



MEMORANDUM

Date: February 4, 2025
To: Luke Schwartz, Transportation Manager, City of San Luis Obispo
From: Joe Fernandez and Michelle Matson, CCTC
Subject: 600 Tank Farm Road – Access Evaluation

CCTC prepared a Transportation Impact Study (TIS) for the 600 Tank Farm Road project in March 2021. The applicant proposes an interim configuration (**Attachment A**) with the following features:

- A new full access side-street-stop controlled intersection is proposed at one of the project driveways (Tank Farm Road/Santa Fe Road West) and an additional right-in, right-out only driveway is proposed on Tank Farm Road between Santa Fe Road West and East.
- A Class I bicycle/pedestrian path is proposed on the north side of Tank Farm Road from Santa Fe Road West to MindBody.
- A temporary sidewalk is proposed on the north side of Tank Farm Road from MindBody to Broad Street.
- The Acacia Creek culvert under Tank Farm Road would be widened and driveway sight distance obstructions removed.
- The Tank Farm Road/MindBody intersection would be modified to provide a crosswalk on the east leg with pedestrian crossing indications and a bike signal and bike box to facilitate crossing Tank Farm Road to connect to the new Class I path.
- Center acceleration lanes serving Santa Fe Road West and East to facilitate outbound left turns by allowing the turns to occur in two stages.
- Speed feedback signs and other advance warning features to improve driver awareness of the new intersection bicycle and pedestrian conflicts.

No on-site land use changes are proposed, and the Santa Fe Road West project frontage would not change from the previous approvals. The proposed interim configuration changes the lane configurations on multiple approaches when compared to the previously proposed roundabout layout. This memorandum evaluates if the proposed changes would substantially change the findings and requirements identified in the prior TIS.

SUMMARY AND RECOMMENDATIONS

The proposed interim side-street-stop control at Tank Farm Road/Santa Fe Road West (#3) would provide acceptable automobile operations under Existing, Near Term, and Cumulative conditions with the addition of project traffic. Side-street-stop control does not support pedestrian and cyclist crossings of Tank Farm Road at this location and is inconsistent with the prior recommendations to construct a roundabout. However, there are no destinations immediately across Tank Farm Road from the project, the roundabout is not needed to accommodate vehicular volumes without the Prado Road extension, and interim access is proposed which provides acceptable vehicular operations and pedestrian and cyclist connectivity to the east.

The proposed intersection control and CCTC's recommendations are shown in **Attachment A**. The roundabout is recommended as a future improvement and will be necessary to accommodate traffic levels when

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Santa Fe Road is extended to Prado Road. We recommend that the project be conditioned to make fair share contributions towards the roundabout and that frontage designs accommodate the facilities planned in the Active Transportation Plan and Circulation Element.

BACKGROUND

The 2021 TIS identified nine local transportation deficiencies and recommended improvements to address them. Five of these deficiencies, described in **Table 4**, were associated with the project frontage or site design, and would be affected by the currently proposed access changes.

The 2021 TIS identified deficiencies related to automobile, pedestrian, and bike level of service (LOS) associated with side-street-stop control at the project driveway (Santa Fe Road West) which would be addressed by construction of a roundabout. Section 0.2.1 of the 2021 TIS noted that stop control at this intersection would not address pedestrian connectivity deficiencies and was not recommended as an interim measure. This recommendation was due to high levels of side-street vehicular delay due to a single southbound approach lane, and poor bicycle and pedestrian LOS due to an uncontrolled crossing. The revised interim design addresses these concerns by providing median left-turn acceleration lanes, dual southbound approach lanes, and pedestrian and bicycle connections to the east with a protected crossing at the Mindbody signal.

POLICY CONSISTENCY

Tank Farm Road is classified as a regional route/parkway arterial in the City's Circulation Element, a street type described as *arterial routes with landscaped medians where the number of cross-streets is limited and direct access from fronting properties is discouraged*. Santa Fe Road West is a proposed commercial collector planned to connect to the future Prado Road extension to Broad Street. As currently proposed it would only serve the proposed project until the Santa Fe Road and Prado Road extensions are complete.

Section 3.1.8 of the City's Uniform Design Criteria relates to access management, noting that new driveways should not be allowed within the functional area of adjacent signalized intersections. On 40 mile per hour roadways, the upstream functional area is 420 feet plus 95th percentile queues, and the downstream functional area is 300 feet.

Santa Fe Road West is approximately 465 feet from Santa Fe Road East and the proposed eastern project driveway is approximately 170 feet from Santa Fe Road East. Secondary access to the site is recommended and the eastern driveway is proposed as right-in, right out which limits conflict points and potential interaction with nearby intersections.

The City's General Plan, Airport Area Specific Plan, and Active Transportation Plan (ATP) recommend a future roundabout at the Tank Farm Road/Santa Fe Road West intersection. As modified, the project would not advance that improvement. However, the project would not preclude the roundabout as a future improvement and should be conditioned to pay fair share costs toward the future roundabout and ensure that the site design accommodates the planned roundabout footprint.

The City's ATP also calls for future Class IV bikeways on both sides of Santa Fe Road and Tank Farm Road, with Class I paths on both sides of Tank Farm Road west of Santa Fe Road. The project's Santa Fe Road frontage does not preclude these planned facilities. The Tank Farm Road frontage proposes a Class I path on the north side of Tank Farm Road to the MindBody signal, and Class II bike lanes on Tank Farm Road, which differs from the ATP. The proposed two-way Class I path design may require modifications to the one-way Class IV design already prepared for the adjacent 650 Tank Farm Road development frontage improvements. The City could consider amending the ATP to evaluate a two-way Class I path on the north side of Tank Farm

Road between Santa Fe Road and Broad Street as the ultimate design for this location. This would allow eastbound riders destined north on Broad Street to avoid an extra crossing of Tank Farm Road, or riding on the sidewalk or contra-flow in the westbound bike lane.

The City’s Active Transportation Committee recommends, and the project proposes, an interim Class I shared-use path connecting the project to the MindBody signalized intersection to the east. This will convert to a separate sidewalk and one-way Class IV bike lane in the future consistent with the ATP.

AUTO OPERATIONS ANALYSIS

Existing and Existing Plus Project

The project TIS relied on traffic data collected in 2018 and 2019. Segment-level traffic counts on Tank Farm Road from 2022 are lower than the 2018 data. The 2022 data was used to evaluate conditions at the Santa Fe Road intersections under Existing and Existing Plus Project conditions with side-street-stop control and two-stage gap acceptance as currently proposed. Turning volumes were assumed to remain the same for Santa Fe Road East and Mind Body, through volumes on Tank Farm Road were adjusted to 2022 levels, and no volumes were assumed on the northern intersection legs. The PM peak hour is the critical time period, so the analysis focuses on this time period. **Table 1** shows the auto LOS results under these scenarios. The intersection analysis worksheets are included as **Attachment B**.

Table 1: Existing and Existing Plus Project Auto LOS

Existing and Existing Plus Project Intersection Auto Levels of Service						
Intersection	Peak Hour	Approach	Existing		Existing+Project	
			Delay ¹	LOS	Delay ¹	LOS
3. Tank Farm Road/Santa Fe Road West	PM	SB	<i>Future Intersection</i>		0.5 (20.0)	- (C)
4. Tank Farm Road/Santa Fe Road East	PM	NB	6.0 (54.6)	- (F)	3.3 (29.6)	- (D)
5. Tank Farm Road/MindBody	PM	All	10.6	B	6.7	A

1. HCM 6th average control delay in seconds per vehicle. For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.

Unacceptable operations shown in bold text.

The analysis assumes all project trips would use Tank Farm Road/Santa Fe Road West (#3) and represents the worst-case operations of LOS C if all project trips used a single driveway. The peak hour signal warrant would not be met if all project trips used a single driveway. Note that without a center acceleration lane that enables two-stage gap acceptance, the southbound approach to Santa Fe Road West (#3) would operate at LOS F.

The table also assumes two approach lanes for the northbound approach of Tank Farm Road/Santa Fe Road East (#4) consistent with **Attachment A**. The results show acceptable LOS D or better operations with the existing intersection lane configurations and a center acceleration lane that enables two-stage gap acceptance. This reduces delay at the Tank Farm Road/Santa Fe Road East (#4) intersection compared to the existing condition. The PM peak hour signal warrant is met at Tank Farm Road/Santa Fe Road East (#4) under Existing conditions with and without the project.

The addition of a bicycle signal phase, an eastern pedestrian crosswalk with leading pedestrian intervals (LPI), and northbound no right turn on red would maintain acceptable operations at Tank Farm Road/Mindbody (#5). The delay improves with the project due to the longer cycle length. However, the 95th percentile eastbound and westbound queues on Tank Farm Road would increase to 406 and 692 feet, respectively, under Existing conditions with the project when the bike phase is actuated. These queues would be reduced with a

second westbound through lane on Tank Farm Road, which is expected to occur once the parcels between the project site and Broad Street develop.

Near Term and Near Term Plus Project

Near Term conditions in the 2021 TIS forecast traffic volumes for substantial planned development in the City, a portion of which is now complete. The 2021 TIS Near Term Plus Project scenario assumed the following relevant roadway improvements:

- The Tank Farm Road/Santa Fe Road West (#3) intersection included a second westbound through lane, an eastbound left turn lane, a shared southbound right/left turn lane, and median storage to enable two-stage gap acceptance.
- The Tank Farm Road/Santa Fe Road East (#4) intersection included a second westbound through lane, closure of the north leg, and median storage to enable two-stage gap acceptance.

The 2021 TIS identifies an auto LOS deficiency under Near Term Plus Project PM conditions at Tank Farm Road/Santa Fe Road West (#3) with the above assumptions in place.

The proposed configuration shown in **Attachment A** is different from the prior Near Term lane configurations. **Table 2** shows the auto LOS results under Near Term and Near Term Plus Project conditions. Near Term conditions assume no lane configuration changes from the Existing conditions layout. The intersection analysis worksheets are included as **Attachment B**.

Table 2: Near Term and Near Term Plus Project Auto LOS

Near Term and Near Term Plus Project Intersection Auto Levels of Service						
Intersection	Peak Hour	Side Street Approach	Near Term Delay¹	Near Term LOS	Near Term+Project Delay¹	Near Term+Project LOS
3. Tank Farm Road/Santa Fe Road West	PM	SB	<i>Future Intersection</i>		0.5 (26.4)	- (D)
4. Tank Farm Road/Santa Fe Road East	PM	NB	12.5 (138.8)	- (F)	4.2 (45.1)	- (E)
1. HCM 6th average control delay in seconds per vehicle. For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.						
Unacceptable operations shown in bold text.						

The addition of project traffic and the proposed intersection improvements results in acceptable operations at the Tank Farm Road/Santa Fe Road West (#3) intersection with the provision of median storage. The Tank Farm Road/Santa Fe Road East (#4) intersection is forecast to operate unacceptably both with and without the project, but the delay with the project is reduced due to the provision of median storage.

The peak hour signal warrant would not be met at Tank Farm Road/Santa Fe Road West (#3). The peak hour signal warrant would be met at Tank Farm Road/Santa Fe Road East (#4) under Near Term conditions.

Cumulative and Cumulative Plus Project

Cumulative conditions in the 2021 TIS included many planned network and land use changes expected upon buildout of the City's General Plan. In addition to the Near Term improvements, the following key network changes were assumed that would shift travel patterns in the study area:

- Prado Road extension from Higuera Street to Broad Street with a new intersection south of Capitolio Way.
- A full interchange would be constructed at Prado Road and US 101 along with replacement of the Prado Road Creek Bridge.

- Bullock Lane extension from Orcutt Road to Tank Farm Road.
- Victoria Avenue extension from Woodbridge Street to High Street.
- Orcutt Road widening to four-lanes from the railroad tracks to Johnson Avenue.
- Tank Farm Road widening to four lanes west of 250 Tank Farm Road.
- A multilane roundabout at Tank Farm Road/Santa Fe Road West (#3).
- Santa Fe Road south of Tank Farm Road would be realigned to the west with a new bridge and Santa Fe Road would be extended north of Tank Farm Road to the Prado Road extension.
- A multilane roundabout at Edna Road (SR 227)/Buckley Road.

The multilane roundabout at Tank Farm Road/Santa Fe Road West (#3) operated acceptably in the 2021 TIS under Cumulative conditions with the project with the above assumptions in place.

The timing of the Santa Fe Road realignment and connection to the Prado Road Extension is unknown. **Table 3** shows the auto LOS results under Cumulative and Cumulative Plus Project conditions without the Santa Fe Road improvements. Cumulative no project conditions assume no lane configuration changes from the Existing and Near Term conditions, except a right-in, right-out driveway on the north leg of Tank Farm Road/Santa Fe Road East (#4) based on the recommendations shown on **Attachment A**. The intersection analysis worksheets are included as **Attachment B**.

Table 3: Cumulative and Cumulative Plus Project Auto LOS

Cumulative and Cumulative Plus Project Intersection Auto Levels of Service						
Intersection	Peak Hour	Side Street Approach	Cumulative Delay¹	Cumulative LOS	Cumulative+Project Delay¹	Cumulative+Project LOS
3. Tank Farm Road/Santa Fe Road West	PM	SB	<i>Future Intersection</i>		0.5 (24.6)	- (C)
4. Tank Farm Road/Santa Fe Road East	PM	NB	83.2 (>200)	- (F)	13.0 (96.8)	- (F)
1. HCM 6th average control delay in seconds per vehicle. For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.						
Unacceptable operations shown in bold text.						

The addition of project traffic and the proposed intersection improvements results in acceptable operations at the Tank Farm Road/Santa Fe Road West (#3) intersection with the provision of median storage.

The Tank Farm Road/Santa Fe Road East (#4) intersection is forecast to operate unacceptably both with and without the project, but the delay with the project is reduced due to the provision of median storage. The 95th percentile queues for northbound left and northbound right are 5 and 10 vehicles, respectively, under Cumulative conditions with the project.

The peak hour signal warrant would not be met at Tank Farm Road/Santa Fe Road West (#3). The peak hour signal warrant would be met at Tank Farm Road/Santa Fe Road East (#4) under Cumulative conditions. Note that if Santa Fe Road is extended to Prado Road volumes at this intersection will increase, resulting in unacceptable operations with side-street-stop control. A roundabout or signal would be triggered when Santa Fe Road West is extended to Prado Road and/or when Santa Fe Road East is realigned opposite Santa Fe Road West. The project will be required to pay transportation impact fees which constitute the project's fair share contribution towards the planned roundabout and other area improvements.

PEDESTRIAN AND BICYCLE ANALYSIS

The 2021 TIS reports multiple pedestrian and bicycle deficiencies and recommends improvements to address them. The improvements included a new roundabout at the Tank Farm Road/Santa Fe Road West (#3) to

provide a controlled crossing location as well as connections to the east to enable non-auto access to shopping, jobs, transit, and other residences. However, the roundabout is infeasible at this time.

Table 4 summarizes the local transportation deficiencies that were associated with the project frontage or site design and would be affected by the currently proposed access changes.

Table 4: 2021 TIS Relevant Deficiencies

Selected Local Impacts and Deficiencies				
#	Mode	TIS Deficiencies	TIS Recommended Improvements	2024 Findings
1	Auto Intersection LOS	Tank Farm Rd/Santa Fe Rd West (#3): With side St stop control, the southbound approach operates unacceptably during the PM peak hour under Near Term Plus Project conditions.	Install a roundabout at Tank Farm Rd/Santa Fe Rd West (#3).	Intersection operates at acceptable auto LOS with proposed layout. Roundabout recommended as future improvement.
3	Pedestrian Intersection LOS	Pedestrian intersection LOS deficiencies were reported for Tank Farm Rd at Santa Fe Rd (#3-4) and MindBody (#5).	Install pedestrian signal and crosswalk to cross Tank Farm Rd at the existing Tank Farm Rd/MindBody (#5) signalized intersection (if not yet completed by 650 or 660 Tank Farm Rd developments) and install a roundabout at Tank Farm Rd/Santa Fe Rd West (#3).	Prior deficiencies and recommendations still applicable. Pedestrian and bicycle access is proposed from site to Broad Street with crossing at Tank Farm Rd/MindBody (#5) traffic signal.
4	Pedestrian Segment LOS	Pedestrian segment LOS deficiencies were reported for Tank Farm Rd from project east to Broad St and Tank Farm Rd from new Santa Fe Rd west 4,700' to new collector St.	Provide continuous pedestrian connection between project and Broad St (if frontage improvements not yet completed by 650 and 660 Tank Farm Rd developments). Construct Class I Path west of Santa Fe Rd (if feasible).	Prior deficiencies and recommendations still applicable. Pedestrian and bicycle access is proposed from site to Broad Street with crossing at Tank Farm Rd/MindBody (#5) traffic signal.
5	Bike LTS	The segment of Santa Fe Rd north of Tank Farm Rd would operate at deficient Bicycle LTS 4 if no controlled crossing is provided at the intersection of Tank Farm Rd/Santa Fe Rd West (#3).	Install a roundabout at Tank Farm Rd/Santa Fe Rd West (#3).	Prior deficiencies and recommendations still applicable. Pedestrian and bicycle access is proposed from site to Broad Street with crossing at Tank Farm Rd/MindBody (#5) traffic signal.
7	Auto/Ped/Bike Access	Frontage improvements require adequate geometric transitions.	Construct geometric transitions per Caltrans and/or AASHTO standards.	Prior recommendations still applicable.

The applicant proposes a pedestrian and bicycle connection from the project site to Broad Street on the north side of Tank Farm Road with a signalized crossing at Tank Farm Rd/MindBody (#5) which will address some of the deficiencies. Pedestrian access will be provided to nearby destinations via the Class I path and signalized crossing. While the proposed interim configuration does not provide a protected pedestrian crossing of Tank Farm Road at the project site there are no destinations immediately across from the project, and pedestrian access is provided to other nearby destinations.

Westbound bicycle access would be provided via the Class I path, while eastbound cyclists preferring a controlled crossing (riders could use the left turn lane into the site) would pass the project site, cross at the MindBody signal, and return the project. This additional travel for eastbound cyclists (roughly 2,000 feet) is

contextually insignificant since these riders would have already traveled at least double this distance to reach the site from the nearest destination from the west.

The preferred alternative for intersection control and recommendations are shown in **Attachment A**.

ATTACHMENTS

Attachment A: Preferred Alternative and Recommendations

Attachment B: LOS Worksheets

REFERENCES

City of San Luis Obispo. 2005. Airport Area Specific Plan.

_____. 2017. Circulation Element of the General Plan.

_____. 2020. Engineering Standards and Specifications.

_____. 2020. Transportation Impact Study Guidelines.

_____. 2021. Active Transportation Plan.

Federal Highway Administration. 2024. Crash Modification Factors Clearinghouse.

_____. 2020. Access Management in the Vicinity of Intersections.

Preferred Alternative and Recommendations

