



FARMINGTON CITY

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City Council Staff Report

To: Honorable Mayor and City Council

From: Dave Millheim, City Manager

Date: January 15, 2015

SUBJECT: **NORM MARSHALL MODELING REPORT FOR WEST DAVIS CORRIDOR**

DISCUSSION ONLY

Review and discuss the attached report from Norman Marshall with Smart Mobility regarding the draft Environmental Impact Statement (DEIS) for the West Davis Corridor. Direct staff as needed.

BACKGROUND

Farmington has undertaken an independent modeling study of the WDC. This was completed by Norm Marshall, a nationally recognized traffic modeler out of Florida who has done significant work in Utah. We undertook this study because we identified too many flaws in the UDOT assumptions in the draft EIS.

All of you know Farmington has spent considerable time and effort studying the issue. I challenge anyone to identify a city in Utah which has dedicated more time and attention to this matter than Farmington. All of our previous comments to UDOT (including this report) regarding the draft EIS have been placed on the City web page for any interested party to review. It has been very frustrating for staff and our elected officials to listen to elected officials in Northern Utah complain about Farmington's position when they have not read nor studied this complicated issue. The elected officials (and these are few) that have studied the issue and honestly done their stewardship have my respect.

After raising many of the specific concerns with UDOT through multiple meetings and letters over the past few years, we have received no satisfactory answers to these questions we have raised. On occasion we have been met with resistance in our requests for information and meetings and the City had to use legal counsel, more than once to obtain documents, which were part of the public domain. This has been more than

frustrating. Our support of the "objective" process is wearing very thin. Farmington sought and obtained funding for the EIS. Staff, the Mayor and Council members have attended countless meetings where the WDC was discussed but our faith in the process is seriously waning. I do believe there are members of the UDOT team trying to do the right thing but they are under considerable political pressure from many competing interests and their job is difficult.

As a result of our lack of satisfactory answers to legitimate questions, we sought (at considerable expense) an independent outside transportation modeler, familiar with Utah to take a look at the DEIS. This report was just completed and provided to my City Council recently for their review. We tasked Mr. Marshall to only look at the modeling and assumption issues that have gone into the DEIS so that we would not repeat planning or environmental issues already raised in earlier Farmington comments to UDOT.

The summary findings of this report are disturbing in that they more than enough show the WDC is not needed and serves very little purpose. Staff believes these modeling assumptions cannot and will not be ignored by Federal Highways which ultimately has authority on whether or not this proposed highway is built. Whether UDOT chooses to address these fatal flaws or not in the final EIS is to be determined. Staff recommends multiple things be considered as part of your discussion of this item.

1. The Council fully discuss and understand the ramifications of this report.
2. Farmington City host a public (open house) in the Community Center in the future to schedule presentation of this report and take additional public comment. NOTE: This item is not a public hearing item at this time and staff recommends not holding the public open house until the other steps listed below are taken.
3. Additional meetings with UDOT and Wasatch Front Regional Council (WFRC) take place to discuss the findings of this report. To that end I have provided Randy Jefferies an advance copy and we are scheduled to discuss this report with him and members of his team on January 22nd. I am also recommending City legal counsel be present at that meeting and we have informed UDOT of such. We have provided a copy of this report to Andrew Gruber with WFRC. Andrew wants to meet and discuss the modeling mistakes we identified which we plan to do when they get it scheduled.
4. The City pass a resolution in support of the "Shared Solution" being considered as a viable alternative to be studied. A draft for your consideration is attached which had been written to address Farmington concerns as well as a UDOT request. UDOT staff at a prior meeting held in December with multiple stakeholders including all cities along the proposed route asked the cities for a letter of support or resolution that the "Shared Solution" be further studied. Staff believes a resolution is not necessary for UDOT is evaluate an alternative which should have been a consideration all along in the DEIS but we understand and support why UDOT is asking for the respective cities to weigh in on this one. The request from UDOT serves three purposes. The first is the additional study they have done shows that many features of the

Shared Solution does provide a more viable alternative in some evaluation areas than many of the alternatives being considered. Second, the request is informative in nature and UDOT wants the cities to know this alternative is being looked at and further evaluated. Last, it provides UDOT some political cover (perhaps important but not legally necessary) so that as this alternative affects the outcome of the project, no one can say the Cities were not informed.

We hope these issues will be taken more seriously before the taxpayers of Utah pay the price. Staff also wants in the public record all to understand Farmington is in a very difficult position. Twenty years of land planning are being flushed down if the proposed WDC does what UDOT wants. 300 acres of conservation easements which the City pledged to thousands of residents abutting them to preserve as open space will be destroyed. Farmington gets no access and zero benefit from WDC. A needed interchange at Shepard Lane benefiting Farmington, Kaysville and Fruit Heights residents is being delayed. The proposed alignment bypasses a major transit station and economic and employment centers. The most frustrating thing of all is that the deeper we dig into the draft EIS and related data, the more we are convinced this highway is not needed -- contrary to what is being spun by some. It has almost no benefit except in some very limited applications and only reaches those benefits by some exaggerated assumptions in the EIS. For example, there are density assumptions for the respective communities to the north far beyond what their current zoning allows, their Council's will ever approve nor the market will bear in a real world application. Those mistakes alone should cause everyone great pause. We firmly believe it does not meet purpose and need and that it will likely be legally challenged IF it even gets past Federal Highways approval which we think doubtful. The impacts to homes and some businesses is way beyond measurable. We also understand there is considerable political pressure from many to get this highway built.

None of us really know what is going to happen with the WDC but I do hope (at a minimum) the modeling mistakes we see being made on this project will not continue as a matter of practice by those involved. For example, someone needs to explain why a 1992 household travel survey is being used in the DEIS to describe travel trends in terms of average miles driven when the actual data shows a decreasing pattern of miles driven which has been the case since 2004. The relief the highway promises is only being provided due to the traffic it induces through the false assumptions being used to justify its creation.

Final comment – this is a very tough issue and the most important issue the City Council will likely wrestle with for many years to come. DO NOT ACT IN HASTE. The Mayor often advises me to be nice. I am thankful for his support and advice. I personally recognize that statements and recommendations contained herein may not be universally shared by all. My job is to call it like I see it and do so after considerable evaluation and study. Your job as the elected representatives of the people is to take those recommendations – agree, disagree and/or modify them as you deem best.

Thank you for your consideration.

Respectfully Submitted

A handwritten signature in blue ink that reads "Dave Millheim". The signature is written in a cursive style with a prominent horizontal stroke at the end.

Dave Millheim
City Manager

Review of the West Davis Corridor Draft Environmental Impact Statement

January 12, 2015

Prepared for City of Farmington

Norman Marshall
President



Executive Summary

The Draft Environmental Impact Statement (DEIS) for the West Davis Corridor (WDC) published in April 2013 shows modest “potential” benefits of the proposed WDC. However, a careful review of the modeling, the assumptions relied upon and the choices made by UDOT, together with the use of unacceptable practices during the DEIS effort reveals that the avowed “Need” for the WDC is questionable at best, even in 2040. DEIS travel demand modeling shows most roads in the Study Area will be uncongested in 2040 with or without the WDC – even in peak travel periods. For the roadways the modeling shows as congested in 2040, the WDC would reduce congestion somewhat, however, these impacts are small. Much of the congestion shown in the model is found on east-west streets far to the east of the proposed WDC. By diverting some traffic from I-15 to the WDC, some of the east-west streets are modeled as carrying less traffic at their eastern end with the WDC than without, however, the new routes using the WDC will often be longer in distance. Therefore, even with the higher speeds on the WDC, any time savings will generally be small except for long trips from the western part of the Study Area to Salt Lake City and beyond. These trips would primarily be from housing that does not even exist today, furthermore, the existing and future driver preferences do not appear to support the Need for these sorts of assumed trips.

The actual benefits of the WDC would be substantially less than set forth in the DEIS because of a set of flawed assumptions made in the DEIS analyses. These include:

- The model used is based on a 1992 household travel survey that cannot account for the current trends toward less auto travel per person. As a result, future travel is overestimated and the benefits of new roadway capacity are also overestimated.
- The location of future households and jobs is critical in the modeling effort and the determination of current and future “Need,” yet it remains highly uncertain. The household growth assumed in the Study Area is significantly greater than what is allowed by the existing and future land use planning. The construction of the WDC would encourage dispersed housing growth in the western and northern parts of the Study Area and these impacts are not included in the DEIS. The WDC does not solve the congestion problems, such as they are or may be, it helps to create them.
- The DEIS shows that widening existing streets would lessen future congestion more than the WDC would. However, the DEIS analysis of this alternative greatly exaggerated the impacts of such widening. The DEIS assumes 5 to 10 times as much widening of local streets than would be necessary and also includes unnecessary widening of I-15. It further overstates the impacts by assuming grossly unnecessary cross-sections for the widened streets.
- The Study Area for the Project was artificially constrained and, thus, it deals with only a portion of the regional traffic and other issues. These regional and other issues are also worthy of inclusion.
- The Purpose and Need described in the DEIS can be better achieved through targeted improvements like those included in the Shared Solutions alternative, rather than through construction of a new north-south freeway.

The questionable practices in the modeling and subsequent DEIS efforts also undermine the benefits the DEIS claims will accrue. In particular, the version of the travel demand model used in developing the DEIS fails to properly account for induced travel that would result from construction of a new freeway.

For a host of reasons, the Need for the WDC is poorly understood and is not adequately justified by the efforts to date. It appears the Project is not necessary and there are other alternatives available to address the regional traffic congestion problem. Of course, a Study Area appropriately sized to take into account the entire region is required, if you are trying to solve that set of issues and the current Study Area is about half this size it should be.

Our suggestion is to fix the fundamental flaws relating to the Model, revisit the travel preference trends regarding commuting, include the actual land use information from the area, sharpen the focus on what the actual housing/employment numbers are and will be in 2040 and then develop a new set of Alternatives for modeling, which should include the Shared Solution.

Putting the Potential Benefits of the WDC in Perspective

In addition to reviewing the DEIS documentation, we also reviewed the regional transportation model files¹ on which the DEIS traffic analysis is based. Examination of the model files show:

- 1) Most roadways in Study Area are forecast to be uncongested in 2040;
- 2) Areas that are congested are far to the east of the WDC;
- 3) Congestion is mostly in PM peak period; and
- 4) WDC does not remove all of this congestion and actually will increase congestion north of the WDC.

¹ Model developed by Wasatch Front Regional Council in 2009 and applied by consultants to Utah Department of Transportation.

Figure 1: AM Peak Period 2040 No Build



Red=volume/capacity > 0.9 (1 direction or both)
Green = volume/capacity < 0.5 in both directions
Gray = volume/capacity between 0.5 and 0.9
Purple = roadways not in model

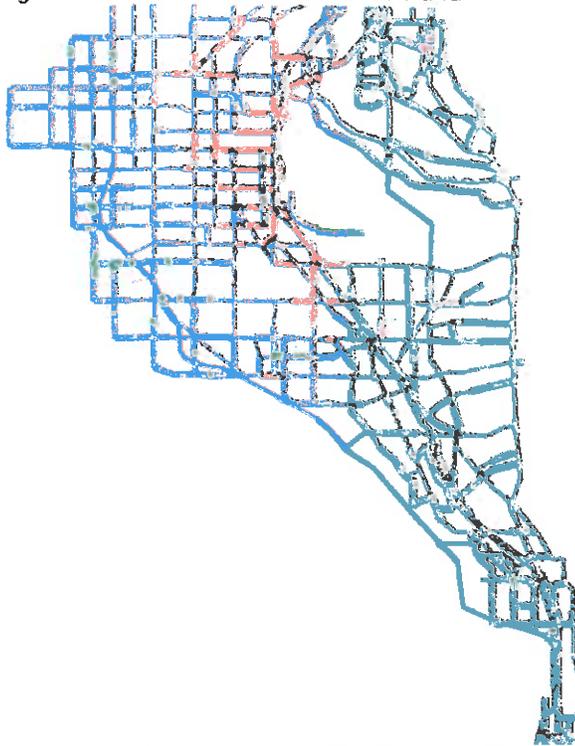
Figure 2: AM Peak Period 2040 Alternative B-1



Red=volume/capacity > 0.9 (1 direction or both)
Green = volume/capacity < 0.5 in both directions
Gray = volume/capacity between 0.5 and 0.9

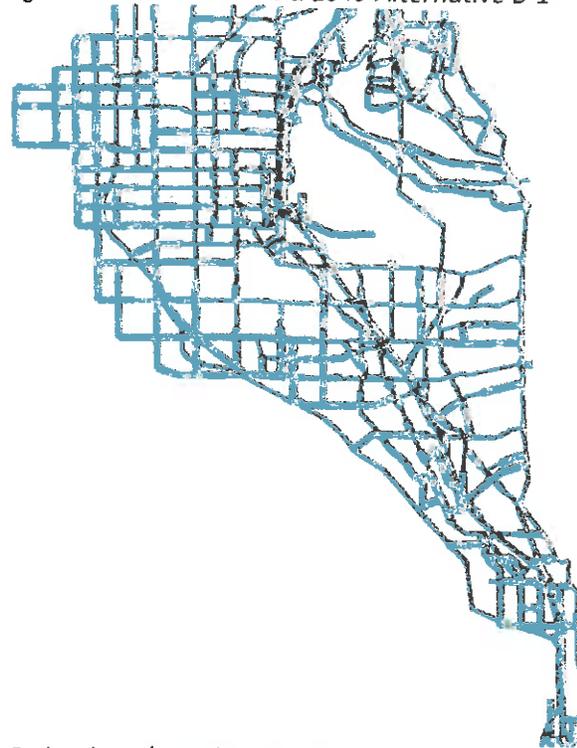
In the regional travel demand model dated 2009, a volume/capacity ratio of 1.0 is intended to be the point where a roadway is carrying as much traffic as it can. The DEIS uses a lower threshold of 0.9 to indicate streets that are congested. The graphics above use a threshold of 0.5, i.e. 50% of the maximum possible traffic, to highlight how little the future roadway network will suffer from even minor congestion, even during peak periods of the day in 2040. In the above graphics, one finds a vast majority of uncongested links (green), relatively few congested links in the AM peak period (red) and some links (including most of I-15) where the volume/capacity ratio is forecast to be between 0.5 and 0.9 during the peak traffic periods in 2040.

Figure 3: PM Peak Period 2040 No Build



Red=volume/capacity > 0.9 (1 direction or both)
Green = volume/capacity < 0.5 in both directions
Gray = volume/capacity between 0.5 and 0.9
Purple = roadways not in model

Figure 4: PM Peak Period 2040 Alternative B-1

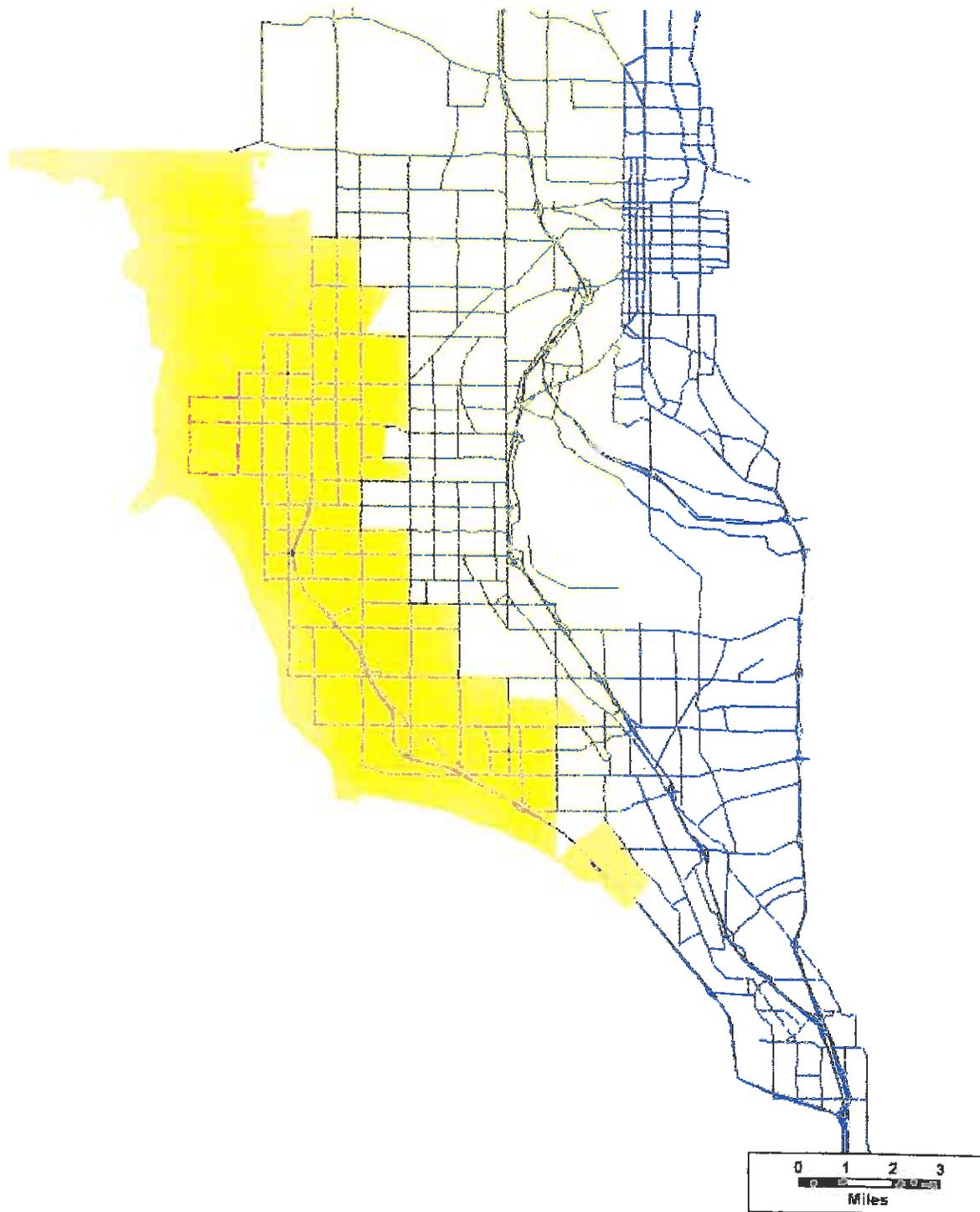


Red=volume/capacity > 0.9 (1 direction or both)
Green = volume/capacity < 0.5 in both directions
Gray = volume/capacity between 0.5 and 0.9

As shown in figures above, the WDC was modeled as reducing the extent of congestion in 2040 but not eliminating it. It actually increases congestion north of the WDC in the PM peak period. Much of the congestion shown in the model is on east-west streets far to the east of the proposed WDC. By diverting some traffic from I-15 to the WDC, some of the east-west streets are modeled as carrying less traffic at their eastern end with the WDC than without. However, the new routes using the WDC often will be longer in distance. Therefore, even with the higher speeds on the WDC, any time savings generally will be small except for long trips from the western part of the Study Area to Salt Lake City and beyond.

The figure below illustrates the area that would see time savings of two minutes or more for travel from the Salt Palace in Salt Lake City in the afternoon peak period (i.e. the most congested time period in the peak direction).

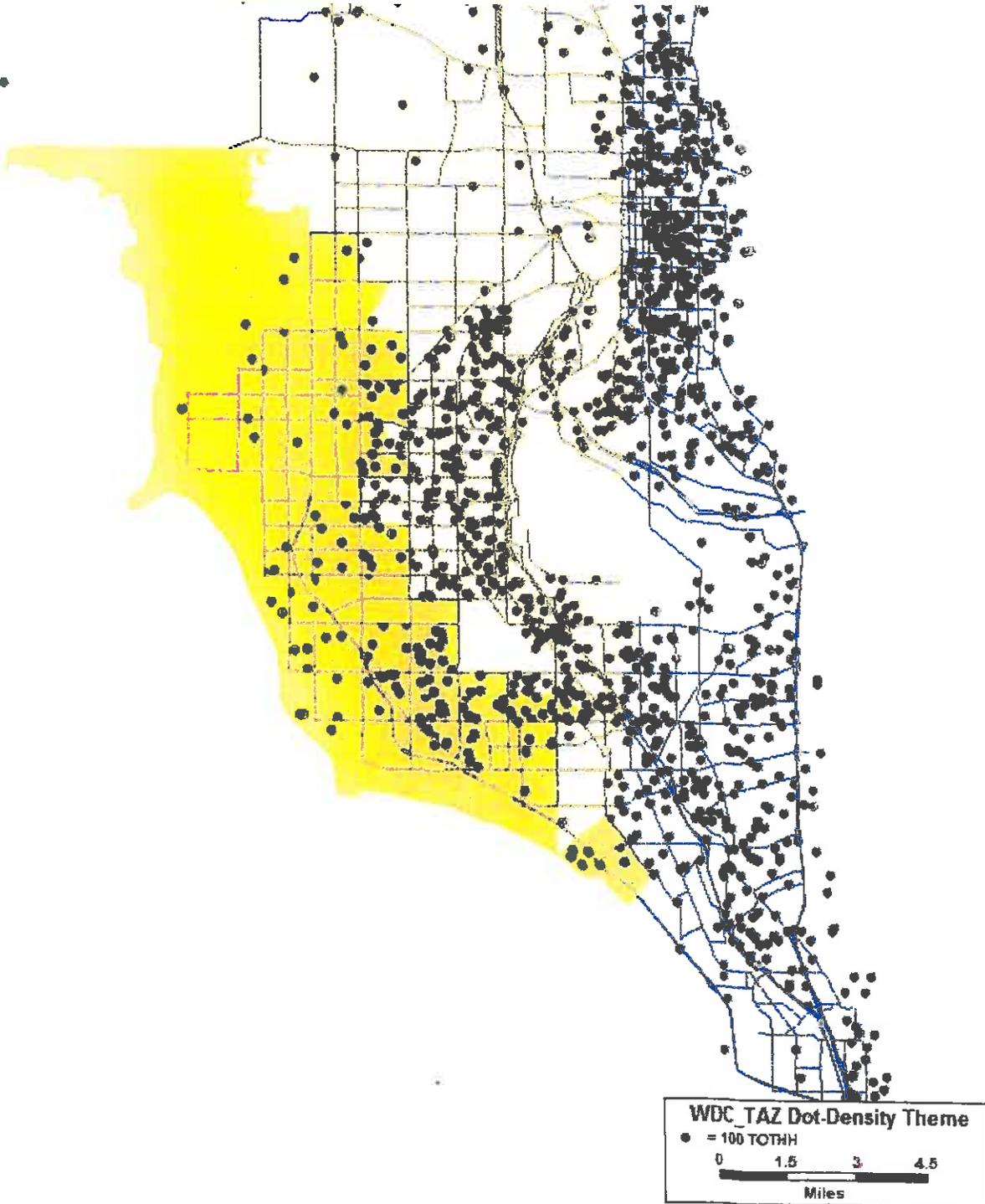
Figure 5: Time Savings of Two Minutes or More Returning Home from Salt Palace: 2040 PM Peak Period with WDC



The graphic above shows a large area of potential time savings (based on the modeling) but that area is relatively unpopulated today as illustrated in the figure below with the base year model data (2009) where each dot represents 100 households.

A large portion of the density shown in the figure below is located outside of the DEIS Study Area, which we believe was improperly truncated. As a result, the WDC does little for the Study Area, save serve growth it will partially induce and it does next to nothing to serve the existing Need to the east of the Study Area. There appears to be no rational basis underlying the scope and extent of the WDC Study Area.

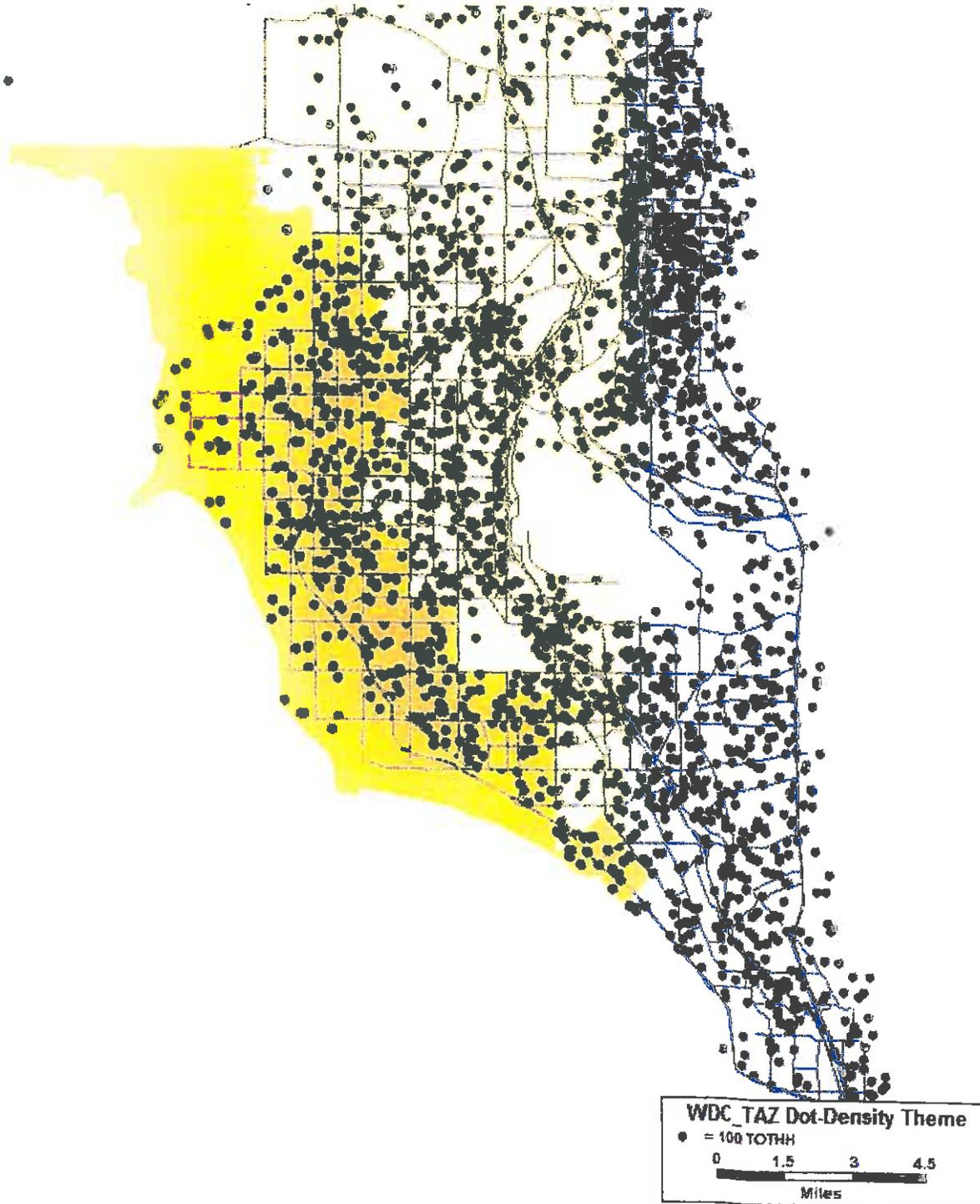
Figure 6: Time Savings of Two Minutes or More Returning Home from Salt Palace: 2040 PM Peak Period with WDC Along with 2009 Households



Note: Each dot represents 100 households in base model (2009) organized within Transportation Analysis Zones (TAZs).

As shown in the graphic above, most housing that already exists would save little time – even in 2040 – for trips returning from Salt Lake City during the afternoon peak period. The primary time savings would be for future housing as shown in the figure below. It appears the WDC is being constructed to serve growth and traffic it will partially create and induce. It is not in response to actual current and future regional needs.

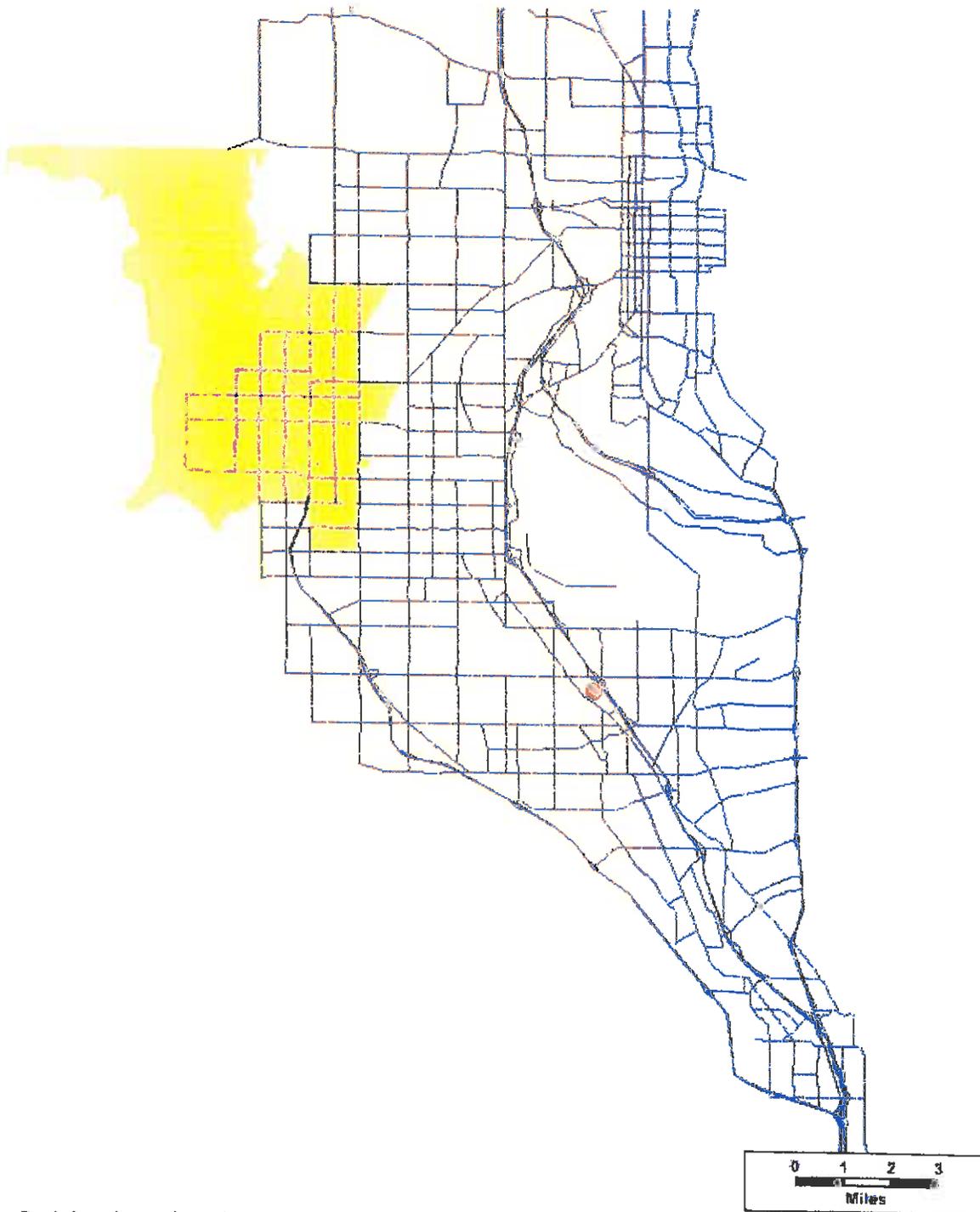
Figure 7: Time Savings of Two Minutes or More Returning Home from Salt Palace: 2040 PM Peak Period with WDC Along with 2040 Households



Note: Each dot represents 100 households in future model (2040).

Even for these future households, the time savings are most pronounced for trips from Salt Lake City and beyond. The figure below illustrates the area that would see time savings of two minutes or more for travel from the Davis Hospital and Medical Center in the afternoon peak period (i.e. the most congested time period in the peak direction).

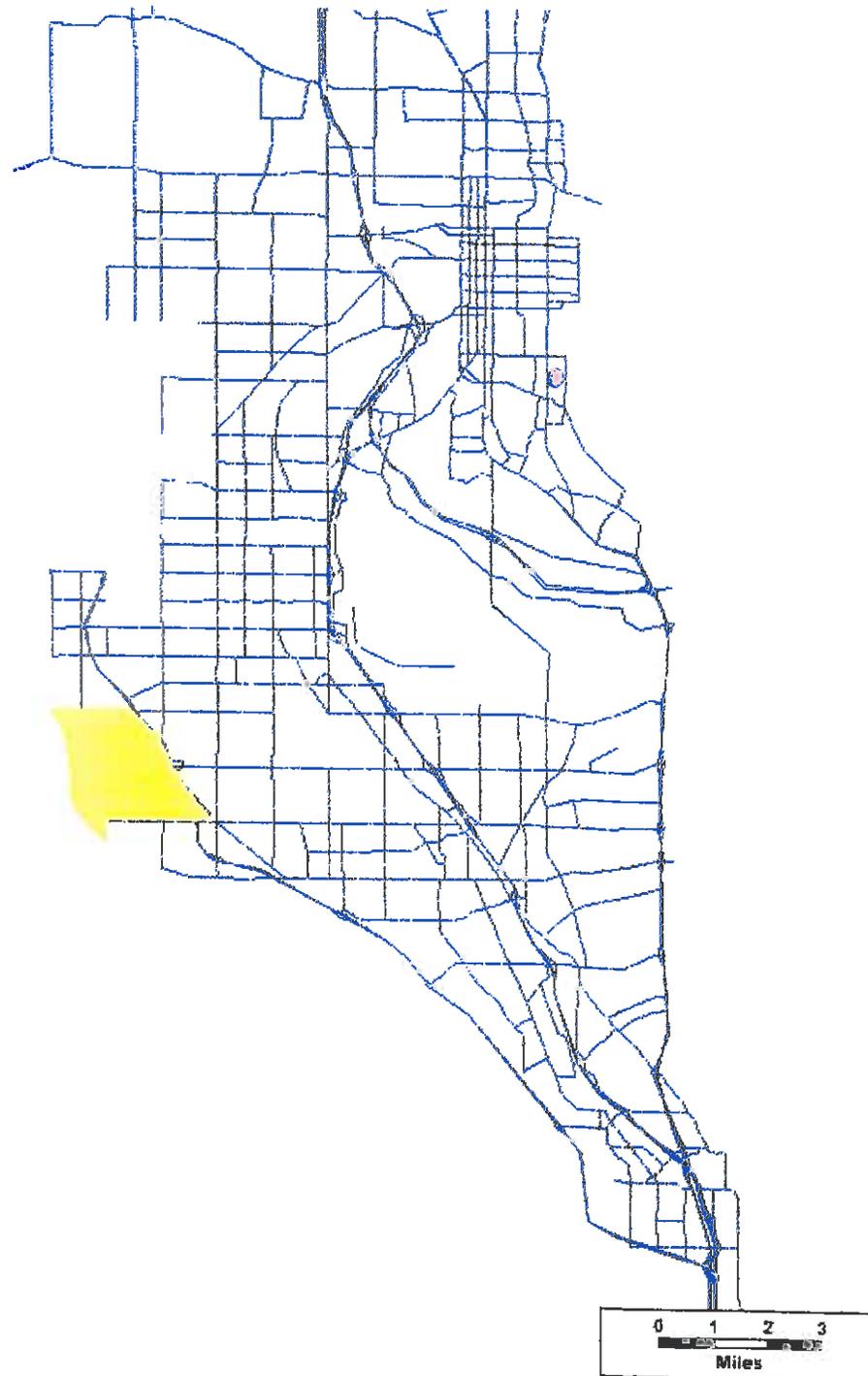
Figure 8: Time Savings of Two Minutes or More Returning Home from Davis Hospital and Medical Center: 2040 PM Peak Period with WDC



Note: Red dot shows location of Davis Hospital and Medical Center

For shorter trips in a north-south direction, the area that the modeling shows benefits from the WDC is much smaller than for the long-distance trips. For east-west trips in the Study Area, there is very little benefit. The figure below illustrates the area that would see time savings of two minutes or more for travel from the Weber State College.

Figure 9: Time Savings of Two Minutes or More Returning Home from Weber State College: 2040 PM Peak Period with WDC



Note: Red dot shows location of Weber State College

As shown in the graphic above, the modeling is showing only a small area where people could save more than 2 minutes traveling home from Weber State College during the PM peak period in 2040 with the WDC. People traveling in these areas may not even choose to use the WDC because this would entail driving south on I-15 and then turning north on the WDC, increasing trip lengths by 3 to 10 miles.

The Potential Benefits of the DEIS are Overstated

Summarizing the potential travel time savings maps, the WDC would primarily benefit people living in the western part of the Study Area, who are living in housing that has not yet been built today and who are traveling long distances from Salt Lake City and beyond during the afternoon peak hour. While some such travel is inevitable, the future level of such travel is highly uncertain and does not justify this location for the WDC, nor even the need for any of the WDC build alternatives. Furthermore, it is not rational nor in the best public interest to encourage this sort of future development pattern, or to subsidize it by building an expensive new roadway and making travel on it free. For the areas showing the 2 minute or more savings for PM peak period travel from the Salt Palace, the travel distances range from 23-40 miles one way, or 46-80 miles round trip. In an age when we are increasingly concerned with air pollution, climate change and rising fuel prices, making such trips daily is undesirable both for the individuals involved and for the community as a whole. Then there is the fact that the WDC is being designed to serve a vanishing need, that being a large commute to and from employment in Salt Lake City.

The DEIS analyses are biased toward an exaggeration of the amount of and need for this sort of travel and thus exaggerate the benefits of the WDC. Regional transportation models are the best tool we have for quantitative analysis of future traffic conditions. Nevertheless, any future travel forecasts are subject to a large margin of uncertainty. Good practice is to acknowledge this uncertainty and to avoid overreaching conclusions based on small differences between alternatives. That is a trap into which the DEIS has fallen.

A 2007 report on modeling by the Transportation Research Board (TRB) states:

Most travel forecasting models produce a single answer, although the model is estimated, calibrated, and validated on the basis of data sets that are subject to many sources of error and uncertainty. The data used are based on sampling and include sampling errors, as well as other types of errors due to survey methodology. Errors also are made, for example, when data are aggregated and entered into databases. The models themselves may suffer from misspecification. When models are used for prediction, additional errors are necessarily introduced because the values of parameters in the future are always estimates and thus subject to error.

Some degree of error is unavoidable. Within reason, moreover, the presence of errors does not prevent effective applications. It is necessary and appropriate, however, to develop sampling and modeling strategies that are informed by the patterns in which errors occur and especially by understanding of the ways in which errors are propagated through sequences of models. Errors should be discussed in the course of normal practice; their influence understood and disclosed; and proper account taken of the variation that necessarily occurs in the use of models for forecasting purposes, particularly when forecasts are used to evaluate alternatives that differ only modestly or to produce point estimates of travel to meet regulatory requirements.²

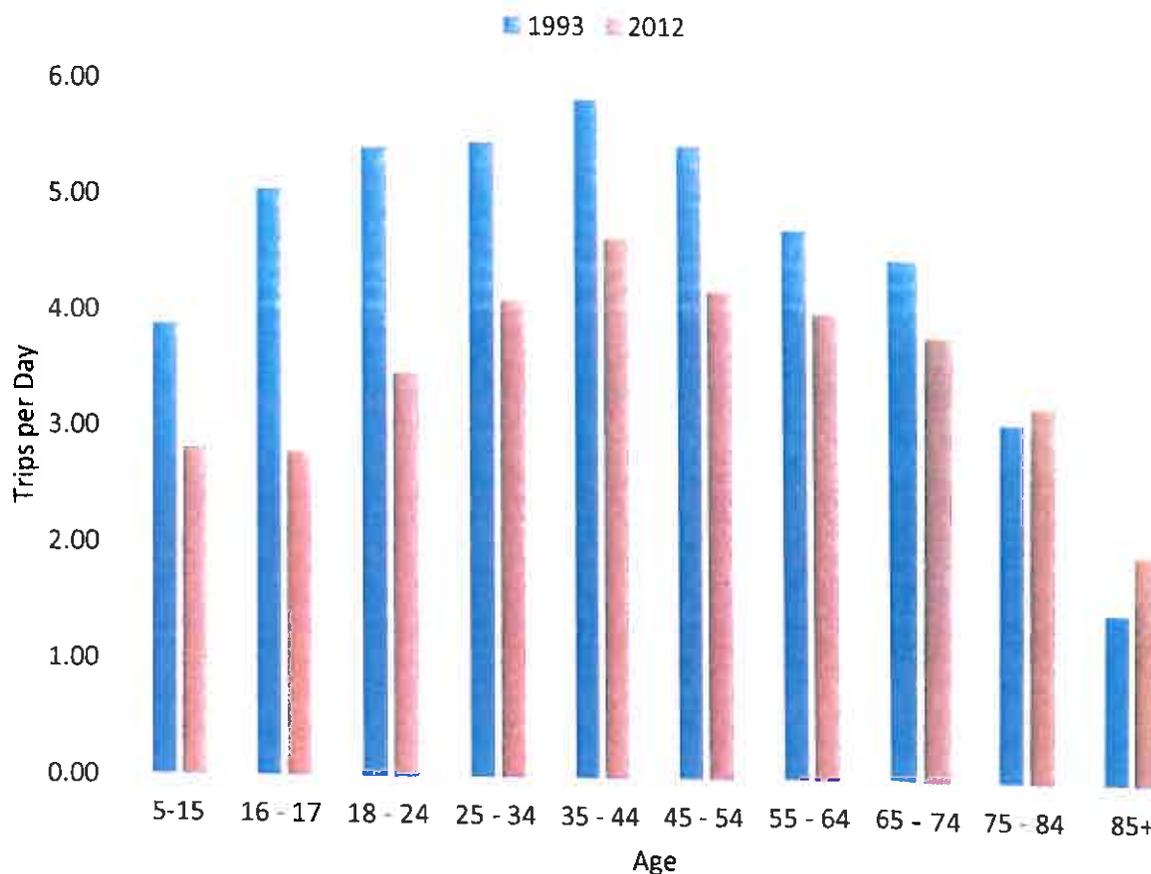
² Transportation Research Board (TRB) Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting. Special Report 288: *Metropolitan Travel Forecasting Current Practice and Future Directions*, p. 71. 2007

It is highly likely the regional transportation model is significantly overestimating future travel. The model is based on a 1992 household survey and 2009 traffic volumes. In the U.S. as a whole, per capita vehicle miles traveled (VMT) peaked in 2004 and has declined each year since for a total decline of 7.5%.³ While highway advocates often try to explain the decline in terms of the economic downturn beginning in 2008, it is important to emphasize that the decline began 4 years before that. Factors contributing to the decline include the aging population, revitalization of urban cores, higher energy prices, and investments in walk, bicycle and transit infrastructure. There is a particularly large shift in behavior by young adults in comparison to past generations. For many in this generation, cars no longer represent freedom but instead get in their way of social media connections, and they prefer transit. Peak hour VMT per capita has likely declined even more due to the aging population, more flexible work schedules and other social changes. Therefore, the model "uncertainty" is most likely in the direction of overestimating future traffic volumes, particular in the peak hour.

The Wasatch Front Regional Council (WFRC) travel demand model used for the DEIS analyses is based on a 1992 household travel survey rather than a much more recent 2012 household travel survey. As shown in Figure 10, average weekday trip rates between these two surveys dropped for all ages under 75 and dropped dramatically for teenagers and young adults.

³ Sundquist, Eric. State Smart Transportation Initiative, <http://www.ssti.us/2013/02/per-capita-vmt-ticks-down-for-eighth-straight-year/>, 2013.

Figure 10: Average Weekday Trips per Person in the Salt Lake City Region by Age⁴



Some research has suggested that travel behavior patterns established in young adulthood tend to persist throughout life – therefore, the reduced travel of young adults today likely is a better indication of future travel than the travel patterns of their parents and grandparents: “All things equal, younger generations appear to (a) travel fewer miles and (b) make fewer trips than was the case for previous generations at the same stages in their lives...”⁵

The Effects of Socio-Demographics on Future Travel Demand was recently published by the National Cooperative Highway Research Program.⁶ A key concept in the report is “assumption drag”, i.e. “the tendency to maintain assumptions based on past trends, even after they have lost their validity.” In their view:

⁴ Analysis of 1993 household travel survey data compared to RSG Inc. *Utah Travel Study*, 2013, Table 1.16, p. 35.

⁵ Blumenberg, Evelyn, Rian D. Yalor, Michael Smart, Kelcie Ralph, Madeline Wander and Stephen Brumbaugh. “What’s Youth Got to Do With It?: Exploring the Travel Behavior of Teens and Young Adults”, p. iii. University of California Los Angeles, September 2012.

⁶ Zmud, Johanna P., Vincent P. Barabba, Mark Bradley, J. Richard Kuzmyak, Mia Smuda and David Orrell. *Strategic Issues Facing Transportation Volume 6: The Effects of Socio-Demographics on Future Travel Demand*, P. 5. National Cooperative Highway Research Program Report 750, 2014.

... forecasting's primary purpose is to generate information useful to decision makers for the specific types of decisions they are facing. The decisions are influenced by the degree of uncertainty associated with forecasts about the future. How many people will live in a region; in what types of households will they reside and by what modes will they travel; what will be the price of fuel; what are the rates of adoption of autonomous, self-driving vehicles? Good decisions (and good policies) should be robust across a wide range of socio-demographic futures. Therefore, to aid with this process, models should be viewed as tools for exploring scenarios, rather than providers of hard predictions, and should be designed to be flexible enough to explore scenarios, while avoiding (as much as possible) traps such as assumption drag.⁷

Future Households and Jobs

Uncertainty about future households and jobs is particularly relevant to the WDC modeling work. As shown above, the proposed WDC focuses on serving housing that does not exist today and is not present in much of the future land use planning for the Study Area. Modeled future traffic volumes on the WDC and other roads are based on estimates of future land use and this is a weak foundation as discussed in the 2007 report:

An inherent weakness of the aggregate trip-based modeling approach is reliance on demographic forecasts that are independent of the travel forecasting system. With few exceptions, travel forecasting procedures make use of data that are developed independently, often with no input from or feedback to transportation system attributes. These data—forecasts of population, households, and employment, both in total magnitude and as allocated to specific geographic subareas—are significant drivers of travel forecasts. Errors or uncertainties in these data may introduce errors of unknown magnitude into the travel forecasts. In metropolitan regions that are growing slowly or are stable, regional errors in demographic forecasts are likely to be small; in more rapidly changing regions, greater errors in demographic forecasts would be expected. There may be considerably more uncertainty in allocating regional demographic forecasts to subareas. If an area is undergoing steady or even dramatic growth, one can predict future regional population and employment with some confidence; where those people and jobs are going to go within the region is far more uncertain.⁸

The excerpt above emphasizes the need for “feedback”, i.e. modeling transportation and land use together in the mix for the NEPA process. As illustrated in the graphics above, the WDC would offer reduced travel times to Salt Lake City from the western part of the Study Area. Both common sense and extensive research demonstrate that construction of the WDC would influence and induce future growth in this area. This induced land use would in turn increase average trip lengths, adding vehicle miles of travel that would undermine the potential benefits of the project. This feedback between land use and transportation is not accounted for in the DEIS, so the DEIS exaggerates the benefits of the WDC and pays little heed to the detriments it

⁷ Zmud et. al. 2014, p. 6.

⁸ TRB 2007, p. 76.

creates. Serving the very growth the WDC creates is not a legitimate Purpose and Need for the WDC.

The Underlying Data Gathering Effort was Seriously Flawed.

Dave Petersen of Farmington City undertook a detailed evaluation of the growth in population and households assumed in the Study Area and found it significantly exceeded the maximum development allowed. The DEIS assumes a 90 percent increase in study area housing between 2009 and 2040 compared to allowed maximum increase of 51 percent between 2010 and 2040. Additionally, even with in more developed communities along the Wasatch Front, where many consider these communities achieved "residential build-out" years ago, one may still find large vacant tracts of land and/or numerous opportunities for in-fill development. Therefore, a more realistic housing increase in the study area between 2009 and 2040 is approximately 45 to 46%.

A large proportion of the assumed travel in the model is between households and non-residential locations – for work, for school, for shopping and so forth. Therefore, total travel would be lower if jobs and housing were better balanced – particularly through Farmington City.

The WDC DEIS forecasts are based on Utah Governor's Office of Policy and Budget (GOPB) forecasts. These forecasts indicate a continuing jobs shortfall for Davis and Weber Counties. In general, the shortfall remains relatively constant in percentage terms, but grows as the population grows. These assumptions make it inevitable that modeled traffic through Farmington will increase in the future as people living north of Farmington travel south to work, shop and get services. Better jobs/housing balances would be beneficial for all areas by reducing traffic. It would be especially beneficial for the Davis and Weber County tax bases.

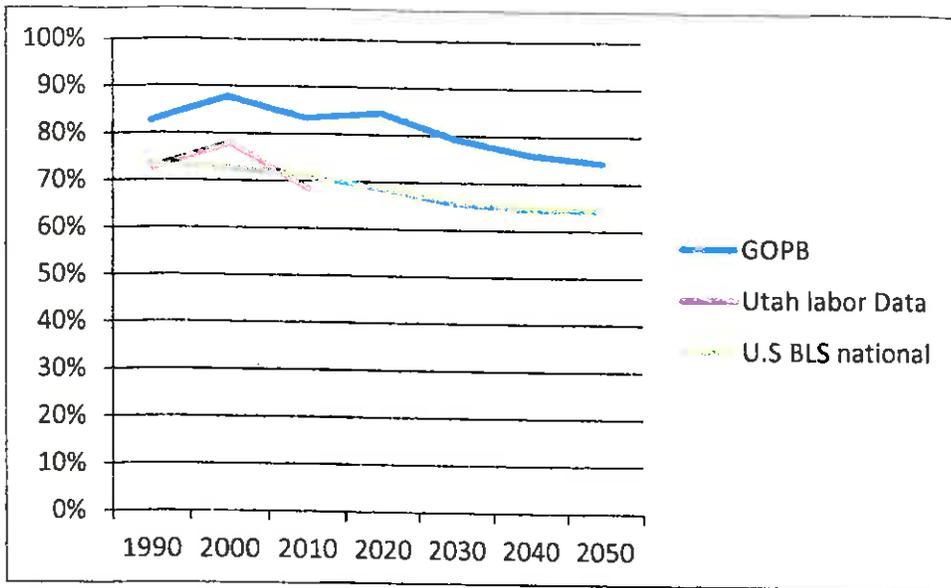
GOPB did not provide any documentation or justification for the forecasts in response to the City of Farmington's GRAMA request, suggesting that no documentation or justification exists. It appears that the primary basis is a REMI economic model. The REMI model extrapolates past trends into the future without consideration either of available land for development or travel time and cost. Therefore, the model is so limited in its representation of the future that the numbers should be labeled "projections" rather than "forecasts."

An added challenge in analyzing the employment projections is that the totals are obviously wrong. Comparing the GOPB employment estimates to the population age 18 and over, it appears that about 90 percent of all adults are working. If however, looking also at Utah state government employment statistics, the number of jobs indicates that only 65-70 percent of adults are working in "covered employment", i.e. jobs subject to unemployment insurance. Nationally, the difference between total employment and covered employment is about 10% - much too little to explain the discrepancy.

Figure 11 below compares the GOPB estimates and forecasts for labor force participation to Utah data, U.S. data and U.S. forecasts

Figure 11: GOPB Data and Forecasts Compared with Utah and National Data and Forecasts⁹

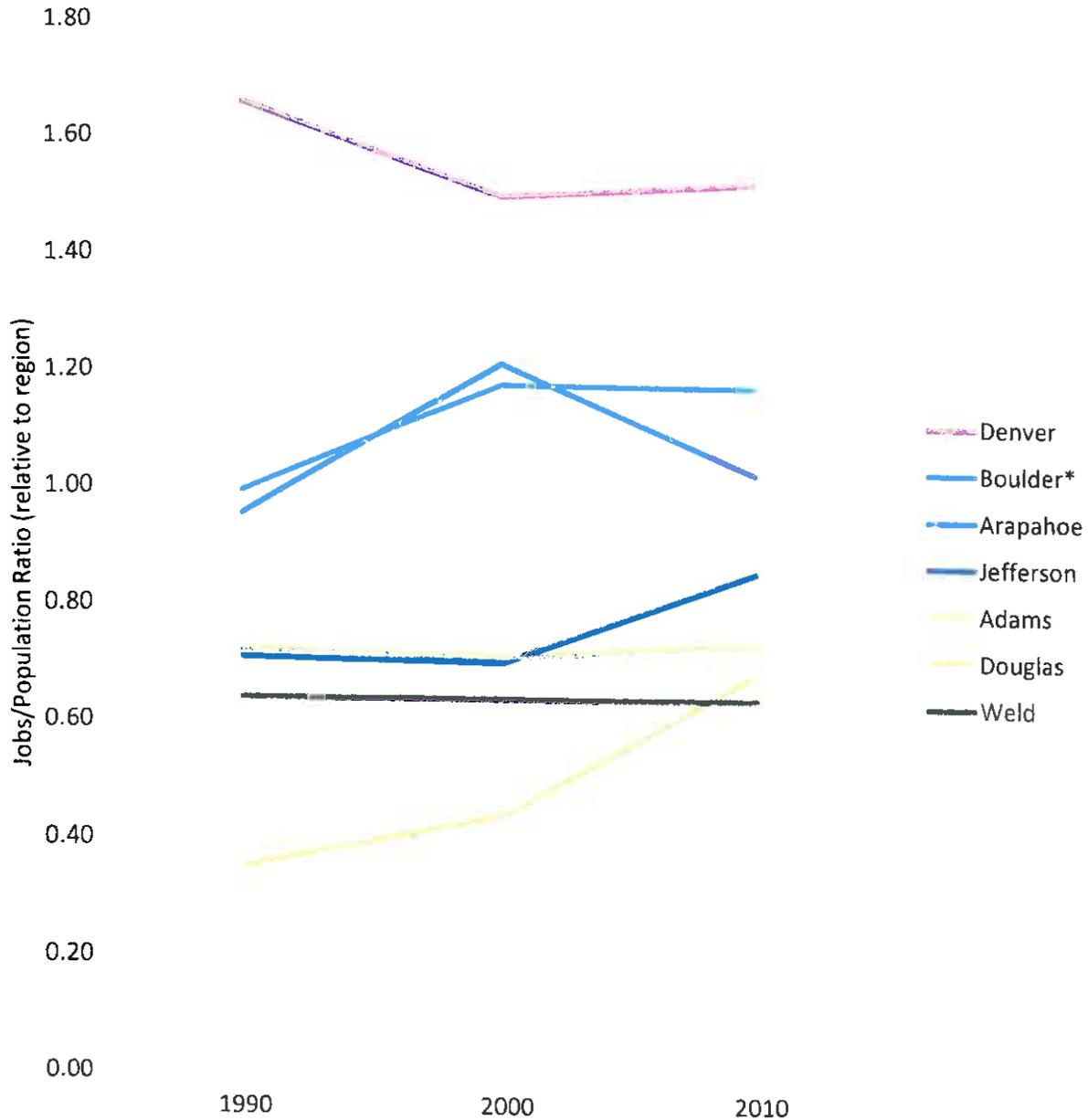
⁹ Utah labor data and U.S. Bureau of Labor Statistics data and forecasts adjusted upward by 10% to account for non-covered employment.



The red Utah historical line dropped considerably with the last recession. Both forecasts decline with the aging of the population. The striking difference is between the blue line and the other line. This represents about 15% of the total GOPB and WFRC employment. These are jobs that do not really exist!

Given that GOPB does not even appear to have the current employment numbers right, it is highly unlikely that they have the future employment numbers right. In fact, as regions grow, employment tends to follow housing to the suburbs and initial jobs/housing imbalances level out. Figure 12 illustrates this for the Denver region.

Figure 12: Jobs/Housing Balances in the Denver region



“*” in 2010, Boulder County includes Broomfield County which was formed in 2001 from parts of four counties, with the greatest portion from Boulder County.

As shown in Figure 12, two of the job poor counties increased their jobs/housing ratios significantly between 1990 and 2010 – Jefferson County and especially Douglas County. This sort of pattern should be expected and encouraged for Davis and Weber Counties.

The Wasatch Front Regional Council (WFRC) has invested hundreds of thousands of dollars beginning in the late 1990s to develop integrated transportation/land use modeling capability

that includes feedback, first with UrbanSim and now with its successor OPUS model.¹⁰ If projects like the WDC have no effect on future land use, all this money has been spent for nothing. After 15 years of development, the WDC should have used either UrbanSim or OPUS to develop separate No Build and Build land use forecasts. If for some reason this was not possible, The National Cooperative Highway Research Program (NCHRP) has published a *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (Special Report 466, 2002). This reference describes several methods for evaluating land use changes from a major transportation project. It is hard not to take a cynical view and conclude that the WDC DEIS instead assumes a single land use forecast for both No Build and Build alternatives simply in order to make the benefits of the WDC appear as great as possible while minimizing the detriments.

When Portland, Oregon region does integrated land use and transportation modeling, the modelers report:

Under conditions of increasing congestion, nonresidential land uses increase their decentralization in order to take advantage of attracting labor and customers traveling in the off-peak direction. Over a period of time, this leads to equivalent travel times over a link in both directions of travel. As a result, the capacity of the transportation system is much greater than traditional modeling procedures indicate.¹¹

In contrast, all of the 2040 WDC Figures and data shows strongly directional traffic on all roadways in the Study Area, even with peak period, peak direction congestion. These strong directional flows out of the Study Area in the morning and back in the afternoon is problematic for a number of reasons. In addition to poor utilization of roadway investments, it causes the local residents to have long commutes and long trips for services. It is also not reflective of the trends in travel preference toward living near your place of work. Not building the WDC would help encourage an improved jobs/housing balance in the Study Area.

More generally, not building WDC would help the Study Area better achieve the Growth Principles for a Bright Future set out in the regionally-adopted *Wasatch Choice for 2040 Greater Wasatch Vision for 2040*.¹² These include:

- Efficient Infrastructure
Maximizing existing infrastructure and building more compactly and contiguously conserves green space, saves taxpayer dollars, and makes high-quality, lower-cost services available to us all.
- Regional Mobility (Transportation Choice)
With a balanced multi-modal transportation system, more transportation options, and jobs and services closer to home, we reduce the growth in per capita vehicles miles traveled, we spend less time in traffic and have more time for friends, family, and doing what we enjoy.
- Housing Choice

¹⁰ Wasatch Front Regional Council. Final Draft WFRC Unified Planning Work Plan (UPWP) Fiscal year 2013 and Fiscal Year 2014, p. 60, May 2012.

¹¹ Conder, Sonny and Keith Lawton. Alternative Futures for Transportation and Land Use – Integrated Models Contrasted with “Trend-Delphi” Methods: The Portland Metro Results. Metro: Portland, OR, July 2001.

¹² Wasatch Front Regional Council and Mountainland Association of Governments, Final-Poster_TheWasatchChoice2040_20Dec2010_Update_Reduced-2.pdf, 2010.

Encouraging a variety of housing options, especially near transit and job centers, addresses market demand and makes living more affordable for people in all life stages and incomes.

- Health and Safety

When our streets are walkable, interconnected, and safe, we lead healthier lives by walking and biking more and driving less. These streets also provide efficient access for emergency services. Trails and access to nature provide healthy recreational opportunities.

- Regional Economy

Strategic transportation investments and land use decisions can encourage business investment and help secure jobs closer to home, so we can provide for our families and keep our dollars in our region.

The vision described includes: “maximizing existing infrastructure” and “jobs and services closer to home.” The single land use future assumed in the DEIS is inconsistent with the Wasatch Choice Growth Principles. The WDC also is inconsistent with the Growth Principles.

The “Shared Solution” alternative now being analyzed by UDOT is completely in sync with the Growth Principles and partly addresses this discrepancy between the future land use assumptions Wasatch Choice Principles by changing some of the future development in the Study Area to “Compact, Mixed Use Development.”¹³ However, this addresses micro land use issues without directly affecting the macro issues discussed above. Furthermore, it has been determined that the current regional transportation model does not account for micro land use effects properly.

Currently, the travel model predicts zones with higher residential densities have a proportionally higher number of vehicle trips, because more people imply more trips. However, it is recognized that areas with higher population and employment densities commonly have good pedestrian amenities and transit options that influence trip rates and mode choice. Also, the concentration of destinations, represented by both density and diversity, can have a significant effect on trip making characteristics. With an increase in density and/or diversity, it is generally expected that vehicle trip rates (per person) will decline. To improve the travel model’s response to changes in residential density, WFRC/MAG may choose to employ “Placetypes.” Placetypes can be used as a way to characterize the tangible and intangible built environment variables that influence travel. This approach may also be an opportunity to make a stronger connection between WFRC/MAG travel modeling and land use planning/visioning efforts, such as *The Wasatch Choice for 2040*.¹⁴

The assumptions regarding future housing and employment are unjustified, i.e. apparently based on GOPB for which no documentation has been provided. The housing projections exceed maximum allowed housing development in the Study Area. The relative lack of job growth assumed is both unrealistic and undesirable. These greatly flawed assumptions translate directly in to unrealistic traffic growth in the model that exaggerates any potential value of the proposed freeway.

¹³ “Shared Solution Alternative: Modeling Assumptions and Methodology”, November 10, 2014.

¹⁴ Fehr and Peers. “D” *Sensitivity Enhancement Study for the WFRC/MAG Regional Travel Model*, p. 3. Prepared for Wasatch Front Regional Council, January 2013.

Induced travel

In addition to land use changes that would result from construction of the WDC, there are other reasons why the WDC would increase future traffic volumes. These effects can be captured in good modeling. When high speed roadway capacity is built in urban areas, regional vehicle miles of travel (VMT) will be higher than if the capacity were not constructed. Model accuracy requires sensitivity to induced travel. UDOT commissioned a sensitivity analysis of the 2003 WFRC model with regard to induced travel.¹⁵ This analysis evaluated the induced travel effects of four different freeway projects with Version 2.1 of the WFRC model. The elasticities of regional VMT to regional lane miles¹⁶ were 0.70 for I-15 improvements, 0.68 for US 89 improvements, and 1.23 for addition of the Mountain View Corridor (Table 5.2, p. 5.5). The report concludes:

Model elasticities fall within the expected range of acceptability based on comparisons with elasticities cited in a variety of research papers. (p. 7.1)

Since 2003, the WFRC model has changed significantly. For the WDC modeling, the elasticity of regional VMT to regional lane miles is only 0.17.¹⁷ This is much lower than the general accepted range and indicates that the VMT for the WDC Build scenario should be significantly higher. This deficiency could be due to changes in the WFRC model and/or misapplication of the model by not properly feeding back congested travel times to earlier model stages¹⁸. Either way, the DEIS modeling is exaggerating the potential benefits of the WDC by not properly accounting for the impacts of induced travel from the WDC.

Figure 13 illustrates how construction of the Legacy Highway likely has induced travel to the north on I-15.

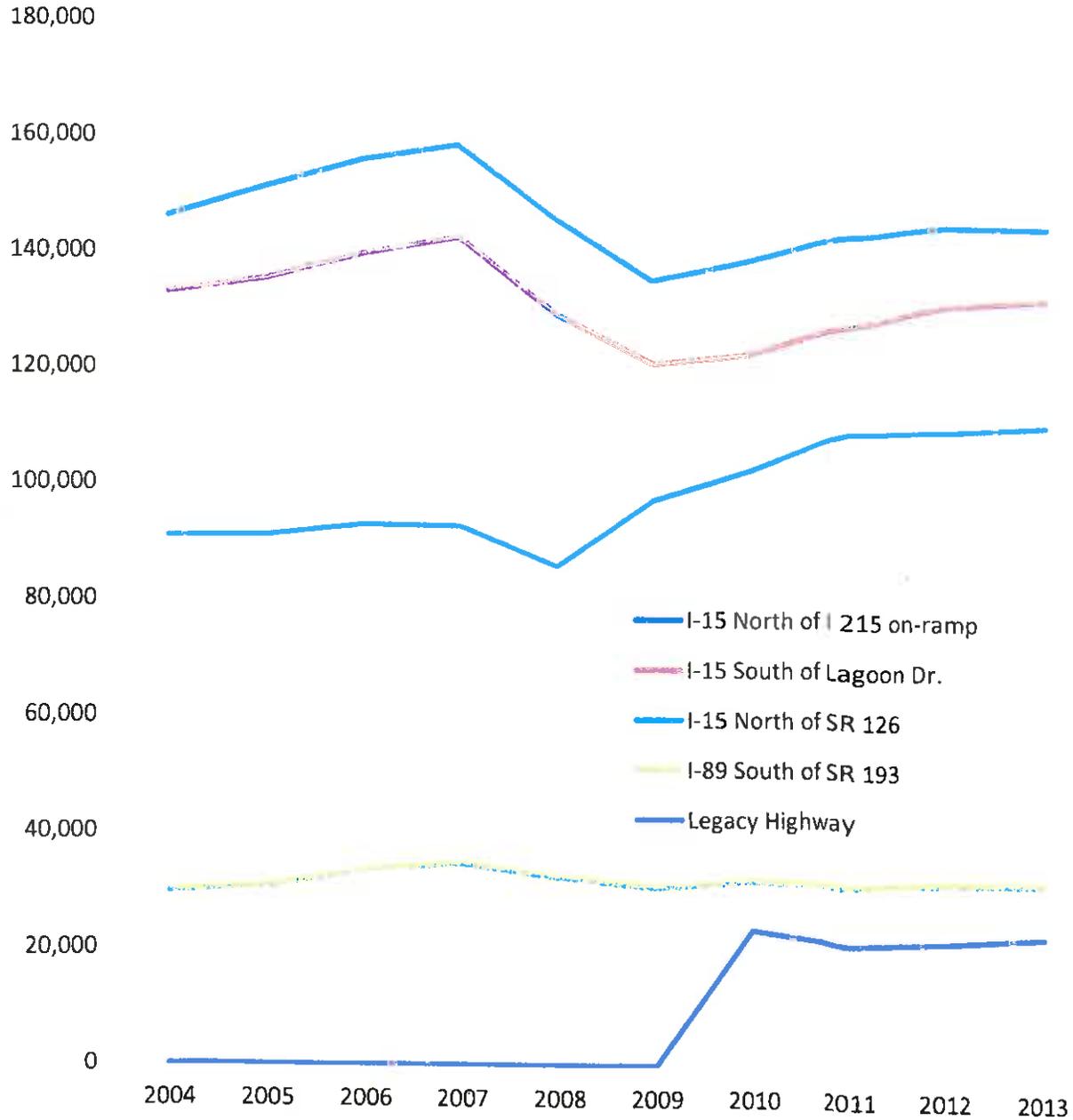
¹⁵ Cambridge Systematics, Inc. with Fehr and Peers Associates, Inc. *Wasatch Front Region Council (WFRC) Model Sensitivity Testing and Training Study Final Report*, Prepared for Utah Department of Transportation, November 2003.

¹⁶ A basic tenet of economics is that the demand for goods vary as supply, and therefore price, changes. However, demand for some goods varies more widely with price than for others, depending on how important the good is to the consumer (milk to a family with children versus a luxury item), and whether other substitute goods are available at a lower price. This relationship—the degree to which demand varies with price—is known as “elasticity of demand.” Similarly, the amount of travel (travel demand) will vary according to supply, and therefore the “price” of travel in terms of the time it takes to make a given trip. The amount by which travel demand increases as the supply (e.g., road lanes) increases is also expressed as an elasticity of demand. A higher elasticity value indicates more induced demand as road supply (lane capacity) increases.

¹⁷ Calculated from the WDC DEIS transportation model files.

¹⁸ We requested All Cube input files, intermediate files, and output files for the 2009 base year, the 2040 No Action alternative and for alternatives A1, A2, A3, A4, B1, B2, B3 and B4 in 2040.” We received only one set of 2040 intermediate files and it is unclear which scenario the intermediate files are for. It is impossible to determine how the modeling was done without these files and these questions also are not addressed in the DEIS or in the Technical Memoranda.

Figure 13: UDOT Traffic Data 2004-2013

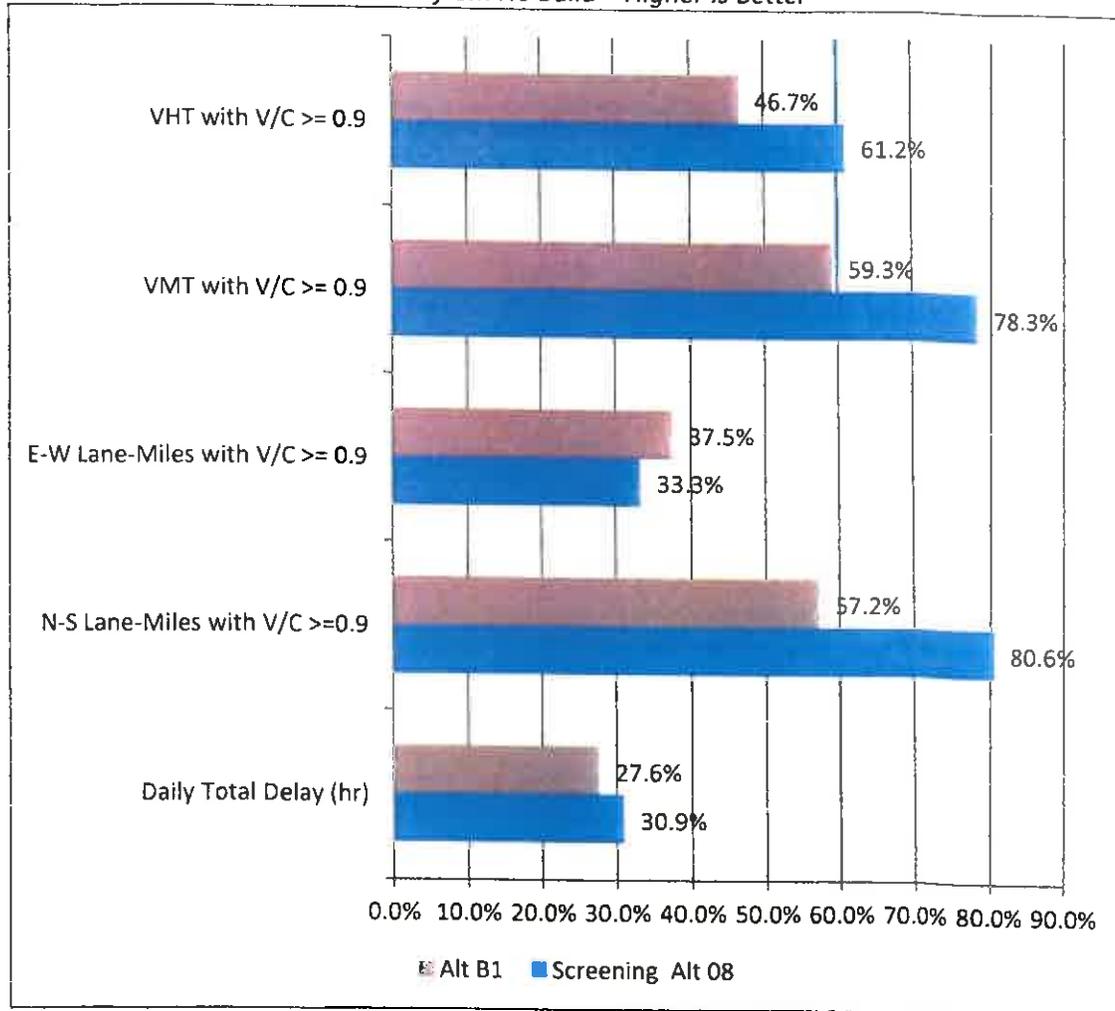


As shown above, traffic volumes were flat on I-15 to north of SR 126 prior to the completion of the Legacy Parkway (labeled "Legacy Highway" in UDOT traffic data reports) in 2008 but then grew rapidly during the period when traffic volumes on most roadways were flat or declining during the economic downturn.

The DEIS Did an Inadequate Job of Evaluating a Non-Freeway Alternative

Technical Memorandum 15 (TM15) dated **October 14, 2012** evaluates the potential congestion benefits of Alternative 8 which combines widening both north-south and east-west roads in the Study Area. As shown in the figure below, this Alternative outperforms Alternative B-1, the construction of the WDC freeway.

Figure 14: Afternoon Peak Period DESI Congestion Measures: Screening Alternative 08 vs. Selected Alternative B-1 – Percent Reduction from No Build – Higher is Better



Sources: Technical Memorandum 15 Table 3-2, p. 23 and DEIS Table 7-16, p. 7-26

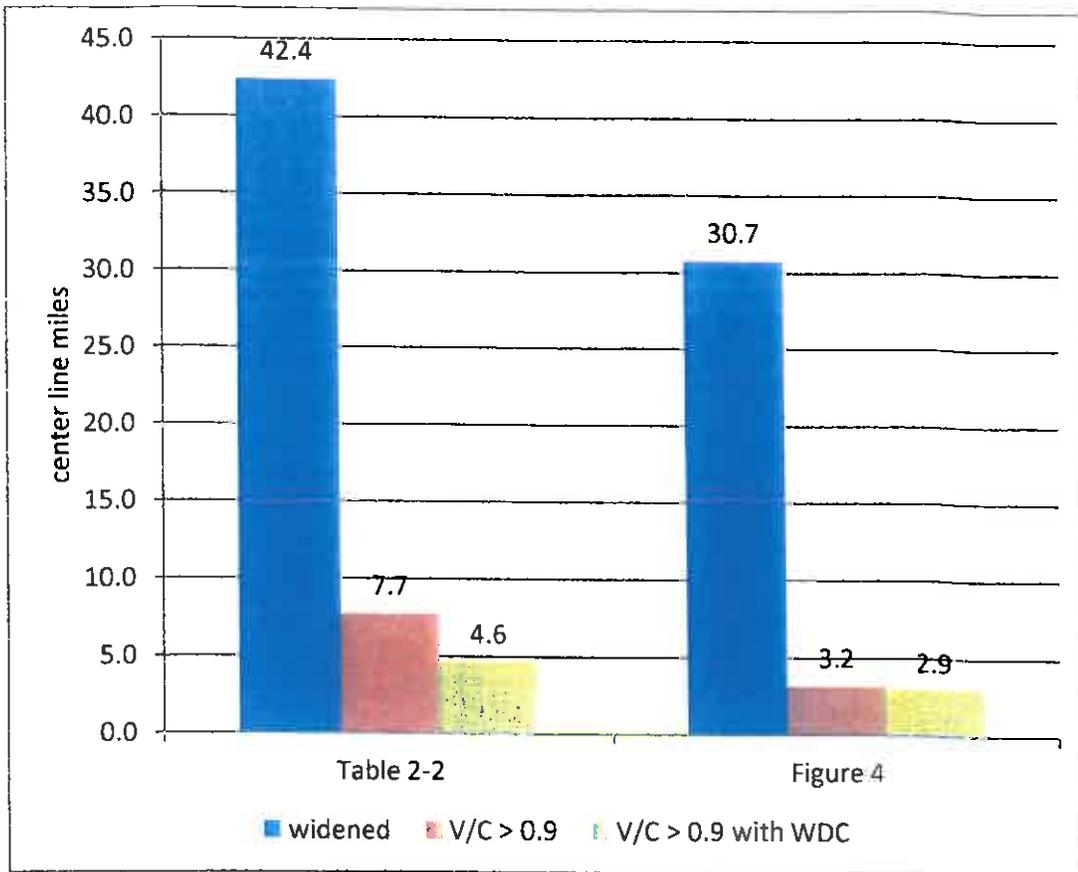
Despite this promising performance, the DEIS process quickly eliminated Screening Alternative 08 because of alleged enormous impacts on land use and other resources. However, these impacts were greatly and unfairly exaggerated due to a combination of: 1) including too many roadway sections; and 2) assuming much larger cross-sections than are standard practice in the Study Area. The most significant place where excessive roadway widening is included involves I-15. TM15 also includes this false statement:

The screening analysis for Alternatives 05 and 08 showed that, to substantially reduce delay and congestion in the Study Area by improving existing facilities, additional capacity improvements beyond the planned improvements identified in the 2040 WFRC RTP would be needed on six east-west arterials in addition to capacity improvements on 17.5 miles of I-15. (p. 39)

This is incorrect. Alternatives 05 and 08 modeling demonstrates that widening existing roadways can "substantially reduce delay." The modeling does not demonstrate that all of the widening projects included are necessary to achieve this result because no other combinations of widening projects were tested. The inclusion of the I-15 widening, in particular, is a red herring, because the 2040 No Build scenario shows volume/capacity ratios of greater than 0.9 only because the model is under-assigning the express lanes in the model so that their volume/capacity ratios are 0.2 to 0.4 in the AM and PM peak periods. If the express lanes and the general purpose lanes had the same density of traffic in the model, no section would show a volume/capacity ratio of greater than 0.9. In any case, the presence of the express lanes makes it somewhat less important to achieve a volume/capacity ratio of less than 0.9 on the general purpose lanes because there will be an uncongested choice. The DEIS makes a huge assumption that without a new freeway I-15 must be widened. It never tests this assumption but instead presents it as factually demonstrated in the modeling of Alternatives 05 and 08. This is false. In fact, the inclusion of I-15 widening in Alternative 08 might be aggravating modeled congestion on the east-west roadways intersecting I-15.

I-15 is not the only road that was unnecessarily included in Alternative 08. The extent of the widening included in those Alternatives, particularly Alternative 08 is ambiguous in the DEIS because TM15 defines it two different ways. There is one description in Table 2-2 (p. 15) and another description in figure 4-3 (p. 58). The first version includes about 6 times as much widening of local streets as is needed to address roadways that have volume/capacity ratios of greater than 0.9 in the 2040 No Build alternative. The second version includes about ten times as much widening than would be required. These statistics were extracted from the DEIS modeling and are summarized in the figure below.

Figure 15: Local Street Widening in Alternative 08 Compared to Sections with Volume/Capacity > 0.9



As shown in the figure above, only a small part of the widening assumed as necessary for Alternative 08 is in the congested sections. As also shown in the figure, the WDC would do very little to address these congested street sections – in sharp contrast to widening that would address the congested sections.

Because the DEIS assumes 5 to 10 times as much widening of local streets as necessary for Alternative 08 and also includes unnecessary widening of I-15, it enormously overstates the impacts of this alternative. However, the DEIS goes even further to overstate the impacts by assuming grossly unnecessary cross-sections for the widened streets.

The widths assumed for these cross-sections are:

- Four-lane divided highway: 250 feet wide
- Five-lane arterial: 112 feet wide
- Seven-lane arterial: 136 feet wide (TM15, p. 46)

These widths must be referenced back to Technical Memorandum 14, wherein the arterial cross-sections are smaller: 104-110 feet for five lanes and 128-134 feet for seven lanes depending on whether or not bicycle lanes are included (TM 14, p. 4-5). All of these proposed widths and designs are suburban in nature, include large shoulders, and are fundamentally incompatible with the local street system in the existing built-out areas west of I-15. These areas already have a number of 5-lane streets and the typical cross-section is about 80 feet, including 60 feet curb-to-curb and about 10 feet on each side to accommodate the sidewalks. All of the

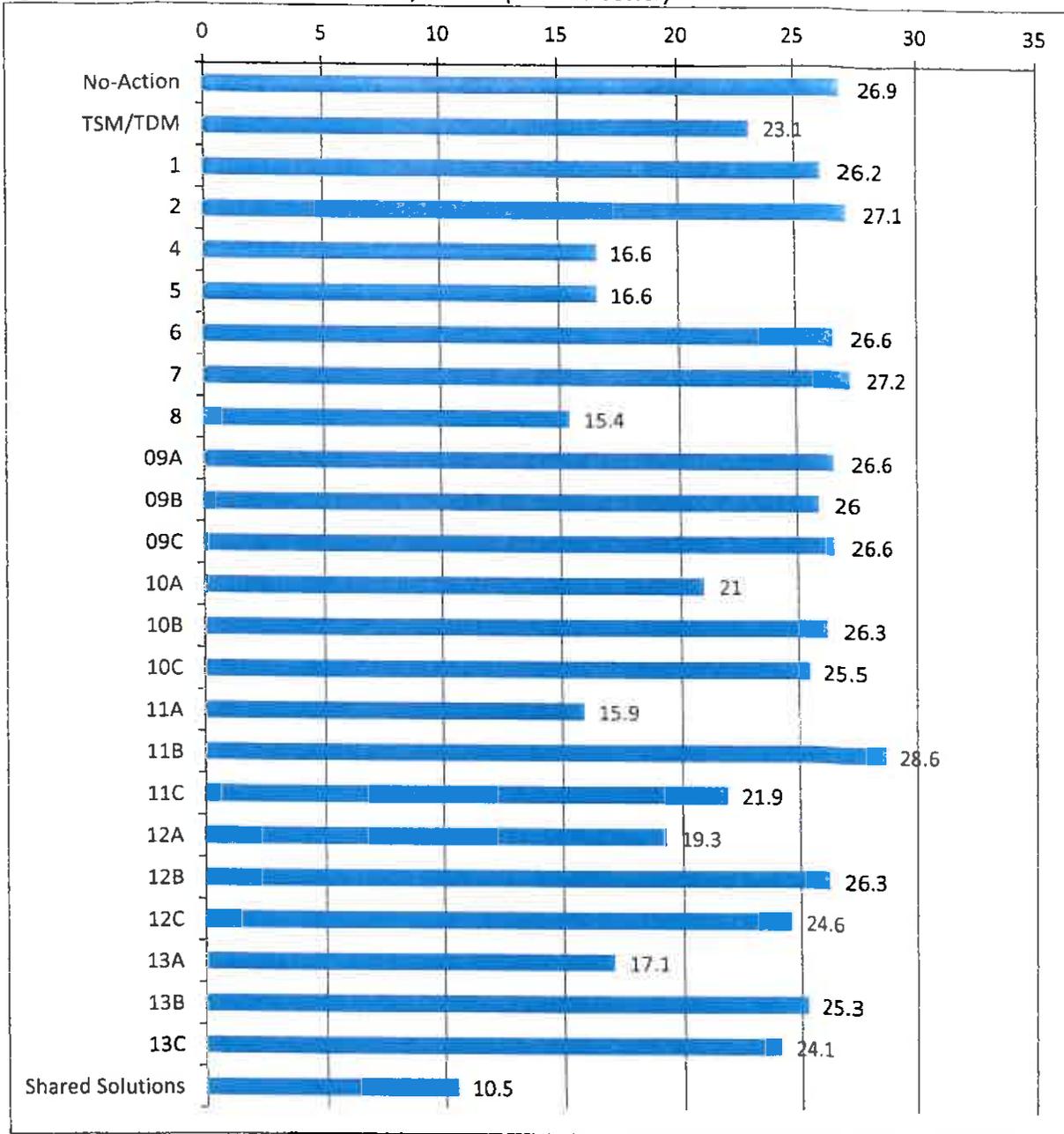
widths included in the DEIS— 104 feet, 110 feet and 112 feet – are excessive, unnecessary and way off the mark.

Even 80 feet is not necessarily required for the entire length of the street. In the model, streets are not 5 lanes or 7 lanes; they are 4 lanes or 6 lanes. The provision of a center lane is a block-by-block decision and may not be necessary throughout but instead only be necessary at intersections. All of these issues deserved further study with a much more critical eye

The DEIS demonstrates that increasing capacity on local streets can address future congestion in the Study Area, but only presents a bloated version of such an alternative, calculates unacceptable impacts based on this bloated version and then returns to support of new freeway options only. The public deserves a better analysis and approach than this. What is needed is a smarter, context-sensitive look at right-sized solutions to transportation Needs in the Study Area. The Shared Solutions alternative is such an approach and recent analysis done by UDOT¹⁹ has demonstrated that it does a much better job of reducing east-west congestion than any of the WDC alternatives (see Figure 16).

¹⁹Alternatives Summary Shared-Solution-12-12-14.xlsx

Figure 16: East-West Road Miles with V/C >=0.9 (lower is better)²⁰



The Shared Solutions outperforms all of the preliminary alternatives on this metric, most of which are new north-south freeways, by a wide margin.

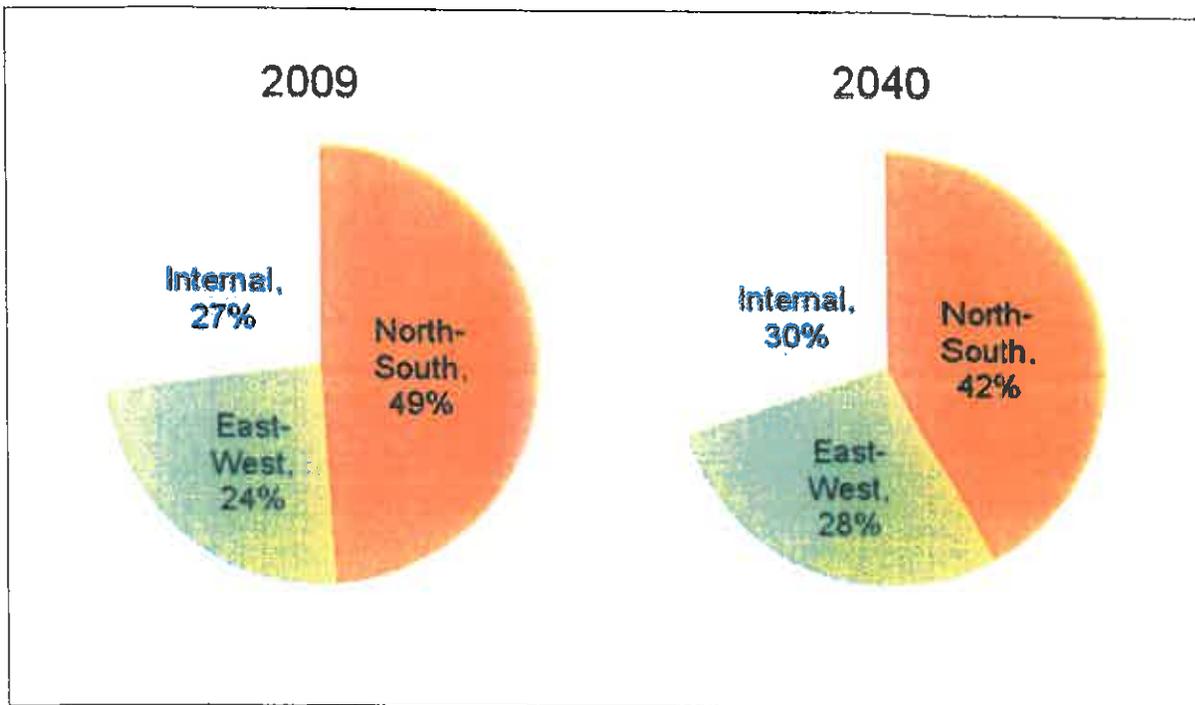
²⁰ Numbers for all alternatives other than Shared Solutions from DEIS *Technical Memorandum 15: Alternatives Screen Report*, Table 3.2, p. 23. Shared Solutions number from Alternatives Summary Shared-Solution-12-12-14.xlsx.

The Study Area in the DEIS Was Artificially Constrained

The focus on north-south travel in the DEIS is a vestige of the outdated view that the purpose of the transportation system in this area is to get workers from Davis and Weber Counties to Salt Lake City. Even the DEIS information indicates this flow will be less important in the future.

Figure 17 Figure Reproduced from DEIS p. 1-26

Chart 1-8. No-Action Travel Patterns for Home-Based Work Trips during the PM Peak Period in the Needs Assessment Study Area



The Figure above shows the importance of north-south commuting will decline in the future. As discussed above, it is highly likely that even this Figure overestimates the future level of north-south commuting for two reasons: 1) the jobs/housing balance in Davis and Weber Counties will be better than assumed in the DEIS; and 2) workers in 2040 are unlikely to want to make the long auto commutes assumed in the DEIS.

Figure 18 (enlarged from Figure 3) shows modeled congestion in the 2040 No Build scenario during the weekday afternoon peak period (the most congested time of the day in the model).

Figure 18: PM Peak Period 2040 No Build



Red=volume/capacity > 0.9 (1 direction or both)
Green = volume/capacity < 0.5 in both directions
Gray = volume/capacity between 0.5 and 0.9
Purple = roadways not in model

In Figure 18, there is no evidence that future north-south congestion is a more significant issue than future east-west congestion. There also is no evidence that consideration of congestion in Davis County should include only West Davis County. There are similar amounts of congestion to the east and west of I-15. Furthermore, alternatives to shift future traffic from I-15 could include north-south alternatives either east or west of I-15. The two primary DEIS Purposes are extremely general: 1) "Improve Regional Mobility" and 2) "Enhance Peak-Period Mobility". Given these purposes, the Study Area should have included all of Davis and Weber Counties, rather than only the Western portions. Certainly the idea of a single "corridor" should not be presumed at all.

Conclusion

For a host of reasons, the Need for the WDC is poorly understood and not adequately justified by the efforts to date. It appears the WDC is not necessary and there are other alternatives available to address any regional traffic congestion problem. Of course, a Study Area appropriately sized to take into account the entire region is required if you are trying to solve that set of issues and the current Study Area is about half this size it should be.

The Model must be recalibrated and reliance on the GOPB numbers is misplaced due to the methodology employed thereby. It bears no resemblance to reality and reliance should instead be placed on the land use plans in place, especially as to housing and employment. The use of the 1992 travel preferences is particularly troubling, as there is quite clearly a new paradigm in place that is summed up by the statement that people want to live close to where they work. They also prefer more workable communities.

Our suggestion is to fix the fundamental flaws relating to the Model, revisit the travel preference trends regarding commuting, include the actual land use information from the area, sharpen the focus on what the actual housing/employment numbers are and will be in 2040 and then develop a new set of Alternatives for modeling, which should include the Shared Solution.

RESOLUTION NO. _____

A RESOLUTION OF FARMINGTON CITY TO REQUEST A REVISED APPROACH TO THE WEST DAVIS CORRIDOR NEPA EFFORT AND IN SUPPORT OF FULLY AND FAIRLY REVIEWING THE SHARED SOLUTION AND OTHER LESS IMPACTFUL ALTERNATIVES THEREIN.

WHEREAS, Farmington City has reviewed the Shared Solution Alternative for the West Davis Corridor (“WDC”) created by Utahns for Better Transportation and the Shared Solution Coalition; and

WHEREAS, the Shared Solution Alternative has passed the initial NEPA screening level for Alternatives by the Utah Department of Transportation (“UDOT”) and should now be reviewed as an Alternative to the West Davis Corridor; and

WHEREAS, Farmington City has over the past two years undertaken, at its own expense, significant efforts to better understand the Need for, impacts of and Alternatives to the “Locally Preferred Alternative” for the WDC contained in the Draft Environmental Impact Statement (“DEIS”) published in April 2013; and

WHEREAS, that review has revealed the that the “Locally Preferred Alternative” (Glovers Lane) and the Shepards Lane Alternatives are unnecessary, overly impactful to many environmental and other resources and overly expensive by comparison to the Shared Solution Alternative, as well other alternatives that were not reviewed or advanced by UDOT and the Federal Highway Administration (“FHWA”); and

WHEREAS, Farmington City caused the creation of the a document entitled West Davis Corridor Draft Environmental Impact Statement (“Report”), dated January 12, 2015 and has reviewed that Report; and

WHEREAS, the Report reveals that the efforts supporting the DEIS for the WDC published in April 2013 suffers from a considerable number of flaws, including but not limited to improper modeling, reliance upon improper assumptions and improper choices by UDOT, as well as with use of unacceptable practices during the DEIS effort; and

WHEREAS, a careful review of the DEIS modeling and the totality of the DEIS effort raises the question of whether there is a Need for the WDC at all; and

WHEREAS, there appears to be no rational reason to create the impacts in and to Farmington City and the remaining communities in Davis and Weber Counties contemplated by the “Locally Preferred Alternative” in the DEIS; and

WHEREAS, the flaws in the DEIS are so significant and so pervasive and widespread that Farmington City believes the entire NEPA effort must be revisited, with a new Study Area that includes the entirety of Weber and Davis County and to the north:

NOW, THEREFORE, BE IT RESOLVED THAT FARMINGTON CITY FULLY SUPPORTS THE REVIEW OF THE SHARED SOLUTION ALTERNATIVE AS A VIABLE REPLACEMENT ALTERNATIVE FOR THOSE PREVIOUSLY STUDIED IN THE DEIS; THAT FARMINGTON CITY FULLY SUPPORTS THE TAKING OF A NEW DIRECTION BY UDOT AND FHWA THAT WILL ALLOW THEM TO FULLY REVISIT THE NEED FOR THE WDC, AS WELL AS OTHER ALTERNATIVES THERETO IN A LARGER STUDY AREA, INCLUDING ALL OF WEBER AND DAVIS COUNTIES AND FARTHER NORTH; AND THAT

FARMINGTON CITY BELIEVES THIS NEW EFFORT MUST BEGIN IMMEDIATELY TO AVOID UNNECESSARY EXPENSE, TOGETHER WITH IRRETRIEVABLE IMPACTS ON THE LAND AND POPULACE OF FARMINGTON CITY, WEBER AND DAVIS COUNTY AND THE CITIES THEREIN FROM THE LOCALLY PREFERRED ALTERNATIVE:

Section 1. Effective Date. This resolution shall become effective immediately upon its passage.

PASSED AND ADOPTED BY THE CITY COUNCIL OF FARMINGTON CITY, STATE OF UTAH, ON THIS ____ DAY OF _____, 2015.

FARMINGTON CITY

By: _____

Mayor

ATTEST:

City Recorder