Oak Hill/Fix 290
Alternative Plan for the
290/71 TXDOT Toll Road Proposal

Applying the Principles of Smart Growth to
290 and the 290/71 interchange

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SUMMARY

The intersection of 290 and 71 in the Oak Hill area has seen tremendous growth in traffic in recent years, and is highly congested during peak hours. The proposed improvements by TXDOT include the construction of 4 to 6 elevated toll lanes, paralleled by 4 or 6 frontage road lanes that would not be tolled. The Fix 290 Coalition has proposed an alternative plan to address traffic congestion and the need to accommodate future growth which consists of an 8 lane grade level Parkway facility, with a grade separated interchange for 71 and 290, and overpasses for local streets

The purpose of this report is to explore how this alternative would address the future traffic volumes on the 290 and 71 corridors and interchange area. The TXDOT proposal for a 12 lane facility is designed in response to projected future traffic growth in the area solely by increasing highway capacity. The Fix290 plan is a multi-faceted approach to future growth in traffic. It seeks to reduce the traffic burden on 290 itself by providing a more effective local street network. In addition, alternative modes of transportation are promoted by this plan, including Bus Rapid Transit and bicycle transportation. Further, the plan will promote a new urbanism form of growth which, due to more compact development and a greater mix of land sues, reduces the amount of vehicle travel.

Using guidelines in the Highway Capacity Manual, and accepted traffic engineering practices for determining conceptual design, the proposed 8 lane parkway can provide sufficient capacity for the projected year 2030 traffic volumes in the CAMPO model for 290 to operate at Level of Service D/E.

OHAN/Fix290 Parkway, Smart Growth, and Street Connectivity Strategy

The Oak Hill Association of Neighborhoods and Fix290 (OHAN/Fix290) have developed a proposal that can address the need for through traffic capacity and provide for a compact, mixed use, walkable development area. The major transportation facility is proposed to be an 8 lane grade level parkway, which would have overpasses for local street crossings, and right hand exits and merges. This plan also includes greatly improves local street and collector connectivity, so that more local trips can completely avoid the 290 and 71 corridors. This plan would also restore the desired functional classification system such that the major corridors, 290 and 71, serve longer trips and shorter, local trips utilize a highly connected network of local and collector streets.

Capacity of the Proposed Grade-level Parkway

Our primary concern is to evaluate if the proposed Fix290 parkway will provide sufficient capacity to meet the future traffic demand. The proposed at-grade Parkway will provide equivalent operations as an urban freeway, as all of the access will be right hand merges and exits, yet design and operating speeds will be slightly lower. While the exact design speed is not yet established, it may be appropriate to set it lower than a conventional freeway, which will actually result in increased vehicular capacity. This is due to vehicles having shorter safe following distances at lower speeds, resulting in more efficient lane use and higher capacity.

Table 1 below is reproduced from the Highway Capacity Manual, which shows service volumes for freeway segments. Service volumes are general indicators of the traffic operations for a given number of lanes, desired level of service, and the road environment (urban versus rural). A number of assumptions are built into these volumes, which must be evaluated in detail in later stages of design to make a more precise determination of capacity.

Table 1: Service Volumes for Basic Freeway Segments from the Highway Capacity Manual,

EXHIBIT 13-6. EXAMPLE SERVICE VOLUMES FOR BASIC FREEWAY SEGMENTS
(SEE FOOTNOTE FOR ASSUMED VALUES)

	Number of Lanes	FFS (mi/h)	Service Volumes (veh/h) for LOS A	B	C	D	E
Urban	2	63	1230	2030	2930	3840	4560
	3	65	1900	3110	4500	5850	6930
	4	66	2590	4250	6130	7930	9360
	5	68	3320	5430	7820	10,070	11,850
Rural	2	75	1410	2310	3340	4500	5790
	3	75	2110	3460	5010	6750	8680
	4	75	2820	4620	6680	9000	11,580
	5	75	3520	5780	8350	11,250	14,470

Notes:
Assumptions: Urban: 70-mi/h base free-flow speed, 12-ft-wide lanes, 6-ft-wide shoulders, level terrain, 5 percent heavy vehicles, no driver population adjustment, 0.92 PHF, 1 interchange per mile.
Rural: 75-mi/h base free-flow speed, 12-ft-wide lanes, 6-ft-wide shoulders, level terrain, 5 percent heavy vehicles, no driver population adjustment, 0.88 PHF, 0.5 interchanges per mile.

Source: Highway Capacity Manual 2000, page 13-13

The traffic volumes provided above in Table 1 are hourly volumes. The CAMPO model[1] provides average daily traffic volumes. Therefore, we will need to estimate the peak hour/peak direction CAMPO volumes using default assumptions, as shown in Table 2 below.

Table 2: CAMPO Model Volumes for 290

	East of 71	Between Bee Cave and William Cannon	East of William Cannon
Frontage EB	26,500	27,000	4,800
Mainline EB	52,000	52,000	75,000
Mainline WB	53,000	53,000	77,000
Frontage WB	26,000	28,500	4,300
TOTAL DAILY 290	157,500	160,500	161,100
Peak Hour (9%)	14,175	14,445	14,499
Peak Direction (60%)	8,505	8,667	8,699
HCM Service Volume LOS D		7,930	
HCM Service Volume LOS E		9,360	

[1] The CAMPO model is the official model for the region. The model output referred to is entitled "2030_Amended_Plan_010906v2."

The grade level parkway proposed in the Fix290 proposal can provide sufficient vehicular capacity to meet the CAMPO 2030 forecasts for between Level of Service D or E in the year 2030. While the proposed Fix290 design is at the conceptual stage at this point, and will be refined through the design process, comparison with these Highway Capacity Manual Service Volumes shows that sufficient capacity and reasonable operations can be provided to the year 2030.

In order to compare with other daily traffic volumes in the area, the HCM service volumes can be converted to daily traffic capacity. An 8 lane parkway can provide sufficient capacity for average daily traffic (ADT) between 148,000 and 166,000[2]. The CAMPO Official model shows an average daily traffic on this portion of 290 east of 71 of between 157,500 and 161,100. The other portions of the interchange area have lower volumes.

Benefits of the Proposed Grade-level Parkway

The Fix290 proposal will foster smart growth and transit-oriented development, which will reduce the generation of new traffic. It offers development and redevelopment potential along a future BRT line, as well as environmental benefits to Williamson Creek and recreational opportunities. It is highly consistent with the growth and development principles of transit-oriented development, new urbanism and smart growth, which are strategies that offer widespread benefits to the entire region, including improved air quality, less congestion and delay, and more green and open space.

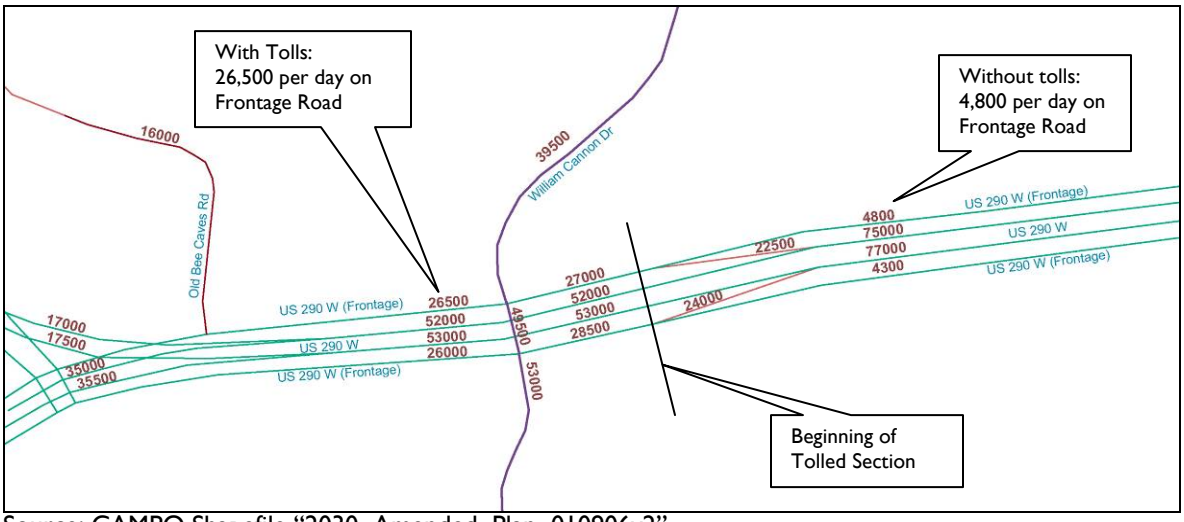
TXDOT Toll Road Alternative

While toll roads have become an appealing means of funding needed infrastructure improvements, the short tolled segment proposed by TXDOT is not an ideal application of toll lanes. Facilities with express toll lanes that are paralleled by free facilities (in this case the Frontage Roads) can lead to severe congestion on the "free" facilities, as many people will seek to avoid paying tolls and instead tolerate the congestion. Tolled facilities that are immediately paralleled by "free" facilities are generally used very lightly through most of the day, and only see heavy use during peak hours, when the "free" lanes will be severely congested. Potential toll revenue is far less on parallel facilities compared to a toll facilities without adjacent parallel routes. It also means that an expensive investment in elevated toll lanes is effectively used for only a small portion of the day, and only by a small portion of the population who are willing to pay a toll. Finally, it also means that the frontage roads will become significantly congested with traffic using them to avoid paying tolls, which will affect all local traffic as well.

The CAMPO official travel demand model shows the effect of tolls quite dramatically. The CAMPO 2030 model includes tolls only on the 3 mile portion of 290 that is part of the proposed improvements. East of this area, there are no tolls in their model. Where there are no tolls, the CAMPO model shows that 6% of the total traffic volume on 290 uses the frontage roads, with the remaining volume on the express lanes. In the segment that is tolled, near the 71 interchange, there is a dramatic shift so that 34% use the frontage roads and only 66% use the express lanes (see Figure 1, following page). The frontage roads have significantly lower capacity and lower speeds. It is very possible that the express toll lanes, while providing a congestion-free route for those willing to pay, will create high levels of congestion on the frontage roads. Unless street connectivity in the Oak Hill area is improved, most local trips will also require use of the congested frontage roads, and most local traffic will be burdened by this increased congestion.

[2] Assumes a 60/40 peak direction split, and 9% of daily traffic occurring during the peak hour.

Figure 1: CAMPO Model Volumes at Tolled Section of 290



Source: CAMPO Shapefile "2030_Amended_Plan_010906v2"

The proposed TXDOT toll plan will bring high levels of congestion to both local residents making short trips on the frontage roads, and to commuters wishing to avoid tolls. The expensive investment in the elevated toll lanes will see limited use, and generated limited revenue. This may not be the most ideal or efficient type of investment for this area, indicating that a renewed study of alternatives should be undertaken.

Conclusions and Recommendations

The proposed TXDOT toll lanes for 290 and the 290/71 interchange brings with it a number of concerns that warrant reconsideration. It provides a much higher vehicular capacity than the CAMPO 2030 model suggests is needed. The proposal to construct elevated toll lanes could bring severe traffic congestion to the frontage roads. Further, the project as proposed will bring significant environmental impacts and lost recreational opportunities along Williamson Creek.

The Fix290 at-grade parkway plan will provide the needed vehicular capacity to meet the CAMPO 2030 daily traffic projections for this location. Further, this plan will result in many longer term benefits to the region. It will provide a more highly connected local street network, and will promote more compact, transit-oriented development. It will allow for conservation and recreational opportunities along Williamson Creek, and provide bicycle/pedestrian transportation opportunities. The costs will be far less for the infrastructure, and there will be far greater long term benefits of this plan.