

City of Houston



Traffic Impacts of Major Planning Projects

~ Draft ~

August 2015

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1 Introduction

There are several projects planned or considered for construction in and around the City of Houston which could change the flow of traffic through the existing and future roadway network. Additionally, as traffic levels increase on the existing network, proactive improvements and alternatives may need to be considered in order to accommodate future demand.

In this report, Kinney Engineering, LLC (KE) presents an analysis of the traffic impacts of these projects and makes recommendations for future road infrastructure improvements and alternatives.

2 General Growth and Development

The City of Houston is on the far western edge of an urban/suburban core area of the Matanuska Susitna Borough. Growth and development within the City of Houston is expected to continue at a steady pace through the horizon year of 2035 as the Wasilla and Meadow Lakes area population densities increase and push the extents of the suburban density zone farther towards Houston and Big Lake. Growth is specifically expected to occur in the areas north of the Parks Highway, particularly on King Arthur Road and Armstrong Road, and especially on lakefront and riverfront properties.

Industrial development is possible in the area of the Big Lake Road and Parks Highway intersection and on Miller's Reach Road in the direction of a new future rail connection.

Commercial growth is most likely along the Parks Highway corridor. Near the intersections of Armstrong Road and King Arthur Road with the Parks Highway, commercial growth will target the increased residential traffic served by these roadways.

3 Base Level Traffic Volumes

KE projected average annual daily traffic (AADT) volumes for 2035 using an area travel demand model (TDM) which includes all current planned and funded transportation projects. The models used in this analysis were developed by the Alaska Department of Transportation and Public Facilities (ADOT&PF) in conjunction with the Municipality of Anchorage (MOA) and the Matanuska Susitna Borough (MSB). The extents of the model include the entire network of the MSB and MOA from north of Willow all the way to Girdwood and east as far as the community of Sutton on the Glenn Highway. This model has been used to analyze the traffic impacts of the Knik Arm bridge project as well as the Highway-to-Highway project in downtown Anchorage and various Wasilla Bypass alternative corridors.

The model generates traffic volumes based on socio-economic background data such as population, income level, employment in various work sectors, and school enrollment, as well as a number of special generators such as hotels and airports.

The results of the model were used as a baseline for recommendations and for judging project impacts.

Figure 1 on page 4 presents a diagram of the City of Houston with 2035 AADTs for key roadways taken from the TDM.

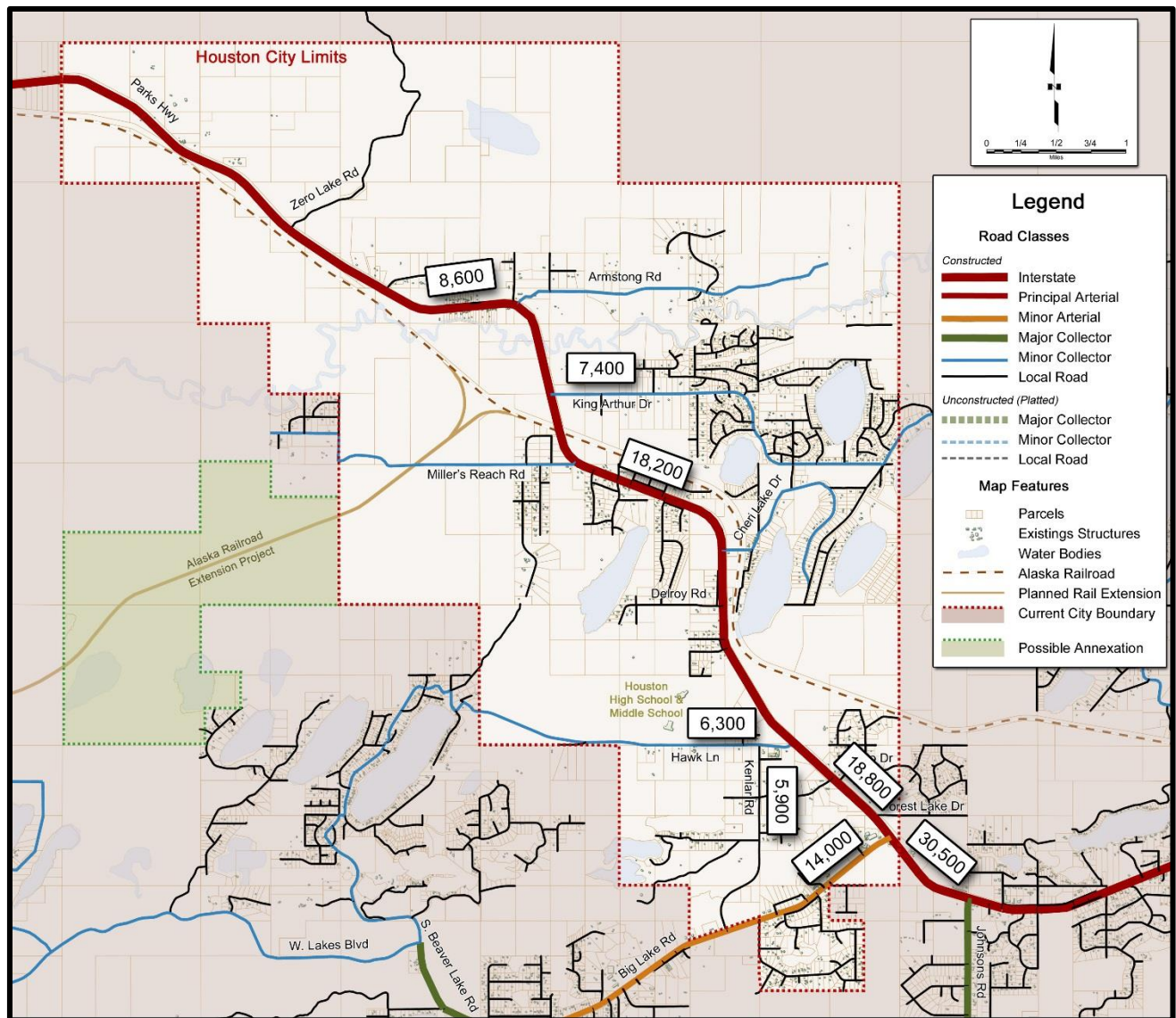


Figure 1 - Projected 2035 Demand Volumes

Note that the above figure shows a planned extension of the Alaska Railroad (ARR) which would link to the existing rail line within Houston city limits.

4 Performance Estimates

One key concern which has arisen from this analysis is the potential 2035 traffic volumes between Big Lake Road and King Arthur Road. These volumes were presented earlier in Figure 1 above. The travel demand model used in this analysis indicates that the volumes north of Big Lake will grow to about 18,500 AADT in the horizon year. Currently these road segments carry 7,000 AADT. This increase is partially a result of the inclusion of the proposed Knik Arm Bridge and Wasilla Bypass Road alternatives in the TDM which would pull additional traffic from Anchorage and Wasilla to attractions in Houston and north on the Parks.

KE used planning level screening analysis to estimate the performance of the existing Parks Highway in this area (a 2-lane undivided rural road). The approximate capacity of the Parks Highway through Houston is 16,500 AADT to achieve a level of service of “D”, which is the limit of what is recommended by the American Association of State Highway and Transportation Officials. The projected volumes would be at or above this approximate capacity threshold, which suggests that if growth occurs in accordance with the TDM it will likely result in congestion on the Parks Highway between Big Lake Road and King Arthur Road.

Note these projected volumes are equivalent to the traffic volumes currently traveling along segments farther east on the Parks Highway (such as between Vine Street and Pittman Road). As traffic volumes grow over time, congestion and safety concerns similar to current conditions on the Parks Highway MP 44-52 are likely.

5 Future Projects

Several planned and future capital projects are included in the scope of this study. These projects include the Parks Highway MP 44-52 Upgrade, the Alaska Railroad Port MacKenzie Rail Extension, and a Port MacKenzie to Parks Highway roadway corridor.

The scope of this study includes the recent annexation of Knikatu/CIRI lands into the City of Houston along the route of the planned rail extension, as shown in green in Figure 1.

5.1 Project 1 – Parks Highway MP 44-52 Upgrade Phase 3

The Parks Highway MP 44-52 Upgrade Phase 3 project is the third and final phase of an ADOT&PF central region project that is currently in final design with planned construction completion in 2017. The entire project extends from Lucus Road to Big Lake Road. Phase 3 of the project is the section from Pittman Road to Big Lake Road, entering the city limits of Houston.

The project will expand the existing 2-lane Parks Highway facility to a full 4-lane divided facility from Wasilla west to Big Lake Road. The main goal of the project is to improve safety along the corridor which historically has had a high rate of severe crashes. The project would also alleviate congestion by increasing estimated segment AADT capacity from approximately 16,500 to 33,000 vehicles per day (vpd). This would result in faster and more consistent trips between Houston or Big Lake and the city of Wasilla, which would impact the economic development in these communities. Additionally, the project would include frontage roads and additional signals, which could also affect the economic development along the corridor.

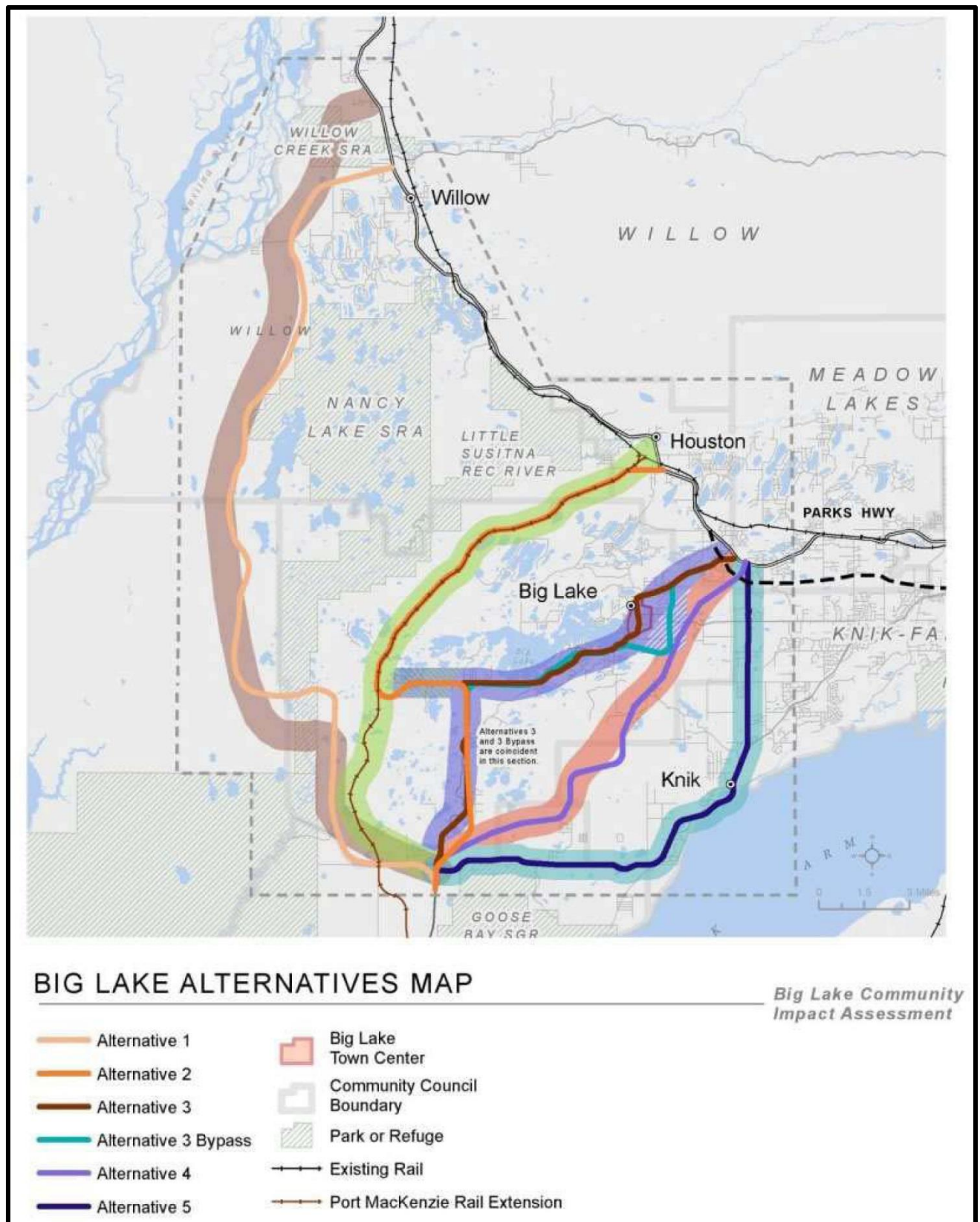
Due to the scheduled completion date of this project, it is already included in the base traffic volume forecast.

Likely effects of the Parks Highway upgrade include an increase in the number of recreational trips to the City of Houston from Wasilla and surrounding communities; however, local traffic growth as a result of population increases is expected to continue at a steady pace.

5.2 Project 2 – Port MacKenzie to Parks Highway Roadway Corridor

This proposed project would construct a more direct route from Point MacKenzie to the Parks Highway. Various routes have been considered in conjunction with the 2003 Matanuska Susitna Borough Rail Corridor Study, the 2007 Port MacKenzie Rail Corridor Study and the Big Lake Community Impact Assessment in 2013. Figure 2 on page 7 shows the alternatives studied in the more recent Big Lake study, conducted by the Matanuska Susitna Borough.





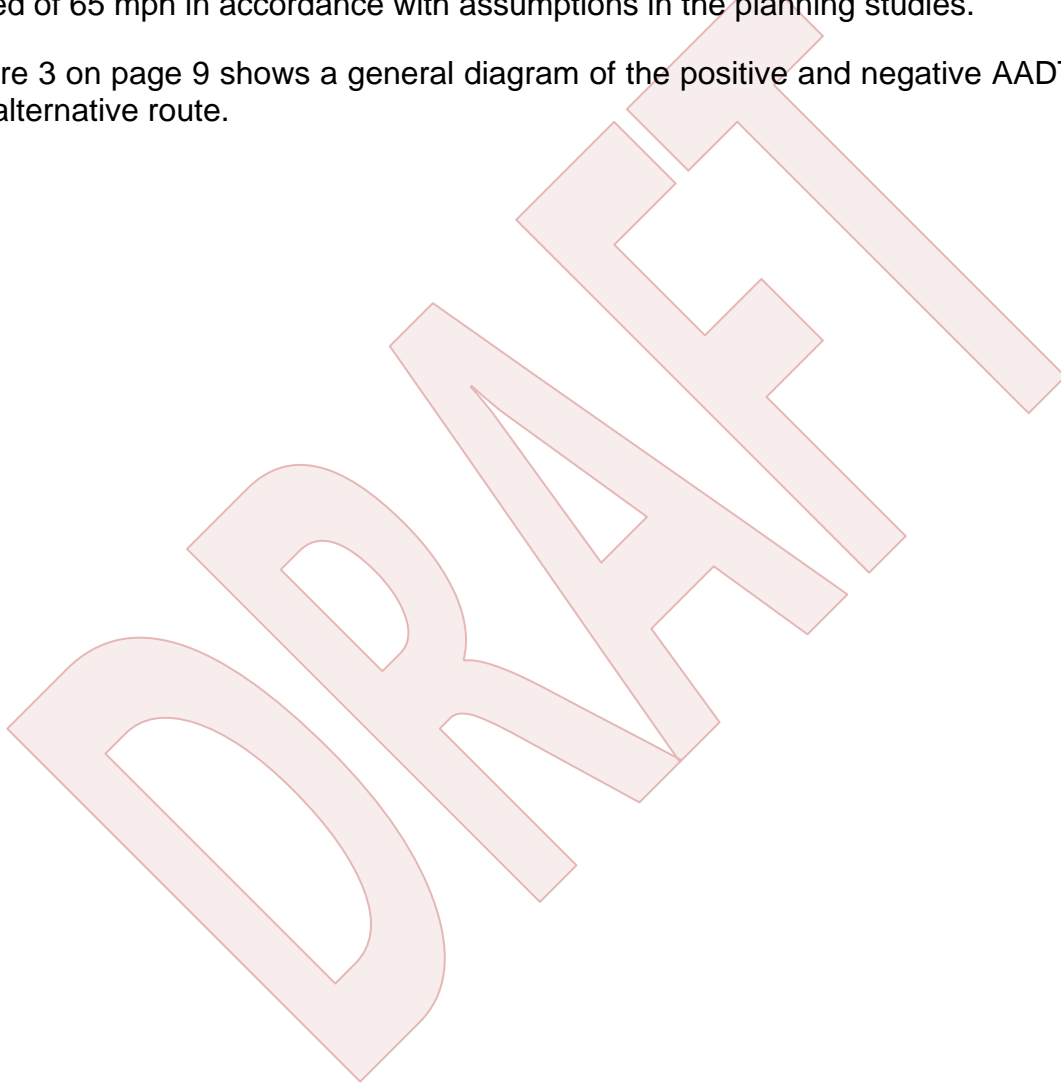
Source: Big Lake Community Impact Assessment, 2013

Figure 2 - Port Mackenzie to Parks Highway Road Alternatives Map

The only alternative that falls within the City of Houston is Alternative 2 which would run north from the port along the section line currently occupied by Purinton Road until it reaches Burma Road. At this point it would travel west on Burma and intersect the railroad extension and would parallel the railroad tracks north to Houston. It would access the Parks Highway at or around the Millers Reach Road intersection.

The expected traffic impacts were assessed using two different versions of the travel demand model. One with the currently planned road network and a second with the alternative road segments included. The road section is modeled as a 2-lane undivided road with a design speed of 65 mph in accordance with assumptions in the planning studies.

Figure 3 on page 9 shows a general diagram of the positive and negative AADT impacts of the alternative route.



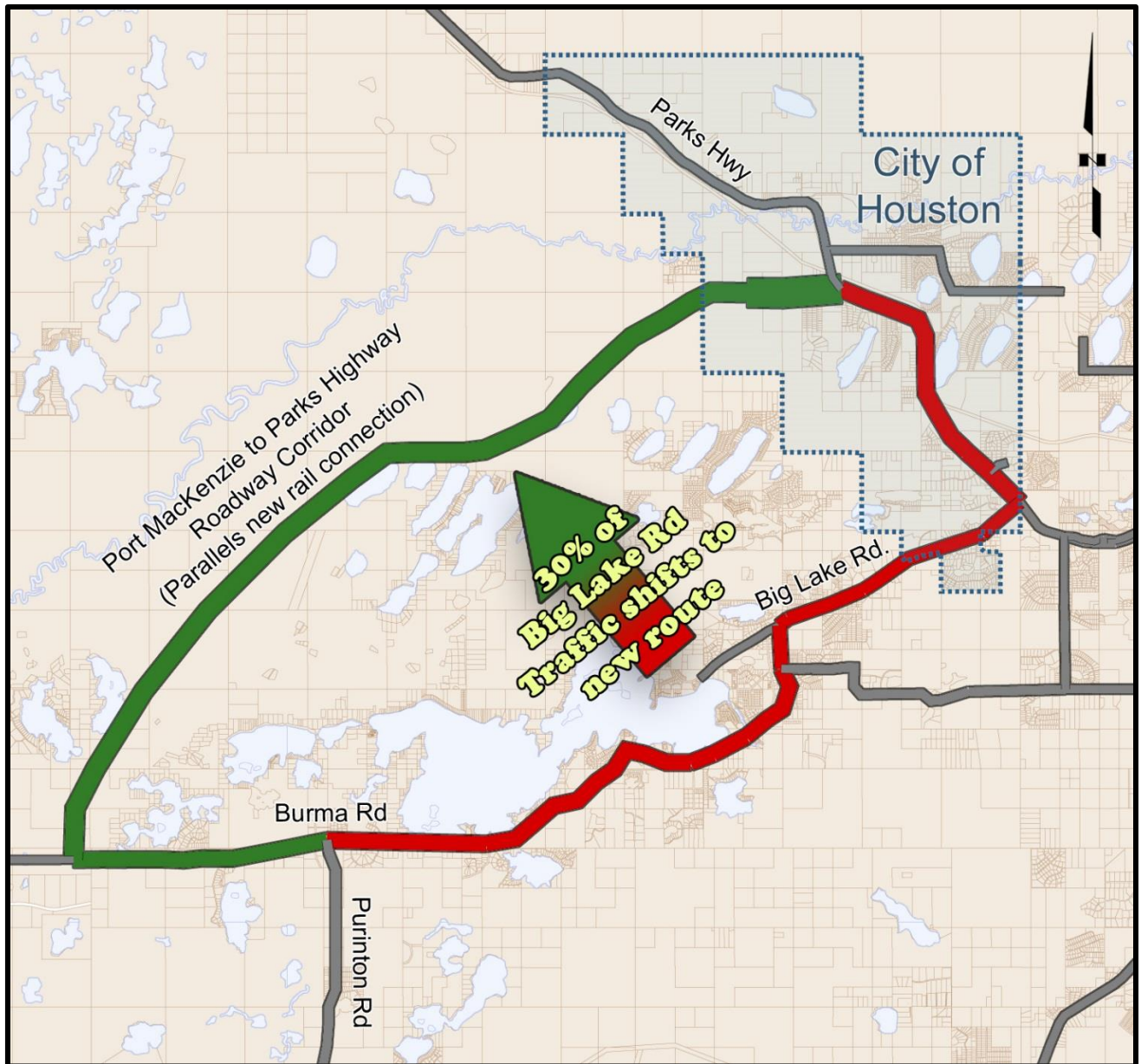


Figure 3 - Traffic Impacts of Road Extension

Note that the traffic impacts would not be highly significant when compared to the current system. The existing distance from Millers Reach Road to the intersection of Purinton and Burma is approximately 15 miles via Big Lake Road. The alternative corridor between these same two points would be approximately 16 miles. Therefore, the benefit for travel would be exclusively based on the fact that the new route would have a design speed of 65 mph, compared to Big Lake Road which is currently posted at 55 mph, the reduced turbulence of adjacent access along Big Lake Road, and the avoidance of existing and future traffic signals or roundabouts in Big Lake.

Likely effects of a new and improved route between Port MacKenzie and Houston include a shift of traffic volumes from Big Lake to Houston of about 4,000 vehicles per day, which is approximately 30% of projected daily traffic on Big Lake Road. A large percentage of

the heavy vehicle trips on Big Lake Road would be included in this shifted traffic, particularly after the construction of the Knik Arm Bridge. The decrease in travel time using the new route, if the travel speed is 65 mph, is approximately 5 minutes, considering side street friction and intersection delay due to signals and roundabouts.

5.3 Project 3 – Port MacKenzie Rail Extension

The Alaska Railroad has begun construction on a 32-mile rail line from Port MacKenzie to connect with the existing ARR line within the City of Houston. The location of the planned rail line was shown previously in Figure 1 on page 4.

The ARR does not currently have any plans to construct facilities or base any operations at the new railroad junction in Houston. Therefore direct socioeconomic impacts (and therefore traffic impacts) due to the rail line project alone are considered to be minimal.

The ARR has expressed willingness to accommodate loading facilities at the junction for private development. The potential passenger car traffic associated with operations such as this would be minimal compared to overall traffic. However, this may have a considerable impact on the percentage of trucks in the local road network.

One scenario currently being considered would use the rail junction as a loading site for material currently being driven by truck north from Big Lake to Fairbanks. Therefore, trips that currently exist on Big Lake Road and the Parks Highway through Houston, would now be turning in and out of a railroad access point at or near Millers Reach Road. Likely accommodations for these truck traffic maneuvers would involve constructing turn lanes to remove the trucks from the travel lanes on the Parks Highway and providing adequate sight distance for trucks leaving the access road to enter the Parks Highway. The existing intersection of Millers Reach Road and the Parks Highway does not meet these characteristics, as it is on the outside of a curve and has no additional turn lanes.

6 Recommendations

The following are general traffic-related observations and recommendations for the City of Houston.

6.1 Functional Classifications

The current traffic volumes on roads outside the Parks Highway corridor are currently at the level of local roads regardless of their planned functional classification. Although several roads are currently classified as “Minor Collectors” they have not yet matured to the point where this function is critical to maintain. Volume projections indicate that in the future, a properly designed and well maintained collector road network will be essential. The current functional classifications of roads were shown previously in Figure 1 on page 4.

It is recommended that the “minor collector” road network in the City of Houston should be preserved. Property driveways should access local roads when possible instead of collector roads and new local roads should be constructed with adequate spacing from adjacent roads to accommodate possible future turn lanes. Additionally, local roads accessing on opposite sides of a collector should be aligned directly across from each other to eliminate offset

intersections. Consideration should be made to possible future right-of-way needs around minor collectors in case these roads ever need to be widened for turn lanes or pathways, particularly in areas around intersections.

6.2 Access Management

Access management will likely become a growing concern as traffic volumes on the Parks Highway continue to increase. The TDM indicates that the majority of growth on the Parks Highway would be local to Houston, rather than being related to pass-through traffic continuing north toward Fairbanks. This suggests that there will be a higher percentage of turning traffic on and off the highway.

One method of accommodating this increase in turning traffic is to encourage turns at safe, logical locations throughout the corridor. This means limiting the number of intersections with the Parks Highway, and relocating trips to consolidated intersections through the use of parallel connections and frontage roads. Specifically, frontage roads are recommended in the existing commercial zone south of Armstrong Road where linked parking lots currently operate as a de facto frontage road.

If the traffic volumes do increase to the level indicated in the 2035 model, a 4-lane divided highway would likely be necessary with access points at a minimum of ½ mile increments. It is recommended that the City of Houston plan for these access points, encouraging development patterns that would reduce the impact and cost of construction for a 4-lane divided highway.

6.3 Pedestrian Crossings

In connection with the consolidation of turning traffic, consideration should also be made concerning the desired location for pedestrian crossings of the Parks Highway. As residential development continues to grow north of the Parks Highway, along King Arthur Road and Armstrong Road, commercial development is expected to increase adjacent to the highway. The major commercial developments currently are on the south side of the highway, and new commercial development is likely to expand out from this established location. This development creates a conflict as pedestrians make home based commercial trips which require crossing the Parks Highway.

Safer crossings could be encouraged through construction and proper maintenance of surrounding trail networks which would direct the flow of walking, biking and motorized pedestrians to reduced speed areas of the Parks Highway or to access points that might be signalized in the future.