



I-19 Frontage Roads Study

Task Assignment TPD 01-08

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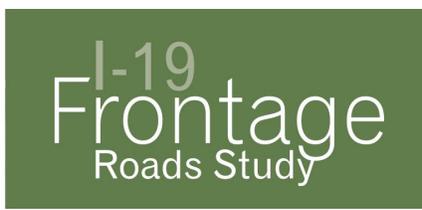


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Introduction

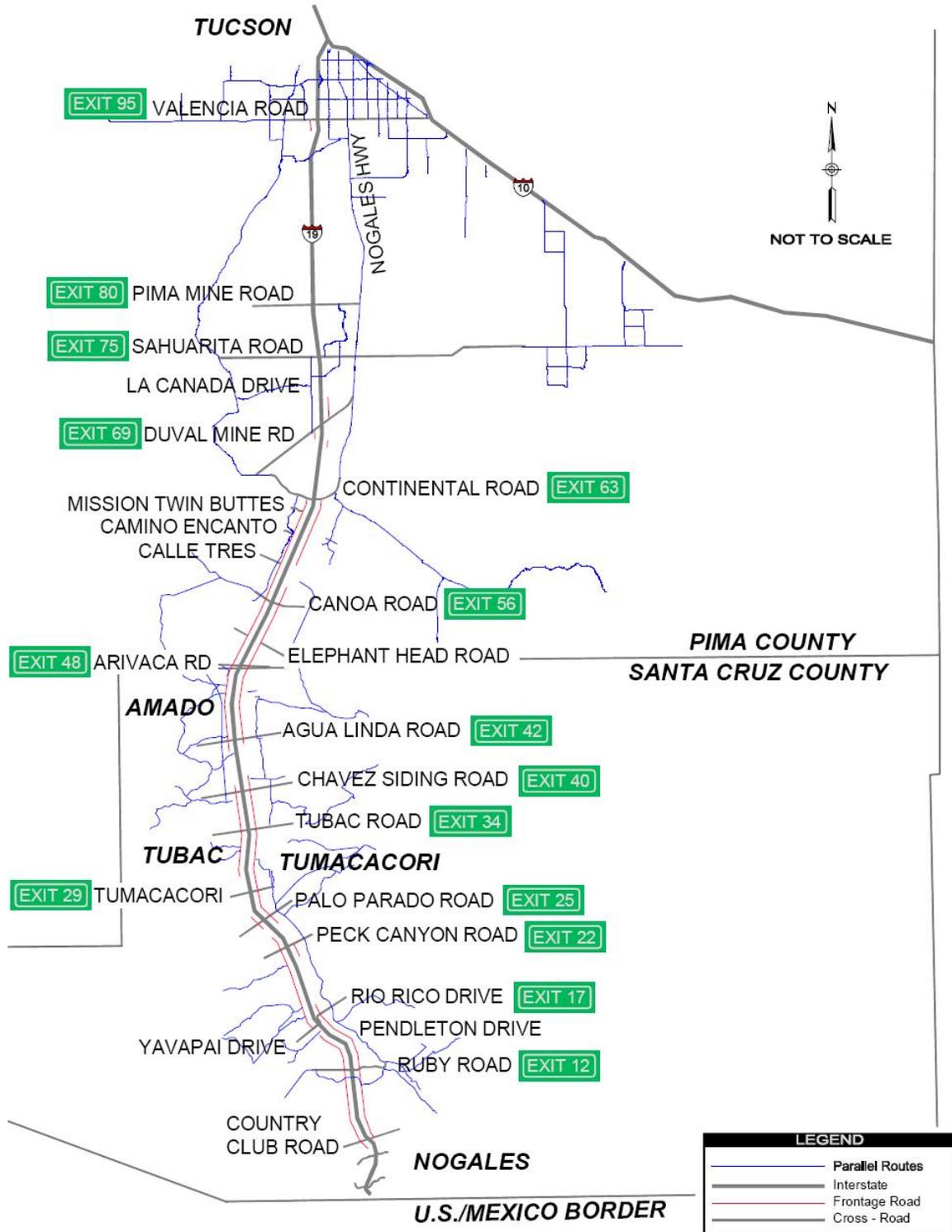
The Arizona Department of Transportation (ADOT) has completed a study of the frontage roads (east and west sides) on Interstate 19 (I-19) from the United States/Mexico border in Nogales, Arizona to the I-10/I-19 interchange in Tucson, Arizona. The study area includes the entire length of I-19, and lies within the eastern portion of Pima County and the western portion of Santa Cruz County. The existing frontage roads in the study area are primarily two-way facilities that serve an important local circulation function, but they are discontinuous in many areas. **Exhibit S-1** displays the I-19 frontage roads and surrounding street system.

The purpose of the I-19 Frontage Roads Study was to:

- Document existing (2007) traffic operations, safety, and land access conditions on the I-19 frontage roads.
- Identify traffic and safety deficiencies on the frontage roads for a 10-year planning horizon.
- Review recommendations for long-term improvements on the frontage roads made in other studies and plans and document the status of the recommendations.
- Assess ADOT policies and jurisdictional perspectives on frontage roads relating to construction, maintenance, and operations.
- Develop a policy recommendation to ADOT for the function, construction, maintenance, and operations of the frontage roads.
- Recommend a 10-year program of multi-modal improvements. This may include projects such as shoulder widening, intersection improvements, speed-change lanes, access management strategies, or future studies by ADOT.



Exhibit S-1 - Study Area





The development of the frontage road projects was based on a review of existing system deficiencies, public input, and an analysis of future needs. A summary of issues addressed in the study include:

System Continuity — The existing I-19 frontage road system is largely limited to segments between Country Club Road in Santa Cruz County and Continental Road in Pima County. Existing development constraints make construction of new frontage roads north of Continental Road infeasible. South of Continental Road, the frontage road serves as a backbone for the local access system. This section of frontage road has several discontinuities that are considered deficiencies. Frontage roads do not exist south of Country Club Road in Santa Cruz County.

Roadway Cross Section — The majority of the existing frontage roads are two lanes, two-way roadways with the exception of the East Frontage Road north of Ruby Road where the frontage road transitions to one lane in each direction with a center left-turn lane. Paved shoulders are generally not provided along the majority of the frontage roads and the lack of shoulders is considered an existing deficiency. Representatives of the Santa Cruz County Bicycle Advocate Committee have proposed that the ADOT standard for four-foot shoulders be changed to six-foot shoulders.

Future Traffic Capacity — An analysis of traffic volumes and the existing capacity of the frontage road system indicate that the existing frontage road system, as a two-way, two-lane facility, (on both east and west sides) will accommodate future 2017 traffic volumes.

Turn Lanes — Currently, there are only two frontage road segments with a continuous left-turn lane and a limited number of locations with left or right-turn lanes.

Access Control — The existing frontage roads often serve as the sole means of local access and circulation to development along the I-19 corridor. Santa Cruz County relies heavily on the frontage roads as a collector/arterial roadway to provide linkage between I-19 and the interstate-based businesses that front the corridor, as well as the residential developments that extend into the rural foothills. As traffic volumes increase, turn lanes will be required at intersections and access points.

Interchange Configurations and Traffic Control — Almost all of the intersections at I-19 interchanges are stop-controlled with the exception of Valencia Road/West Frontage Road, Continental Road/West Frontage Road, and Ruby Road/East Frontage Road which are signalized.

Currently, the existing stop-controlled interchange configurations operate at acceptable levels of service under existing traffic volumes. However, as traffic volumes increase, signalization of the frontage road/cross street intersections may be necessary. When the I-19 interchanges require signalization, it is recommended that frontage roads are converted to one-way operations. One-way frontage road operations allow the frontage roads to merge with the interstate ramps in advance of the cross road intersection and reduces the number of intersections on the cross road to two.

It should be noted that there is a proposed roundabout for traffic control at the Canoa Road/East Frontage Road intersection. Pedestrian and bicycle accommodations need to be factored into the roundabout design.

Alternative Modes of Travel — Mainline I-19 and the frontage roads are the only routes available for bicycle travel between Green Valley and Rio Rico. The ADOT Bicycle Policy (MGT 02-1) states that “bicyclists have the right to operate in a legal manner on all roadways open to public travel.”



There are no restrictions on bicycle use on the frontage road system but paved shoulders are mostly non-existent.

The lack of shoulders on frontage road segments is a deficiency in terms of standard roadway cross-sections. In addition to accommodating bicycle travel, the shoulder width is necessary for emergency parking and incident response.

Speed Limits — Existing speed limits vary widely on the frontage roads. It is not anticipated, nor is it recommended, to use only one speed limit along the entire frontage road system. As development continues along the frontage roads, the number of access points and associated traffic volumes will increase creating the need to periodically re-evaluate the existing speed limits.

Maintenance Responsibility — The ADOT Tucson District is responsible for the maintenance of the frontage roads with the exception of the following segments:

- Santa Cruz County is responsible for the maintenance of the West Frontage Road between Rio Rico Road and Peck Canyon Road.
- The Town of Sahuarita is responsible for the maintenance of the East Frontage Road from 0.10 mile north of the Duval Mine Road Traffic Interchange to the terminus. ADOT maintains the frontage road from the interchange to 0.1 mile north.

According to the ADOT Roadway Design Guidelines (2007), Section 309, “Frontage roads, outside of the ramp areas, are generally returned to the control of the local jurisdiction for maintenance and operation.” Field review of the frontage road has indicated a general need for street sweeping and debris removal of the frontage roads.

Recommended Program of Projects

The proposed projects were developed by utilizing the results of the needs and deficiency analyses, input received from the Technical Advisory Committee and ADOT Tucson District representatives, and supplemental project references such as the Statewide Bicycle and Pedestrian Plan, regional and local jurisdictions, stakeholders, and the public.

A guidance statement was developed and it incorporates principles for future frontage road development. The guidance statement is on the next page.



GUIDANCE STATEMENT FOR IMPROVEMENTS TO I-19 FRONTAGE ROADS

General

- New frontage roads will not be recommended north of Continental Road:
 - a. The I-19 Corridor Study recommends against construction of frontage roads north of Valencia Road based on geometric, traffic operations, and land use access issues.
 - b. Frontage roads will not be constructed north of Continental Road because of existing development constraints, stakeholder perspectives, and availability of alternatives. Provision of new frontage road segments north of Continental Road are not considered critical links in the system as established parallel routes are already available and serve a similar purpose (La Cañada Drive, Mission Road, and Old Nogales Highway/Nogales Highway).
- Consideration should be given to constructing frontage roads between Continental Road and Country Club Road. Establishment of continuous frontage roads in this section will improve the functionality of the frontage road as well as improve local circulation.

One-Way Versus Two-Way Frontage Roads

- It is recommended that the frontage roads along Interstate 19 remain two-way operation until conditions (a) and (b) stated below apply. At such time that both of the conditions are met, it is recommended that frontage roads be converted to one-way operations.
 - a. Traffic interchanges on I-19 are sufficiently spaced to make one-way frontage roads feasible (e.g. approximately two mile spacing or less). Currently, no new traffic interchanges are planned between Continental Road and Country Club Road within the 10-year horizon period. Approximately 8 interchanges would need to be constructed to make one-way frontage roads feasible.
 - b. Existing traffic interchanges where frontage roads exist require signalization with the frontage roads and two-way frontage roads would adversely impact interchange operations.
- Future development of the frontage road between Agua Linda Road and Chavez Siding Road should consider needs and input from the United States Border Patrol. The Border Patrol has indicated preference for no frontage road construction or for one-way frontage road operations in this area.

Access Management Policies

ADOT has a red letter process where local jurisdictions and counties notify ADOT District staff of new developments within one mile of the frontage roads. ADOT uses their Red Letter Notification Process to help limit future escalation of right-of-way costs by requesting that local agencies notify ADOT of potential development plans within or near right-of-way corridors.

- Improved coordination and communication among agencies regarding proposed developments should be considered a priority.
- New developments adjacent to the frontage road should dedicate adequate right of way to provide right/left turn lanes and paved shoulders along the I-19 frontage roads.



GUIDANCE STATEMENT FOR IMPROVEMENTS TO I-19 FRONTAGE ROADS (cont.)

Maintenance Policies

ADOT, Pima County, Santa Cruz County, and the Town of Sahuarita should consider establishment of maintenance agreements for increased maintenance of the frontage roads including sweeping, trimming of brush, and pavement repairs. Innovative programs such as the “Adopt-a-highway” program should be explored for routine maintenance such as trash collection.

Alternate Mode Policies

- Paved shoulders, consistent with ADOT standards, should be constructed with all new construction and major reconstruction projects on I-19 frontage roads. Striping and signing for bicyclists should be considered in the design of frontage road widening projects.

Safety

- Golf cart access should continue to be prohibited on the frontage roads, due to the speed differential between golf carts and vehicular traffic. Golf carts are prohibited on the frontage roads per ARS 28-966*.

Jurisdictional Responsibilities

- ADOT should maintain and have jurisdiction over the frontage roads.

Design

- Frontage road design shall conform to ADOT design criteria. Frontage road infrastructure design projects should also coordinate with local jurisdictions, integrate local design criteria when reasonable, and include a public information program to obtain public input during the design process.

*28-966. Neighborhood electric vehicles; speed; restrictions

A. A neighborhood electric vehicle shall not be operated at a speed of more than twenty-five miles per hour.

B. A neighborhood electric vehicle shall not be driven on a highway that has a posted speed limit of more than thirty-five miles per hour. This subsection does not prohibit a neighborhood electric vehicle from crossing a highway that has a posted speed limit of more than thirty-five miles per hour at an intersection.

C. A neighborhood electric vehicle shall have a notice of the operational restrictions applying to the vehicle permanently attached to or painted on the vehicle in a location that is in clear view of the driver. 28-966



The 15 roadway improvement projects will address critical needs over the next 10 years. These projects were further prioritized into the following categories:

- c. **Short-term (lower cost projects)** — These projects are typically safety improvement projects that will cost under \$500,000. Seven of the 15 projects are categorized as short-term, lower cost projects. One of seven projects is a proposed ADOT study.
- d. **Mid-term (higher cost projects)** — Mid-term projects include higher cost projects with higher priorities due to safety, connectivity, and affected jurisdiction concerns. Six of the 15 projects are included in this category. Two of the mid-term projects should be combined in programming because they are in the same area—the West Frontage Road, Continental Road to Canoa Road shoulder widening/lighting project and the West Frontage Road/Calle Tres intersection improvement project.
- e. **Long-term (higher cost projects)** — Two of the 15 project are long-term, higher cost projects that may require additional lead time to obtain funding and are not necessary to address a specific safety concern. The construction of frontage roads between Chavez Siding Road and Agua Linda Road is included in this category.



Summary of Short-term Projects

A summary of the short-term, lower cost projects are provided in **Exhibit S-2**. Since the construction year is yet to be determined, a range of costs for the time period from 2008 to 2012 was developed using a base year of 2008 and an inflation factor of six percent per year. The cost estimates do not include right-of-way costs.

Assuming 2008 dollars, the project costs total \$1,593,000. Within the time frame 2008 to 2012, project costs range from \$1,593,000 to \$1,958,000.

Exhibit S-2 - Short-term (Lower Cost Projects)

Project No.	County	Name	Project Type	Estimate of 2008 Probable Cost	Estimate of Range of Probable Costs, 2008 - 2012
7	Pima	West Frontage Road / Arivaca Road / County Line Road	Safety Improvement - Design and construct northbound and southbound left-turn lanes	\$152,000	\$152,000 - \$192,000
8	Santa Cruz	West Frontage Road / San Cayetano Elementary School	Safety Improvement - Design and construct continuous left-turn lane and right-turn Lanes	\$294,000	\$294,000 - \$371,000
9	Santa Cruz	West Frontage Road / Camino Lito Galindo	Safety Improvement - Design and construct northbound left-turn lane and southbound right-turn lane	\$240,000	\$240,000 - \$302,000
10	Santa Cruz	West Frontage Road, Circulo Mercado (north) to 0.25 miles south of Circulo Mercado (south)	Safety Improvement - Design and construct continuous left-turn lane	\$356,000	\$356,000 - 450,000
12	Santa Cruz	East Frontage Road, Barrio De Tubac	Safety Improvement - Design and construct northbound and south bound left-turn lane	\$213,000	\$213,000 - \$269,000
14	Santa Cruz	East Frontage Road, Avenue de Otero	Safety Improvement - Design and construct northbound right-turn lane	\$138,000	\$138,000 - \$174,000
15	Santa Cruz	I-19 Corridor from Country Club Road to Mariposa Road	Study - Evaluation for provision of frontage roads	\$200,000	\$200,000
	SUBTOTAL			\$1,593,000	\$1,593,000 - \$1,958,000



Summary of Mid-term Projects

A summary of the mid-term, higher cost projects are provided in **Exhibit S-3**. For projects assumed to be mid-range projects, a range of costs for the time period from 2010 to 2015 was developed, using an inflation factor of six percent per year. Cost estimates do not include right-of-way costs. Assuming 2008 dollars, the project costs total \$14,023,000. Within the time frame 2010 to 2015, project costs range from \$15,802,000 to \$21,145,000.

It should be noted that on Project No. 4 – pavement preservation for the I-19 West Frontage Road, Peck Canyon to Rio Rico Road, stakeholders would like to include shoulder widening as part of the project. A preliminary cost estimate for the project with new four-foot shoulders is \$2,553,000 (2008 dollars), or an increase of \$1.22 million. This cost does not include right-of-way costs.

Exhibit S-3 - Mid-term (Higher Cost Projects)

Project No.	County	Name	Project Type	Estimate of 2008 Probable Cost	Estimate of Range of Probable Cost, 2010 - 2015
1	Santa Cruz	West Frontage Road, Yavapai Drive (Rio Rico Dr.) to Calle Calabasas	Capacity Improvement - Design and construct new frontage road	\$ 4,361,000	\$4,900,000 - \$6,557,000
4	Santa Cruz	I-19 West Frontage Road, Peck Canyon to Rio Rico Road	Pavement Preservation Improvement - Pavement resurfacing	\$ 1,332,000	\$1,496,000 - \$2,002,000
5*	Pima	West Frontage Road, Continental Road to Canoa Road	Safety Improvement - Design and construct shoulder widening and intersection lighting at intersections of west frontage road at Via Del Petirrojo and Camino Encanto	\$4,337,000	\$4,919,000 - \$6,582,000
6*	Pima	West Frontage Road / Calle Tres	Safety Improvement - Design and construct northbound left-turn lane and intersection lighting	\$587,000	\$659,000 - \$882,000
11	Santa Cruz	East Frontage Road, Tumacacori Road	Safety Improvement - Design and construct northbound left-turn lane	\$1,598,000	\$1,796,000 - \$2,403,000
13	Santa Cruz	East Frontage Road, Avenida Goya to Bridge Road	Safety Improvement - Design and construct continuous left-turn lane	\$1,808,000	\$2,032,000 - \$2,719,000
	SUBTOTAL			\$14,023,000	\$15,802,000 - \$21,145,000

*Note: Consider combining projects 5 and 6 when programming.



Summary of Long-term Projects

Long-term, higher cost projects are summarized in **Exhibit S-4**. For projects assumed to be long-range projects, a range of costs for the time period from 2012 to 2017 was developed using an inflation factor of six percent per year and a base year of 2008. Assuming 2008 dollars, the project costs total \$7,115,000. Within the time frame 2012 to 2017, project costs range from \$8,982,000 to \$12,020,000.

Exhibit S-4 - Long-term, Higher Cost Projects

Project No.	County	Name	Project Type	Estimate of 2008 Probable Cost	Estimate of Probable Cost 2012 - 2017
2	Santa Cruz	West Frontage Road, Chavez Siding Road and Agua Linda Road	Capacity Improvement - Design and construct new frontage road	\$3,126,000	\$3,946,000 - \$5,281,000
3	Santa Cruz	East Frontage Road, Chavez Siding Road and Agua Linda Road	Capacity Improvement - Design and construct new frontage road	\$3,989,000	\$5,036,000 - \$6,739,000
	SUBTOTAL			\$7,115,000	\$8,982,000 - \$12,020,000

Other potential projects should be considered as development continues on the corridor. For example, a recommendation in the Santa Cruz Valley Bicycle Advocate Committee Master Plan is to widen the East and West frontage roads between Canoa Road and Arivaca Road to accommodate paved shoulders. As new developments are proposed, shoulder widening should be included as part of development improvements.