Non-Code Ordinance

By: Public Works Department
Introduced: February 24, 2014
Public Hearing: March 24, 2014
Adopted: March 24, 2014
Vote: Buswell, Harris, O'Barr, Sullivan-Leonard and Wilson in favor
Wall opposed

City of Wasilla
Ordinance Serial No. 14-13

An ordinance of the Wasilla City Council amending the transportation chapter of the 2011 City of Wasilla Comprehensive Plan to add design standards and the use of context sensitive solutions for the construction and/or upgrade of roads and highways within the city limits and requesting approval from the Matanuska-Susitna Borough Planning Commission and Assembly as required by AS 29.40.010(b) and MSB 17.45.020.

Section 1. Classification. This is a non-code ordinance.

Section 2. Purpose. To further define the transportation goals, objectives, and actions in the City's Comprehensive Plan to use context sensitive solutions for the construction and/or upgrade of roads and highways within the city limits.

Section 3. Adoption of the amended transportation chapter of the 2011 City of Wasilla Comprehensive Plan. The amended transportation chapter of the 2011 City of Wasilla Comprehensive Plan as contained in Exhibit A of this ordinance, is hereby adopted.

Section 4. Submission to the Matanuska-Susitna Borough. The Mayor shall submit the amended transportation chapter of the 2011 City of Wasilla Comprehensive Plan adopted as part of this ordinance to the Matanuska-Susitna Borough for approval by the Borough Planning Commission and Assembly as required by AS 29.40.010(b) and MSB 17.45.020.

Section 5. Effective date. Sections 3 and 4 of this ordinance shall be effective upon the effective date of the Matanuska-Susitna Borough Assembly ordinance approving the amended transportation chapter of the 2011 City of Wasilla Comprehensive Plan. The remaining sections of this ordinance shall take effect upon adoption by the Wasilla City Council.

ADOPTED by the Wasilla City Council on March 24, 2014.

VERNE E. RUPRIGHT, Mayor

ATTEST:

KRISTIE SMITHERS, MMC, City Clerk

[SEAL]

WASILLA
• ALASKA •

CITY COUNCIL LEGISLATION STAFF REPORT

Ordinance Serial No. 14-13: Amending the transportation chapter of the 2011 City of Wasilla Comprehensive Plan to add design standards and the use of context sensitive solutions for the construction and/or upgrade of roads and highways within the city limits and requesting approval from the Matanuska-Susitna Borough Planning Commission and Assembly as required by AS 29.40.010(b) and MSB 17.45.020.

Originator: Public Works Director
Date: February 10, 2014 Agenda of: February 24, 2014

Route to:	Department Head	Signature	Date
X	Public Works Director		2/10/14
X	Finance Director		2/11/14
X	Deputy Administrator		2/14/14
X	City Clerk		2/11/14

Reviewed by Mayor Verne E. Rupright:

Fiscal Impact: ☒ no
Account name/number:

Attachments: Planning Commission Resolution Serial No. 14-01 w/Exhibit "A" (4 pages)
Knik-Goose Bay Road Planning Papers by Gary Toth (17 pages)

Summary Statement: This ordinance is proposed to amend the transportation chapter of the 2011 City of Wasilla Comprehensive Plan to add design standards and the use of context sensitive solutions for the roads and highways within the city. The administration has been working with transportation planning consultants over the last year to further define transportation goals, objectives and actions that can be incorporated into the City's Comprehensive Plan to help plan and design the City's road and highway network into the future that is in keeping with the overall goals and objectives of the City.

Exhibit "A" adds language to the transportation chapter of the 2011 Comprehensive Plan that has been approved by the Planning Commission that further defines goals, objectives and actions for road and highway improvements in the future.

Recommended Action: Adopt Ordinance Serial No. 14-13.

By: Planning
Public Hearing: 02/04/14
Adopted: 02/04/14

WASILLA PLANNING COMMISSION
RESOLUTION SERIAL NO. 14-01

A RESOLUTION OF THE WASILLA PLANNING COMMISSION RECOMMENDING THAT THE WASILLA CITY COUNCIL AMEND THE TRANSPORTATION CHAPTER OF THE 2011 CITY OF WASILLA COMPREHENSIVE PLAN TO ADD DESIGN STANDARDS AND THE USE OF CONTEXT SENSITIVE SOLUTIONS FOR CONSTRUCTION AND/OR UPGRADES OF ROADS AND HIGHWAYS WITHIN THE CITY LIMITS.

WHEREAS, the City of Wasilla is the commercial center for the Matanuska-Susitna Borough; and

WHEREAS, the demands on the City's road networks are intensifying; and

WHEREAS, the Parks Highway, Palmer-Wasilla Highway, Knik-Goose Bay Road, and Main Street are state roads and serve as major corridors entering into and through the city limits; and

WHEREAS, the State of Alaska Department of Transportation has classified these roads as principal arterials that are now part of the National Highway System and are required to meet standards for higher mobility and lower degrees of access by the Department of Transportation; and

WHEREAS, where these roads enter the city limits, the city desires to find a balance between mobility and access that supports commercial development and residential access; and

WHEREAS, the Parks Highway Alternate Corridor is designated as a priority project for the City of Wasilla and it is where the high degree of mobility needs to be focused; and

WHEREAS, the City of Wasilla is committed to establishing a network of local roads and joined accesses between developments to promote secondary routes and reduce the need to expand arterials in the city limits; and

WHEREAS, to meet a balance between mobility and access the City is willing to accept some levels of congestion during peak hours such that principal arterials can be designed to a Level of Service "E" with a design speed of 35 mph.

NOW, THEREFORE, BE IT RESOLVED, that the Wasilla Planning Commission hereby recommends that the Wasilla City Council amend the transportation chapter of the 2011 City of Wasilla Comprehensive Plan as follows:

EXHIBIT A

Chapter 3. Transportation

3.3 Goals, Objectives, and Actions

Goal 1. Provide for streets and highways that promote mobility, connectivity and access for both present and future users <u>while utilizing context sensitive solutions for roadway and highway design</u>.

Objectives	Actions
1.4 Improve the City's road system to meet projected growth.	1.4.1 Continue efforts to locate, design, and maintain roads based on their function and the community needs. <u>1.4.2 Promote the development of secondary roads to establish a network of local roads to reduce the need to expand arterials.</u> <u>1.4.3 Continue to support the Parks Highway Alternative Corridor project as the primary route to move traffic through the City.</u>

Goal 2. Provide a streets and highway network that supports economic development and growth.

Objectives	Actions
2.1 Create regulations that protect and improve the traffic flows on highways and arterials<u> that integrate environmental and community values in the transportation decisions at an early point in planning, and continue through project design.</u>	2.1.1 Promote access management along collector and arterial roadways<u>, as appropriate and where secondary access is available or planned</u>. 2.1.2 Reserve sufficient room for major future roadway upgrades along collector and larger roads when developing new roads <u>to allow for the use of context sensitive solutions in the roadway design.</u> 2.1.3 Revise right-of-way reservation requirements in City Land Development Code to accommodate four lanes or more<u> for the Parks Highway Alternative Corridor Project.</u> 2.1.4 Require new commercial developments to provide connectivity with adjoining commercial uses.

EXHIBIT A

	2.1.5 Require new residential developments to provide connectivity with adjoining neighborhoods. 2.1.6 Require arterials to be designed with a Level of Service "E" where some congestion is acceptable during peak hours or as approved by the Planning Commission for a specific project. 2.1.7 Require arterials to be designed with a speed limit of 35; and 25 mph when in downtown along the Main Street Couplet or as approved by the Planning Commission for a specific project. 2.1.8 Consider the use of roundabouts when planning improvements to roads and highways.

APPROVED by the Wasilla Planning Commission on February 4, 2014.

APPROVED:

Glenda Ledford, Chairman

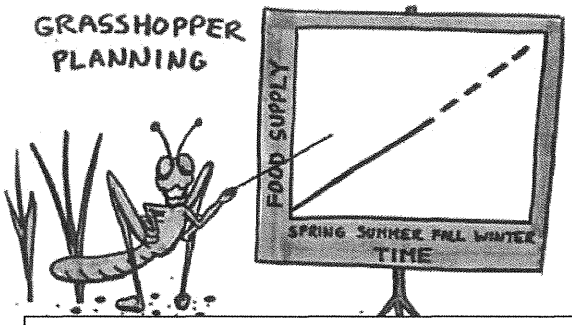
ATTEST:

Tina Crawford, AICP, City Planner
for

Growth Assumptions used to scope Knik Goose Bay (KGB) Road
Gary Toth
January 27, 2012

There are two fundamental parameters that Alaska DOT is using to set the framework for evaluating alternatives under consideration for KGB Road: traffic volumes projected for the year 2035, and selection of Level of Service C are the target for determining when roadway capacity is exceeded. This paper focuses on the first.

According to both Alaska DOT's FAQ page for the KGB reconstruction and a presentation made by Gerry Welsh on December 11, 2012, the projected 2035 volumes for KGB road were calculated taking current volumes and growing them at 2.7% a year every year until 2035. The FAQ indicates that: *"The Department is operating on the assumption that the historic rate of traffic growth of 2.7% (average traffic growth rate over the past two decades) will continue. This rate is consistent with the LRTP's model."* This assumption is put out there nonchalantly, and not a word of qualification is presented. It is as if it is a given that just because traffic has growth in Mat-Su Borough has grown at a rate of 2.7% over the last 20 years, that it will continued to do so for at least the next 25 years. But what reason do we have to believe that it will?



Some folks call simply extending historical growth rates into the future to size roads "Grasshopper Planning". In this analogy, the grasshopper, born in the spring, finds that its food supply continues to growth as it does. In the summer, it assumes that this trend will continue indefinitely and makes no plans for adaptation necessitated by the limiting factors brought on by winter.

Graphic courtesy of Ian Lockwood, AECOM

Yet nationally, vehicle miles traveled (VMT) have been declining since 2006. In fact, Alaska DOT reports decreases in statewide VMT in 4 of the 6 years since 2006. Overall Alaska's VMT is 1.37% less in 2011 than in 2005. I couldn't find statistics for Mat-Su, but data collected by the Texas Transportation Institute (they have been doing this since 1982) reveals that VMT for the Anchorage Region (which includes Mat-Su) has dropped almost 8% or 1.5% a year since 2005, after growing at a rate of almost 11% a year from 1982 to 2005. Since the population of the Anchorage Metropolitan area has grown at 8.5% a year since 2005, clearly some sort of limiting factors are setting in.

This downtown has even caught USDOT by surprise. In 2006, it predicted a VMT growth of between 2% and 2.5% nationally. Many transportation insiders now predict that this reversal – while not expected to continue to descrease annually ever year over the next 25 years, will drop substantially below the historical trend of 2.5% or more. While many are still debating the extent and length of this new downward trend, there are a number of limiting factors coming to light that should cause transportation and community officials to seriously reconsider simply assuming the continuation of robust growth rates of the last 20 to 40 years. The examples of new demographic, economic and

transportation trends are from The Case for Moderate Growth in Vehicle Miles of Travel: A Critical Juncture in U.S. Travel Behavior Trends, prepared for the USDOT by the Center for Urban Transportation Research, University of South Florida, April 2006.

- Stabilizing average household size following decades of declines,
- Stabilizing female labor force participation rates following decades of increases,
- Stabilizing female share of licensed drivers following decades of increases,
- Stabilizing share of zero-vehicle households following decades of decreases,
- Transition of the baby boom population bubble through their peak travel years.
- Stabilizing or declining average travel speed following years of increases,
- A change from declining to modest increases in vehicle travel cost
- Stabilizing public transit mode shares following decades of declines,
- Stabilizing auto occupancies following decades of declines,
- Renewed interest of Generation X and Y in living in walkable urban areas; less interest in travel by and owning a car.

Why this is so relevant to the KGB project?

Alaska DOT has divided KGB Road into five sections for the sake of traffic analysis. At a 2.7% growth rate, even under the 4 lane divided alternative, three of those five sections reach LOS E by the year 2034. See table below:

2.7% Growth Rate	**2015**	**2020**	**2025**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Vine Road to Fairview loop road	**15100**	**17252**	**19710**	**22518**	**23126**	**23751**	**24392**	**25050**	**25727**
Fairview Loop Rd to Edlund Road	**18400**	**21022**	**24017**	**27439**	**28180**	**28941**	**29723**	**30525**	**31349**
Edlund Road to Fern St	**19900**	**22736**	**25975**	**29676**	**30478**	**31300**	**32146**	**33013**	**33905**
Fern St to P/W Highway	**21000**	**23992**	**27411**	**31317**	**32162**	**33031**	**33922**	**34838**	**35779**

Green numbers mean the volumes remain within Level of Service C
Orange numbers mean the volumes fall within the range for Level of Service D
Red numbers mean the volumes are in the Level of Service E range

If however, the growth rate is simply reduced to half, or 1.35%, none of the sections of KGB Road reach LOS E at any time during the period leading up to the 2035 design year.

1.35% Growth Rate	**2015**	**2020**	**2025**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Vine Road to Fairview loop road	**15100**	**16147**	**17267**	**18464**	**18714**	**18966**	**19222**	**19482**	**19745**
Fairview Loop Rd to Edlund Road	**18400**	**19676**	**21040**	**22500**	**22803**	**23111**	**23423**	**23739**	**24060**
Edlund Road to Fern St	**19900**	**21280**	**22756**	**24334**	**24662**	**24995**	**25333**	**25675**	**26021**
Fern St to P/W Highway	**21000**	**22456**	**24014**	**25679**	**26026**	**26377**	**26733**	**27094**	**27460**

Conclusion

Due to the major ramifications to the City of Wasilla that the alternative chosen will have, and the cost ramifications of a 6 lane road designed to 55 mph posted and likely 65 mph design speed, Alaska DOT owes it to the City and to all Alaskans to make sure that they are using growth rates that are not overkill.

Appendix A to Growth Paper
Alaska DOT reporting of VMT growth rates since 1986

State of Alaska VMT growth rates *	
2011	-4.27
2010	-2.71
2009	1.38
2008	-5.01
2007	3.72
2006	-1.33
2005	0.9
2004	0.97
2003	0.73
2002	1.92
2001	2.29
2000	1.42
1999	4.4
1998	7.02
1997	-2.43
1996	2.35
1995	-0.66
1994	5.25
1993	1.96
1992	-4.66
1991	2.74
1990	0.61
1989	1.18
1988	-1.54
1987	-2.77
1986	-0.05

Average Annual Growth Rate 1985 to 2005 = 1.08%
Average Annual Growth Rate 2006 to 2011 = -1.37%

Appendix B to Growth Paper
Growth in VMT on Anchorage + Mat-Su Borough Metro Area Freeways

	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1990	1982
Urban Area Population (1000s)	304	297	290	290	285	280	280	275	270	265	260	235	220
VMT Freeways	1421	1414	1465	1560	1520	1535	1505	1520	1495	1455	1430	1045	800
VMT Arterials	2065	2055	2130	2220	2240	2240	2250	2240	2220	2190	2125	1900	1700
VMT Arterials plus Freeways	3486	3469	3595	3780	3760	3775	3755	3760	3715	3645	3555	2945	2500
Growth Rate from previous year	0.49	-3.50	-4.89	0.53	-0.40	0.53	-0.13	1.21	1.92	2.53	2.07	1.47	

Annual VMT Growth Rate 2006 to 2010 = -1.77%
Annual VMT Growth Rate 1982 to 2005 = 10.7%

Why is Knik Goose Bay (KGB) Road being designed to high posted and design speeds?

Gary Toth

January 27, 2012

KGB Road is being predominately designed to allow posting of the speed limit to be 55 mph. This means that the design speed is likely 65 mph. What are the pros and cons of such a high speed?

KGB is classed as a major arterial. As ADOT points out (KGB FAQ page): *"KGB is the only north-south route, existing or planned, providing access the undeveloped lands southwest of Wasilla and at Point Mackenzie. DOT and local plans recognize the importance of preserving KGB Road as a high functioning arterial route."* Later it points out that the primary purpose of the project is to "help ease movement in the area and to address the alarming fatality and injury rate". With this as the sole performance metric, is it understandable why ADOT reached the conclusion that a high speed forgiving highway that is wide and straight with wide clear zones is needed. But in this paper, I want to dig beneath the surface to evaluate whether there are alternatives not yet being considered that better meet transportation goals and do so more sustainably. Whether the project goals should be broaden to meet community, not just mobility goals is the topic of another paper.

Does the high design speed address the high crash rate? Actually, a case could be made that the opposite is true. The Insurance Institute for Highway Safety states that: *"The overwhelming majority of evidence suggests that reductions in speed limits reduce vehicle speeds and crashes; increases in speed limits increase speed, as well as crashes* ***(Relation of Speed and Speed Limits to Crashes, Dr. Susan Ferguson*** *Insurance Institute for Highway Safety)".*

Research synthesized by FHWA (FHWA Publication Number: FHWA-RD-98-154 Date: July 1998) on the effects of lowering or raising speed limits on the incidence and severity of crashes reveals that:

- In eight studies related to lowering speed limits, universally the crash or fatality rate went down, generally in the 20% range
- In 9 of 11 studies related to raising speed limits, crash rates and fatal crashes went up

The Institute for Road Safety Research, the Netherlands has found: *"The higher the collision speed, the more serious the consequences in terms of injury and material damage. This is a law of physics. The faster a car is driven, the higher the risk of being involved in a crash. This is partly due to the longer braking distance and partly to the fact that the human being is limited in its capacity to process information and act on it."*

In the case of KGB Road, 22 of the 29 fatal accidents involved either head on collisions or vehicles leaving the travelled way and entering a ditch or hitting an embankment. Wider clear zones and non traversable medians will be a huge help in reducing these types of crashes and are a good send. But this could be accomplished on a road posted

for 45 mph and maybe even 35 mph. Designing the road to be posted at 55 mph has no role in addressing safety and in fact, could partially negate the safety benefits. Design the road to feel safe at 65 mph (the likely design speed) and drivers will drive faster.

This in fact is exactly what Pennsylvania DOT learned when it analyzed 20 projects advanced as "Safety projects" from 2000 to 2006. When it analyzed these projects – ones that widened clears zones, installed medians and barriers and flattened curves – it learned that the crash rate went up on half of those projects. Why? Because drivers went faster. The lessons learned by PennDOT was that wider, straighter and faster was generally safer on freeways, but on roads with intersections and driveways, more thought needed to be given before applying the tried and true approach of increasing design speeds. The presence of many intersections and driveways on KGB Road suggests lower desired operating speeds.

How would ADOT lower desired operating speeds while still using non traversable medians and wider clear zones? The best way would be by installing roundabouts at the 12 locations identified as possible new signal installations on their December 2012 Concept Plan, as well as the three existing signal locations at Vine Road, Fairview Loop Road and Palmer Wasilla Highway. These intersections are located from 1200 to 3200 feet apart, with an intersection spacing almost exclusively in the ¼ to ½ mile range. This would create a nice cadence and help control speeds, particularly if combined with other context sensitive design elements. As pointed out in my companion paper, use of Roundabouts is now supported if not fostered by ADOT.

Are the safety problems on KGB Road related to the lack of capacity?

On their FAQ page, ADOT says that KGB Road is over capacity and is experiencing high numbers of capacity-related crashes. I suspect that this is just a semantic issue, but we need to find out why ADOT thinks the high crash rate is related to lack of roadway capacity, which is measured by the number of lanes, intersection designs, roadway geometry and presence/absence of things like driveways.

It would appear that the majority of major injury and fatal crashes -- head on collisons and the off road into ditches crashes -- do not need extra lanes to be resolved, but rather a center barrier or non traversable median in the center, and guiderail or a wider clear zone on the outside. Looking over the crash reports, a preponderance of the crashes are alcohol/drug or sleep related. Not only does the current lane configuration not seem to be the cause of those crashes, it is reasonable to assume that most of these occurred during off peak period or at night where volumes were low and lane capacity would not be a problem. In fact, the high level of service during those periods (along with the alcohol and the drugs) probably explains why speed was listed as a factor in over 40% of the fatalities.

Now this may seem like I am splitting hairs, but to properly test the various alternatives, we need to separate the specific design elements from the problems that are designed to solve. If the difference between 2, 4 or 6 lane configurations is not a factor in safety,

then we need to understand that. Dealing with fatalities and serious injuries that are ridiculously high is imperative. When a state DOT portrays alternatives as need to stop the carnage, it is making politically difficult if not impossible for communities and citizens to make the case for lesser designs. Communities and state DOTs have much more maneuvability in deciding whether to accept Level of Service E or even F. This is particularly true when one considers that even at its current two lanes, KGB road is not "over capacity" all day, but likely for one or two peak hours a day. See the paper on Level of Service and acceptance of congestion for more discussion.

Will high design speeds get people around Wasilla faster?

Conventional wisdom suggests that the faster we post the speed limit on a roadway, the faster people can get around. But as Steven Levitt suggested in his book Freakonomics, conventional wisdom is everywhere, and much of it is wrong.

EXHIBIT 7-3. CONDITIONS AT TRAFFIC INTERRUPTION IN AN APPROACH LANE OF A SIGNALIZED INTERSECTION

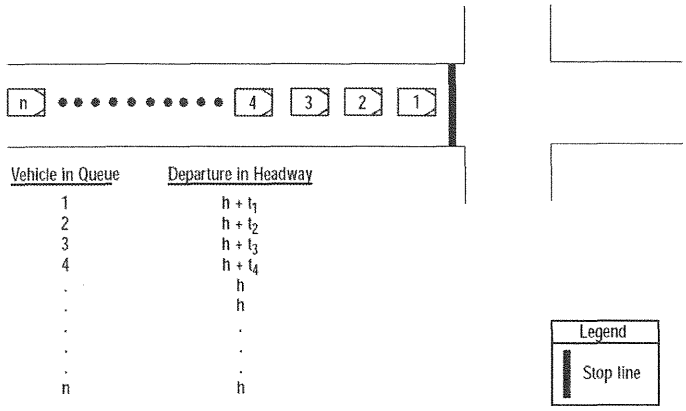


Figure 7.3, Highway Capacity Manual depicting an algorithm for estimating delay at signals based on number of queued cars.

Street designers automatically assume that they can get motorists from point A to point B faster by increasing speeds. This usually works on Freeways, which don't have traffic lights and adjacent land uses. It only works to a point on arterials, where lack of green time and the need to get back up to speed generally limits travel to within the 35 to 45 mph range. At higher speeds, cars begin to pile up at signals, and the longer the queue, the longer it takes to unload the intersection. The Highway Capacity Manual includes a section on how to calculate this effect.

Doug MacDonald, former Secretary of Washington State DOT, developed a video that helps explain the phenoma of how slowing down the rate of cars reaching bottlenecks can actually enhance through travel times. See http://www.youtube.com/watch?v=8G7ViTTuwno

Conclusions: The safety problems which are a key issue that needs to be addressed by the KGB project do not need high posted and design speeds to solve. In fact, slowing down the target operating speed to 45 mph and even 35 mph in areas where adjacent land use is expected or already is present in moderate to high density would likely reduce projected crash rates even further. This would be even more enhanced by substituting roundabouts for the 15 existing and potential traffic signals with the project limits. Furthermore, designing the road to allow vehicles to operate at 55 mph will likely lead to higher vehicle queues at signals, effectively reducing the throughput operating speed of

the roadway to 45 mph or less anyway. Therefore, why not reduce the design philosophy to foster a roadway that operates at a more steady 35 to 45 mph flow, thereby reducing costs, enhancing safety, reducing the barrier effect on Wasilla and fostering Context Sensitive street that will support all modes?

What are the appropriate Level of Service Targets for KGB Road and should the project goals be expanded to include community based measures?

Gary Toth

January 27, 2012

In his December 27, 2012 letter to ADOT, Mayor Rupert requests KGB Road project manager Gerry Welsh to reduce the design level of service from C to D for the project. The December 11, 2012 presentation given by Welsh sets the pass fail threshold at LOS D. It's not clear whether this ADOT construes "failure" at passing from C to D, or whether operating at LOS D is acceptable. Whichever interpretation, I want to suggest in this paper that using either LOS C or D as the ***sole*** metric for sizing KGB Road is in appropriate.

Calculating LOS using daily volumes or peak volumes? First an observation and a point of clarification. On their FAQ page, ADOT says that KGB Road is over capacity and is experiencing high numbers of capacity-related crashes. Interpreting their graphics on pp. 43-45 of the Gerry Welsh 12/11/2012 presentation, it appears that they have set the capacity of KGB Road at an Average Annual Daily traffic of about 16,500. Now this may seem like I am splitting hairs, but the prevailing industry approach is to calculate LOS using peak hour volumes, not daily volumes.

My guess is that ADOT presented the data this way because it is more understandable and less complex to the layman and that no deviousness is involved. What they likely did was either measure the actual peak hour volumes or use something called a "K factor" to calculate the peak hour volume from the daily traffic. I have to make a lot of assumptions here, but if an Average Annual Daily Traffic volume (AADT) of 16,500 is considered to represent the capacity of KGB road, it probably means the K factor for KGB is 15%. Why? Because the suggested capacity of a rural arterial which is relatively flat with decent sight distances is around 2500. Back calculating, I get to 15%. A high K factor like this means a pronounced peak hour volume compared to the rest of the day.

Why is this an important distinction? This is not just a semantical nit picking distinction. If I am right, then KGB Road should not be portrayed as "failing" for the entire day. Instead, it is failing, likely for only an hour or two a day. This is a huge if subtle change in how the public mindset is being shaped by the choice of language and use of technical graphs to support the case for KGB alternatives. In my opinion, a less biased presentation would say something like:

"KGB between Vine Road and Parks Highway has been growing rapidity for ten years, and now has reached the point where it no longer has the capacity to handle peak hour traffic volumes. Given the current absence of alternative routes, this lack of capacity adds several minutes onto the daily commute within Wasilla. Today, this is a nuisance; if traffic continues to grow, even at half the historic 2.7% per year growth rates, this will spread to many hours a day a become a meaningful detriment to the quality of life and economics of the City of Wasilla. To put this into perspective, according to Google Maps, it only takes 17 minutes to get from Vine Road in the south part of Wasilla to

Comment [G1]: *(note to Archie and Frank: my yet to be written paper on the importance for Mat-Su, Wasilla and ADOT to fundamentally change how it approaches transportation and land use, street network planning and Complete and Context Sensitive Streets will better inform the language to the left in italics.*

Seldon Road in the north part of Wasilla; to get to Palmer, Google is suggesting 28 minutes. According to ADOT calculations, it is expected that unchecked traffic growth due to business as usual planning and failure to widen KGB road will increase these times to...X...

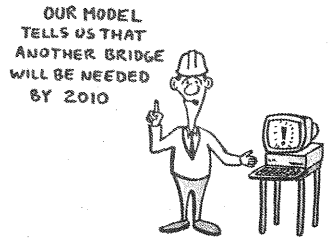
In light of the barrier effect that widening KGB Road will have on current and future quality of life, ADOT is seeking citizen input on whether lower design speeds and acceptance of some level of congestion and erosion of travel times by a few minutes during one or two hours a day. Furthermore, ADOT is exploring with the City of Wasilla and Mat-Su Borough on how changing approaches to future growth, transportation and network connectivity to provide better transportation and Placemaking options so that our citizens won't have to spend increasing portions of their lives in their cars.

There is no FHWA Headquarters mandate to achieve LOS C/D for arterials. It is possible that some folks in the Alaska Division may have taken this position, but the direction is not coming from Headquarters.

Levels of Service (LOS) is a performance metric which flourished during the Interstate and Freeway building era of the 1950s to the 1990s. Engineers decided that LOS C was a good balance between over investing in perfection and underinvesting leading to congestion. In urban areas, an additional concession was made to accept LOS D, which is still commensurate with free flowing traffic albeit within heavy traffic volumes. LOS is commonly – actually almost always – calculated using travel projections for twenty to thirty years into the future.

Using this approach to plan and design the Interstate System of Highways was a no brainer in the 20th Century. In an era where traffic was growing at leaps and bounds, it was prudent to make sure our freeways had enough lane capacity to remain free flowing for at least 20 years after construction.

This logic becomes increasingly less persuasive when applied to arterials with at grade intersections – such as KGB Road -- in urban areas. Unlike interstates and freeways, arterials in Cities are places where pedestrians and bicyclists should be allowed to travel comfortably, and where adjacent properties have rights of access onto the roadway, including driveways. Even if they are major arterials on the state highway system, have multiple purposes. They exist not just to move traffic through the area, but they also serve the homes, businesses and people along them.



Sketch by Ian Lockwood, AECOM

What makes this most troubling is that there are no comprehensive requirements dictating the use of either levels of service or travel modeling in transportation planning and project design. Manuals such as the Association of American State Highway and Transportation Officials (AASHTO) "**A Policy on**

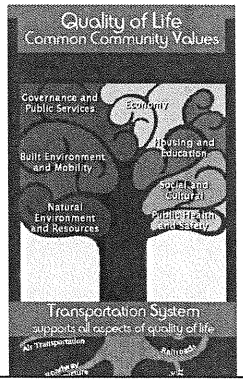
Geometric Design of Highways and Streets" (often called the Green Book) and the Federal Highway Administration's **"Highway Capacity Manual"** clearly state that these are guidelines to be applied with judgement, not mandates. Our transportation profession has self imposed the mandate to do everything possible to avoid any and all traffic congestion. To be fair to ADOT, they have been subjected to many years of much public and political process driven by unhappy motorists pressing them to "do something about that traffic jam on my way back and forth to work". Today, in light of the City of Wasilla new philosophy about fitting roads into its social, land use and economic contexts (as well as the mobility context), it is important that ADOT engage in a collaborative conversation about the tradeoffs between high LOS, high design speeds and community values.

If KGB Road is designed to never drop below LOS D along its entire length, it will function successfully for vehicles during that one or two peak hours, but will be "over-designed" for the other 22 to 23 hours of the day and will always function poorly for the surrounding community. Furthermore, until the forecasted growth materializes, the roadway will be over designed, even during the peak hour. As I noted in my paper on Growth Assumptions, even using the 2.7% Growth Rate and assuming expansion to four lanes, sections of KGB Road will not reach LOS E until 2030. And the section south of Fairview Loop will remain well below LOS E even in 2035.

In the meantime, the abundant capacity in off peak hours will encourage motorists to drive at higher speeds. The history of KGB Road becoming a speedway, will continue, and combined with its new cross section, which will be multiples wider than currently, will make it extremely difficult to cross and unpleasant to walk along. This will degrades public spaces between the edges of the road and the adjacent buildings, discourage walking and biking even for short distances, and generally unravels social fabric and lowers quality of life.

What are the alternative performance metrics? ADOT should use a Context Sensitive Solutions process to work with the City and the Borough to develop a more balanced series of performance metrics. The National Cooperation Research Program – the research arm of FHWA – has produced a comprehensive guidebook on how to do this, called "Going the Distance Together - Context Sensitive Solutions for Better Transportation." This can be downloaded at
http://contextsensitivesolutions.org/content/reading/going_the_distance_together__co/

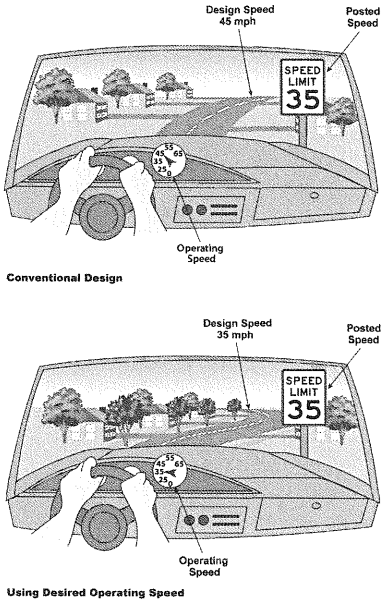
Further guidance on use of performance metrics beyond LOS for automobiles has been developed by the transportation community. In the Smart Transportation Guide http://www.smart-transportation.com/guidebook.html, adopted jointly by the state DOTs in Pennsylvania and New Jersey, the two DOTs direct its designers to consider the tradeoffs between vehicular LOS and "local service". It goes onto say that if the street in question is not critical to regional movements, that LOS E or F could be acceptable and that designers may actually need to design to *slow down cars*. . The Institute of Transportation Engineers also promoted this concept in its landmark Context Sensitive Solutions Guidelines for Urban Thoroughfares actually promote this concept. Florida DOT has adopted Multimodal LOS standards and cities like



Transportation needs to be viewed in ways that go beyond narrow LOS metrics (From the NCHRP Going the Distance Guide

Charlotte, North Carolina, have elevated pedestrian and bicycle LOS to the level of that for automobiles. We have a long way to go, but the door is opening.

Consideration of LOS as a metric should be one of the contexts, but so should community cohesion.



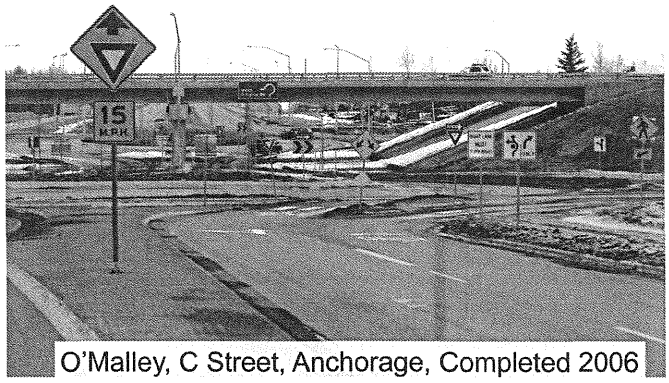
Graphic from the Smart Transportation Guide depicting road design intended to slow down vehicular speeds

Why are Roundabouts not being considered for Knik Goose Bay (KGB) Road?
Gary Toth
January 27, 2012

According to its website, the Alaska Department of Transportation and Public Facilities will soon adopt a "Roundabout First" policy, which will require designers to provide a written justification of any decision to install a traffic signal instead of a single lane roundabout. Installing more single lane roundabouts is one of the action plans in the Alaska Strategic Highway Safety Plan, completed in 2007.

State DOTs with "roundabouts first" policies include New York, Virginia, Washington, Wisconsin and Maryland.

Now it is acknowledged that the alternatives being proposed for KGB road are four lanes and even six lanes. Nonetheless, four lane roundabouts are not an alien concept to Alaska; the four lane dumbbell roundabout serving as ramp termini for the Minnesota Drive/C Street/O'Malley Road interchange (shown to the right, photo downloaded from Alaska DOT Roundabout page) is one of the most progressive examples of roundabout deployment in the US. As Alaska DOT points out on its roundabout resource site, starting with no roundabouts in 2000, "Today, we have sixteen and counting.



O'Malley, C Street, Anchorage, Completed 2006

While it is clear that Alaska DOT needs no convincing that roundabouts are far superior to conventional signalized or stop sign controlled intersections, the rest of this paper lays out the benefits of roundabouts for those less versed in their value.

Safety

The Alaska DOT website indicates: "According to a study by the Insurance Institute for Highway Safety, roundabouts reduce injury accidents by 75%, capacitating injury or fatal accidents by as much as 90% when compared to intersections with traffic signals or stop signs." The Federal Highway Administration's Safety website reports that there were 733,000 injury crashes and 7,196 fatal intersection-related crashes in the United States in 2008, and that the injury rate would be cut in half if intersections were converted to roundabouts.

Delays and Travel Times

It is a common misconception that roundabouts increase travel times. Roundabouts usually reduce congestion at intersections during peak hour, and over the course of repeated travel, eliminate the need to ever stop at a traffic light. This is because one of the most significant causes of delays is the need to get back up to speed from a stopped condition. Roundabouts allow many cars to continue flowing through at a reduced speed. A study by the National Cooperative Highway Research of roundabout sites showed reductions in peak hour delays of about 75 percent. The Insurance Institute for Highway Safety states that if just 10% of the 265,000 signalized intersections were replaced, annual vehicle delays would be reduced by 800 million hours. To put this into perspective, the total annual delay for the San Jose Metro area in 2009 was 42 million hours; in Achorage/Mat-Su, it was 3 million.) New York State DOT, which has built over 60 roundabouts since 1995, generally reports reduction in delays of 50% or more. The attached paper includes a number of references documenting the travel time advantages of roundabouts. *"Roundabouts keep traffic moving. The major delay on a person's morning and evening commute is usually the time spent sitting still at traffic signals. Eliminating the need to stop and wait reduces delay (Alaska Roundabouts.com myth 3)."*

Costs

States that have experience with roundabouts, such as Arizona and New York State DOT, understand that roundabouts do not cost more than signalized intersections and depending on the number of turning lanes and property acquisition that often accompanies the later, roundabouts can cost less in initial capital construction costs. All agree that maintenance costs are less: according to Alaska DOT's website, the annual Maryland State Highway Administration points out that if one factors in the public costs of fatalites, serious injuries and property damage, the return on investment for a roundabout is 15:1. (Maryland's Roundabouts: Accident Experience and Economic Evaluation, Maryland State Highway Administration, April 5, 2004).

Conclusion: Why Should Roundabouts be the solution of choice for KGB Road's intersections?

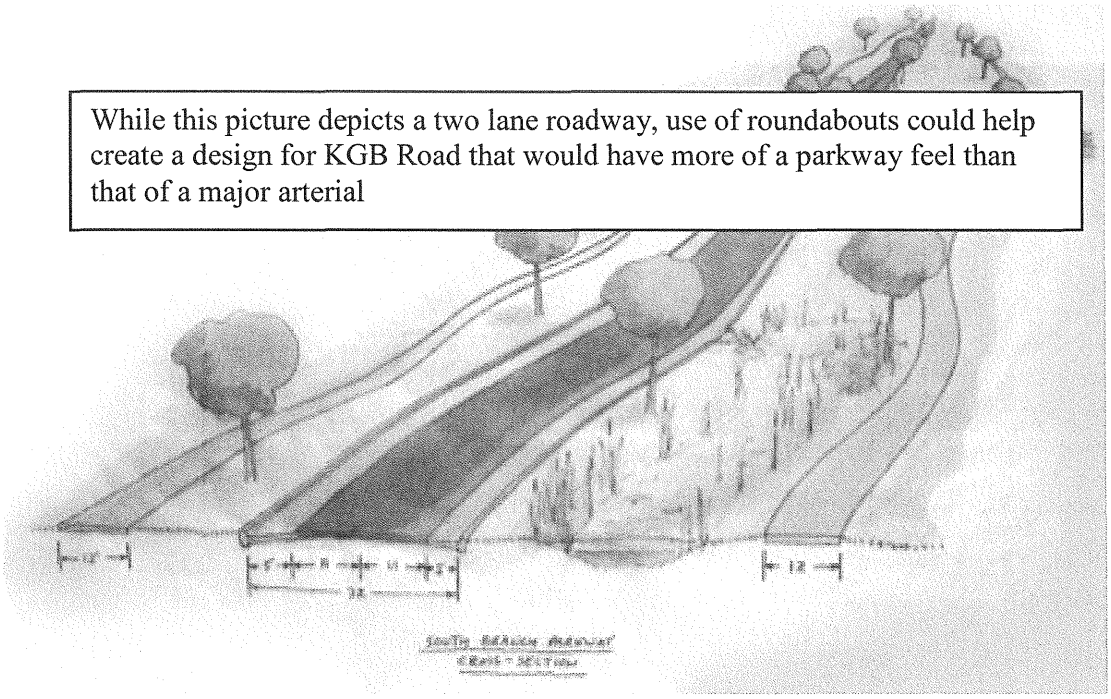
There are a number of reasons why roundabouts should be used on the KGB Road project.

First, the annual operating costs are much less. According to the Alaska DOT website, the average annual operating cost of a traffic signal is $15,000. The annual cost of a roundabout is about $2000 to $3000. Over the 22 years between now and the 2035 design year of KGB Road, this comes to $264,000 per intersection. Currently, there are three signals on the 6.3 mile section of KGB Road within the project; the project plans identify 12 potential locations where project design will prepare for new signals. If new signals are installed in only half of those potential locations, the life cycle costs of signals will be over $2.5 million higher than that for roundabouts.

Second, my analysis of the Alaska DOT crash data for KGB Road reveals that 17 of the 29 fatal crashes and 18 of the 32 fatalities occurred within 1000 feet of a potential roundabout location (Note: I assumed that any intersection identified in ADOT's preliminary concept plan dated 12/11/12 as a potential location for a signal, was a potential roundabout location). If we use the 75% fatal and injury crash reduction rate cited for roundabouts, we could have saved 13 of those lives. On p. 64 of the Gerry Welsh presentation dated 12/11/2012, a figure of 2135 total crashes are predicted for the 4 lane divided alternative, for the years 2015 to 2035. If we assume that half of the total crashes occurred within 1000 feet of a potential roundabout (according to my analysis 60% of fatal crashes did occur within 1000 feet), with a 75% reduction, use of roundabouts on KGB Road would reduce total crashes by another 800.

Roundabouts would also improve travel times. I don't have the modeling capabilities to estimate, however the experience around the nation is clear: traffic signals erode travel time. Using google maps to estimate, a trip on KGB Road from just south of Vine Road to just north of Parks Highway is 7 miles and is calculated to take 11 minutes. That is an average speed of 38 mph. If there were no traffic lights and everyone drove the speed limit, that same trip should take 7.7 minutes and average about 53 mph.

Finally, roundabouts, by moderating speeds throughout, would assist in creation of a more Context Sensitive Roadway that does not further divide the City of Wasilla with yet another high speed, wide roadway. If combined with reduced design speeds throughout, cross sections could be reduced while still achieving if not enhancing ADOT's safety goals while allowing the contours of the road to fit better into the Wasilla landscape.



While this picture depicts a two lane roadway, use of roundabouts could help create a design for KGB Road that would have more of a parkway feel than that of a major arterial

Appendix A to Roundabout Paper
References

(1) State DOTs with Roundabout first policies are New York, Virginia, Washington, Wisconsin and Maryland

(2) (Maryland's Roundabouts: Accident Experience and Economic Evaluation...
Administration, Maryland Department of Transportation, March 2007)

(3) www.azdot.gov/ccpartnerships/Roundabouts/index.asp

(4) Route 376 Raymond Avenue Operations Study, NYSDOT Region 8; contact Howard McCulloch hmcculloch@dot.state.ny.us

(5) Final Evaluation Report Route 114 Traffic Calming; contact Howard McCulloch hmcculloch@dot.state.ny.us

(6) The Use Of Roundabouts:Comparison With Alternate Design Solution
Michael E. Niederhauser, Brian A. Collins, P.E. and Edward J. Myers, P.E.

(7) Troutbeck 1993

(8) NCHRP Synthesis 264: Modern Roundabout Practice in the US

(9) Bergh, Retting and Meyers for the Insurance Institute for Highway Safety 2005

(10) Presentation by Howard McCulloch, New York State DOT hmcculloch@dot.state.ny.us

(11) Insurance Institute of Highway Safety Status Report Vol. 36, No. 7, July 28, 2001

(12) Vail Daily news article January 20, 1996 www.azdot.gov/ccpartnerships/Roundabouts/PDF/Articles.pdf

(13) Video on Senator Frank Wolf's website: http://www.youtube.com/watch?v=jbNdj8f6iRw

(14) Citizen post on Youtube about Glen Falls NY roundabouts:
http://www.youtube.com/watch?v=jZNkzgzPeOg

(15) Roundabouts v. Signalized Intersections: A Comparative Analysis; Scott Alisoglu, Kansas Government Journal 2010

(16) http://www.alaskaroundabouts.com/mythfact6.html

Appendix A to Roundabout Paper
Video Links

FHWA Mini-Roundabouts Informational Video
http://www.youtube.com/watch?v=Mr3QAKszLag&feature=related

Roundabouts - Pedestrians and cyclists
http://www.youtube.com/watch?v=Y05qGz5B1Wg&feature=autoplay&list=PLF17268C1DF90AB53&index=3&playnext=2

Kings Beach Highway Project - Webisode 1: Roundabouts Designed To Fail
http://www.youtube.com/watch?v=oAvsB8dE0NA&feature=related

Roundabout and Traffic Engineering, Scott Ritchie,
http://www.roundabouts.us/index.php

Arizona DOT overview:
http://www.azdot.gov/asfroot/CCP/Modern_Roundabouts/Introduction.wmv

Gilbert's Corner Roundabouts: Virginia Senator Wolf PR video on four roundabouts that he helped fund:
http://www.youtube.com/watch?v=jbNdj8f6iRw

Modern Roundabout a Fix for Heathcote 5 Corners? Ask Glens Falls! : Citizen post on YouTube about roundabout in Glen Falls NY:
http://www.youtube.com/watch?v=jZNkzgzPeOg
Modern Roudabouts: A Safer Choice
http://safety.fhwa.dot.gov/intersection/roundabouts/fhwasa10023/wmv_cc_final/10-2124_Roundabouts.wmv