillefreightdepot.com/.*

[3] *Wikipedia. Prineville, Oregon. Accessed on October 21, 2013 at http://en.wikipedia.org/wiki/Prineville,_Oregon.*

Forest Products

The Four Forest Restoration Initiative (4FRI) is public-private collaboration to restore forest ecosystems on portions of the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests along the Mogollon Rim in Northern Arizona. Ponderosa pine forests stretch from the south rim of the Grand Canyon in north-central Arizona to the White Mountains of eastern Arizona and into the mountains of southwestern New Mexico. More than a century of logging and wildfire suppression has resulted in forest stands with small trees that are prone to intense fires that can climb into the crowns and kill even older trees. These dense forests have fewer plants in the understory and provide poor wildlife habitat.

The purpose of the 4FRI is to restore 2.4 million acres of northern Arizona's ponderosa pine forest ecosystems through landscape-scale restoration. The plan calls for treating 50,000 acres per year during a 20-year period. [4] This industrial-scale process is intended to reduce the fuels that generate catastrophic fires and promote forest health and diversity. It is creating jobs in the harvesting, processing and selling of forest products. [5] In fact, the Snowflake Power biomass plant is already using material from the 4FRI tree thinning effort to generate electricity to power approximately 20,000 homes. [6]

The 4FRI will create a steady source of forest products that could eventually anchor the northern Arizona rural economy. These case studies show how communities similar to Snowflake and Taylor capitalized on their existing forest products infrastructure and knowledge base to establish more sustainable industries. As shown by the John Day, Oregon, case study, opportunities exist to expand the use of forest biomass fuels into sustainable municipal wood heating projects. The case studies further show experiences with redeveloping brownfield mill sites as multimodal freight depots, wood pellet mills, biomass power projects, or industrial parks.

John Day, Oregon, Thermal Biomass

In eastern Oregon, communities are taking advantage of forest stewardship projects to build sustainable wood heating projects for their municipal facilities. [7] Working with business and non-profit interests, John Day and Burns, Oregon, are using wood-based fuels generated by forest restoration to heat local schools and municipal buildings. Malheur Lumber Company expanded its mill to integrate the production of wood pellets and bricks. Municipal buildings in John Day and Burns retrofitted their heating systems to wood-fired boilers.

This effort was seeded by an American Recovery and Reinvestment Act (ARRA) grant administered by the Forest Service. A combination of tax credits and private equity lending gave the Malheur Lumber Company in John Day the financing needed for improvements. A state energy program provided

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[4] *4FRI.org. Four Forests Restoration Initiative. Accessed October 21, 2013 at http://www.4fri.org/goals.html.*

[5] *United States Department of Agriculture Forest Service. Four Forests Restoration Initiative. Accessed October 21, 2013 at http://www.fs.usda.gov/4fri*

[6] *Arizona Journal. Snowflake Power Plant to Restart. Accessed October 21, 2013 at http://www.azjournal.com/2013/08/02/snowflake-power-plant-to-restart/*

[7] *Oregon Forest Resources Institute. Woody Biomass Offers Potential for Heat, Electricity and Fuel. Accessed October 21, 2013 at http://oregonforests.org/sites/default/files/publications/pdf/OFRI_woody-biomass-report_WEBsinglepgs.pdf*

funding to seed the construction of a pellet boiler at the local hospital. The wood pellets and bricks from the wood heating project are expected to reduce energy costs as combined heat and power facilities can capture between 70 and 90 percent of energy in the fuel. [8] This type of distributed, renewable energy generation may qualify for energy credits that provide an incentive for the installation and operation of renewable energy systems.

Brownfield Redevelopment

Many communities across North America have been affected by paper mill closings. These abandoned, idle, or underused mill sites are being transformed into new economic development projects. Unlike an undeveloped 'greenfield' site, a brownfield location – such as the Catalyst Paper Corporation mill – generally has roads, water, sewer, power, and rail already in place. States, including Arizona, have assistance programs[9] to assist with any required remediation. These programs have made brownfield site redevelopment more cost effective.

Oakridge, Oregon

Oregon has an example of the redevelopment of forest products brownfield sites that may interest the Second Knolls region. In his 1999 paper "Brownfields Approach to Redevelopment of Forest Products Facilities in Oregon: Update" Mark Winters provides case studies on three brownfield projects in Oakridge, Eugene, and Springfield.[10]

Of the three case studies presented by Winters, Oakridge is most comparable to the Second Knolls region. Located 40 miles east of Eugene with a population of 3,200, it is similar to Snowflake and Taylor in size and rural setting. After environmental remediation, the city developed a former lumber mill site as an industrial park using federal grant funding aimed at aiding displaced timber workers. The industrial park employs less than 100 workers, and a 2009 newspaper article reports that most of the town's livelihood comes from a growing tourist trade.[11]

Berlin, New Hampshire

On the other side of North America in Berlin, New Hampshire, a closed 150-year-old paper mill site is being redeveloped as a new biomass power plant. When operational, the $275 million Burgess BioPower biomass power plant will provide 40 new permanent jobs and reuse portions of the old paper mill. One key to the financial success of this project was state renewable energy credits. However, the project has encountered a number of obstacles, including local opposition and petitions for intervention

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[8] *Sustainable Northwest. Local Energy Development in John Day. Accessed October 21, 2013 at http://www.sustainablenorthwest.org/what-we-do/success-stories/a-regional-strategy-for-wood-based-energy*

[9] *Arizona Department of Environmental Quality. Accessed October 21, 2013 at http://www.azdeq.gov/environ/waste/cleanup/brownfields.html*

[10] Winters, M. B. (1999). BROWNFIELDS APPROACH TO REDEVELOPMENT OF FOREST PRODUCTS FACILITIES IN OREGON: UPDATE. In *TAPPI International Environmental Conference: Proceedings*. TAPPI Press. Accessed October 21, 2013 at http://www.tappi.org/Downloads/unsorted/UNTITLED-ENV99357pdf.aspx

[11] *The Oregonian. Accessed October 21, 2013 at http://www.oregonlive.com/opinion/index.ssf/2009/10/oakridge_a_mill_town_on_the_me.html*

in the power purchase agreements. Power purchase agreements with the local utility company provided a stable market for power from the redevelopment site. Intervention by state's governor and legislature helped find a funding solution that allowed the project to go forward.[12]

Comparison to Second Knolls Region

These case studies show several examples of how other rural communities have built on forest restoration projects to establish more sustainable industries. In the case of the City of Prineville Railway, an intermodal transload facility allowed the historic shortline to stay in business and contribute to growth. The case studies show that the Catalyst Paper Corporation mill site could be redeveloped to house a freight depot for the Apache Railway. With existing infrastructure to build from, the paper mill site could also host a wood pellet mill, an expanded biomass power project, or other industrial or warehousing use.

Additional Information and Resources

Four Forest Restoration Initiative

[http://www.4fri.org/]

[http://www.fs.usda.gov/4fri]

John Day, Oregon, Thermal Biomass

[http://www.sustainablenorthwest.org/what-we-do/success-stories/a-regional-strategy-for-wood-based-energy]

Forest Products Brownfield Site Redevelopment

[http://www.tappi.org/Downloads/unsorted/UNTITLED-ENV99357pdf.aspx]

[http://biomassmagazine.com/articles/5757/nhs-berlin-station-biomass-power-project-gets-new-life]

[12] *Biomass Magazine. Accessed October 21, 2013 at http://biomassmagazine.com/articles/5757/nhs-berlin-station-biomass-power-project-gets-new-life*

Lessons Learned

To compete against other parts of the nation and globe, rural communities require access to a seamless intermodal transportation system in order to attract businesses seeking to maximize their reach. In order to compete in a global economy, where producers and consumers have access to an increasing number of options, rural communities without the capability or capacity to support freight transportation will suffer. The private sector not only prefers access to major highways and railroad facilities when siting new facilities, they demand it.

Several common themes emerged from the case studies, providing a set of lessons learned that should be considered as the Snowflake-Taylor area seeks to attract future industry and economic development to central Navajo County. Perhaps the most important theme taken from each case study was that of partnerships, and the importance of identifying project champions with a vision and clear direction for implementation of a project or strategy to attain economic development for a region.

In each case, the physical setting and natural environment, existing and planned public infrastructure, and public policy played equally important roles in promoting economic development and continued investment in rural areas. The themes that emerged from the case studies are discussed in greater detail below.

Leveraging Existing Built and Natural Environment Characteristics

The built and natural environments influence the location of land use types and can influence the creation of future transportation networks serving undisturbed areas. The availability of open, undisturbed land areas, coupled with the price of land, were determining factors considered by potential investors in the selection of sites for industrial facilities.

Additionally, linkages with major commercial markets were important. The time associated with moving products or raw material to major markets was often cited as a top priority. As shown by the natural resource case studies, the abundance of renewable sources of water, wind, and sun can provide a continuous source of income at minimal cost.

Availability and Price of Open Land

Each of the case studies demonstrated that the availability of open land suitable for development was a key factor in determining the locations where facilities were constructed. Private developers and public agencies sought to minimize the need for land clearing and earth works engineering to minimize costs and proceed to construction and operation as quickly as possible.

As shown by the VIP example, clearing, grading, and additional engineering led to significant unanticipated costs in the construction of the port facility. These extra costs translated into extra time before the facility could be operational. Project planners and designers indicated that if they had the opportunity to make changes and "redo" the project, the facility's physical layout would have been changed to account for topographic and geologic conditions.

Conversely, the Alliance Global Logistics Hub benefited from the availability of large, generally flat parcels of contiguous property that enabled project planners to quickly develop an efficient site layout and construct facilities near major transportation features, along with providing room for future expansion (as market conditions warrant).

Access to Commercial Markets and Connections with Major Transportation Networks

Access to commercial markets was a key factor in the location of projects considered in the case studies. The ability to manufacture raw materials and move finished goods to markets across the country and internationally quickly and at minimal cost was vital when businesses or industries considered relocating or opening new facilities. This was especially true for businesses that manufacture products under the "just in time" delivery method.

Accessibility to major commercial markets is provided through expedient, reliable transportation routes. As shown by the case study in Tupelo, Mississippi, the manufacturing industry can thrive in rural America when reliable, multimodal transportation networks are available, along with plans for continued investments in these facilities.

Understanding Public Infrastructure Assets, Amenities, and Liabilities

In addition to the built and natural environment characteristics, an existing public infrastructure capable of supporting a variety of industry and commercial enterprises was vital to the location and success of each industry considered in the case studies.

Public infrastructure meant more than transportation facilities and wet and dry utilities. Several case studies demonstrated the power of leveraging local institutions and human capital to attract industry and investment, helping to create self-sustaining, entrepreneurial, and innovative economies capable of attracting future investment not foreseen by project planners at the time the sites were developed.

Availability of Public Roads and Utilities

Several of the case studies illustrated the importance of providing development sites with sufficient access to public roads along with wet and dry public utilities. Extending public roads and utilities within future development areas was often a cost incurred by local governments. Such costs were handled though special tax assessment districts or agreements with land developers and/or tenants to repay infrastructure costs over time.

For example, the Alliance Global Logistics Hub benefited from coordinated investments between public and private partners. Project developers worked with the City of Fort Worth to install wet and dry utilities throughout the development site. The State of Texas Department of Transportation was also engaged for the creation of entrance and exit ramps to the development area, affording the facility with expanded access to regional highways and other surface transportation networks.

As discussed in the case study of Tupelo, Mississippi, the Mississippi legislature approved $294 million for extension of public utilities, site grading, and other land improvements to support development. Contributions from private enterprise helped cover the remaining costs of the facility.

Understanding Community Assets and Liabilities

A shared theme among the case studies was that community assets, amenities, and liabilities were all elements businesses and industry considered when evaluating potential locations for future facilities. Beyond advocating a community's assets and amenities, a thorough understanding of a community's liabilities and needs will help identify and prioritize public investments to entice and support business and industry investment.

Understanding Local Skills and Knowledge Bases

Is there a strong institutional knowledge base that can be leveraged to demonstrate the existing skills within a local community? Several of the case studies, such as the examples of Polaris, Arctic Cat, and Toyota, showed the importance of understanding the existing institutional knowledge of the local workforce and targeting industries that can capitalize on this knowledge base. For the Second Knolls region, forest products manufacturing, ranching, and agriculture are long-established regional industries. Comparatively, attracting a vehicle manufacturer to the region may present a challenge unless it can be shown that manufacturing skill sets are comparatively strong within the region.

Establishing links between industry and local institutions, such as community or technical colleges, can promote a region's economic competitiveness. Workforce training programs that correspond to the needs of industry through apprenticeship programs or customized job training can serve both the emerging and incumbent work force and can offset worker training costs faced by industries considering locating in a region.

Supportive Public Policies and Partnerships for Economic Development

Each of the case studies demonstrated the importance of public policy in supporting local and regional economic development. A clearly structured and transparent planning and permitting process that gives developers and investors a predictable and reliable process to follow will position the Snowflake-Taylor region to compete nationally when attracting industry to the region.

However, balancing the needs of developers and industry with the social values of communities and appropriate environmental protection are equally important. Community values (such as the promotion of a healthy, well educated, and safe town), character (historic features or culturally distinct events), and natural amenities (clean air and water quality) contribute to a community's livability and desirability, and are attributes often examined by businesses when considering relocation.

Public-Private Partnerships

Cooperation among public and private partners is clearly essential for attracting and retaining industry and commercial development. Public-private partnerships offset the increasing capital costs associated with land development.

These partnerships take different shapes. In certain cases, the public sector provides the site's initial infrastructure (roads and utilities) and recoups the investment through property taxes or special assessment districts. The private sector pays for the capital costs of public infrastructure, with an agreement that the costs for this infrastructure will be recovered through reduced land taxation or long-term lease agreements. A clear understanding of the needs of industry and the values of communities can create mutual trust to ensure that the interests of both the public and private sectors are protected. The case studies all demonstrated the effectiveness of public-private partnerships in helping to attract, retain, and grow businesses.

Supportive Zoning and Land Development Regulations

Each of the case studies dealt with the construction of new facilities, with a principal focus on industrial or commercial services. For these developments to occur, the case studies demonstrated the importance of supportive land use plans, land development policies, and a legible permitting process that ensures the timely delivery of building permits. Land developers have often said that crucial decisions on locations for new facilities are based on zoning regulations and land development controls.

Once the type of desired development is identified, establishing a supportive policy foundation provides additional leverage to the region as a marketing tool that may be shown to potential businesses. It will also be important to ensure that sufficient land (with applicable zoning controls) is provided for future development and expansion.

In the VIP case study, port officials indicated that the initial development did not consider future expansion needs, and the size of the facility (and, subsequently, its capacity) were limited by residential development and open space surrounding the facility and by those developments that occurred after the facility opened. Furthermore, port representatives identified that greater separation was needed between incompatible land uses, and that neighbors had complained about noise from the facility. Equally important to establishing a supportive regulatory environment for development is the need to balance community interests for the protection of natural resources, residential areas, and civic spaces that help create community and are amenities valued by local citizens.

Interagency Coordination and Involvement

Cooperation and coordination between public agencies and project stakeholders emerged as an unwritten theme from the case studies. Each of the case studies identified multiple stakeholders, from local governments to state and federal agencies, in addition to private-sector interests. Time, communication, and cooperation among actors were essential to each project's success. A clear understanding of the expectations of oversight agencies, such as U.S. Customs and Border Protection, would be essential to establishing an inland port or logistics hub facility, as would be knowledge of the business needs and practices for container shipment companies managing freight logistics.

Increasingly, public utilities are subject to enhanced protections against threats from domestic or international terrorism and, therefore, are subject to review by agencies such as the U.S. Department of Homeland Security or applicable state agencies. The heights of structures such as wind turbines or transmission lines often require review by the Federal Aviation Administration to ensure they do not present obstacles and hazards to flight paths. Once an industry type is selected as the target for future development within the Second Knolls study area, creating a working group or team of agency representatives will be important to guide the process of attracting potential businesses and industries.

Strong Local Leadership

The projects discussed in the case studies would not have taken root without strong local leadership, both public and private. In spite of increasing awareness that local communities and regions must work together to build effective economies, economic development strategies remain notoriously local in nature. Communities that presented unified approaches and enlisted the support of multiple advocates working toward a common goal fared better than communities relying on a single voice or representative.

Towns that demonstrate a coordinated plan and effort can assure businesses that their interests and needs are important to the local community. However, strong local leadership must be accompanied by a focused agenda for economic development. Local advocates and leaders should send a similar, clear message to businesses and industries considering relocating or opening a new facility in a region. Strong local leadership and a focused economic development strategy are also important when pursuing financial resources from foundations, nonprofit groups, or government agencies that may be used to promote a community or region.

Local Cooperation on Economic Development Projects is a Promising Strategy

Rural areas with limited financial resources face numerous challenges in developing public infrastructure, industrial parks or other development projects. Counties and municipalities that cooperate on economic development infrastructure projects can save costs, create economies of scale, and working together, help lure jobs back to the region.

Appendix C: Public Involvement Summary Reports

Snowflake Second Knolls Development Transportation Study

Summary Report from the March 21, 2013 Stakeholder Visioning Workshop

Prepared by
Arizona Department of Transportation
206 S. 17th Ave.
Phoenix, AZ 85007

Visioning Workshop

Date: **Thursday, March 21, 2013; 10:00 a.m. to 3:00 p.m.**

Location: Snowflake Town Hall Council Chambers
81 West 1st South, Snowflake, AZ 85937

Staff Present

Justin Feek, Arizona Department of Transportation Multimodal Planning Division; Michael Gorton, HDR; Megan Griego, ADOT Communications; Rodney Wigman, ADOT Communications; Jennifer Grentz, ADOT Communications; Laura Paty, ALA

Summary

As part of the public outreach process, the project team hosted a public visioning workshop to bring together public and private stakeholders at the local, regional, county, state and federal level to lay out a transportation vision for the area.

Participants were asked to focus on opportunities to take advantage of the region's assets and develop supporting transportation scenarios. Road networks, the Apache Railway, non-motorized paths and trails plans will be geared toward targeted industries and job providers.

Notification

The project team developed and distributed a postcard invitation to members of the Technical Advisory Team; sent an email blast to stakeholders and media; and, published ads in the Silver Creek Newspaper on March 13 and March 20, 2013. Copies of these items are available in Attachment A and on the project website: azdot.gov/secondknolls.

Presentation

A brief PowerPoint presentation was given that welcomed attendees, provided an overview of the study, process and previous studies to date, and the goals of the study. A copy of the presentation is available in Attachment B and on the project website: azdot.gov/secondknolls.

Panel Presentation and Planning Workshop

Panelists from agency partners and private industries in the study area were invited to participate in a panel discussion. Panelists were asked to talk about their vision for the future of the region, the assets needed to support growth and development, and they types of development they see over the next 20 years. Following were some of the comments made during this portion of the workshop.

Town of Show Low – Rob Emmett

- There is an opportunity to grow economic development in the area
- The project team should look at integrating the Aztec plan with its transportation study
- Mentioned that unemployment in the are is high - 17%; the closing of the Catalyst paper mill cost more than 30 jobs
- There are a lot of agrarian uses in this area as well as Potash mining opportunities and forest restoration; timber processing
- The study area has power, rail, gas, aquifer, developable land
- The final plan should work in conjunction with the Show Low regional transportation plan
- He would like to expand study area to include phase II and III

Town of Taylor – Stu Spalding

- Plan should include the local airport in the study
    - Research airport studies
- Mentioned that Paper Mill Road is the most used road
    - Move sign on SR 277 further from intersection
    - Taylor maintains road, but it's no longer a 'local' road
    - How can Paper Mill Road be kept in operation? Taylor can't afford maintenance if it becomes busier
- There is a planned commercial development at Paper Mill Road and SR 77
    - When developed, roads won't be able to handle the traffic
- Would like to know how the study area traffic will impact the region?

Aztec Land and Cattle – Steve Brophy and Mark Reddie

- Detailed existing land maps
- Used Navajo Comprehensive Plan as basis for character areas
- 14 planning areas
- Navajo Comprehensive Plan was adopted into the county plan in 2011
- Use plan (Snowflake North) to market for economic development
- Detailed planning for Snowflake North; plans temporarily on hold due to Catalyst closing and this PARA study

Rocking Chair Ranch – Billy Elkins

- Helped develop first wind farm
- Still wants to keep a working cattle ranch

- There is a lot of infrastructure through their land
- Looking at all options

Snowflake-Taylor Economic Development Committee – Kerry Ballard

- Hard to develop north of town due to rock; rock extends east of town as well
- Town will grow to west
- Amenities are the golf course and temple
- Would like the project team to look at the scoping document on SR 277 west of town (available from ADOT)
- Should look at a west loop road
- Concho Highway (heading east) may become busier when Potash mine opens
- Industrial should be west of town (west and north)
- Residential growth will be to the southwest
- Does not want truck traffic going through the middle of town

Arizona Commerce Authority – Keith Watkins

- The Arizona Commerce Authority is the state's economic development authority. Its goal is to enhance the state's job base.
- ACA's job is make Snowflake/Taylor in the site selection process, making sure all the elements are in place to attract new business.
- Snowflake and Taylor's assets are viable for base employment creation
- Roads should be enhanced, and maintenance is needed to ensure infrastructure is ready
- Very bullish about the area's prospects

Real AZ Development Council – Gus Lundberg

- Real AZ corridor is region branding
- What region assets can be marketed?
- Real AZ includes nine regional municipalities (from Winslow to Alpine), 2 counties, and 15 businesses
- Wants to bring more jobs to the area and recognizes the importance of transportation to this endeavor

Bureau of Land Management (BLM) – Tom Schnell

- BLM manages 230K acres in Navajo and Apache counties
- BLM manages multiple uses on their land
- There is a wind farm
- BLM is working on a vegetation treatment plant (juniper)
- Centennial west transmission line application
    - More wind and solar if there's transmission
- Beginning a resource management plan within 1-3 years
    - A long-term plan of land use allocation
- There is an interest in Potash on BLM land

Potash – Ken Bond

- This is the best area for potash
- There are two other companies in the area exploring potash mining
- The company published a study on March 20, 2013
- Potash has a domestic and global market
- Their proposed facility may employ as many as 1,800, plus many more indirect jobs
- The Apache Railroad could work for them – it's ready to go versus building new spur to BNSF
- Apache Railroad still provides service to pig farm; farm also uses trucks

Assets in the Region

After the initial panel discussion, attendees were invited to share their thoughts on the region in a free-flow conversation. Next, they determined the key assets and ranked them in order of importance. Notes from these discussions are below.

- The region needs to lobby state to return HURF money so that transportation projects can be implemented
- There are three proposed downtown bypasses:
    - Freeman Hollow
    - Concho Highway
    - Paper Mill Road
- It was mentioned that bypasses can ruin downtown businesses because vehicles don't get to drive through the downtown area – it becomes a destination
- There is a 5-ton limit on the Little Colorado bridge
- Currently, land is inexpensive, so any right of way should be purchased early
- Need to consider utility easements with right of way
- If ADOT looks at roads going east of town, you will have to cross the creek
- The wind turbine land is better suited to industrial/commercial use
- For the plan to be successful, it will need buy-in from all stakeholders
    - Be adopted by all - If both councils buy-in, more likely to happen
- Look at intermodal
- Railroad economic study due to be completed at the end of March (Keith Watkins)
- Duty-free zone
- The group would like:
    - Another alternative review workshop
    - Deliverables – something to give site selectors
    - Executive summary in the form of a marketing flier

Assets ([#] indicates votes received)

- Transportation (0)
- Land (1)
- Cooperation (1)
- Environment – climate, water (1)
- Snowflake and Taylor can access largest aquifer in state

- Sand and gravel opportunities (1)
- Shovel-ready parcels (2)
- Right-to-work state (6)
- Relatively low-cost-energy state (2)
- Salt storage for gas
- Low county property tax (asset added after voting)
- Hog farm – they ship live hogs to LA via truck for processing
- Copper ingots – trucks through town every day
- Pellets – trucks through town every day
- Study – what materials are here and who has need of them?
- Enough natural gas to run turbines
- Taylor Airport – can handle light jets; hangar space; can expand; 7,200' runway
- Rumors of oil near Holbrook – fracking sand delivered
- Water (12)
- Airport (1)
- Apache & BNSF Railroads (7)
- Highway System (2)
    - Interstate
- Major gas – enough to run factories (2)
- 345 kv lines (3)
- Able workforce (4)
    - Available workforce
- Potash and sister businesses (7)
- Good inter-government coordination (1)
- Good education system – Pioneer College
- No natural disasters ('white zone') (2)
- Doctor/Capita ratio
- Developable land (7)
- Industrial zoning encouraged
- Friendly government (3)
- Industrial park with available parcels for expansion

Public Comments

One public comment was received from an Ad Hoc Interest Group and is available in Attachment C.

Title VI

Title VI of the 1964 Civil Rights Act regulations provides that "no person in the United States shall, on the grounds of race, color, or natural origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance." Related federal statutes and regulations requires ADOT's Title VI/Nondiscrimination Program to include nondiscrimination protection on the basis of age, sex, disability and income status in all ADOT programs or activities.

A display board, brochures and survey cards were displayed and made available at the meeting regarding Title VI. No Survey cards were received at this meeting.

Attachment A – Silver Creek Newspaper Advertisement

Second Knolls Development Transportation Study and Workshop
Thursday, March 21, 2013

Help layout a transportation vision for the Second Knolls area.

The Arizona Department of Transportation, in partnership with Navajo County and the towns of Snowflake and Taylor, is conducting the Second Knolls Development Transportation Study. The study, which covers nearly 100 square miles northwest of Snowflake, will identify the region's assets and transportation needs. As part of the study, the public is invited to help layout the transportation vision.

Public visioning workshop
10 a.m. to 3 p.m.
Stakeholder presentations in the morning
Light lunch served at 12 p.m. (free)
Planning workshop in the afternoon

Snowflake Town Hall
81 W. First South
Snowflake, AZ 85937

Your input is important!

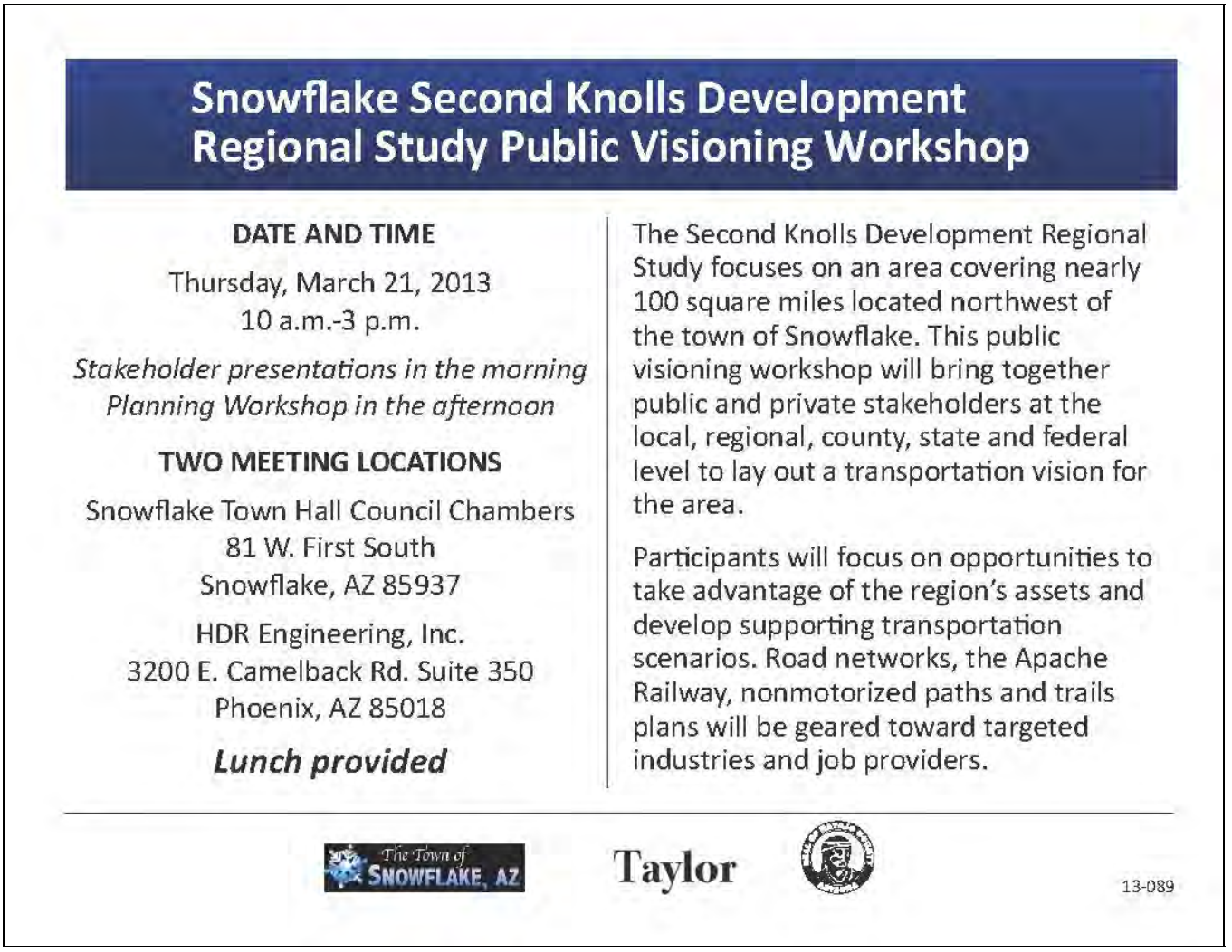
Visit the project website at azdot.gov/secondknolls.
Submit comments through April 4, 2013.

Justin Feek
Program Manager
Multimodal Planning Division, ADOT
206 South 17th Ave 3108
Phoenix, AZ 85007
602.712.8196

ADOT · Taylor

azdot.gov/ secondknolls
projects@azdot.gov
855.712.8530

Attachment A – Post Card



Snowflake Second Knolls Development Regional Study Public Visioning Workshop

DATE AND TIME

Thursday, March 21, 2013
10 a.m.-3 p.m.

Stakeholder presentations in the morning
Planning Workshop in the afternoon

TWO MEETING LOCATIONS

Snowflake Town Hall Council Chambers
81 W. First South
Snowflake, AZ 85937

HDR Engineering, Inc.
3200 E. Camelback Rd. Suite 350
Phoenix, AZ 85018

Lunch provided

The Second Knolls Development Regional Study focuses on an area covering nearly 100 square miles located northwest of the town of Snowflake. This public visioning workshop will bring together public and private stakeholders at the local, regional, county, state and federal level to lay out a transportation vision for the area.

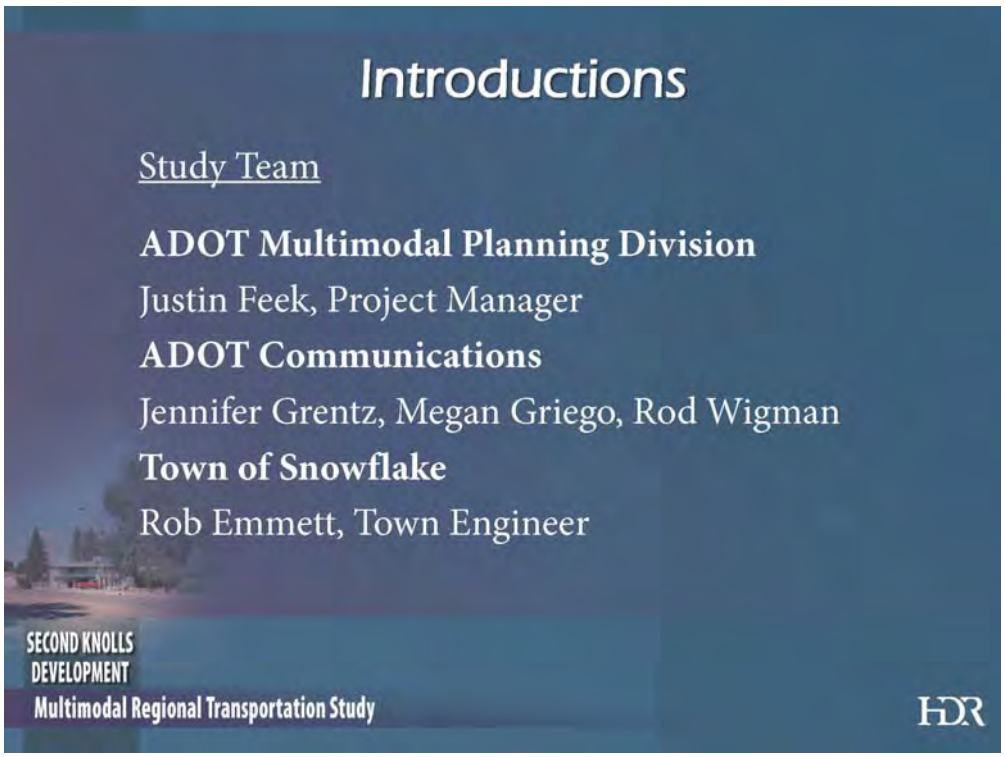
Participants will focus on opportunities to take advantage of the region's assets and develop supporting transportation scenarios. Road networks, the Apache Railway, nonmotorized paths and trails plans will be geared toward targeted industries and job providers.

The Town of SNOWFLAKE, AZ

Taylor

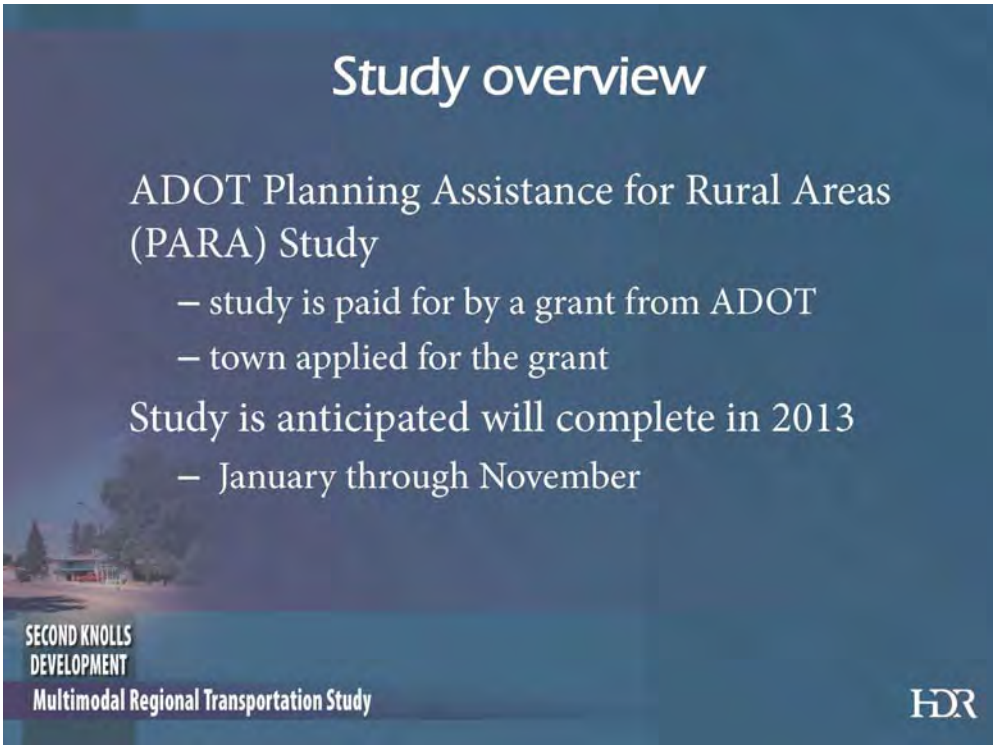
13-089

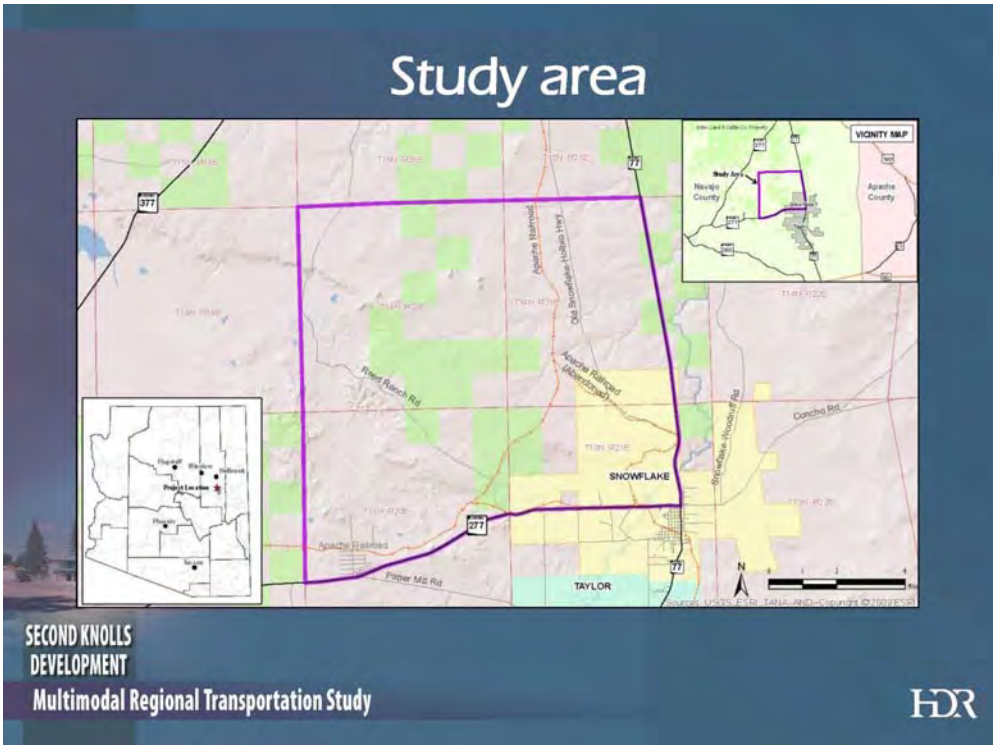
Attachment B – Presentation



Attachment B – Presentation

Attachment B – Presentation





Attachment B – Presentation

Attachment B – Presentation

Attachment C – Second Knolls Study Comments

To: Justin Feek, Project Manager, Snowflake Second Knolls Development Multimodal Regional Transportation Study

CC: Second Knolls Study Team, Technical Advisory Committee

From: Kathy Hemenway, PhD, Ad Hoc Interest Group Coordinator
khemenway@frontiernet.net, 928.536.6075

Ad Hoc Interest Group:
Gary Gumbel, Retired Broker, Chicago Board Options Exchange
Amanda Hafner, Solution Process Architect, Telecommuter
Dorothy Holasek, Retired
Ali Jaffar, Real Estate Investor
Susan MacKay, MA, Retired University Foreign Language Program Coord.
Jim Mills, Retired School Teacher/Counselor
Marjorie Mills, Retired School Teacher
Susan Molloy, MA (Disability Studies)
Jack Otterson, Retired Nursing Assistant
Azucena Perez
Jennifer Sausa Perez
Lise Pettijohn, Senior Project Manager, Telecommuter
Jack Rice, Physicians Assistant
Sue Rice, Respiratory Therapist
Kay Turner, Retired Stationary Engineer, Horse Trainer
Donald Wingard, Retired

Advisors:
Simran Galhotra, MD, MBA, Gila Lung, PA, Show Low, Arizona
Patrick Avery, MBA, Senior Advisor, Former President/CEO, Prospect Global Resources, Inc., Denver, Colorado

Comments on Snowflake Second Knolls Project Vision and Plans – Due April 4

We are residents and landowners in the Snowflake area, and as stakeholders, we are interested in economic development plans being considered for the region. Because we didn't hear about the Second Knolls project until March 25th, we were not able to attend the workshop on March 21st. Consequently, we have no up-to-date information to work from and the period for input has been very short. Since over the past few years several of us have attended many public meetings and hearings on Aztec Area Plan, the county transportation plans, and other land use planning topics, our work is informed by that background. We are including here a white paper about our perspective on some aspects of planning for regional economic and community development.

Please provide us with notes, slides, audio and video recordings, and any other records from the workshop so that we can catch up. Please confirm receipt and distribution of this document. Please revise your public involvement plans to more effectively inform and engage the public. Thank you.

4 April 2013: 1

Attachment C – Second Knolls Study Comments

Public Comments from the Ad Hoc Interest Group

In this white paper, we discuss the premise that future growth will not be dominated by tourism and second home growth, but rather by growth arising from the enhancement of employment-related opportunities.

While we agree that tourism and second home growth will not be economic drivers here, we disagree that only jobs will bring people to the area. We believe that growth can also be driven by the relocation of retiring baby boomers. Further, we believe that actions taken to support that movement will improve quality of life generally, increasing the potential for businesses to site facilities. Better quality of life decreases risks related to workforce recruitment, satisfaction, and retention. Incoming businesses that support the needs of retirees will also increase the prospect for local procurement for industrial facilities, increasing the proportion of company dollars that are spent locally and fed back into the local economy.

Our emphasis on the retiring baby boomer population is based on demographic trends. As they leave the workforce, many baby boomers are relocating to rural areas, bringing with them their incomes and causing growth and transformation in rural counties in the West. In fact, millions of baby boomers are expected to move to rural areas in the coming years.

While this area doesn't fit the classic profile for retiree in-migration, it offers relatively unique advantages that are a top priority for a significant part of that population. Those advantages involve environmental quality – and specifically, air quality – which is mandatory for the retiring population with asthma, emphysema, reactive airways disease, COPD and other pulmonary and cardio-pulmonary diseases. These problems affect people at all levels of the economic spectrum.

According to a recent informal study by ADEQ, the air in this area is ten times better than the air anywhere else in the state. The specific air quality advantages here include: few industrial air emissions, negligible traffic emissions, little pollution from pesticides and herbicides, low pollen counts from sparse vegetation, and low humidity resulting in low levels of mold. Infrequent, sporadic air quality problems result from dust storms, smoke from forest fires, and pollution from the few industrial point sources.

Because of the good air quality, in recent years, retirees, disabled people, and telecommuters have moved here from large urban areas and farm areas throughout the continental US and Alaska, and also from northern and southern Europe, Cuba, South America, the Philippines, and the Middle East.

Whereas growth in the population of people with asthma, emphysema and other lung diseases in the US is relatively recent, the tradition of "lungers" moving to the desert in Arizona is a very old one, having begun about 150 years ago. A boom started with the arrival of railroads, and according to one study, nearly one-quarter of the people who relocated to the southwest during the 19th century came seeking the "climate cure" for tuberculosis and other respiratory disorders. In 1900, one-third of the residents of Tucson, Phoenix, and Cave Creek were people seeking the climate cure. Among the lungers were Governor Safford; Territorial Judge Joseph Pratt Allyn; New York Times owner and editor Whitelaw Reid; Doc Holliday, partner of Wyatt Earp; and many others who are well-known historical figures.

Whereas many lungers migrating to Arizona sought the low desert, now the high desert has become a "climate cure" destination. This has resulted from a variety of environmental conditions in low desert locales, including serious air pollution, increasing temperatures, dependence on air conditioning, non-

Attachment C – Second Knolls Study Comments

native landscaping, extensive use of herbicides and pesticides, and resins from low-desert vegetation. Consequently, southern Arizona is no longer the safe haven it once was. People seeking the climate cure today increasingly look to the high desert in Navajo and Apache counties.

For both working and retired populations, some of the barriers to rural living that were dominant in the past are much less significant now, and some of the disadvantages of urban living are more dominant than they used to be. The Internet has dramatically reduced isolation and improved opportunities in rural areas. It provides direct access to information and goods that are unavailable in rural areas, and enables telecommuting as well as Inter-Library Loan and other valuable services. Meanwhile, the high cost of living, over-crowding, and high crime rates in urban environments make them less attractive than they once were.

Whereas lungers naturally enjoy cultural amenities just like other people do, they are typically more willing to forego the types of amenities that are in short supply here. For that reason, they may be an easier population to satisfy initially than other populations. Nonetheless, a variety of steps would need to be taken to encourage in-migration, and we believe that most of those steps are the same steps that need to be taken to prevent the area from being eliminated from consideration by companies on the basis of anticipated problems related to recruiting, employee satisfaction, and retention. These factors can be a deal-breaker for businesses, just as can the absence of infrastructure.

The first step toward improving quality of life here, and providing a desirable living environment both for those with jobs and those without, is a realistic appraisal of area strengths and weaknesses, and initiation of projects to address the weaknesses while preserving and enhancing strengths. Below we have listed some steps that could be taken.

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Attachment C – Second Knolls Study Comments

Quality-of-Life Enhancements for the Snowflake-Taylor Area

1. **Development of focal landscape features, including scenic canyons, lakes, and groves of trees.**

   Although the area is relatively barren, many people love the expansive blue sky, the rolling hills, and long vistas. While they don't fit images of lush mountain meadows and clear mountain streams that satisfy so easily, they are classically Western and the basis for much Western lore.

   The terrain could be improved, and made appealing to more people, through a greater focus on scenic hot spots and by providing easier access to them. Areas that come to mind are Chevelon Canyon, Silver Creek Canyon, Petroglyph Park, and The Sinks near Snowflake.

   In addition to enhancement of existing scenic hot spots, there could be great value in developing naturalistic, artificial hot spots. In our experience, there is tremendous aesthetic value in artificial, inorganic ponds that have crystal clear water, that are lined with river rocks, and that have waterfalls to provide aeration and moving water. They are very popular with people living in the dry, high-desert climate, and tend to improve people's moods. For people living here, the sound of a breeze rustling through trees is also very welcome.

   These features could use groundwater that is high in total dissolved solids and isn't suitable for higher-priority uses.

2. **Development of focal cultural theme areas.**

   A second way to improve the appeal of the area is to enhance cultural hot spots. For example, Holbrook has the chance to develop an Old West hot spot, while Snowflake can enhance its pioneer heritage theme and Winslow could continue to develop its historic railroad theme. Navajo trading posts could be enhanced, along with other highlights on different aspects of the Navajo culture, as well as ancient pueblo ruins. The Petrified Forest National Park is already developing the archaeological and paleontological assets within its expanded boundaries.

   Cultural hot spots, like scenic ones, can introduce interesting diversity and make the area more engaging and appealing, as well as supporting educational and recreational activities.

3. **Development of commercial centers.**

   Local shopping and commercial centers need to be improved and enlarged. While some centers are accessible in southern Navajo County, many businesses there find it difficult to survive year-round with the reduced population in the winter months. Because of the milder winters here, along with mild summers, we have the potential for a year-round population, which may help to sustain businesses in southern Navajo County as well as local businesses, and help to draw residents and visitors from those areas here for shopping.

   Given the areas' location near intersections of state highways 77, 277, 260, and 377, and Interstate 40, there is also the opportunity to attract passing motorists who might stop for meals or brief sight-seeing while enroute to their destinations.

Attachment C – Second Knolls Study Comments

4. **Medical care.**

   Local access to health care has improved dramatically with the recent expansions to the Summit Regional Healthcare Center. We now have a lung doctor and gastroenterologist along with a full cardiac care center, a full cancer center, and expanded emergency room services. With more healthcare dollars brought in by retirees, the facilities could be developed further, providing additional services, such as an in-hospital elder care facility along with local assisted living.

   The new services and facilities could provide employment opportunities for graduates from the medical and emergency services programs at NPC.

5. **Transportation and air travel.**

   Part of rural living is dealing with the fact that while you don't spend much time in traffic jams or at stoplights, you still spend a lot of time on the road. In our area, it can be a long trip to the grocery store, and most people go to the White Mountains often, as well as taking trips to urban areas and towns for entertainment and services that aren't available here. Ways of coping with this aspect of life, in a sustainable and economic fashion, should be addressed.

   Enhanced air service, both for commercial and private planes, is important, and may be essential for many businesses and for seniors needing services provided at facilities such as University Medical Center in Tucson, as well as people traveling for business, recreation, and to visit friends and family.

6. **Guide to rural, high-desert rural living.**

   People considering moving to a new area spend a lot of time trying to imagine what their lives will be like. In fact, most people won't relocate without a detailed understanding of their anticipated new lives.

   Many counties have developed guides to rural living or stewardship guides for use by newcomers. For our area, guidelines are needed for day-to-day topics such as how to recycle here, and also for topics related to getting set up, such as how to design houses for life in an area with a strong southwest wind, and how to landscape and garden in the high desert. Topics important to equine enthusiasts should also be addressed, as many of them are drawn to the area.

   To root and ground newcomers, this effort will also entail development of educational materials describing the history of the area and explaining how modern settlements evolved from various historical movements. For example, one topic could be the origin and evolution of the land grant checkerboard and how it led to current land use patterns. Informed understanding can help newcomers as well as long-time residents recognize current land use challenges involved in moving toward new settlement patterns. The new patterns must still support the essential features of life in the rural high desert, but better match the requirements of modern infrastructure and public services, and better match the land use patterns necessary for siting industrial facilities.

   On a website, this information can be made accessible to people considering a move, as well as to companies doing facility siting evaluations. A well-written and well-structured website could provide efficient, one-stop shopping for prospective new residents as well as for companies.

Attachment C – Second Knolls Study Comments

7. **Framework for facility siting.**

A framework is needed for working with new businesses to effectively evaluate facility sites and move quickly to get the businesses up and running. Many industries -- in Arizona and elsewhere – require companies to work on an on-going basis with communities to ensure win-win scenarios. This is required by corporate boards, investors, and industry organizations, because to not do so is considered too risky. For example, one industry that has strong requirements of this type is the mining industry, and these requirements apply to potash mines in the planning, development, operational, and decommissioning phases.

For some industries, the regulatory process is the biggest risk factor in siting facilities. This process is less risky and less constrained in Arizona than in many other western states, especially California. With some effort it can be made more effective, efficient, and reliable.

We need a working model for facility siting that enables companies to be confident of reasonable, prompt, informed, and fair treatment while working to mutual advantage with individuals and organizations. In turn, the framework should enable local communities to have confidence that businesses entering the area intend to be responsible, to work toward mutual advantage, and to assist in developing needed infrastructure and access to essential goods and services.

4 April 2013: 6

Second Knolls Development Regional Transportation Study

November 2013

Prepared by
Arizona Department of Transportation

Introduction

The Town of Snowflake, in partnership with the Arizona Department of Transportation (ADOT) and other stakeholders, is conducting a study to identify the region's assets and transportation needs. The study covers nearly 100 square miles northwest of the Town of Snowflake.

Public Meeting/Open House

To inform and involve Snowflake residents in the study, ADOT hosted a public open house on Tuesday, November 12 at the Snowflake Council Chambers, 81 W. First South, Snowflake, Arizona from 5-6 p.m. with a presentation to the Snowflake Town Council on November 19 at 6 p.m. Staff present at the meeting on November 12 included Michael Gorton and Alec More (HDR), Rod Wigman and Justin Feek (ADOT), and Rob Emmett (Town of Snowflake). At the open house, members of the public were able to review the study recommendations, learn more about the project, ask questions, and comment on the study. In total, 18 Snowflake residents were in attendance.

Newspaper Advertisement

A newspaper advertisement providing the date and location of the public meeting was published in the Silver Creek Newspaper for two consecutive weeks prior to the meeting. A copy of the advertisement can be found in Appendix A.

Comments Made

The following comments were made at the open house by members of the public and were addressed by the technical consultant.

- What is meant by a road network in the study area? **It is the interconnectivity of the roads in the study area.**
- What are you going to do with the case studies? T**hey are being used to inform the Town of Snowflake regarding how to attract and retain specific industries by looking at communities with comparable transportation and labor force assets from around the Country and highlighting success stories.**
- There is an omission in the report; it should have information about the rail spur to Holbrook. The spur could be used to pull a data line in for a call center. **A discussion of the rail spur to Holbrook will be added to the Study and a supplemental discussion of data assets will be included.**
- What is currently in the BNSF right-of-way? There was a discussion during the meeting. Further research showed that primary access points to nation's fiber optic backbone are located in the major urban areas such as Phoenix.
- Most of this study just seems to focus on the blue collar workers; it needs to be more rounded to include all levels of workers.
- Climate advantage over several locations studied. Employers are interested because we don't have natural disasters. Close to California, not the same, but inter-modal centers, call centers, can service southwest region.

- How do you get the socioeconomic projections? **Michael Gorton explained that the state demographer's office develops population growth projections at the state, county, and municipal level.**
- Who is responsible for getting this going now? **Rob Emmett from the Town of Snowflake explained what the city is doing to get it moving and how they are going to use the study to try to draw in companies and businesses.**
- A comment was made on what avenues are being taken to bring things together, like the Forest Service starting up logging again and trying to bring in big freight trains.
- A comment was made about finding a basic industry to train and keep locals here so they don't leave because of the lack of work. This area has a lot to offer for the outdoor enthusiast, but that does not keep people here.
- Is there an attitude change in the city to say we can grow and offer jobs to keep people here or is it still the old way where the area feels comfortable about not growing and that everything is okay staying small?
- How is Potash going to impact this? **Rob Emmett answered this by saying most of the potash work is outside of this study area, but we were hoping to draw in incidental businesses when it started up. Currently it is taking longer than projected so it is not a factor now.**

Appendix A

Second Knolls Development Regional Transportation Study Open House

Tuesday, November 12, 2013

Please Join Us

The Town of Snowflake, in partnership with the Arizona Department of Transportation and other stakeholders, is conducting a study to identify the region's assets and transportation needs.

WE WANT TO HEAR FROM YOU

Join us on Tuesday, November 12, 2013, from 5-6 p.m. at our public open house to review the study's findings. A presentation to the Snowflake Town Council will follow at 6 p.m. with an opportunity for questions and answers following the presentation.

Snowflake Council Chambers
81 W. First South
Snowflake, AZ 85937

If you require special assistance in order to participate in the public meeting, please contact projects@azdot.gov or 855.712.8530. Requests should be made as soon as possible to allow time to arrange the accommodation.

ADOT Taylor

For more information:
azdot.gov/secondknolls
855.712.8530

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Presentation and Comments Made

Following the presentation, shown in Appendix B, the following comments were made at the open house by members of the public and were addressed by the technical consultant.

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Second Knolls Development Regional Transportation Study Open House

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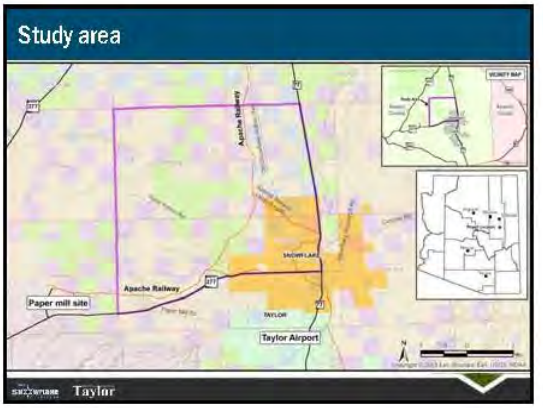
ADOT Taylor

For more information:
azdot.gov/secondknolls
855.712.8530

Appendix B

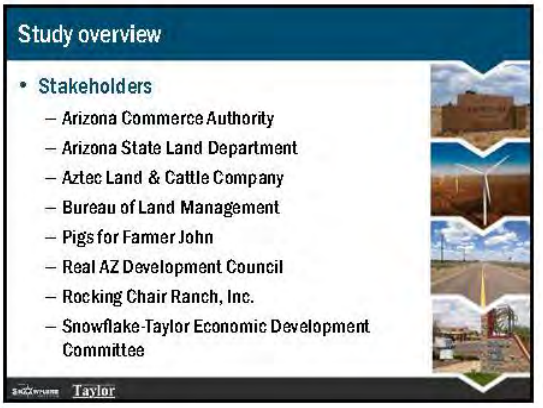

Second Knolls Development Regional Transportation Study
Town Council Briefing
November 19, 2013
NORTH
277
Taylor


Study area
Apache Railway
Paper mill site
Taylor Airport
Taylor


Today's Agenda
• Study overview
• Planning context
• Discuss
– Transportation framework plan
– Development case studies
– Funding opportunities
• Comments/Feedback
Taylor


Study overview
• Arizona Department of Transportation Planning Assistance for Rural Areas (PARA) grant
• Technical Advisory Committee
– Town of Snowflake
– Town of Taylor
– Navajo County
– ADOT
– Northern Arizona Council of Governments
Taylor


Study overview
• Integrate land use planning and future transportation investments
• Establish a multimodal transportation plan to optimize investments and encourage economic development
• Identify infrastructure funding sources and investment strategies
• Development case studies
Taylor


Study overview
• Stakeholders
– Arizona Commerce Authority
– Arizona State Land Department
– Aztec Land & Cattle Company
– Bureau of Land Management
– Pigs for Farmer John
– Real AZ Development Council
– Rocking Chair Ranch, Inc.
– Snowflake-Taylor Economic Development Committee
Taylor


Study overview
• Milestones
– Public Visioning Workshop (March 2013)
– Current and Future Conditions (May 2013
– Funding and Development Case Studies (August 2013)
– Public Open House (November 2013)
– Final Report (December 2013)
Taylor


Transportation framework plan
Network
Cross Sections
Taylor


Planning context
• Previous plans and studies
• Socioeconomic growth projections
• Traffic growth projections
– Network performance
• Crash history
• Multimodal transportation
– Apache Railway
– Taylor Airport
– White Mountain Connection
Taylor


Development case studies
• Second Knolls assets
– Existing road and rail links
– Quality labor force
– Natural resources
– Abundant land
• What industries can these assets attract?
– Industrial clusters
– Inland ports
– Transload facilities
– Forest products
Taylor


Transportation framework plan
• Coordinated with Taylor and Snowflake
• Reflects Aztec Area Plan
• Includes bypass alternative
• Snowflake-Taylor Multi-Jurisdictional Transportation Plan recommendations
• Multimodal road cross sections include bike lanes and multiuse paths
• Scalable within a 200-foot right of way footprint
Taylor


Industrial clusters
• Northern Minnesota snowmobile manufacturing
• Mississippi automobile manufacturing
Taylor

Industrial clusters

- Strengthen regional connections
  - Build on existing local capacities
- Workforce
  - Build on existing skills
  - Educational partnerships
- Site suitability
- Arizona regulatory incentives
  - Jobs tax credits and training fund
  - R&D tax credit, FTZ program

Taylor

Inland ports

- Provide relief to congested seaports
- Important characteristics
  - Market proximity
  - Class I railroad connection
  - Foreign trade zone
  - Labor and real estate
  - Management plan
  - Regulatory incentives

Taylor

Industrial clusters – comparison to Second Knolls

Attribute	Northern Minnesota	Tupelo, Mississippi	Second Knolls
Availability and price of open land	x	x	x
Direct access to large metropolitan markets	x	x	
Connections with major transportation networks	x	x	x
Availability of public roads and utilities	x	x	x
Understanding of community assets and liabilities	x	x	x
Public-private partnerships	x	x	x
Supportive zoning and land development regulations	x	x	x
Interagency coordination and involvement	x	x	x
Strong local leadership	x	x	x
Skilled labor force	x	x	x

Taylor

Inland ports – comparison to Second Knolls

Attribute	Alliance, Texas	Virginia Inland Port	Second Knolls
Connection to major container seaport		x	
Connections to Class I railroad	x	x	x
Minimum of 1,000 acres of land	x	x	x
Foreign trade zone status	x	x	
Access to major metropolitan area	x	x	
Access to major interstate highway(s)	x	x	x
Strong local labor pool	x	x	

Taylor

Inland ports

- Alliance, Texas, Global Logistics Hub

- Virginia Inland Port, Front Royal, Virginia

Taylor

Forest products

- Berlin, New Hampshire

- John Day, Oregon

- Oakridge, Oregon

Taylor

Forest products

- Four Forest Restoration Initiative to provide reliable source of forest products
- Capitalize on existing infrastructure
- Expand forest biomass fuels to municipal heating projects
- Redevelop mill sites as industrial parks, wood pellet mills, power projects, freight transfer and warehousing facilities

Taylor

Transload facility

- Opportunity to grow freight traffic
- Existing mill site used for freight transfer and warehousing
- Serves a variety of different shippers
- Potential anchor for industrial growth to support the Four Forest Restoration Initiative
- Leverage alternative funding to diversify economy

Taylor

Forest products – comparison to Second Knolls

Attribute	Berlin, New Hampshire	John Day, Oregon	Oakridge, Oregon	Prineville, Oregon	Second Knolls
Reliable supply of forest products	x	x			x
Existing mill site for redevelopment	x	x	x	x	x
State highway access	x	x	x	x	x
Interstate highway access					x
Shortline connection to Class I railroad	x			x	x

Taylor

Forest products – comparison to Second Knolls

Attribute	Prineville, Oregon	Second Knolls
Shortline connection to Class I railroad	x	x
Mill site for redevelopment	x	x
State highway access	x	x
Interstate highway access		x
Access to regional shippers	x	x

Taylor

Transload facility

- Prineville, Oregon

Taylor

Funding opportunities

- Variety of sources
  - Federal, state, local
  - Public-private partnerships
  - Community, economic development grants
- Pursuit strategies
  - Emphasize economic development impact
  - Incorporate trails and multiuse paths
  - Project regional impact
  - Corporate sponsorship

Taylor

Appendix D: Tier II Grant Opportunities

Funding Opportunity Report for Snowflake Second Knolls

TIER II

Updated: 05/24/2013

Record #	Funder	Grant Program	Grant Purpose	Website
Planning				
CPG000410	Dept of Transportation (DOT)	Local Rail Freight Assistance (LRFA)	To provide rail service continuation assistance; acquisition assistance; rehabilitation or improvement assistance; substitute service assistance; rail facility construction assistance; planning assistance; and program operations assistance.	http://www.fra.dot.gov/rpd/freight/1502.shtml
CPG003515	US Dept of Agriculture (USDA) - Rural Development	Solid Waste Management Grants	To make grants to public bodies and private non-profit organizations providing technical assistance and training to reduce or eliminate pollution of water resources and improve planning and management of solid waste sites. This assistance is available in rural areas and towns with a population of 10,000 or less.	http://www.rurdev.usda.gov/UWP-solidwastemangement.htm
CPG003487	US Dept of Agriculture (USDA) - Rural Development	Water and Environmental Programs (WEP) - Predevelopment Planning Grants	Predevelopment planning grants may be available, if needed, to assist in paying costs associated with developing a complete application for a proposed project.	http://www.rurdev.usda.gov/UWP-predevelopment.htm
Transportation				
CPG002762	Dept of Energy - National Energy Technology Laboratory	Zero Emission Cargo Transport Demonstration	To accelerate the introduction and penetration of electric transportation technology into the cargo transport sector.	https://eere-exchange.energy.gov/#97e671e8-6b9a-4fd9-89c2-23b19f813709
CPG003845	Dept of Transportation	Commercial Vehicle Information Systems and Networks	To advance technological capability and promote the deployment of intelligent transportation systems applications for commercial vehicle operations, including commercial vehicle, commercial driver, and carrier-specific information systems and networks.	http://www07.grants.gov/search/search.do;jsessionid=N6ZYQ4RGQn1LbBLz7ljskKw2x4HYLMg2wTjKZdJQzgLJkQv9qBKn!1848300817?mode=VIEWREVISIONS&revNum=0
CPG002171	Dept of Transportation (DOT)	Highways for LIFE Technology Partnerships Program	The focus of the Technology Partnership Program solicitation is to work with the highway industry to accelerate the adoption of promising innovations that 1) have the potential to directly reduce crashes or crash severity or 2) innovations that significantly enhance decision-making relative to the deployment of treatments to reduce crashes, crash severity and the understanding of the effectiveness of the treatments.	http://www07.grants.gov/search/search.do;jsessionid=sVLRRhrLczhG6JcnQ67S39nMxwbr9zdZwT5qLZG1JmkbpJRLWp7C!887357918?oppId=134293&mode=VIEW
CPG000134	Dept of Transportation (DOT)	Surface Transportation Infrastructure Discretionary Grants for Capital Investments II	The Department of Transportation (DOT) is authorized to award $600 million in TIGER II Discretionary Grants pursuant to Title I of the FY 2010 Appropriations Act. This appropriation is similar, but not identical to the appropriation for the Transportation Investment Generating Economic Recovery, or "TIGER Discretionary Grant", program authorized and implemented pursuant to the ARRA Act of 2009. Because of the similarity in program structure and objectives, DOT is referring to the grants for National Infrastructure Investments under the FY 2010 Appropriations Act as "TIGER II Discretionary Grants". As with the TIGER program, funds for the TIGER II program are to be awarded on a competitive basis for projects that will have a significant impact on the Nation, a metropolitan area or a region.	http://www.dot.gov/recovery/ost/tigerii/

Record #	Funder	Grant Program	Grant Purpose	Website
CPG002963	Dept of Transportation (DOT) - Federal Transit Administration	National Infrastructure Investments - Transportation Investment Generating Economic Recovery Program (TIGER) Discretionary Grants	For capital investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant impact on the Nation, a metropolitan area, or a region. Larger projects of national or regional significance which DOT determines demonstrate achievement of several of the strategic goals, as well as the project readiness criterion, could be considered for grants larger than those typically awarded in recent rounds of TIGER. Projects that are eligible for TIGER Discretionary Grants ("Eligible Projects") include, but are not limited to: (1) Highway or bridge projects eligible under title 23, United States Code; (2) public transportation projects eligible under chapter 53 of title 49, United States Code; (3) passenger and freight rail transportation projects; and (4) marine port infrastructure investments.	http://www07.grants.gov/search/search.do?&mode=VIEW&oppId=232275
CPG002952	Dept of Transportation (DOT) - Federal Transit Administration	Rural Transit Assistance Program (5311(b)(3))	Training, technical assistance, research, and related support services in rural areas.	http://www.fta.dot.gov/grants/13093.html
CPG002953	Dept of Transportation (DOT) - Federal Transit Administration	Transportation for Elderly Persons and Persons with Disabilities (5310)	Formula funding to States for the purpose of assisting private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities.	http://www.fta.dot.gov/grants/13093_3556.html
CPG003935	Dept of Transportation, Federal Highway Administration	Transportation, Community and System Prevention Program	A comprehensive initiative of research and grants to integrate transportation, community, and system preservation plans and practices that improve the efficiency of the transportation system of the United States; reduce environmental impacts of transportation; reduce the need for costly future public infrastructure investments; ensure efficient access to jobs, services, and centers of trade; and examine community development patterns and identify strategies to encourage private sector development patterns and investments that support these goals.	http://www.fhwa.dot.gov/tcsp/index.html
CPG004007	Arizona State Parks	Off-Highway Vehicle Recreation Fund	To develop and enhance statewide off-highway vehicle recreational opportunities, and develop educational programs that promote resource protection, social responsibility, and interagency cooperation including construction of off-highway vehicle routes and trails.	http://azstateparks.com/grants/index.html
CPG004006	Arizona State Parks	Recreational Trails Program (RTP)	The Recreational Trails Program is part of the federal transportation bill appropriated by Congress from federal gasoline taxes. Funding is available for projects to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses.	http://azstateparks.com/grants/index.html
CPG002070	Bike Belong Foundation	Community Partnership Grant	Strives to put more people on bicycles more often by funding important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.	http://www.bikesbelong.org/grants/
CPG003907	J.P. Morgan Investment Bank	Public Finance Programs - Transportation and Infrastructure Advisory	The division specializes in transactions relating to surface transportation, airports, mass transit and ports. The team helps public sector clients finance, structure and execute deals. They also provide public and private sector clients with advisory services relating to public-private partnerships and concession agreements.	http://www.jpmorgan.com/pages/jpmorgan/investbk/solutions/fixedincome/publicfinance#energy
The Others				
CPG003925	Water Infrastructure Finance Authority of Arizona	Clean Water State Revolving Fund (SRF)	Loan financing for projects that involve the planning, engineering, construction, rehabilitation, modification, improvement, upgrading and/or equipping and expanding of wastewater treatment facilities, water reclamation facilities and related water quality projects.	http://www.azwifa.gov/loan-programs/?cw
CPG003930	Water Infrastructure Finance Authority of Arizona	Clean Water State Revolving Fund (SRF) - Green Project Reserve	Loan financing for projects that involve the planning, engineering, construction, rehabilitation, modification, improvement, upgrading and/or equipping and expanding of wastewater treatment facilities, water reclamation facilities and related water quality projects. Categorically "green" projects meet standards for water efficiency, energy efficiency, green stormwater infrastructure, or environmentally innovative construction.	http://www.azwifa.gov/loan-programs/?cw

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CPG000331	Acorn Foundation	Grant Program	The Foundation supports projects dedicated to building a sustainable future for the planet and to restoring a healthy global environment. The Foundation is particularly interested in small and innovative community-based projects which preserve and restore habitats supporting biological diversity and wildlife; advocate for environmental justice (particularly in low-income and indigenous communities); and prevent or remedy toxic pollution.	http://www.commoncounsel.org/Acorn%20Foundation
CPG001020	American Express	Historic Preservation Grant	Supported projects embrace the preservation, restoration or sustainability of historic places and demonstrate their significance to the community through one or more of the following: (1)restoring historic places to ensure ongoing public access and interaction with the sites, (2) preserving historic places for future or innovative use, and (3) sustaining historic places by creating systems to manage increased visitor activities and environmental impacts.	http://about.americanexpress.com/csr/pip.aspx
CPG001197	Bank of the West	Charitable Investments Program	We support programs for creation, preservation or rehabilitation of affordable housing; home ownership and credit counseling programs for low- to moderate-income individuals; financing services and technical assistance programs for small businesses and farms; and asset creation and preservation programs for low-to-moderate-income individuals.	https://www.bankofthewest.com/about-us/community-support/charitable-investments.html
CPG001331	Carrier Corporation	Contributions: Environment and Sustainability	To support organizations that promote the use of green building practices and environmental sustainability in urban centers; and innovative programs that protect and conserve the environment; and organizations promoting civic and community affairs, including, for example, neighborhood development, legal aid, urban revitalization, civil rights and equal opportunity.	http://www.corp.carrier.com/vgn-ext-templating/v/index.jsp?vgnextoid=e47fdaadadb05210VgnVCM1000009e81000aRCRD
CPG001480	Comerica	Neighborhood Revitalization Program	Focus Areas of this program include: Neighborhood Revitalization (programs that support the existence of safe, stable neighborhoods; examples include affordable housing, and small business development).	http://www.comerica.com/vgn-ext-templating/v/index.jsp?vgnextoid=374970d75d994010VgnVCM1000004502a8c0RCRD
CPG001315	Community Counsel Foundation	Abelard Foundation West	To support grassroots social change organizations that engage in community organizing which: Utilizes membership or grassroots participation to represent the interests of communities in which they are based; Expands community control over economic, social and environmental decisions affecting the community's well-being; and Builds a strong informed voice on public policy issues.	http://www.commoncounsel.org/Abelard%20Foundation%20West/9-Abelard%20Foundation%20West/4-Abelard%20Foundation%20Application%20Information
CPG000486	Enterprise Corporation Green Communities	Sustainability Training Grants	Grants for affordable housing developers to maximize the health, economic and environmental benefits of green development throughout the project's life cycle. This grant program provides an opportunity to transfer the design knowledge that informed the Green Communities planning and construction process to the residents, as well as operations and management staff.	http://www.greencommunitiesonline.org/tools/funding/grants/sustainability/index.asp
CPG001860	Rural Community Assistance Corporation	Community Facility Loans	Helps create and improve essential community facilities in the rural West. This program offers short-term loans to meet early acquisition and pre-development needs, interim construction costs and long-term permanent financing. Applicable facilities include public and nonprofit office buildings, treatment centers, emergency and transitional housing, assisted living, human services, public safety, child care, education and cultural facilities.	http://www.rcac.org/doc.aspx?128

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CPG001859	Rural Community Assistance Corporation	Environmental Infrastructure Loans	Helps create, improve or expand the supply of safe drinking water, waste disposal systems and other facilities that serve communities in the rural West. RCAC's loan programs are unique — they provide the early funds small rural communities need to determine feasibility and pay pre-development costs prior to receiving state and federal program funding. RCAC also may provide interim construction financing as well as intermediate and long-term loans for system improvements.	http://www.rcac.org/doc.aspx?126
CPG001861	Rural Community Assistance Corporation	Green Lending	To promote community greening and sustainability, RCAC gives priority to loan applications that incorporate significant green-build methods and materials into their projects. Green (or sustainable) practices promote building construction, infrastructure and community planning that is healthier for residents and the environment. These practices include using renewable energy, energy efficiency, water conservation, environmentally sensitive site planning, efficient building materials and attention to indoor air quality. As a leader in rural development in the West, RCAC's green lending assists communities to realize a future where healthy neighborhoods, a sustainable economy and responsible environmental stewardship co-exist.	http://www.rcac.org/doc.aspx?212
CPG001047	Tourism Cares	Worldwide Grant Program	Funding is available for projects to help restore historic sites that are in need of care and rejuvenation.	http://www.tourismcares.org/grants
CPG001258	Wells Fargo Regional Foundation	Neighborhood Planning Grants	To support direct expenses that are essential to the planning process such as: Planning consultants and/or staff; Outreach and neighborhood organizing functions; and Community meetings, and advisory group development . The four goal categories are as follows: Children and Families; Economic Development; Affordable Housing and Housing Counseling and Neighborhood Building.	https://www.wellsfargo.com/about/regional-foundation/neighborhood-planning-grants
CPG003964	Arizona Commerce Authority	Private Activity Bonds(PAB)	To provide debt financing for projects used for the trade or business of a private user. The PAB program can be used for the construction of industrial and manufacturing facilities and the purchase of equipment, residential rental projects, facilities for the furnishing of water, sewage and solid waste facilities and more.	https://www.azcommerce.com/pab/
CPG004001	Arizona Dept of Environmental Quality	Brownfields State Response Grant	Through the EPA, the State Response Grant is used to reimburse ADEQ for costs to manage the Brownfields Program, conduct outreach activities, and for state targeted site assessment projects. Additionally, applicants may apply to ADEQ for their sites to be part of the Brownfields Assistance Program. The program can provide financial and technical assistance for Phase I and Phase II Environmental Site Assessments or clean up.	http://www.azdeq.gov/environ/water/watershed/improvement.html
CPG001157	Arizona Dept of Environmental Quality	Water Quality Improvement Grant (WQIG) Program (EPA 319)	To implement on-the-ground water quality improvement projects to control nonpoint source pollution and to fund projects that implement sufficient, economically and scientifically sound management practices that result in quantifiable improvements to surface water quality.	http://www.azdeq.gov/environ/water/watershed/improvement.html
CPG004004	Arizona Dept of Housing	Private Activity Bonds and 501(c)(3) Bonds	Private Activity Bonds are for the development of rental housing in Arizona.	http://www.azhousing.gov/ShowPage.aspx?ID=84&CID=12
CPG004003	Arizona Dept of Housing	State Housing Fund (SHF) Rental Development Programs	For the development of affordable permanent and transitional rental housing units in the form of GAP financing.	http://www.azhousing.gov/ShowPage.aspx?ID=82
CPG001160	Arizona Game & Fish Dept	Heritage Fund Grant Program - IIAPM - (Identification, Inventory, Acquisition, Protection and Management of Sensitive Habitats)	To support projects that will preserve and enhance Arizona's natural biological diversity.	http://www.azgfd.gov/w_c/heritage_sub.shtml

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CPG001163	Arizona Game & Fish Dept	Heritage Fund Grants Program - Public Access Grant	To increase, maintain or reduce public access as needed, for recreational use in cooperation with Federal land managers, local and State governments, private landowners and public users.	http://www.azgfd.gov/w_c/heritage_sub.shtml
CPG001162	Arizona Game & Fish Dept	Heritage Fund Grants Program - Urban Wildlife & Urban Habitat	For projects that conserve, enhance and establish wildlife habitats and populations in harmony with urban environments, and that increase public awareness of and support for urban wildlife resources.	http://www.azgfd.gov/w_c/heritage_sub.shtml
CPG001970	Arizona State Forestry Div	Community Challenge Grant Program	Focuses on activities to encourage and promote citizen involvement in supporting long-term and sustainable urban and community forestry programs at the local level.	http://www.azsf.az.gov/grant_information/default.asp
CPG001211	Arizona Workforce Connection	State Energy Sector Partnership Grant	To help teach workers the skills required in emerging industries, including energy efficiency and renewable energy. To serve businesses, dislocated workers, underemployed and unemployed with education, training, and placement services that will lead to employment in the following targeted industries: Sector One - energy-efficient building, green construction, retrofit industries; energy efficiency assessment industry serving residential, commercial, or industrial sectors; and solar water heating; and Sector Two - the electric power industry, including renewable energy: Smart Grid, solar, and thermal power.	http://arizonaworkforceconnection.com/sesp/default.asp
CPG000611	State of Arizona	Renewable Energy Production Tax Credit	Tax credit for renewable energy.	http://www.epa.gov/agstar/tools/funding/incentive/AZrenewableenergyproductiontaxcredit.html
CPG004000	Water Infrastructure Finance Authority of Arizona	Drinking Water Planning and Design Assistance Program	To help prepare water and wastewater facilities for future infrastructure project construction. Grant funding is provided to employ the services of an engineer or other consultant to complete these activities. Funding cannot be used for project construction or purchase of materials and equipment.	http://www.azwifa.gov/grant-programs/#GP
CPG003815	Dept of Interior - National Park Service	Historic Preservation Fund Grants in Aid	To provide matching grants to States for the identification, evaluation, and protection of historic properties by such means as survey, planning technical assistance, acquisition, development, and certain Federal tax incentives available for historic properties; to provide matching grants to States to expand the National Register of Historic Places.	http://www07.grants.gov/search/search.do?&mode=VIEW&oppId=203553
CPG002543	Dept of Interior (DOI) - Fish and Wildlife Service	Wildlife Restoration Grant Program - Region 2	Funding is available for the selection, restoration, rehabilitation, and improvement of wildlife habitat; wildlife management research; wildlife population surveys and inventories; land acquisition; hunter education and safety programs; coordination; development of facilities; provide facilities and services for conducting a hunter education and safety programs; and provisions for public use of wildlife resources.	http://www07.grants.gov/search/search.do?&mode=VIEW&oppId=141553
CPG001896	Dept of the Interior - National Park Service (NPS)	Federal Historic Preservation Tax Incentives	Federal historic preservation tax incentives are available for any qualified project that the Secretary of the Interior designates as a certified rehabilitation of a certified historic structure.	http://www.nps.gov/tps/tax-incentives.htm
CPG002967	Dept of Transportation (DOT) - Federal Transit Administration	Veterans Transportation and Community Living Initiative Capital Grants Program	Funding is available for projects that will improve transportation options and mobility for America's veterans, service members, and their families.	http://www.fta.dot.gov/grants/12305_13540.html

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CPG002368	Dept of Transportation (DOT)'s Federal Highway Administration (FHWA)	Recreational Trails Program (RTP)	Funding is available for projects to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses.	http://www.fhwa.dot.gov/environment/recreational_trails/
CPG001045	Environmental Protection Agency (EPA)	Wetland Program Development Grants - Region 9	To fund projects to conduct and promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution.	http://www.epa.gov/region9/funding/wetlands.html
CPG003861	Fred W. Stang Foundation	Community Development Grant	To enhance the common good of the Arizona community. Assists the Arizona community by endowing organizations that support the needs of children, the underprivileged, and nature's gifts that enrich our lives.	http://www.fredwstang.org/
CPG003236	National Fish and Wildlife Foundation and Wells Fargo	Environmental Solutions for Communities	To promote sustainable communities through Environmental Solutions for Communities by supporting projects that link economic development and community well-being to the stewardship and health of the environment. Collectively, investments under this initiative will promote a sustainable future for communities by supporting sustainable agricultural practices and private lands stewardship; conserving critical land and water resources and improving local water quality; restoring and managing natural habitat, species and ecosystems that are important to community livelihoods; facilitating investments in green infrastructure, renewable energy and energy efficiency; and encouraging broad-based citizen participation in project implementation.	http://www.nfwf.org/Pages/environmentalsolutions/home.aspx#.URBHO6V9LpU
CPG003485	US Dept of Agriculture - Rural Development	Water and Environmental Programs (WEP) - Technical Assistance and Training Grants for Rural Waste Systems	To make grants to non-profit organizations to provide technical assistance and/or training to associations on a wide range of issues relating to delivery of water and waste disposal service.	http://www.usda.gov/wps/portal/usda/usdahome?navid=UTILITY_SERVICES
CPG000107	US Dept of Agriculture (USDA) - Rural Development	Business & Industry Guaranteed Loan (B&I) Program	To improve, develop, or finance business, industry, and employment and improve the economic and environmental climate in rural communities. Eligible projects include businesses that will: 1) Provide employment; 2) Improve the economic or environmental climate; 3) Promote the conservation, development, and use of water for aquaculture; or 4) Reduce reliance on nonrenewable energy resources by encouraging the development and construction of solar energy systems and other renewable energy systems.	http://www.rurdev.usda.gov/rbs/busp/b&i_gar.htm
CPG003595	US Dept of Agriculture (USDA) - Rural Development	Community Facilities Direct and Guaranteed Loans	Loan funds may be used to construct, enlarge, or improve community facilities for health care, public safety, and public services. This can include costs to acquire land needed for a facility, pay necessary professional fees, and purchase equipment required for its operation.	http://www.rurdev.usda.gov/HAD-CF_Loans.html
CPG003508	US Dept of Agriculture (USDA) - Rural Development	Community Facility Grants	Community Programs provides grants to assist in the development of essential community facilities in rural areas and towns of up to 20,000 in population.	http://www.rurdev.usda.gov/HAD-CF_Grants.html
CPG000108	US Dept of Agriculture (USDA) - Rural Development	Community Facility Grants	To assist in the development of essential community facilities in rural areas and towns of up to 20,000 in population. Grant funds can be used to construct, enlarge, or improve community facilities for health care, public safety, and community and public services. This can include the purchase of equipment required for a facility's operation.	http://www.rurdev.usda.gov/HCF_CF.html
CPG000118	US Dept of Agriculture (USDA) - Rural Development	Section 306C Water and Waste Disposal Grants	To provide water and waste disposal facilities and services to low income rural communities whose residents face significant health risks.	http://www.rurdev.usda.gov/UWP-dispdirectloansgrants.htm
CPG003516	US Dept of Agriculture (USDA) - Rural Development	Section 306C Water and Waste Disposal Grants to alleviate health risks	To provide water and waste disposal facilities and services to low income rural communities whose residents face significant health risks. Every effort is made to identify and fund the neediest projects.	http://www.rurdev.usda.gov/UWP-Colonias.html