

## Technical Memorandum

**To:** Russ Blount, PE, Public Works Director, City of Fife  
**From:** Michael Lapham, KPG and Don Samdahl, PE, Fehr & Peers  
**Date:** October 24, 2013  
**Re:** Transportation Analysis for Reopening 54<sup>th</sup> Avenue E at the Union Pacific Railroad Crossing

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The segment of 54<sup>th</sup> Avenue E adjacent to the Union Pacific Railroad (UPRR) at-grade crossing was closed to motorized and non-motorized traffic in. KPG and Fehr & Peers are assisting the City of Fife to update the citywide Transportation Plan and Six Year Transportation Improvement Program (2014-2019). As part of these efforts, we are analyzing safety, traffic operations, and motorized and non-motorized connectivity throughout the City. Based on this analysis, we recommend reopening 54<sup>th</sup> Avenue E at the intersection with the UPRR crossing to motorized and non-motorized traffic to improve connectivity, provide more route options, enhance overall system safety, and reduce travel distances and emergency vehicle response times. Our analysis could apply to either an at-grade crossing or a grade-separated crossing of the railroad tracks. This technical memo will address the following transportation issues related to reopening 54<sup>th</sup> Avenue E at the UPRR crossing:

- Connectivity
- Emergency vehicle response times
- Forecasted traffic volumes that would occur with the reopening of 54<sup>th</sup> Avenue E
- Recommendations to address safety, traffic operations, access and ensure that 54<sup>th</sup> Avenue E will continue to function as a residential type street

### **Connectivity**

The UPRR and Interstate-5 (I-5) travel through the City of Fife and act as barriers to connectivity dividing the City into three segments. There are two crossings of I-5 in the City of Fife at Port of Tacoma Road and 54<sup>th</sup> Avenue E, with 70<sup>th</sup> Avenue E located just east of the City limits. The City has three crossings of the UPRR at Frank Albert Road E, 70<sup>th</sup> Avenue E and Freeman Road E. A distance of approximately 1.6 miles exists between the Frank Albert Road E and 70<sup>th</sup> Avenue E crossings through the most densely populated portion of the City. The limited north/south connections across these two facilities cause the following issues:

- Increased travel distance for vehicles, pedestrians and bicyclists
- Concentration of vehicles on fewer streets, which can lead to traffic bottlenecks
- Fewer route options during congestion, construction or other events

At the time of the 54<sup>th</sup> Avenue closure, there was minimal development south of the railroad tracks and north of the Puyallup River. Since the closure, significant development has occurred in the area, including the Puyallup Tribe's youth and community center and the Radiance, Saddle

Creek and other residential developments which have approximately 3,500 people. This increase in development combined with the two nearest railroad crossings being located 1.6 miles apart at Frank Albert Road E and 70<sup>th</sup> Avenue E, increases the importance of the 54<sup>th</sup> Avenue E connection across the railroad tracks.

The 54<sup>th</sup> Avenue E closure means more drivers travel on N Levee Road E to cross the UPRR at Frank Albert Road E and 70<sup>th</sup> Avenue E. N Levee Road E is a substandard roadway with narrow 10' lanes, narrow shoulder widths, minimal street lighting, and steep drop offs along segments of the roadway. Reopening 54<sup>th</sup> Avenue E would improve safety by reducing the number of vehicles using N Levee Road E.

There are currently sidewalks along the majority of 54<sup>th</sup> Avenue E from N Levee Road E to Valley Avenue E. Reopening 54<sup>th</sup> Avenue E would encourage walking and biking in the area.

If the UPRR crossing is opened, we recommend keeping 54<sup>th</sup> Avenue E as a 2-lane roadway from N Levee Road E to Valley Avenue E, restricting truck traffic, and constructing improvements to ensure it continues to be a residential type street, primarily serving local traffic. The specific recommended improvements are described in the Recommendations section on page 7. The 70<sup>th</sup> Avenue E corridor is being constructed as a 5-lane principal arterial and would continue to carry the majority of the vehicles and nearly all of the truck traffic.

**Emergency Vehicle Response Time**

Emergency vehicle response time is affected by street connectivity and the closure of the 54<sup>th</sup> Avenue E means the Fife Police and Fire Departments have to travel longer distances to the Radiance and Saddle Creek communities, and other developments in the area. The Fife Police Department is located north of Pacific Highway E and east of Port of Tacoma Road and the Fire Department is located on 54<sup>th</sup> Avenue E south of 20<sup>th</sup> Street E.

To measure the effects of the UPRR crossing closure on emergency vehicle response times, we measured the travel time and distance from the Fire Station to the Radiance Community and the Puyallup Tribe’s youth and community center. The Fire Department responds to fires and medical emergencies. Travel times vary by time of day. We measured the travel time during midday conditions and travel times would likely be longer during the afternoon peak when traffic volumes are higher. **Table 1** shows that reopening 54<sup>th</sup> Avenue E at the UPRR crossing would reduce the travel time from the Fire Station to the Radiance Boulevard E/Daybreak Avenue E intersection by an estimated 3 minutes and 1 second.

**Table 1. Travel Time from Fife Fire Station to Radiance Blvd E/Daybreak Ave E Intersection**

Measurement	Existing Conditions	With 54 <sup>th</sup> Ave E Railroad Crossing Opened	Reduction
Travel Distance	2.65 miles	1.12 miles	1.53 miles
Travel Time	5 minutes, 29 seconds	2 minutes, 28 seconds	3 minutes, 1 second

**Table 2** shows that reopening 54<sup>th</sup> Avenue E at the UPRR crossing would reduce the travel time from the Fire Station to the Puyallup Tribe’s youth and community center by an estimated 1 minute and 44 seconds.

**Table 2. Travel Time from Fife Fire Station to Puyallup Tribe’s Youth and Community Center**

Measurement	Existing Conditions	With 54 <sup>th</sup> Ave E Railroad Crossing Opened	Reduction
Travel Distance	2.20 miles	1.31 miles	0.89 miles
Travel Time	4 minutes, 32 seconds	2 minutes, 48 seconds	1 minute, 44 seconds

These reductions in travel times would be a significant safety improvement in the event of a fire or medical emergency.

**Traffic Volumes**

We used 2002 traffic counts prior to the railroad crossing closure and the City’s travel demand forecasting model to forecast how traffic volumes in the area would change with the reopening of 54<sup>th</sup> Avenue E at the UPRR crossing. The travel demand model was also used to forecast the traffic volume changes that would occur with the completion of three important transportation projects in the area. The scenarios modeled included:

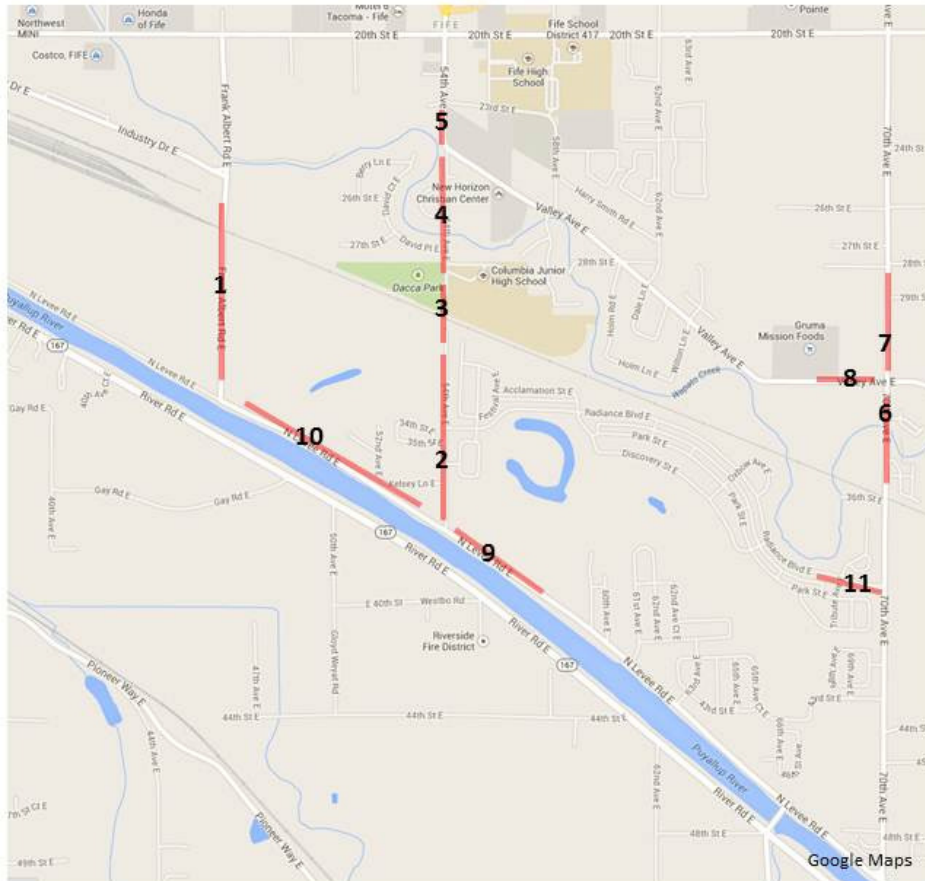
1. **Existing Conditions without Railroad Crossing**
2. **Existing Conditions with Railroad Crossing**
3. **Railroad Crossing and Canyon Road E Extension** – new connection from River Road E to 70<sup>th</sup> Avenue E, including new bridge across the Puyallup River
4. **Railroad Crossing and SR 167 Extension** – new freeway between SR 509 and SR 161
5. **Railroad Crossing and 54<sup>th</sup> Avenue E/I-5 City Center Interchange** – rebuild interchange to relocate I-5 ramps from 54<sup>th</sup> Avenue E to Pacific Highway E and 20<sup>th</sup> Street E, including new I-5 overcrossings at Frank Albert Road E and 62<sup>nd</sup> Avenue E
6. **All Projects** listed in 2-5

The traffic volumes were forecast for 11 corridors in the area, including the north/south corridors of Frank Albert Road E near North Levee Rd E, 54<sup>th</sup> Avenue E between N Levee Rd E and 20<sup>th</sup> Street E, and 70<sup>th</sup> Avenue E near Valley Avenue E. The east/west corridors included Valley Avenue E near 70<sup>th</sup> Avenue E, North Levee Road E near 54<sup>th</sup> Avenue E, and Radiance Boulevard E near 70<sup>th</sup> Avenue E. **Figure 1** on the following page maps the locations analyzed.

Existing year (2012) PM peak hour volumes were modeled for each scenario. The PM peak hour traffic volumes were then converted into Average Weekday Traffic (AWDT) volumes for each scenario, with the assumption that the PM traffic volumes are equivalent to 10 percent of the daily traffic volumes<sup>1</sup>.

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<sup>1</sup> The PM peak hour to weekday factor was derived from existing counts on the studied facilities.

**Figure 1. Map of Corridors Analyzed**

The traffic forecasts for each location under the different scenarios are found in **Table 3** and **Table 4** on the following pages. The first column lists the AWDT volumes obtained from traffic counts. The Existing Conditions with the 54<sup>th</sup> Avenue E Crossing shows the percent difference compared to the Existing Conditions without the 54<sup>th</sup> Avenue E Crossing. All other scenarios show the percent difference compared to the Existing Conditions with the 54<sup>th</sup> Avenue E Crossing.

The results illustrate that opening the 54<sup>th</sup> Avenue E crossing may increase daily travel volumes to 4,800 vehicles a day at the crossing. This traffic volume is offset by expected decreases in traffic volumes on Frank Albert Road E, 70<sup>th</sup> Avenue E, Valley Avenue E, and Radiance Boulevard E west of 70<sup>th</sup> Avenue E.

With the completion of the Canyon Road E Extension, traffic volumes may increase by 13 percent to 5,400 vehicles a day at the 54<sup>th</sup> Avenue E crossing. Building the SR 167 Extension would decrease volumes at the crossing by 17 percent to 4,000 vehicles a day. There is also an expected 10 percent decrease in traffic volumes when the crossing is included with the Fife City Center I-5 and 54<sup>th</sup> Avenue E Interchange. When all projects in the area are considered in the model, there is an expected 42 percent decrease in crossing volumes to an estimated 2,800 vehicles per day. Overall, constructing the identified roadway projects within Fife would divert non-local traffic from the 54<sup>th</sup> Avenue E corridor.

**Table 3. Average Weekday Traffic Volumes - North/South Corridors**

ID	Location	Existing (w/o 54 <sup>th</sup> Crossing)	Existing (w/ 54 <sup>th</sup> Crossing)		Canyon Road Project (w/ 54 <sup>th</sup> Crossing)		SR 167 Tolled Extension (w/ 54 <sup>th</sup> Crossing)		Fife City Center Interchange (w/ 54 <sup>th</sup> Crossing)		All Projects (w/ 54 <sup>th</sup> Crossing)	
		AWDT	AWDT	% Diff (w/o crossing)	AWDT	% Diff (w/ crossing)	AWDT	% Diff (w/ crossing)	AWDT	% Diff (w/ crossing)	AWDT	% Diff (w/ crossing)
1	Frank Albert Rd E, north of N Levee Rd	5,100	2,300	-55%	2,100	-9%	1,400	-39%	3,200	39%	2,200	-4%
2	54th Ave E, north of N Levee Rd E	1,700	3,300	94%	3,800	15%	2,500	-24%	3,300	0%	2,000	-39%
3	54th Ave E, at railroad Crossing	0	4,800	-	5,400	13%	4,000	-17%	4,300	-10%	2,800	-42%
4	54th Ave E, south of Valley Ave E	3,200	7,800	144%	8,400	8%	7,000	-10%	7,900	1%	6,400	-18%
5	54th Ave E, north of Valley Ave E	10,500	14,300	36%	16,000	12%	10,000	-30%	13,500	-6%	6,900	-52%
6	70th Ave E, south of Valley Ave E	9,000	7,000	-22%	18,700	167%	6,800	-3%	7,200	3%	22,000	214%
7	70th Ave E, north of Valley Ave E	10,200	9,200	-10%	17,300	88%	9,600	4%	9,500	3%	12,500	36%

Source: City of Fife Traffic Counts (2012); Analysis by Fehr & Peers.

**Table 4. Average weekday Traffic Volume - East/West Corridors**

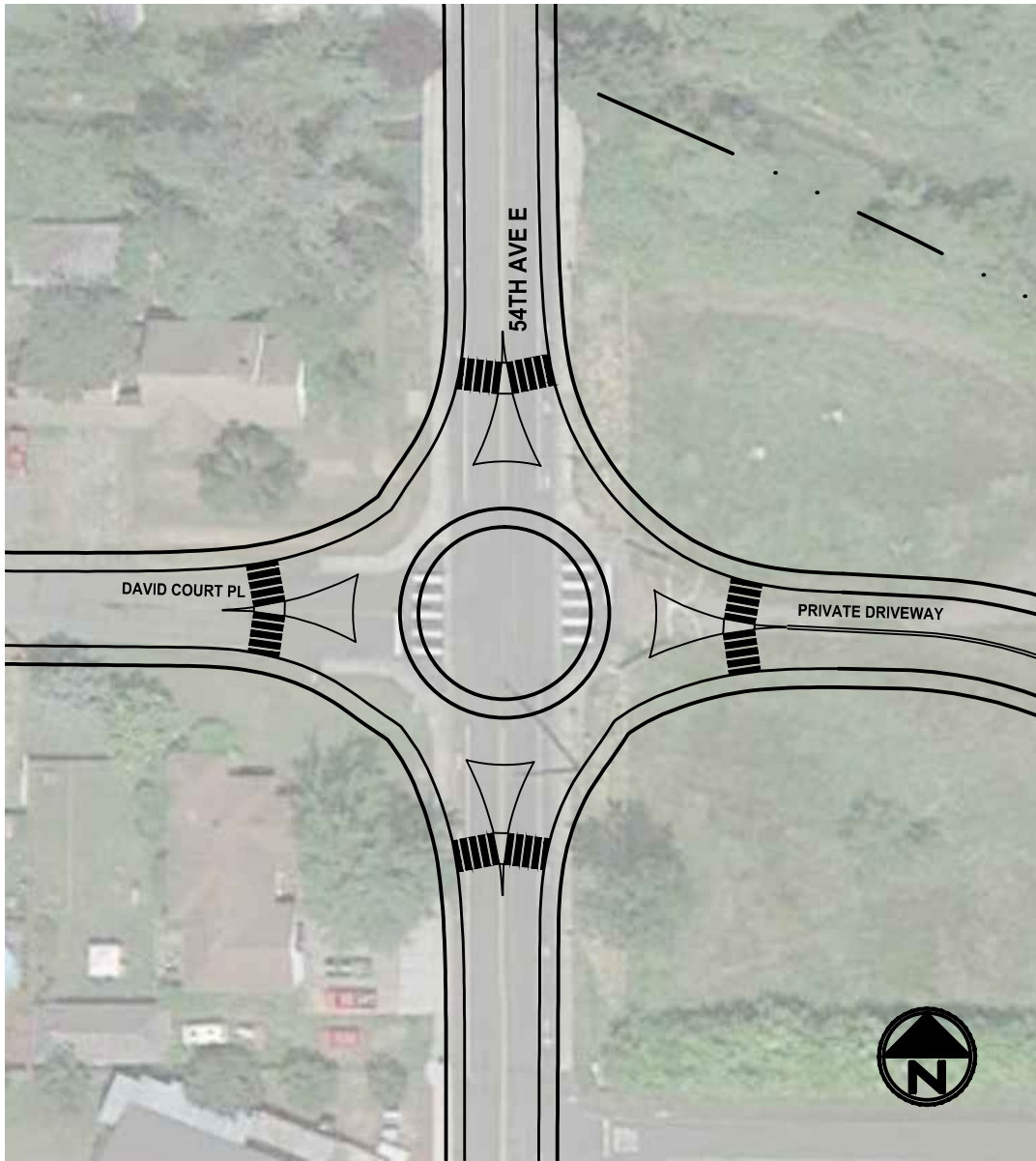
ID	Location	Existing (w/o 54 <sup>th</sup> Crossing)	Existing (w/ 54 <sup>th</sup> Crossing)	Canyon Road Project (w/ 54 <sup>th</sup> Crossing)		SR 167 Tolled Extension (w/ 54 <sup>th</sup> Crossing)		Fife City Center Interchange (w/ 54 <sup>th</sup> Crossing)		All Projects (w/ 54 <sup>th</sup> Crossing)		
		AWDT	AWDT	% Diff (w/o crossing)	AWDT	% Diff (w/ crossing)	AWDT	% Diff (w/ crossing)	AWDT	% Diff (w/ crossing)	AWDT	% Diff (w/ crossing)
8	Valley Ave E, west of 70th Ave E	10,400	9,400	-10%	10,000	6%	5,300	-44%	10,800	15%	3,300	-65%
9	N Levee Rd E, east of 54th Ave E	4,200	5,200	24%	5,500	6%	3,600	-31%	5,700	10%	3,300	-37%
10	N Levee Rd E, west of 54 <sup>th</sup> Ave E	5,400	2,600	-52%	2,400	-8%	1,700	-35%	3,000	15%	1,900	-27%
11	Radiance Blvd E, west of 70 <sup>th</sup> Ave E	2,400	1,300	-46%	1,300	0%	1,300	0%	1,300	0%	1,300	0%

Source: City of Fife Traffic Counts (2012); Analysis by Fehr & Peers.

## Recommendations

We recommend reopening 54<sup>th</sup> Avenue E at the UPRR crossing to improve connectivity, provide more route options, encourage walking and biking, and reduce travel distances and emergency vehicle response times. Reopening 54<sup>th</sup> Avenue E at the railroad crossing will increase traffic volumes on 54<sup>th</sup> Avenue E. We recommend the following improvements to mitigate the impacts to the corridor and to ensure 54<sup>th</sup> Avenue E functions as a residential type street:

- Keep 54<sup>th</sup> Avenue E as a 2-lane roadway from N Levee Road E to Valley Avenue E.
- Reduce the speed limit along 54<sup>th</sup> Avenue E from N Levee Road E to Valley Avenue E from 30 miles per hour to 25 miles per hour.
- Restrict trucks on 54<sup>th</sup> Avenue E from N Levee Road E to Valley Avenue E.
- Construct two single lane roundabouts on 54<sup>th</sup> Avenue E at Radiance Boulevard E and David Court E. The roundabouts would improve access to Radiance Boulevard E and David Court E, reduce travel speeds along 54<sup>th</sup> Avenue E, and discourage trucks from using the segment of 54<sup>th</sup> Avenue E from N Levee Road E to Valley Avenue E. The roundabouts would be designed to allow school buses to access the Junior High School, but make it difficult for trucks to use this segment of 54<sup>th</sup> Avenue E. **Exhibit 2** and **Exhibit 3** show the preliminary channelization plans and locations of the two roundabouts. As the design is refined for the two roundabouts, the location and right of way impacts may change.
- Install a rectangular rapid flash beacon (RRFB) system on 54<sup>th</sup> Avenue E at the Columbia Junior High School to assist the pedestrian crossing between the School and the playfields on the west side of 54<sup>th</sup> Avenue E. The RRFB system would require improved illumination for the pedestrian crossing and minor sidewalk improvements on the east side of 54<sup>th</sup> Avenue E. RRFBs are pedestrian activated supplemental warning signs at unsignalized crosswalks that emit a bright rapid flashing light similar to emergency flashers on police vehicles. RRFBs are lower cost alternatives to traffic signals and are shown to significantly increase driver yielding rates to pedestrians compared to traditional overhead beacons. **Exhibit 4** and **Exhibit 5** show photos of RRFB systems. The Federal Highway Administration has additional information on RRFBs at the following website:  
<http://safety.fhwa.dot.gov/intersection/resources/techsum/fhwasa09009/>
- Enhance school zone signage by supplementing existing School Speed Limit Assembly with a flashing beacon that is activated during school hours.
- If vehicles on 54<sup>th</sup> Avenue E are regularly exceeding the 20 mile per hour speed limit during school hours, supplement existing School Speed Limit Assembly with BEGIN HIGHER FINE ZONE signs (R2-10) and END HIGHER FINES ZONE signs (R2-11) and consider installing a real time speed warning sign assembly. If this does not reduce vehicle speeds, consider the use of speed enforcement cameras.



0 30 60 90  
 SCALE: 1"=60'

FILE: FIFE 54TH ROUNDABOUTS.DWG

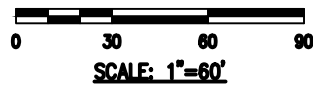
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Exhibit 2. 54th Ave E / David Court Pl E Roundabout  
 Preliminary Channelization Plan





FILE: FIFE 54TH ROUNDABOUTS.DWG

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Exhibit 3. 54th Ave E / Radiance Blvd E Roundabout  
Preliminary Channelization Plan

**Exhibit 4. Rectangular Rapid Flash Beacon System with Midblock Refuge Island**



**Exhibit 5. Rectangular Rapid Flashing Beacon System**

