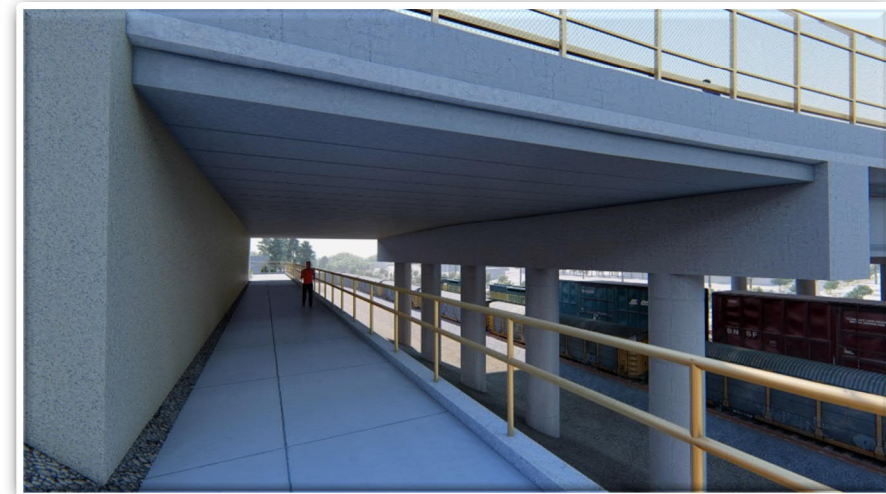
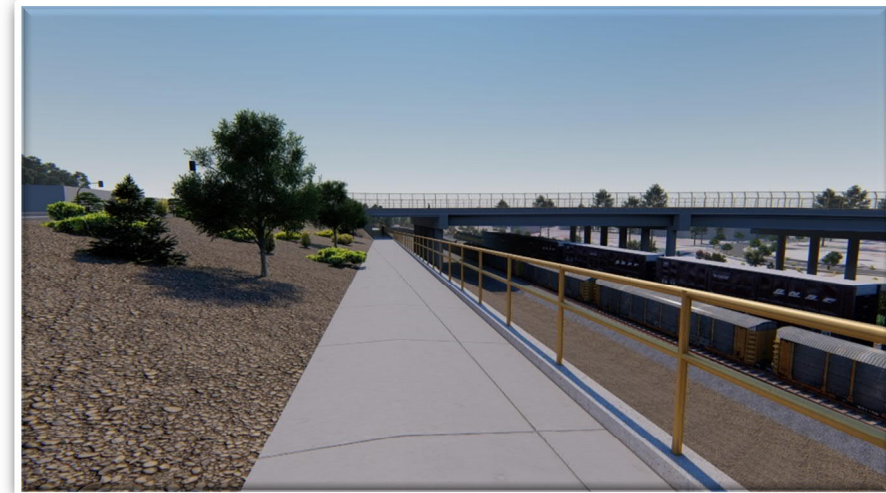
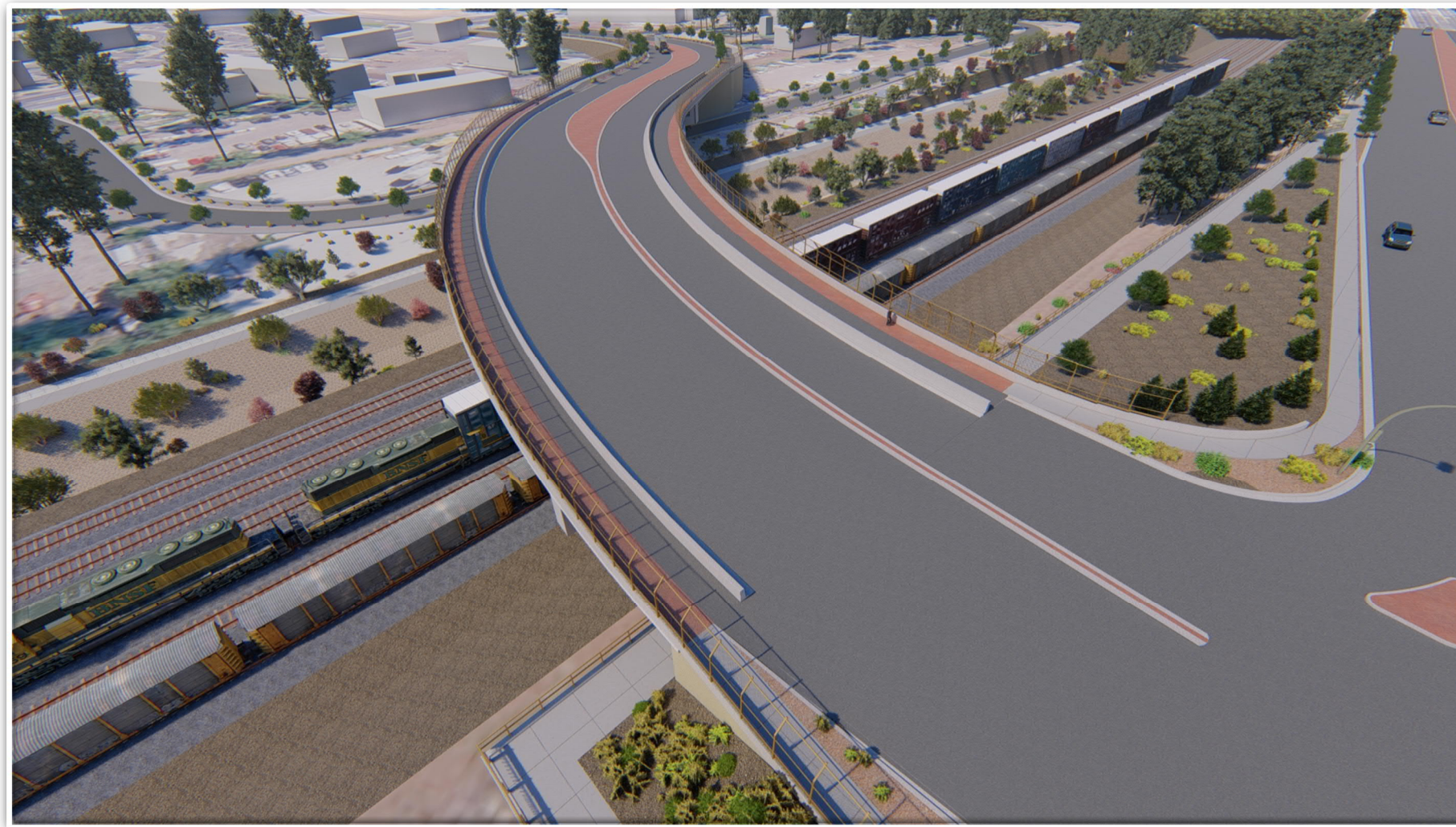


CITY OF FLAGSTAFF

# LONE TREE OVERPASS

## ECONOMIC IMPACT STUDY





# **LONE TREE OVERPASS**

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CITY OF FLAGSTAFF

REVISED DRAFT

PROJECT NO.: 03-19004  
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# 1 INTRODUCTION

The Lone Tree Overpass project involves the construction of a new connection between Lone Tree Avenue and Butler Avenue to the south and a new connection at US 66 to the north. The project will result in significant changes in traffic patterns, detailed in the Long Tree Overpass Traffic Impact Analysis (TIA). These traffic impacts in turn have an impact on the neighborhoods surrounding the Lone Tree Overpass, including the historic Southside neighborhood. This report describes how these changes in traffic patterns may impact the nearby commercial spending, in particular within the core commercial corridors on Beaver Street and San Francisco Street, which are anticipated to experience a sizeable reduction in vehicular traffic once the Lone Tree Overpass is built, and the commercial center South of Butler Avenue and East of Lone Tree, which are both anticipated to see increased traffic as a result of the project.

The analysis finds that economic impacts of the project on commercial spending in the area will be minimal, with a reduction in consumer spending in the Beaver/San Francisco district of only \$351,000 annually, on average from 2026 to 2040. This is partially offset by a projected average annual gain in consumer spending in the Butler/Lone Tree district of \$231,000, leading to a net change of \$120,000. This net change in spending is associated with a possible aggregate reduction of approximately 1.2 jobs. However, this may be offset by improved walkability of the Beaver/San Francisco district due to the reduction in automobile traffic and the addition of bike lanes on Beaver Street and Butler Avenue, as well as the jobs supported by the construction of the Lone Tree Overpass. Section 2 explains the methodology used to arrive at these economic impacts and provides more detailed results.

The Economic Impact Study also looks at how the Lone Tree Overpass project will impact greenhouse gas (GHG) emissions. Over the first 15 years after opening, the Lone Tree Overpass is anticipated to reduce annual GHG emissions by more than 17,000 tons, equivalent to nearly 1.9 million gallons of fuel saved. This is the same impact as taking 3,700 vehicles off the road for a year. When monetized, this represents in \$1.1 million in undiscounted economic value. Section 3 provides more information on the methodology and results for the greenhouse gas analysis.

Finally, this report considers the relationship between the proposed Lone Tree Overpass and broader changes in the area that are causing concern related to gentrification for some community members.

# 2 CONSUMER SPENDING IMPACTS

## 2.1 METHODOLOGY

The economic impacts of consumer spending are derived by first understanding how traffic in key commercial districts is anticipated to change as a result of the Lone Tree Overpass Project, described in Section 2.1.1, and then how those trips translate into changes in spending and economic impacts, reflected in Section 0.

### 2.1.1 TRAFFIC IMPACTS

This study focuses on changes in traffic along key streets that provide direct access to the Beaver/San Francisco and Butler/Lone Tree commercial districts:

- Beaver Street, between Route 66 and Butler Avenue (one-way Southbound)
- San Francisco Street, between Route 66 and Butler Avenue (one-way Northbound)
- Butler Avenue, between Lone Tree Road and Sawmill Road (Eastbound and Westbound)
- Lone Tree Road, between Butler Avenue and Sawmill Road (Northbound and Southbound)

Table 1 shows the average annual daily traffic for each of these street segments in 2019, representing existing conditions, and projected under the Build scenario, where the Lone Tree Overpass project is completed as proposed, and the No-Build Scenario, in

which the project is not built, for both the anticipated opening year of the project in 2026 and in the horizon year of 2040. Values for Beaver Street and San Francisco Street represent the one-way volumes on these streets, while for Butler Avenue and Lone Tree Road, the values include the sum of traffic in both directions. These values are pulled from detailed maps developed as part of the Traffic Impact Analysis.

Table 1: Average Daily Traffic by Road Segment, Year, and Scenario

ROAD SEGMENT	2019		2026		2040		
	EXISTING CONDITIONS	NO-BUILD	BUILD	CHANGE FROM NO-BUILD TO BUILD	NO-BUILD	BUILD	CHANGE FROM NO-BUILD TO BUILD
Beaver Street, between Route 66 and Butler Avenue	9,470	8,810	2,710	-6,100	12,350	4,270	-8,080
San Francisco Street, between Route 66 and Butler Avenue	9,590	8,940	1,290	-7,650	10,460	3,590	-6,880
Butler Avenue, between Lone Tree Road and Sawmill Road	28,230	27,920	26,330	-1,590	30,810	31,840	1,030
Lone Tree Road, between Butler Avenue and Sawmill Road	16,370	15,810	22,110	6,290	22,740	31,170	8,430

Source: WSP, Lone Tree Overpass Project Traffic Impact Analysis, 2021

Table 1 shows that there is a significant change in traffic along Beaver Street and San Francisco Street, with daily volumes decreasing by 68 percent and 86 percent respectively in 2026. By 2040, the reductions subside somewhat to approximately 65% across both streets. The impact on Butler Avenue traffic between Lone Tree Road and Sawmill Road is minimal, reflecting growth of just 3-6 percent, while on Lone Tree Road between Butler Avenue and Sawmill Road, growth of 37-39 percent is anticipated.

Trucks account for approximately 20 percent of current trips in the Beaver/San Francisco area and approximately 40 percent in the Butler/Lone Tree area. It is assumed that these shares will remain constant in the future under both the Build and No-Build scenarios. Trucks are not anticipated to contribute to consumer spending in the area and are thus removed from the traffic values considered for this analysis.

Much of the remaining passenger traffic on the core streets of interest in this analysis is pass-through traffic that does not stop. This traffic adds to congestion and emissions in the area without generating any positive impacts of spending at local businesses. Analysis using StreetLight Data's InSight platform<sup>1</sup> shows that in a typical day, less than 1,600 automobile trips end in the Beaver/San Francisco commercial district area, out of approximately 14,000 total auto trips that pass through the area,<sup>2</sup> representing 11 percent of all trips. The proportion of area non-truck vehicle trips stopping in the Lone Tree/Butler commercial district is somewhat higher, at 23 percent. The share of trips that stop in the area is assumed to remain the same under the future Build and No-Build scenario. This is a conservative assumption; in reality, the trips that divert from the Beaver/San Francisco area as a result of the Lone Tree Overpass project likely include a higher share of pass-through traffic, while the traffic that remains would contain a higher proportion of trips that today stop in the area.

Based on the assumptions laid out in this section, Table 2 reflects the anticipated change in trips that will stop in the Beaver/San Francisco and Butler/Lone Tree commercial districts in the Build scenario, relative to the No-Build scenario. These trips form the basis for the economic impact analysis, representing the trips most likely to have an impact on consumer spending.

Table 2: Average Annual Change in Automobile Trips Stopping in Each Commercial District, by District and Year

COMMERCIAL DISTRICT	2026	2040
Beaver/San Francisco District	-505,370	-561,740
Butler/Lone Tree District	+239,010	+480,870

Source: WSP analysis, 2021

<sup>1</sup> StreetLight Data's InSight platform is a web-based application that brings together anonymous location data from millions of mobile devices into customized analytics including origin-destination data information.

<sup>2</sup> This daily trip total differs from that shown in Table 1 due to the removal of trucks and the use of a different data source.

In 2026, the first year of operation of the Lone Tree Overpass, the Beaver/San Francisco commercial district is estimated to lose approximately 505,000 trips, with this number growing to 562,000 trips by the 2040 horizon year. The growth in the Butler/Lone Tree district is somewhat lower, with approximately 239,000 additional trips in 2026, growing to 481,000 by 2040. These change-in-trip values are multiplied by the average spending per trip, described in the next section, to derive projected changes in consumer spending.

### 2.1.2 SPENDING IMPACTS

Businesses impacted by the changes in travel patterns resulting from the Lone Tree Overpass project will primarily be consumer facing business, such as restaurants and retail establishments. Table 3 shows how many of these types of businesses, by category, are located in the Beaver/San Francisco and Butler/Lone Tree commercial districts. Food Services and Drinking Places establishments are most prevalent business in each area, followed by Business Retail, which includes stores selling clothing stores, sporting goods, art supplies, electronic goods, flowers, etc. Due to the unique characteristics and location of the Beaver/San Francisco District (a dense historical downtown retail area in a residential neighborhood) and the Lone Tree/Butler District (a large mixed-use shopping mall area on a major arterial route), each area and its businesses are expected to be affected differently by the traffic changes related to the Lone Tree Bypass.

Table 3: Types of Businesses by Commercial District

BUSINESS TYPE	BEAVER/SAN FRANCISCO DISTRICT		BUTLER/LONE TREE DISTRICT	
	NUMBER	PERCENT	NUMBER	PERCENT
Convenience Retail	1	1.5%	2	5.4%
Business Retail	14	20.9%	8	21.6%
Grocery Retail	1	1.5%	2	5.4%
Recreation	5	7.5%	4	10.8%
Food Services and Drinking Places	32	47.8%	16	43.2%
Personal Care Services	11	16.4%	5	13.5%
Auto Repair	3	4.5%	0	0.0%

Source: WSP analysis of City of Flagstaff's Southside Community Plan data

Based on an analysis of the data compiled as part of the City of Flagstaff's Southside Community Plan and a literature review of similar initiatives, businesses deriving a larger portion of sales from "opportunity" traffic are expected to experience the greatest revenue impacts from the change in traffic patterns in the area.<sup>3</sup> These establishments with a higher share of opportunity sales are classified as those to which consumers may not actively plan to travel to in advance and for which there are readily available alternatives, such that a consumer would likely have purchased the same or a similar product at another business if the chosen establishment were not so visible and/or easy to access. Because of the unplanned nature of opportunity trips, it is assumed that each trip entails visiting only one business. In contrast, a business with a higher share of "destination" sales would be patronized by consumers because they provide a special product or attraction, for an appointment, or to receive a specific service. Most businesses support a mix of destination and opportunity sales, resulting in varying degrees of impact because of the construction of the Lone Tree Bypass. Table 4 shows the assumed share of spending that is assumed to be destination- or opportunity-based for the different types of consumer-facing businesses in the Beaver/San Francisco and Butler/Lone Tree Districts. These spending shares were developed from survey data of business owners collected as part of the City of Flagstaff's Southside Community Plan, the characteristics of the businesses in the Beaver/San Francisco and Butler/Lone Tree Districts, and a review of research evaluating the impacts of transportation projects on consumer spending behavior.

Table 4: Destination and Opportunity Shares of Spending by Type of Business

BUSINESS TYPE	OPPORTUNITY SPENDING SHARE	DESTINATION SPENDING SHARE
Convenience Retail	45%	55%
Business Retail	40%	60%
Grocery Retail	35%	65%
Recreation	15%	85%
Food Services and Drinking Places	25%	75%
Personal Care Services	40%	60%
Auto Repair	30%	70%

Source: WSP analysis and literature review

The level of estimated impact experienced by local businesses is calculated based on the average household spending per consumer vehicle trip and the expected change in consumer trips to the Beaver/San Francisco and Lone Tree/Butler Districts following the construction of the Lone Tree Bypass. The average household spending per consumer vehicle trip is calculated from an extract of localized annual household expenditure data divided by the average number of annual household trips. According to the Bureau of Transportation Statistics, there are approximately 5 daily vehicle trips per household in the Flagstaff area, equal to 1,825 annual trips.<sup>4</sup>

The household expenditure data is sourced from the Bureau of Labor Statistics' Consumer Expenditure Survey conducted in 2019 and includes a breakdown of the median household spending by category, including purchases of food, housing, transportation, apparel and entertainment. Household expenditure data for the Flagstaff, AZ metro area is not available; instead, this analysis uses a composite spending profile that blends 1) the average household expenditures for the Phoenix, AZ metro area, adjusted for differences in area median household income with 2) the national average spending profile for persons under the age of 25. The adjusted Phoenix spending accounts for 75% of the composite profile, while the student spending accounts for the other 25%. The line items in the household expenditure data were classified in accordance with the spending most likely associated with each business type identified in the business survey data. Several household expenditures line items, such as those related to housing, education and healthcare, were regarded as not related to the consumer trips in the Beaver/San Francisco and Lone Tree/Butler Districts. In total, approximately 33 percent of household expenditures were determined to be represented in consumer trips in the Beaver/San Francisco and Lone Tree/Butler Districts. Table 5 below shows the Consumer Expenditure Survey line items classified to each business type.

Table 5: Household "Consumer Expenditure" (CE) Survey Line Items Classified by Business Type

BUSINESS TYPE	CE SURVEY CLASSIFICATION
Convenience Retail	Gasoline, other fuels and motor oil; Tobacco products and smoking supplies
Business Retail	Housekeeping supplies; Household furnishings and equipment; Apparel and services; Reading; Miscellaneous
Grocery Retail	Food at home
Recreation	Social, recreation, health club membership (sub-category of Entertainment)
Food Services and Drinking Places	Food away from home; Alcoholic beverages,
Personal Care Services	Personal care products and services
Auto Repair	Other vehicle expenses

Source: WSP analysis of BLS Consumer Expenditure Survey data (localized to Flagstaff, AZ)

In the analysis, the changes in traffic patterns related to the Lone Tree Bypass are expected to predominantly translate into changes in expenditures related to opportunity sales of businesses in the Beaver/San Francisco and Lone Tree/Butler Districts. By definition, the destination sales of businesses within each commercial district would be expected to be retained, as an acceptable substitute would either not be sought by or available to existing consumers. To calculate the change in consumer expenditures

<sup>3</sup> New York State Thruway Authority/US DOT FHWA, Williamsville Toll Barrier Improvement Project Draft EIS, Parsons-Brinckerhoff, 2005

<sup>4</sup> 2017 Local Area Transportation Characteristics for Households (LATCH Survey), Bureau of Transportation Statistics, <https://www.bts.gov/latch/latch-data>

related to the change in traffic patterns, the annual household spending per consumer trip is calculated for each business type (shown in Table 6 below) and multiplied by the number of vehicle trips stopping in each commercial district. The opportunity consumer spending per trip indicates the revenue risk of each business type to changes in traffic and the frequency of consumer transactions.

Table 6: Household Spending per Consumer Vehicle Trip Classified by Business Type

BUSINESS TYPE	TOTAL ANNUAL HOUSEHOLD SPENDING (2021\$)	ANNUAL HOUSEHOLD OPPORTUNITY SPENDING (2021\$)	AVERAGE OPPORTUNITY SPENDING PER TRIP (2021\$)
Convenience Retail	\$2,360	\$1,060	\$0.58
Business Retail	\$5,880	\$2,350	\$1.29
Grocery Retail	\$3,610	\$1,260	\$0.69
Recreation	\$210	\$30	\$0.02
Food Services and Drinking Places	\$4,660	\$1,160	\$0.64
Personal Care Services	\$930	\$370	\$0.20
Auto Repair	\$3,470	\$1,040	\$0.57

Source: WSP analysis of BLS Consumer Expenditure Survey and City of Flagstaff's Southside Community Plan data

With the annual opportunity spending per trip by business type and the forecasted change in traffic patterns following the construction of the Lone Tree Bypass, the total change in consumer expenditures in the Beaver/San Francisco and Lone Tree/Butler Districts between 2026 and 2040 can be estimated. The total and average annual change in consumer expenditures is shown below in Table 7. While businesses in the Beaver/San Francisco District are expected to experience an impact in revenues across all business types, the change translates into an average shortfall in sales worth \$5,240 per business, while the increased consumer spending in the Lone Tree/Butler District related to higher traffic volumes is expected to experience an average increase in sales of \$6,260 per business. These impacts are measured from the average change in total sales in each commercial district divided by the total number of consumer-facing businesses in the commercial district.

Table 7: Estimated Total and Average Annual Change in Consumer Spending by Business Type, 2026 to 2040 (2021\$)

BUSINESS TYPE	BEAVER/SAN FRANCISCO DISTRICT		LONE TREE/BUTLER DISTRICT	
	TOTAL	AVERAGE ANNUAL	TOTAL	AVERAGE ANNUAL
Convenience Retail	-\$70,100	-\$4,700	\$167,500	\$11,200
Business Retail	-\$2,171,300	-\$144,800	\$1,482,800	\$98,900
Grocery Retail	-\$83,200	-\$5,500	\$198,900	\$13,300
Recreation	-\$10,500	-\$700	\$10,000	\$700
Food Services and Drinking Places	-\$2,455,300	-\$163,700	\$1,467,100	\$97,800
Personal Care Services	-\$270,200	-\$18,000	\$146,800	\$9,800
Auto Repair	-\$205,800	-\$13,700	\$0	\$0
Total	-\$5,266,500	-\$351,100	\$3,473,000	\$232,000

Source: WSP analysis of BLS Consumer Expenditure Survey and City of Flagstaff's Southside Community Plan data

To estimate the economic impacts from these changes in annual consumer spending by type, this analysis uses input-output multipliers. These multipliers, purchased from the Bureau of Economic Analysis' Regional Input-Output Modeling System (RIMS II), reflect how an initial change in spending (direct impact) can result in downstream changes, including to suppliers of the initially impacted businesses (indirect impacts), and to the many other businesses that employees of the directly and indirectly impacted industries patronize (induced impacts). Multipliers differ by industry and region depending on how much of an industry's supply chain is available in the region. While the direct impacts take place within the two commercial districts studied in this analysis, the indirect and induced impacts are spread throughout the Flagstaff region (defined as Coconino County).

Three types of economic indicators are evaluated in this analysis: output, earnings, and employment. Output can generally be thought of as sales; indeed, the change in direct output is equal to the change in spending/sales described above for non-retail industries. For retail industries, output is adjusted to account for the cost of goods sold. Earnings includes wages and salaries,

benefits, and proprietors' income. Employment represents total jobs, including full-time and part-time employment. This change is not cumulative over time, but rather represents the steady state change in employment expected based on the change in spending.

## 2.2 RESULTS

The analysis finds that direct output is anticipated to decline by approximately \$279,000 annually in the Beaver/San Francisco district as a result of the Lone Tree Overpass project, while it will increase by an average of \$170,000 in the Butler/Lone Tree area. This results in a net change of negative \$109,000 annually in direct output impacts in the area. These direct output changes are associated with a reduction of approximately 3.3 direct jobs in the Beaver/San Francisco area and a corresponding increase of 2.1 jobs in the Butler/Lone Tree district. Direct earnings in the Beaver/San Francisco commercial district are calculated to decrease by an average of \$93,000 annually, while in the Butler/Lone Tree district, earnings are projected to increase by approximately \$55,000 per year on average.

The net reduction in direct output, employment, and earnings, results in small declines in indirect and induced output, employment, and earnings, as shown in Table 8 through Table 10. However, even these modest changes may be overstated, as it is likely the consumer spending associated with the net change in vehicle trips in the project area would be displaced elsewhere within the region, limiting the impacts on regional business supply chains and businesses dependent on household spending. The results of the analysis indicate the specific impacts related to vehicle trips in the Beaver/San Francisco and Lone Tree/Butler Districts, which may not fully account for the elasticity of consumer spending and business employment in the downtown Flagstaff, AZ area.

These results only account for the change in vehicle traffic in the areas directly surrounding the Lone Tree Overpass. They do not include any impacts from changes in pedestrian, bicycle, and bus passenger traffic, which is anticipated to increase in the Beaver/San Francisco area as the reduction in cars makes it more pleasant for pedestrians and bikers and allows buses to proceed with less congestion, and as buffered bike lanes are installed on Beaver and Butler as already programmed. Research shows that bike lanes have a neutral to positive impact on nearby retail and food-services businesses (even when they displace car parking or lanes. Were the impacts of increased cycling and pedestrian activity able to be included, it is reasonable to believe that the small negative impacts from displaced trips in the Beaver/San Francisco District would be minimized or possibly even reversed. This is especially true as the changes favoring cyclist/pedestrian travel may encourage more mixed-use and higher density development, which will attract even more trips and spending in the area.

Finally, the results exclude the economic impacts of spending on design and construction of the Lone Tree Overpass, which will support temporary economic activity at businesses approximate to the project area.

Table 8: Change in Economic Output, 2021\$

COMMERCIAL DISTRICT	TYPE OF IMPACT	2026	2040	AVERAGE ANNUAL
Beaver/San Francisco District	Direct	-\$263,000	-\$292,000	-\$279,000
	Indirect	-\$52,000	-\$58,000	-\$55,000
	Induced	-\$68,000	-\$76,000	-\$73,000
	Total	-\$384,000	-\$426,000	-\$408,000
Butler/Lone Tree District	Direct	\$115,000	\$231,000	\$170,000
	Indirect	\$23,000	\$46,000	\$34,000
	Induced	\$29,000	\$59,000	\$44,000
	Total	\$167,000	\$336,000	\$248,000
Net Change in Economic Output	Direct	-\$148,000	-\$62,000	-\$109,000
	Indirect	-\$29,000	-\$12,000	-\$21,000
	Induced	-\$39,000	-\$17,000	-\$29,000
	Total	-\$216,000	-\$90,000	-\$160,000

Source: WSP analysis, 2021



Table 9: Change in Employment

COMMERCIAL DISTRICT	Type of Impact	2026	2040	Average Annual
Beaver/San Francisco District	Direct	-3.1	-3.5	-3.3
	Indirect	-0.3	-0.3	-0.3
	Induced	-0.5	-0.6	-0.6
	Total	-4.0	-4.4	-4.2
Butler/Lone Tree District	Direct	1.4	2.9	2.1
	Indirect	0.1	0.3	0.2
	Induced	0.2	0.5	0.3
	Total	1.8	3.6	2.7
Net Change in Employment	Direct	-1.7	-0.6	-1.2
	Indirect	-0.2	-0.1	-0.1
	Induced	-0.3	-0.1	-0.2
	Total	-2.2	-0.8	-1.6

Source: WSP analysis, 2021

Table 10: Change in Earnings, 2021\$

COMMERCIAL DISTRICT	Type of Impact	2026	2040	Average Annual
Beaver/San Francisco District	Direct	-\$87,000	-\$97,000	-\$93,000
	Indirect	-\$13,000	-\$14,000	-\$14,000
	Induced	-\$20,000	-\$23,000	-\$22,000
	Total	-\$121,000	-\$134,000	-\$128,000
Butler/Lone Tree District	Direct	\$37,000	\$75,000	\$55,000
	Indirect	\$6,000	\$12,000	\$9,000
	Induced	\$9,000	\$18,000	\$13,000
	Total	\$52,000	\$104,000	\$77,000
Net Change in Earnings	Direct	-\$50,000	-\$22,000	-\$38,000
	Indirect	-\$7,000	-\$3,000	-\$5,000
	Induced	-\$12,000	-\$5,000	-\$9,000
	Total	-\$69,000	-\$30,000	-\$52,000

Source: WSP analysis, 2021

## 3 GHG ANALYSIS

### 3.1 METHODOLOGY

The change in GHG emissions associated with a new road project depends primarily on the change in total vehicle miles traveled (VMT) (i.e., not just on the relevant corridor but within the entire region and beyond) and the speed at which the vehicles travel. In general, more VMT leads to more emissions; however, changes in speed can also impact emissions. Automobiles tend to be most fuel efficient around 45-50 miles per hour (MPH), while at above 70 MPH or below 25 MPH (and especially as speeds approach zero), fuel efficiency is considerably lower. Truck fuel efficiency typically increases with speed.

This analysis considers the total VMT in the region under the Build and No-Build scenarios by speed bin, as measured by the MetroPlan (Flagstaff MPO) Travel Demand Model (TDM), as shown in Table 11. The MetroPlan TDM, like all TDMs, uses road networks and population/land use as inputs to estimate future traffic. VMT is calculated by the model based on the projected

traffic volumes on each link and the lengths of the links, and grouped into speed bins based on the estimated congested speed on each link. The No-Build version of the model was updated to include known future developments unrelated to the project, such as the North Arizona Healthcare (NAH) medical center, student housing and some retail at the Southeast corner of the Sawmill Road and Butler Avenue, and the Ponderosa Parkway Residential development. The Build model includes all these changes plus the Lone Tree Overpass network link.

Daily VMT by speed under each scenario was developed for years 2026 and 2040 and interpolated assuming a linear trend between those years. As shown in Table 11, overall VMT is anticipated to be somewhat lower in the Build scenario relative to the No-Build scenario in the opening year of 2026, though this pattern reverses soon after; already in 2027, daily VMT is projected to be slightly higher in the Build scenario compared to the No-Build, and this difference grows over time such that by 2040 there will be approximately 11,500 additional daily VMT. This shift towards higher VMT represents induced demand, and the fact that the greater efficiencies with Lone Tree Overpass will result in more or longer trips being made.

Using an annualization factor of 365, total additional VMT with the Lone Tree Overpass is calculated to be 4.2 million in 2040 based on the MetroPlan model outputs. This value is considerably higher than the 0.6 to 0.8 million increase in VMT estimated by the SHIFT calculator based on the project's addition of 0.8 lane miles to the Flagstaff area roadway network. The SHIFT calculator is a tool designed to estimate induced demand from additional roadway capacity, and the fact that the model used in this analysis demonstrates considerably more induced demand than the SHIFT calculator can instill confidence that induced demand has been sufficiently considered in this analysis. Despite the increase in VMT by 2040, there is a shift in VMT from some of the lowest, and least efficient, speed bins to faster, more efficient bins, thus offsetting the VMT increase.

Fuel efficiency projections and speed-based adjustment factors from the Energy Information Administration are used to convert the total regional VMT under each scenario to total gallons of fuel consumed. Across both the Build and No-Build scenarios, fuel efficiency is projected to increase over time as technology improves and more people shift from internal combustion engines to electric/hybrid vehicles. The change in fuel consumption between the Build and the No-Build scenario are then multiplied by the EPA-recommended values for the amount of carbon dioxide emitted per gallon of fuel (8,887 grams per gallon of gasoline, and 10,180 grams per gallon of diesel).

Table 11: Daily VMT in Flagstaff Region by Speed Bin, Year, and Scenario

SPEED BIN (MPH)	2026			2040		
	NO-BUILD	BUILD	CHANGE	NO-BUILD	BUILD	CHANGE
0 to 5	35,800	33,200	-2,600	58,400	58,400	0
5 to 10	20,800	19,500	-1,200	40,800	38,300	-2,500
10 to 15	201,800	203,800	2,000	298,200	288,200	-10,000
15 to 20	89,500	71,400	-18,100	133,000	110,600	-22,500
20 to 25	163,000	144,200	-18,800	187,400	226,000	38,600
25 to 30	120,500	147,200	26,700	183,900	202,700	18,800
30 to 35	197,300	246,800	49,400	305,400	302,500	-2,900
35 to 40	264,800	219,000	-45,800	224,000	227,000	3,000
40 to 45	134,600	143,600	9,100	208,200	205,100	-3,200
45 to 50	136,400	136,900	500	189,600	189,800	200
50 to 55	155,200	155,500	200	260,800	203,600	-57,300
55 to 60	140,800	138,300	-2,500	170,900	223,800	52,900
60 to 65	188,500	188,400	-100	176,100	176,900	800
65 to 70	755,900	756,200	300	986,600	982,200	-4,400
70 to 75	0	0	0	0	0	0
Total	2,604,800	2,604,000	-900	3,423,400	3,434,900	11,500

Source: WSP analysis of MetroPlan (Flagstaff MPO) Travel Demand Model

## 3.2 RESULTS

The GHG analysis reveals that Lone Tree Overpass project would reduce fuel consumption by nearly 1.9 million gallons over its first 15 years of life, thereby preventing more than 17,000 tons of carbon emissions from entering the atmosphere. When converted to a dollar value, representing the social cost of carbon including impacts to health and climate change, the total monetized benefit from 2026-2040 is calculated to be nearly \$1.1 million in 2021 dollars. Table 12 provides additional ways of measuring the impact, including the average annual impacts and the impact in 2026 (the first year of operations), and what equivalent changes would provide a similar amount of GHG reduction.

Table 12: GHG Analysis Results

MEASURE	2026-2040, TOTAL	2026, ANNUAL	2026-2040, ANNUAL AVERAGE
Gallons of Fuel saved	1,896,500	285,900	126,400
Tons of CO2 emissions avoided	17,000	2,600	1,100
Value of CO2 emissions, 2021\$	\$1,084,500	\$153,100	\$72,300
Equivalent annual energy use by number of homes	2,000	300	100
Equivalent vehicles taken off road for a year	3,700	600	200
Equivalent trash bags of waste recycled instead of landfilled	723,800	109,300	48,300
Equivalent carbon sequestration from tree seedling grown for 10 years	281,300	42,600	18,800

Source: WSP analysis, 2021

## 4 GENTRIFICATION CONSIDERATIONS

The Southside is a unique, historic, and dynamic community that in the recent past has been, and in the near future will be, subjected to significant gentrification pressures. These gentrification pressures are significantly a result of, and serve to dilute the history of, the neighborhood's past as a redlined community, a noteworthy and historic Black community, and a community that was disproportionately exposed to natural disasters as a policy choice. This chapter considers and discusses how the Lone Tree Overpass project interacts with the significant existing gentrification pressures on the community. While the gentrification impacts of the Lone Tree Overpass are expected to be minor compared to broader trends impacting the Southside, this chapter discusses how the project can be used to mitigate its own gentrification impact as well as be used to at least partially ameliorate the broader trends of displacement and community change.

### 4.1 DEFINING GENTRIFICATION

Gentrification can mean different things to different people. Typically, people who express concern about gentrification are worried about displacement and/or change in community character/culture and these are the focus of this report.

Displacement typically occurs when existing residents move away because they can no longer afford to live in an area due to increasing rents or property taxes. Occasionally displacement may be a direct result of a developer or government purchasing residents' land for another purpose. More often, it is an indirect result of an area becoming more broadly desired as a place to live, often by people with higher incomes/wealth. This problem can be exacerbated when the housing supply does not keep up with growing demand, causing prices to increase.

With or without displacement, there may also be changes in community character/culture, represented by the social and built environment. This can be caused by significant or rapid development activity, which may make a community look or feel different than it used to or have a different mix of businesses, cultural spaces, art, and social events. It may be related to changes in the demographics of residents or visitors to the neighborhood, who may vary in meaningful ways from the long-time residents. Change in the income level or race/ethnicity of new community residents are often the most salient characteristics, but changes in age distributions, household size, professions, and other characteristics may also be perceived as changing a community's character. Changes may be gradual or sudden, and occasionally may be caused by an external shock, such as a natural disaster or a major infrastructure project. Often exacerbating these trends is a lack of legal and social protections for existing residents.

Both of these outcomes of gentrification will be considered in this report.

### 4.2 SOUTHSIDE NEIGHBORHOOD CHANGE: PAST AND PRESENT

The Southside neighborhood of Flagstaff is a historically significant, walkable mixed-use neighborhood with easy access to many of the jobs and cultural activities of the city. As of 2017, there were about 1,800 residents within the neighborhood, and over 850 homes. The neighborhood's history shares a common thread with many gentrifying neighborhoods: a history of redlining, disinvestment, and a proud art and intellectual scene, followed by a lifting of redlining which is in turn followed by a significant inflow of development investment. These changes are occurring in a neighborhood that historically has been the most diverse in Flagstaff. Demographic estimates for the neighborhood show that the neighborhood may be about 20% Hispanic and up to 7% Black, rates higher than the city as a whole.

Beyond changes in the residential makeup of the neighborhood, other economic, social, and cultural changes have been occurring that have been called out by the community for their disruptive forces. The closing of the South Beaver School, which was built to educate mostly Hispanic, Spanish-speaking elementary students starting in 1935, closed in 2010 as the last local public school in the neighborhood. The loss of major employment centers like the lumberyard facilities on Phoenix Ave. and the loss of local mom and

pop stores have been cited as a major loss to the character of the community in studies such as the Southside Community Specific Plan and academic research from NAU students and faculty.<sup>5,6</sup>

While the majority of homes in the Southside historically have been low-rise single-family or multi-family buildings, recent construction in the area has been geared to Northern Arizona University (NAU) students. NAU has grown considerably in the last 20 years, with geographic expansion of both official campus facilities and services catering to students. Specific developments, like the Hub on Mikes Pike St. and student-catered housing directly east of Lone Tree Rd. have been the leading areas of development. In recent years, there have been only about 10 lots where housing has been developed, according to the Community Plan, and sales records indicate that multiple adjacent lots have been purchased since 2020 with the potential for student-oriented multi-family housing.

Conversations with community leaders indicate that many students have a preference for off-campus housing, where fewer rules and regulations are in place compared to on-campus or NAU-administered housing. Importantly, many single-family homes and older homes have turned to student rentals instead of permanent residents. This has impacted the development of a permanent community and has disincentivized housing maintenance in those homes rented to students. Because of this continuous demand, home ownership costs are inflated beyond the general means of those who live in the area. For residents, living and working in the neighborhood is becoming less and less attainable due to the present market forces of the student population, and because Flagstaff is one of a handful of American cities with the most rapid growth in housing prices in recent years.

Finally, the community's relationship with the Rio de Flag has important implications for both the affordability of the community and the quality of housing. Most of the neighborhood is within the 100-year floodplain of the Rio de Flag, and regular flooding impacts the neighborhood. Starting in the 1980s, regulations regarding the management of floodplains led to a drop in real estate development in the Southside. This lack of development as well as existing flooding-related limitations on the type of development that was allowed or realistic, have created a lack of supply to meet the growing demand for housing, both from permanent homeowners and renters, today. In addition, a deterioration of floodway maintenance in recent years has led to the perception by local residents that flooding has gotten worse, leading to a further drop in quality of the housing in the neighborhood. The City of Flagstaff is working in conjunction with the Army Corps of Engineers to remove the neighborhood from the floodplain through major water resilience projects. While the immediate effects of lower flood insurance costs would benefit existing homeowners, there is an understanding that present housing values are negatively impacted by the potential for flooding, and that the removal of this physical risk is likely to invite new development and greatly increase the risk of gentrification in the Southside.

### 4.3 LONE TREE OVERPASS AND GENTRIFICATION RISKS

As described in Section 4.2, there are many gentrification pressures within Southside, and Flagstaff more broadly, that are largely independent of the Lone Tree Overpass. However, the Overpass project will interact with these external factors, in some cases pushing in the same direction toward increasing gentrification, while in other cases working in the opposite direction, helping to alleviate some of the pressures. Table 13 summarizes the primary risk factors for gentrification in the Southside neighborhood, the level of impact these are likely to have, and how the Lone Tree Overpass project will interact with these factors to counter or amplify their impacts. Overall, the impacts of the Lone Tree Overpass on gentrification are expected to be low, especially relative to some of the more significant pressures increasing prices in, causing displacement from, and changing the neighborhood.

Table 13: Lone Tree Overpass and Gentrification Risks

GENTRIFICATION RISK	SUMMARY OF IMPACTS	LONE TREE OVERPASS INTERACTION
Northern Arizona University growth and expansion	High. NAU has grown considerably since 2005, and while this growth has reversed modestly in recent years, future campus expansion and enrollment growth is expected. Approximately 60% of NAU students live off campus – the number of off-campus NAU students is significantly greater than the population of the Southside. As NAU grows, off-campus living is expected to become increasingly popular, leading to additional demand for Southside and other areas near NAU.	Counter. By making it easier and faster for NAU students, faculty, and staff to access downtown and other areas north of Route 66, Lone Tree Overpass is expected to somewhat alleviate demand for housing in Southside.
Climate Migration, short-term rentals, and second homes	Medium. As other parts of Arizona and the Western U.S. experience higher temperatures caused by climate change, Flagstaff's comparatively temperate climate is becoming increasingly attractive. This is leading to an increase in full-time population, as well as the proliferation of short-term rentals (such as Airbnb) and second homes.	Amplify. Lone Tree Overpass will increase automobile access to Southside, likely making it more attractive to new residents and visitors.
Rio de Flag Flood Control Project	High. By reducing the risk of flooding from the Rio de Flag, this project is expected to make it significantly more practical (from a regulatory, financing, and insurance perspective) and more attractive for developers to invest in the neighborhood, likely causing displacement and changing neighborhood character. However, if housing supply increases enough, it could also help to keep prices in check. In addition, it may also make it less risky for the homeowners who can stay to invest without worrying that their nest-egg could be destroyed by a flood.	Neutral. Lone Tree Overpass is expected to have little to no impact on the gentrification risks caused by the Rio de Flag project.
Attractive neighborhood character	Medium. The Southside neighborhood is prized for its walkable character and mix of uses. These are desirable characteristics that increase demand for the neighborhood, potentially leading to higher prices and gentrification.	Mixed. By diverting automobile traffic away from the primary thoroughfares in Southside, the Lone Tree Overpass is expected to make streets like Beaver and San Francisco safer and more comfortable for pedestrians and cyclists. While undoubtedly a positive outcome, it may make the neighborhood more attractive, causing prices to rise. Balancing this effect is that the Lone Tree Overpass is likely to somewhat increase the number of auto trips to, from, and around the neighborhood.

<sup>5</sup> The City of Flagstaff, "Southside Community Plan" 2020. [https://www.flagstaff.az.gov/DocumentCenter/View/64366/SAA\\_Final](https://www.flagstaff.az.gov/DocumentCenter/View/64366/SAA_Final)

<sup>6</sup> Jeffrey Breshears "Intersections of Gentrification: The Demographic and Residential Conditions of Flagstaff's Southside Neighborhood. Northern Arizona University. 2017. <https://core.ac.uk/download/pdf/151423136.pdf#page18>

GENTRIFICATION RISK	SUMMARY OF IMPACTS	LONE TREE OVERPASS INTERACTION
Demand for parking	Medium. Increasing demand for parking from residents and visitors may threaten the current walkable neighborhood character.	Mixed. While the Lone Tree Overpass may increase driving, most of the increases will result in through traffic that will not stop in Southside and therefore its impact on parking demand is likely to be limited. Any increase in parking demand by residents could make the neighborhood less walkable and desirable, but could also raise the cost of living (as parking spaces are priced into rents).
Property demolition and redevelopment	Medium. Demolition of historic properties can change the character of a neighborhood and also remove naturally occurring affordable housing/commercial space. Furthermore, the existence of a higher-income community adjacent to the community in question is one of the strongest predictors of future gentrification – for the Southside, the development of the mixed use community southeast of the intersection of Lone Tree and Butler raises the risk of this kind of gentrification contagion.	Amplify. A couple dozen properties will need to be demolished as part of the construction of the Lone Tree Overpass. These are primarily commercial/industrial buildings (located in the neighborhood's most prominent concentration of mixed-use low-density industrial properties), though also a few residential properties. Post-construction, there will likely be the opportunity for new commercial and residential development to the east of the overpass. Furthermore, the expanded roadway can support and induce more development in the area to the east of the Southside. This could amplify gentrification contagion within the core of the Southside neighborhood.
Lone Tree Overpass (overall)	Low. The impacts of the Lone Tree Overpass project both amplify and counter existing gentrification trends, and appear to be relatively minor compared to the most significant drivers of current and future gentrification in the Southside: the growth of NAU and the future Rio de Flag Flood Control Project.	N/A

## 4.4 MITIGATION STRATEGIES

This section discusses possible mitigations for gentrification pressures that can be undertaken either within the scope of the Lone Tree Overpass project, or as policy independent of it. Two broad categories of possible mitigations are discussed: those focused on maintaining community character, and those focused on minimizing displacement.

The two categories are deeply intertwined. Actions that minimize the displacement of existing residents can often also help maintain the existing demographics of the neighborhood, which can in turn assist in maintaining the community's character. Furthermore, programs that help maintain community character can make the community more hospitable to the lives and preferences of existing community residents. As such, there are self-reinforcing benefits to pursuing both types of gentrification mitigations.

We note that only one mitigation – the designation of the roadway and overpass as a multicultural and community-responsive space – is an intervention on the roadway itself, whereas the others concern other sites within the community. This is primarily because the main purpose of the Lone Tree Overpass project is increased mobility and access, which is also the primary vector of the roadway's impact on gentrification. As such, most gentrification mitigation twinned to the LTO project must be somewhat independent of it – we discuss numerous options in this section.

One way to fund some of the mitigations discussed in this section is through a community benefits agreement. In this structure, real estate developers are required to strike a contract with a community group for any development in the community, a contract which sets out what benefits the developer will provide the community in exchange for the right to build. This approach is called out in the Southside Community Specific Plan, which notes that “the community will continue to research and investigate...community benefits agreements...to ensure a just transition of land uses.”

### 4.4.1 POSSIBLE MITIGATIONS FOCUSED ON MAINTAINING COMMUNITY CHARACTER

Funding for art spaces, community spaces, or historic preservation: Much of a community's character thrives and survives through its art spaces, community spaces, and tangible history. The roadway and right-of-way design of the LTO project could include a variety of mitigations of this kind – example may include naming the overpass for a historical community figure, including educational markers about multicultural community history, creating art spaces on (and/or under) the LTO. These kinds of accommodations have occurred on numerous transportation improvements around the country, and are often greatly valued by the community, as it creates a community asset and gives them greater ownership over the new project and its public spaces – this is especially the case if the community is involved in the choice and creation of the content and spaces. Of course, the funding of any art, community, or historical space valued by the community outside the right-of-way could also be bundled with the LTO project.

Creating mixed-use spaces: The Southside community takes great pride in, and finds significant value from, its history and present of mixed land use, particularly in the blending of housing and light industrial production. This blending of uses is once again at the forefront of urban planning and real estate development, most prominently visible in the popularity of maker spaces that blend studios, workspaces, markets, and housing. The creation of such a mixed-use development through the LTO project may be particularly synergistic as the project is slated to be built over a swath of the neighborhood's current low-density industrial area – one of the project's most significant anticipated gentrification impacts. The Southside Community Specific Plan particularly recommends continuing “the tradition of multi-story, multi-use buildings” and creative reuse of existing buildings in the Southside.

Zoning or other policy protections of community character: The Southside Community Specific Plan emphasizes that the community values its walkability and mixed-use nature. As is contemplated in the Plan, zoning and policy can be a key method for allowing and maintaining these attributes. A key policy area is parking policy: any policy that limits the availability of parking promotes walkability, and as discussed further below, can make housing more affordable.

### 4.4.2 POSSIBLE MITIGATIONS FOCUSED ON LESSENING DISPLACEMENT

Build and preserve affordable housing: Making housing in the neighborhood more affordable is a way to directly confront the effects of gentrification – most approaches in this section share this goal. The most direct way to accomplish this is to build and preserve affordable housing, whether for renters or owners. While some cities fund the building and preservation of affordable housing directly, the most common approach is mandating that new development preserve or create new homes that are affordable by the priority populations in the community. The Plan encourages this approach, and furthermore suggests to “exempt affordable housing from civic space contributions” to make affordable housing even lower-cost – the core of this idea is that any required amenities for housing construction makes that housing less affordable in the short- and long-run. For example, experience elsewhere shows that housing can be built and maintained more affordably if it is exempted from requirements to provide parking spaces.

Community land trusts: Community land trusts have proven to be a powerful anti-gentrification strategy in neighborhoods around the United States. Broadly speaking, land is acquired or deeded into a trust, which then builds or maintains, and then leases, housing on the land to priority populations within the community at affordable rates. In order to allow residents to build wealth through housing, resales of the leases are generally allowed, with a portion of the profits accruing to the resident, and a portion to the community land trust. There is an active community land trust in Flagstaff, called the Townsite Community Land Trust. This approach could be twinned to the LTO project by having the project make a contribution to an existing or new community land trust.

Homeownership programs and housing advocates: Some cities have established programs that provide education and funding to priority populations within the community so that they can purchase their homes, particularly for first-time homeowners. Furthermore, some cities provide advocates or advisors to homebuyers or renters to help them in negotiations with developers and landlords. This approach may be particularly valuable in the Southside, as it has been noted that with major redevelopment pressures forthcoming due to the Rio de Flag project, some community members have been taken advantage of by buyers with a greater understanding of the properties' future value.

Property tax relief and rent subsidies: A less direct way of making housing affordable is subsidizing it for priority populations by providing either property tax or rent subsidies, which can allow people to stay in their homes when they are on the cusp of being priced out. A further possible framing of such a subsidy is as a "right to return", where eligibility either includes or is limited to people who were previously priced out of living in the community, or whose parents or grandparents were priced out. Notably, rent control in Arizona is pre-empted by the state, depriving Flagstaff of that policy option.

### 4.4.3 SUMMARY

The table below summarizes the mitigation options discussed above, along with an estimate of the direct cost and logistical difficulty of implementing the strategy.

MITIGATION	DIRECT COST	LOGISTICAL DIFFICULTY	POSSIBLE IMPLEMENTATION
Funding of art, community, or historic spaces	Low - Medium	Low - Medium	Bundled with LTO
Creating a mixed-use development	Medium	Medium	Bundled with LTO
Zoning or policy protections of community character	Low	Medium - High	City policy
Build and preserve affordable housing	Low - High	Medium - High	City policy or city funding
Community land trusts	Low - High	Low	City funding or bundled with LTO
Homeownership programs and housing advocates	Medium - High	Medium	City funding
Property tax relief and rent subsidies	Medium - High	Medium	City policy or city funding

Three strategies are particularly promising for inclusion in the LTO project as gentrification mitigation:

- The creation and ongoing funding of art, community, or historic spaces, particularly on the roadway right-of-way.
- The creation of a mixed-use development combining housing and light industrial uses somewhere in the Southside, ideally creatively reusing an existing structure.
- Allocating funding to a community land trust.

These recommendations acknowledge that the past and present gentrification pressure in the Southside is extreme, that outside gentrification pressures are likely significantly more impactful than the gentrification pressures caused by the LTO project, and that the LTO project may contribute some additional gentrification pressure on the Southside. The first recommendation would allow the LTO to be an asset to the Southside in its fight against gentrification, the second is particularly responsive to a gentrification pressure vector caused by the LTO project, and the third is a simple way the LTO project could contribute to housing affordability in the neighborhood. These recommendations are responsive to the gentrification pressures being experienced by past and present Southside residents, and would contribute to both preserving the community's valued character and reducing displacement. These recommendations could be further bolstered by further community participation and outreach in determining the recommendations' prioritization and scope.

The other strategies listed in this section may also be valuable anti-gentrification tools for the City to consider – while they fit less well with the LTO project, they would also greatly contribute to keeping the Southside distinct, affordable, and diverse.