The Arapahoe County Board of County Commissioners typically holds weekly Study Sessions on Monday and Tuesday. Study Sessions (except for Executive Sessions) are open to the public and items for discussion are included on this agenda. Agendas (except for Executive Sessions agendas) are available through the Commissioners’ Office or through the County’s web site at www.arapahoegov.com. Please note that the Board may discuss any topic relevant to County business, whether or not the topic has been specifically noticed on this agenda. In particular, the Board typically schedules time each Monday under “Committee Updates” to discuss a wide range of topics. In addition, the Board may alter the times of the meetings throughout the day, or cancel or reschedule noticed meetings. Questions about this agenda? Contact the Commissioners’ Office at 303-795-4630 or by e-mail at commissioners@arapahoegov.com

Study Session Topics

8:30 A.M. Administrative Meeting · Michelle Halstead (BOCC Conference Room)
Michelle Halstead, Director, Communications and Administrative Services
Board of County Commissioners

10:00 A.M. *Arapahoe County Transportation Update (WHR)
Discussion with the Board of County Commissioners to provide updated information regarding the transportation system status and needs within Arapahoe County

Request: Information/Direction

Bryan Weimer, Director, Public Works and Development
Janet Kennedy, Director, Finance
Robert Hill, Senior Assistant County Attorney

Documents:

LONG RANGE BUDGET · TRANSPORTATION NEEDS UPDATE BSR 12-27-18.PDF

* To Be Recorded As Required By Law
WHR · West Hearing Room
Arapahoe County is committed to making its public meetings accessible to persons with disabilities. Assisted listening devices are available. Ask any staff member and we will provide one for you. If you need special accommodations, contact the Commissioners’ Office at 303-795-4630 or Relay Colorado 711.

Please contact our office at least 3 days in advance to make arrangements.
BOARD SUMMARY REPORT

DATE: December 28, 2018

TO: Board of County Commissioners

FROM: Bryan D. Weimer, PWLF, Director
       Public Works and Development

SUBJECT: UPDATE ON TRANSPORTATION NEEDS

Direction/Information
This Study Session is to provide the Board of County Commissioners (BOCC) with updated information regarding the transportation system status and needs within Arapahoe County.

Request and Recommendation
This Study Session is to provide the BOCC with an update on the transportation system needs and condition within Arapahoe County. The Session will focus on:

- Maintenance of our infrastructure and capital improvement program needs
- Condition and operational characteristics of the County’s transportation system
- Summary of decisions and prioritization made with limited resources including efficient measures instituted.
- Summary of legislative actions and impacts on the County
- Economic impacts affecting services Public Works provide
- Update on the Arapahoe County recently formed Transportation Forum.
- Initial plans/initiatives for 2019

As mentioned previously, this Study Session purpose is to provide an update on various transportation topics, but Staff would like BOCC to provide feedback regarding these topics and direction of Public Works.

Background
PWD has shared with the BOCC the condition and needs of the County’s infrastructure for many years, but lately compiled a Long Range Budget Committee (LRBC) Infrastructure report in 2016 and presented such in 2017. Furthermore, the information was updated in 2018. As a summary, we broke the infrastructure into several categories, which are 1) Infrastructure Maintenance, 2) Capital Improvements, and 3) Roadway Network Operations and Safety. The explanation of these different categories are as follows:
Infrastructure Maintenance
Within PWD, the Road and Bridge Division is responsible for the maintenance of the County transportation infrastructure, which is located within unincorporated portions of the County only. Cities within the County are responsible for the transportation infrastructure within their jurisdiction. CDOT is responsible for State and Interstate roadways within the County. The Southeast Metro Storm Water Authority (SEMSWA) is responsible for storm water infrastructure within its boundaries (primarily urban portions of unincorporated County and City of Centennial). The primary unincorporated infrastructure includes; roadways (paved and gravel), curb/gutter/sidewalk, bridges major/minor, and drainage structures (rural portion), but also includes other maintenance programs such as traffic control devises such as signals/signs/pavement marking, guardrails, snow fencing, right-of-way (mowing, trash removal, vegetation control), dust control, sweeping, snow and ice control, and equipment to perform such. Funding for this maintenance comes from the County’s Road and Bridge Mill Levy collected County wide and Highway Users Tax Funds (HUTF) which generally comes from the state gas taxes and vehicle registration. The Road and Bridge Mill Levy is shared backed with cities (currently about 50% of the taxes collected). The HUTF is the County’s allocation and is not shared, as cities receive their own HUTF allocation. Both of these funding sources can be used for maintenance and capital improvements, but the County has historically used them for maintenance, while capital is funded as discussed in the following section of the report.

Capital Improvements
The Capital Improvement Program is housed within the Transportation Division of PWD. This program is where County transportation infrastructure projects are planned, engineered, designed, and constructed. Unlike the Maintenance Program discussed above, the Capital Improvement Program projects and the County investments can be for infrastructure in unincorporated portions of the County, but also can include regionally significant projects within cities and/or on state and interstate roadways and/or public transit improvements. The BOCC has historically taken the position that the County will have a regional perspective on transportation and therefore will partner with other entities to further promote projects that benefit the County irrespective of being located within incorporated boundaries. Funding for infrastructure capital improvements comes from the Capital Expenditure Fund (CEF) Mill Levy and outside funding such as federal grants, state/city/county partnership funds, transportation impact fees, and or other developer contributions. The CEF Mill Levy is also collected County wide, but unlike Road and Bridge Mill Levy is not shared back to the cities. Therefore, it is important that CEF funds are not used for infrastructure maintenance, so as not to be confused with Road and Bridge Mill Levy funds and have to be shared.

Network Operations and Safety
As with the Maintenance that considers the physical condition of the County infrastructure such as pavement condition index, percent excellent, good, fair, poor, very poor, or lane mile gain/loss, it is important to understand the operational condition of the infrastructure the County is involved with, in this case the roadway system. These
operational characteristics include such items as travel time, travel time index, travel speeds, hours of delay, cost of delay, crash type, crash numbers and severity all of which are rolled into a Mobility Grade. These measures keep track of how the County’s roadway systems are functioning as a primary indicator of congestion and safety.

**Long Range Budget Committee Summary**
Based on the above programs, the LRBC summarized that the current PCI of the County’s roadways were at 69 on a scale of 0-100. The percentage breakdown of the pavement condition was 22% Excellent, 50% Good, 22.1% Poor, and 5.9% Very Poor. Bridges had a Bridge Health Index of 6.49 in 2015 on a scale of 0-8. These condition levels are reflected in the following graphics.
On the Capital Improvement side of infrastructure, the different funding need levels are based on some policy choices, in terms of how broad a range of projects the County may wish to undertake. PWD categorized projects in three different ways in the LRBC report:

- **Local Projects** - These are projects that are totally within unincorporated Arapahoe County.
- **Joint Projects** - cross jurisdictional boundaries between unincorporated Arapahoe County and incorporated areas of the County or neighboring counties, whereby the Arapahoe County has a jurisdictional portion of the roadway.
- **Regional Projects** - Regionally significant projects may or may not be located within unincorporated Arapahoe County, but are typically projects that are the primary responsibility of another jurisdiction because of boundaries/ownership, such as CDOT or a city, but have a regional significant importance because it serves the vast majority of the County citizens and businesses and is critical to the overall roadway network within the County.

In 2016, the travel time index for all roadways in Arapahoe County was 1.29 meaning that it took 29% long to travel the same distance during the PM Peak Hour than non-peak times. The total number of crashes in the entire County was shown as 12,599 with 31 fatalities in 2014. These values are shown below graphically.
2017 Transportation Citizen Survey and Telephone Town Halls

In 2016, the County began telephone town halls and as part of them a question was asked “What issue should Arapahoe County address?” In each and every town hall, Traffic Congestion was the number one issue as summarized in the following:

<table>
<thead>
<tr>
<th>Issue</th>
<th>1/16</th>
<th>5/16</th>
<th>10/16</th>
<th>2/17</th>
<th>3/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime</td>
<td>24%</td>
<td>18%</td>
<td>14%</td>
<td>11%</td>
<td>21%</td>
</tr>
<tr>
<td>Traffic Congestion</td>
<td>40%</td>
<td>42%</td>
<td>50%</td>
<td>45%</td>
<td>51%</td>
</tr>
<tr>
<td>Job Creation</td>
<td>13%</td>
<td>9%</td>
<td>9%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Seniors Service</td>
<td>16%</td>
<td>15%</td>
<td>14%</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>Trails/Parks</td>
<td>6%</td>
<td>15%</td>
<td>13%</td>
<td>17%</td>
<td>8%</td>
</tr>
</tbody>
</table>

In May 2017, an online survey was conducted using the County Survey Gizmo account. The survey was composed of 20 transportation related questions. The survey was distributed through the County social media accounts and on www.arapahoegov.com. In one month, nearly 1,000 complete responses were gathered and analyzed.

Questions included:
1. How do you get to work or school?
2. How far is your one-way commute in miles?
3. How far is your one-way commute in minutes?
4. How much time do delays add to a typical commute of 30 minutes?
5. How do you rate your commute on a scale of 1 – 5 with 1 being very easy and 5 being very difficult?
6. Which transportation related concern is most important to you?
7. How do you rate the current condition of our roads on a scale of 1 to 5 with 1 being the worst and five being excellent?
8. How do you find out about road work and closures in Arapahoe County?
9. When you drive to commute to do you ever carpool?
10. What areas in Arapahoe County and the southeast Metro region are hardest to travel?
11. If you drive, carpool or ride the bus, how often are you delayed by traffic on the road?
12. How long would your commute have to be in minutes in order to look for an alternate transportation option?
13. Where are the problem areas for traffic congestion?
14. Where are the problem areas for road condition?
15. What ideas do you have to improve transportation in Arapahoe County?
16. Do you use any tools like Waze or Google Maps to help with your commute?
17. Would you use new technologies as they evolve to aid in commute times?

Nearly 87 percent of respondents reported that they drive a car to work or school, or use a combination of driving, biking and/or transit. Only 1 percent of respondents reported that they bike. Most respondents are commuting between five and 15 miles to get to work or school, with the majority saying it takes between 10 – 30 minutes one way.

More than 50 percent of respondents reported that delays add between 5 and 15 minutes to a typical commute. More than 50 percent of respondents also reported that they are delayed by traffic daily. When asked to rate their commute’s difficulty on a scale of one to five, with one being very easy and five being very difficult, the majority of respondents were right in the middle, with 35 percent rating their commute at a three. More respondents (38 percent) rated their commute as a one or two than a four or five (26 percent).

The number one transportation related concern was traffic congestion (56 percent), followed by the quality of roads (13.3 percent) and safety and missing or mistimed traffic signals (tied at 7.8 percent). When asked to rate the current condition of the roads on a scale of one to five, with one being the very worst and five being excellent, the majority of respondents were again right in the middle, with 48.6 percent rating the roads as a three.

2018 Leadership Workshop
During the 2018 County Leadership Workshop PWD introduced the level of service for maintenance and construction (Capital/Congestion). From a maintenance perspective, the concept of “Pay now or pay a lot more later” was introduced and discussed. The cost of deferring pavement maintenance escalates dramatically over time and can exceed 8 to 10 times the cost of less expensive regular preventive maintenance treatments. When it comes to transportation infrastructure, pavement along with the concrete adjacent to the road is the County’s greatest investment and are the assets that serve the most citizens. Asphalt and concrete represent over three-fourths of our total infrastructure assets of nearly $900 million.
Stagnation of revenue in the Road and Bridge Fund has reduced the ability of this program to perform necessary maintenance activity. Funding for Road and Bridge has been relatively flat over the past decade. Meanwhile, the network of paved roads in the unincorporated areas has increased from 900 lane miles to 1,112 lane miles – 24 percent. The network is projected to grow to 1,400 lane miles by 2026. At the same time, costs are escalating. Over the last ten years, the cost of contract paving has gone up 119 percent and the price of asphalt has gone up 62 percent. Without additional funding, the ability to keep pace with escalating costs and citizen demands for service will be impossible.

So for roadway condition the question was – what level of service (LOS) is appropriate for County paved roads? In essence, do we pay now or pay higher costs to maintain a lower roadway condition later?

- **Low** – Current funding level unchanged. Backlog will grow by 400 percent and 41 percent of the paved roads will be in poor or very poor condition within ten years. Level of service does not meet citizen expectations.
- **Medium** – Only 15 percent to 25 percent of the paved roads will be in poor or very poor condition within ten years. The network condition will be stabilized but deferred maintenance will not be reduced. Citizens perceive minor improvements.
- **High** – Less than 15 percent of the paved roads will be in poor or very poor condition within ten years. Overall condition of the network improves and the backlog minimized. Citizens perceive substantial improvements to the roadway network.
From PWD’s perspective the current LOS of the paved roadways was Low. The Leadership Workshop participants agreed with that perspective as well.

While pavement and concrete are the County’s greatest investment and serve the most citizens in the County’s transportation infrastructure, the County also owns and maintains over $200 million invested in bridges, signs, signals, guardrail, curbs, gutters and sidewalks. The problem of deferred maintenance again with stagnation of revenue in the Road and Bridge Fund has reduced the buying power and ability of this program to perform the necessary maintenance activities. Bridges are particularly noteworthy. The County bridge inventory includes 43 major structures, 96 minor structures and 1,300 small structures. An adequate, sustained funding source is essential in order to have a systematic, ongoing program of bridge maintenance, rehabilitation and replacement. Along with bridges, other assets also require systematic maintenance. These assets include 180 centerline miles of gravel roadways, over 14,000 signs, 1,300 marked intersections, 28 traffic signals, snow fences, miles of guardrail, curbs, gutter and sidewalks. The current schedule for maintenance, repair and replacement far exceeds the expected life cycle of these assets. As more focus is placed on maintaining asphalt and concrete infrastructure, maintenance on all other assets is being further deferred.

For these other assets the various levels of service were established as follows:

- **Low** – Repair / replacement intervals twice the standard service life for most assets. (Example: 20 to 25 years for traffic and street signs compared to the recommended standard of 10 to 15 years.) The number of deferred maintenance projects will continue to grow every year.

- **Medium** – Repair / replacement intervals more closely align with projected service life for bridges, culverts, gravel roads, signals and signs. Still about twice the recommended standard for snow fences, paint marking, guardrail and other maintenance. The existing backlog of maintenance projects will be only minimally reduced.

- **High** – Repair / replacement schedules align with projected service life and industry standards. Deferred maintenance backlog is reduced over ten years.

Again from PWD’s perspective the current LOS of these other assets considered was Low. The Leadership Workshop participants agreed with that perspective as well.

Substantial increases in east-west travel, affecting unincorporated and incorporated areas of the County, are projected through 2035. Arapahoe County’s roadway network will continue to experience pressure from growth outside of the County and the employment centers along the South I-25 Corridor and Downtown Denver. Congestion and traffic delays cost our residents, businesses and traveling public exponentially. Mobility is a key factor in the attraction and retention of businesses in the County. Citizens have made it clear they want the County to address congestion as it is their number one priority but we invest less money into transportation infrastructure every year. Investment into roads has been flat and inflation continues to erode buying power. The figure below depicts growth
by displaying east-west traffic growth across two screenlines (imaginary line drawn across an area to show travel demand for a group of roadways)

- The first chart shows growth of 40,000 vehicles/day to nearly 200,000 vehicles/day by 2035.
- The second chart shows growth of 20,000 vehicles/day to over 80,000 vehicles/day by 2035.

The cost of congestion in Arapahoe County is estimated at over $800,000 per day. The DRCOG congestion model, which analyzes the arterial roadway network in the County, presently shows a Peak Travel Time Index of 1.52. This means peak travel time increases 52 percent compared to non-peak time.
Another indicator of congestion is the Mobility Grade. This evaluation incorporates five specific factors, listed below. The Mobility Grade is a widely used system which recognizes that peak hour congestion will exist in urban areas but with a goal to minimize the duration, severity and hours of delay. The Mobility Grade is expressed as Excellent, Good, Fair, Poor and Very Poor, calculated by using these metrics.

**Duration:** How long does the congestion last? (Number of congested hours per day)

**Severity:** How much time is spent driving in delayed conditions?

**Magnitude:** What is the total amount of delay for all travelers?

**Variation:** What is the variation in travel time between off-peak and rush hour? (Travel Time Index)

**Reliability:** How often do crashes of incidents occur? (Crashes per year per mile)

Currently, the Arapahoe County Arterial System has 34 percent of the 1,255 lane miles rated as Poor or Very Poor for Mobility (congested more than three hours a day). This percentage is projected to climb to 54 percent by 2040 with an additional 40 lane miles of arterial roadways added to the network.

The question is – at what service level to fund transportation construction using the following metrics?

<table>
<thead>
<tr>
<th>Travel Time Index</th>
<th>Mobility Grade (%) Lane Miles Poor/Very Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low – Greater than 1.45 *</td>
<td>Above 25% **</td>
</tr>
<tr>
<td>Medium - Between 1.31 and 1.45</td>
<td>Between 15% and 25%</td>
</tr>
<tr>
<td>High - Below 1.30</td>
<td>Less than 15%</td>
</tr>
</tbody>
</table>

* With growth and status quo, TTI by 2040 projected to be 2.61.

** With growth and status quo, Mobility Grade by 2040 projected to be 54% Poor/Very Poor.
PWD’s perspective is that the current LOS regarding congestion in the County was considered Low. The Leadership Workshop participants agreed with that perspective as well.

Safety on roadways in the County should also be considered when considering the health of the County infrastructure. The charts below demonstrate the total number of crashes (13,850) continue to increase along with fatalities (37). Also, Arapahoe County ranked in the top 5 (2015) of all County’s in the number of:

- Serious Injury Crashes - #2 (310)
- Fatalities Involving BAC ≥0.08 - #5 (10)
- Speed Related Fatalities - #4 (17)
- Fatalities, Drivers 20 or younger - #1 (9)
- Pedestrian Fatalities - #4 (6)
Links to Align Arapahoe

All of the pillars of Align Arapahoe are encompassed and embraced with the service Public Works and Development provides. As an Accredited American Public Works Association agency, the Department has demonstrated that it meets and exceed the standard expected of a public works organization and continues with an organizational philosophy of continuous improvement, which is a cornerstone of Align Arapahoe.

Quality of Life
Infrastructure is a key element in providing quality of life for citizens and businesses that reside in or use the infrastructure on a daily basis. By definition infrastructure is comprised of the facilities and systems shared or used by all citizens. The facilities have in common the need for capital investment — sometimes a significant amount. As Arapahoe County and the area surrounding the County continues to grow, the demands placed on sufficient and adequate transportation infrastructure also continues to increase. Therefore, in order to preserve the expected quality of life, transportation infrastructure needs must keep pace with need to provide the basic government services.
Service First
Public Works and Development is an external facing department that interacts with County customers on a daily basis both in a direct manner (issuing permits, processing developments, etc.) and indirect manner (maintenance and operations of infrastructure, or by providing new or upgrade infrastructure. As such, the Departments focus is to provide the best service within the available resources possible. This is reflected in the Department Vision “To provide exceptional service through integrity, collaboration, and innovation”. Without the focus on Service First, the infrastructure PWD is responsible for or have an interest in will not be of the quality deserving or expected of it users.

Fiscal Responsibility
PWD staff view themselves as good stewards of public funds and thus are entrusted with the efficient, thoughtful, and productive use of such funding for the County infrastructure. We continually look for improvements and efficiencies in our daily business, which is exhibited by the quality of services provided with relatively flat budgets for services over time. Innovation and looking at the way we do business to maximize limited resources continues within the Department culture. We have shown an ability to leverage outside funding to maximize the use of County funds and have built an environment of collaboration to accomplish needed transportation infrastructure improvements. These effort help to maximize the services provided with the limited resources available.

Discussion
The primary purpose of this Study Session is to provide the BOCC updated information regarding the transportation system status and needs within Arapahoe County as we move into 2019. The following will show the current condition and operational characteristics of the County’s transportation infrastructure, modifications made in some of the measurements of performance, legislative actions, and projections into the future given the status quo in funding.

Infrastructure Condition - Maintenance
In 2018, the County roadway network was evaluated to establish a condition rating (pavement condition index – PCI). While the results of this analysis are not yet available, Road and Bridge staff forecast a further decline in average PCI rating from the current 69 to as low as 68 or perhaps 67. Final condition data is still being collected and should be available from the consultant within the next couple of months. Although particular attention has been focused on pavement maintenance and preserving the condition of this asset, Road and Bridge still failed to reach the desired 1,162 lane mile years gained in 2018 by over 121 LMY’s.

While other asset maintenance is further deferred, maintaining asphalt pavements has become a priority as it is the most costly to replace. The chart below depicts the increase in pavement maintenance spending from 2015 to present. It is important to note, however; that while spending has increased for pavement maintenance, other maintenance efforts have been significantly reduced.
In using the pavement management model and a status quo funding level of $4.3M, the following graph projects the deterioration in overall pavement condition to a PCI of 61 by 2026.

The other measure utilized to consider the condition of the County’s roadway network is the Lane-Mile Loss/Gain provided by annual maintenance with resources available. On average from 2016 through 2028, the County’s roadway network is losing 339 Lane-Miles of life annually or roughly 28% of the assets useful life. By the end of 2028, the deferred maintenance is estimated to exceed $30M. In just 10 years, recovering this loss will be insurmountable.
The County has 43 drainage structures that are over 20' in width (30 bridge type structure). The contract labor budget for bridge maintenance has historically been funded around $360k. Road and Bridge has recently allocated in-house labor to perform preventative maintenance tasks. The average age of our major structures is 40 years, with 10 of our major structure bridges over 50 years including 3 that are over 65 years old. The Bridge Health Index in 2017 was 6.49, which is the same as 2015. Deterioration is progressing slowly, and consistently (see previous years above). Yet majority of bridges are of the same vintage, so consistent deterioration could mean critical repairs needed at same timeframe. The following graphically depicts this phenomenon below.
For Bridge and Drainage Structures the following deferred maintenance would be as follows, again from the long range budget report. These amounts have increased because of 1) construction cost escalation (steel for one), 2) increase maintenance needs (Costs we have seen with Price Road Bridge Est.-$350K, now $800K). But this gives a general perspective.

<table>
<thead>
<tr>
<th>Structure Type</th>
<th>Current Annual Budget</th>
<th>Needed Annual Budget</th>
<th>Difference (2016 Costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Structures</td>
<td>$360,000</td>
<td>$530,000</td>
<td>$170,000</td>
</tr>
<tr>
<td>Minor Structures</td>
<td>$120,000</td>
<td>$205,000</td>
<td>$85,000</td>
</tr>
<tr>
<td>Mini Structures</td>
<td>$250,000</td>
<td>$420,000</td>
<td>$170,000</td>
</tr>
<tr>
<td>Total</td>
<td>$730,000</td>
<td>$1,155,000</td>
<td>$425,000</td>
</tr>
</tbody>
</table>

Recognizing that concrete and asphalt pavements are the County’s most expensive assets and also those most at risk and more costly to replace, Road and Bridge has focused on the maintenance needs of these critical assets. The updated asset replacement value of the assets is shown below.

In order to prudently maintain these assets at a minimum funding level, the maintenance of other assets has been further deferred and will also be more expensive to repair or replace in the future. Ultimately, this equates to a lower level of service overall within the County. In order to maximize ROI for this resurfacing work and associated concrete curb, gutter and sidewalk work (mandated by ADA requirements), Road and Bridge has made the conscience decision to defer maintenance on other assets. These assets and their associated maintenance include: gravel road maintenance, dust abatement (eliminated altogether), street signs and
pavement markings, guardrails, bridges/drainage structures (specifically bridge maintenance and deck seal on E. Inverness Dr), snow fences, street sweeping, winter maintenance and traffic signal maintenance. As can be seen from the charts below, some basic Right-of-Way maintenance has been incrementally reduced by 80% since 2015.

<table>
<thead>
<tr>
<th>ROW Task</th>
<th>2018</th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mowing</td>
<td>$2,262.86</td>
<td>$66,692.48</td>
<td>$72,376.28</td>
<td>$94,387.72</td>
</tr>
<tr>
<td>Weed Removal</td>
<td>$-</td>
<td>$779.40</td>
<td>$25,747.03</td>
<td>$31,628.37</td>
</tr>
<tr>
<td>Tree Trimming</td>
<td>$32,363.38</td>
<td>$36,813.27</td>
<td>$72,898.67</td>
<td>$91,446.20</td>
</tr>
<tr>
<td>Trash Cleanup</td>
<td>$14,899.29</td>
<td>$37,367.21</td>
<td>$19,903.84</td>
<td>$15,302.17</td>
</tr>
<tr>
<td>Other (fence and Mailbox repair)</td>
<td>$2,202.77</td>
<td>$3,601.37</td>
<td>$4,154.95</td>
<td>$25,802.13</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>$51,728.30</td>
<td>$145,253.73</td>
<td>$195,080.77</td>
<td>$258,366.59</td>
</tr>
</tbody>
</table>

Whatever additional funds have been expended on pavement maintenance results in decreased funding for other operations. Fortunately, a number of factors come into play that allows Road and Bridge team members to still provide satisfactory services. One such factor is snow removal efforts. Due to the relatively mild winters over the past four years or so, Road and bridge has been able to shift this savings on materials and labor to supplement contract trucking for both gravel road maintenance asphalt maintenance. In fact, to date, Staff has plowed and applied materials to approximately 60% fewer road miles compared to the miles plowed in 2015. Although winter is still upon us, so far this season, we have not performed any ice removal operations at all. Up until 2017, Road and Bridge would traditionally spend upwards of $75,000 each year to scrape up and haul away nuisance ice. The BoCC approved a priority system to rate the severity or potential hazards of ice which has significantly reduced the need to actually remove ice from our streets.

Road and Bridge staff are still collecting data and receiving material invoices for work performed in 2018. As such, they have not yet determined the exact unit costs of all operations. That being said, it is still accurate to assume that important work is being completed in an efficient and often innovative manner. Many of these efficiencies are difficult to quantify with exact cost savings. One such example is the new 10 ton patch
trucks we have purchased for 2019. These trucks are the largest such patch trucks within 700 miles of Arapahoe County. They have been custom built and come with heated beds that will allow crews to store hot asphalt for extended periods of time. This will significantly reduce travel times; drastically improve our ability to attend to asphalt repairs in a more timely manner; and therefore make the crews more efficient. That being said, these trucks were very expensive and it will take some time to determine the actual cost/benefit analysis.

Per the Long Range Budget Report the following estimated the value of the additional assets.

### Summary of other Program Needs

<table>
<thead>
<tr>
<th>Program</th>
<th>Current Annual Bdg</th>
<th>Current Annual Need</th>
<th>Current Funding Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign Maintenance</td>
<td>$150,000</td>
<td>$245,000</td>
<td>$95,000</td>
</tr>
<tr>
<td>Markings (Striping)</td>
<td>$250,000</td>
<td>$330,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Snow Fence</td>
<td>$60,000</td>
<td>$100,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>Guardrail</td>
<td>$30,000</td>
<td>$170,000</td>
<td>$140,000</td>
</tr>
<tr>
<td>Dust Control</td>
<td>$50,000</td>
<td>$150,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Right of Way Maint</td>
<td>$300,000</td>
<td>$400,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Signals</td>
<td>$230,000</td>
<td>$230,000</td>
<td>-</td>
</tr>
<tr>
<td>Sweeping</td>
<td>$150,000</td>
<td>$150,000</td>
<td>-</td>
</tr>
<tr>
<td>Winter Maintenance</td>
<td>$1,350,000</td>
<td>$1,350,000</td>
<td>-</td>
</tr>
<tr>
<td>Other Program Costs</td>
<td>$1,249,000</td>
<td>$1,249,000</td>
<td>-</td>
</tr>
<tr>
<td>Equipment</td>
<td>$ -</td>
<td>$500,000</td>
<td>$500,000</td>
</tr>
<tr>
<td>Total</td>
<td>$3,819,000</td>
<td>$4,874,000</td>
<td>$1,055,000</td>
</tr>
</tbody>
</table>

A Traffic Signal Health Index Study was performed in 2018 on the County’s traffic signal poles, which identified one urgent replacement (Dayton/Caley); in process and scheduled for construction in Q1 2019. Also, a pedestrian signal replacement was identified for the near term (programmed to occur with improvements at Yale/Holly project with Denver). 26 other signals being prioritized for existing design life which is anticipated to be at least 5 to over 20 years out. Further structural tests (programmed to occur in 2019) which will monitor conditions and allow us to revise structural priorities in future. Typically, these structural assessments occur every (4) years unless there are specific issues identified.

The Traffic Operations Program has begun upgrading traffic signal controllers to new controller (Cobalt) when the opportunity allows (failures, other upgrades, ADA Compliance, etc.). Older models (ASC2) are planned to all be replaced by 2019, as they are no longer supported, and ASC3 replacements (still supported but no longer manufactured) will be programmed with the intent of replacing a few controllers every year beginning in 2020. These controller upgrades are anticipated to fit within current program budget. These upgrade are liken to the typically process like upgrading your computer as technology
advances are a factor. The new Cobalt controllers have advancements that integrate with the Traffic Management System and allow for better operability for the management of the traffic signals, resulting in more efficient and safer intersections.

**Infrastructure Condition – Network Operations**

In 2018, Staff added additional corridors to the County Critical Corridors evaluated for Travel Time Index, Travel Speeds, and Travel Time. The densification of this network were primarily roadways in the west portion of the County. It was felt that these additions represent better the primary arterial roadway network that is utilized in the County. The additions included US 85 (Santa-Fe), Belleview, US 285, University, Bowles/Littleton Blvd., Broadway, Buckley Road. With these addition the individual roadways were evaluated from 2012 to 3rd Quarter of 2018, as well as the combined subset. With these new segments the INRX Travel time Index is 1.32 for the new subset network of Critical Corridors for January-November 2018. The graph reflects this new information and the map of the new network.
In addition to the use of INRIX data, we received DRCOG’s Congestion Model for 2017. In that data we noticed a change in lane mileage of the County’s arterial network. After research we determined that some previously identified Arapahoe County Arterials were actually located either in Denver or Adams County. As such the 2016 data was adjusted to reflect the new list of County corridors to be consistent with 2017 data. Further analysis was performed and the travel times index adjusted accordingly. What it showed was the Travel Time Index was 1.72 in 2017 and 1.74 in 2016 as compared to the 2016 reported values of 1.52.

### Arapahoe County Arterial System (2017 Updated Network)
#### Average Weekday

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2016</th>
<th>2017</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Lane-Miles</td>
<td>1254</td>
<td>1176</td>
<td>1176</td>
<td>1295</td>
</tr>
<tr>
<td>Congested Lane-Miles</td>
<td>326</td>
<td>451</td>
<td>341</td>
<td>699</td>
</tr>
<tr>
<td>Mobility Grade – P/VP</td>
<td>26%</td>
<td>38%</td>
<td>29%</td>
<td>54%</td>
</tr>
<tr>
<td>Daily VMT</td>
<td>7,685,491</td>
<td>7,724,580</td>
<td>7,917,304</td>
<td>10,171,590</td>
</tr>
<tr>
<td>Daily VHT</td>
<td>25,401</td>
<td>32,543</td>
<td>31,342</td>
<td>60,842</td>
</tr>
<tr>
<td>TTI</td>
<td>1.44</td>
<td>1.74</td>
<td>1.72</td>
<td>2.61</td>
</tr>
<tr>
<td>Daily Cost of Delay</td>
<td>$551,123</td>
<td>$577,190</td>
<td>$654,392</td>
<td>$1,140,247</td>
</tr>
</tbody>
</table>
Crash data was also revisited in 2018. In previous years only severe injuries were reported. In 2018 with 2016 data, Staff began tracking all injury accidents because it better reflects the crash types and better reflects the costs of such. Therefore the data was adjusted backward to reflect fatalities, property damage only, and all injuries. Based on this adjustment the following graphic was generated which shows continuous trend of fatalities increasing to 38 from 31 in 2015. Injury crashes continue to increase as well (3756) in 2016. The total number of crashes stayed relatively the same in 2016. The cost of these crashes in the County is estimated at over $404M.
Crash Type | Crashes | Avg Cost/Crash | Cost        |
-----------|---------|----------------|-------------|
PDO        | 9762    | $8,900         | $86,881,800 |
Inj        | 3756    | $70,200        | $263,671,200|
Fatal      | 38      | $1,410,000     | $53,580,000 |

**Capital Improvements**

When it comes to the capital improvement program, the infrastructure funding is challenged like other capital programs in the County, such as facilities, IT, or Sheriff Office. The Long Range Budget Report recommended a roughly $15M-$20M/year Capital Program needs for a 10-Year Period. If we only receive $5M per year of capital budget and the lower amount of the need ($15M), the deferred maintenance cost would be $134M out to 2028 (See below). This estimate assumes an escalated annual cost of 3% per year from 2018.
An example of the impact of deferrals directly for 2019 is shown below. The following shows the 2019 originally submitted and recommended Transportation Capital Program by the CIP Committee and Executive Budget Committee, which relied on transfer to the CEF fund from the General Fund. The original project list was fiscally constrained at $5.7M by PWD Staff. Because of the draw down of the General Fund reserve, we were asked to cut the program and shift projects to subsequent years. The projects indicated by yellow were those deferred and yields a budget below $5M for 2019.

<table>
<thead>
<tr>
<th>Project</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iliff no UG</td>
<td>$1,700,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E470 Ramps Design &amp; Const</td>
<td>$270,000</td>
<td>$2,733,333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gun Club - Quincy So. to Aurora</td>
<td>$500,000</td>
<td></td>
<td>$1,800,000</td>
<td></td>
</tr>
<tr>
<td>6th Ave Extension</td>
<td>$1,500,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUTCD signal Compliance</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Traffic Signals - Dove Valley IGA</td>
<td>$150,000</td>
<td>$150,000</td>
<td>$150,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>ITS Implementation</td>
<td>$100,000</td>
<td></td>
<td></td>
<td>$100,000</td>
</tr>
<tr>
<td>US 85/Santa Fe PEL Study</td>
<td>$150,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADA Transition</td>
<td>$300,000</td>
<td>$300,000</td>
<td>$400,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Rural Shoulder Projects</td>
<td>$300,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sidewalk Gap Closure</td>
<td>$50,000</td>
<td></td>
<td></td>
<td>$50,000</td>
</tr>
<tr>
<td>Last 1/2 mile Dry Creek</td>
<td>$100,000</td>
<td>$100,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bike/Ped Implementation</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Commanche Creek MDP</td>
<td>$150,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I 70 - Kiowa-Bennett Rd NEPA</td>
<td></td>
<td></td>
<td>$1,000,000</td>
<td>$500,000</td>
</tr>
<tr>
<td>Alameda (Gun Club - Harvest)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County Wide Safety $80K add ‘19</td>
<td>$180,000</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>I-70 &amp; Picadilly Interchange EA</td>
<td>$250,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoky Hill Widening to 6 Lanes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yale Ave &amp; Holly St Intersection</td>
<td></td>
<td></td>
<td>$1,700,000</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Easter/Peoria St. Intersection</td>
<td></td>
<td></td>
<td>$500,000</td>
<td>$500,000</td>
</tr>
<tr>
<td>Quebec Way Sidewalk West Side</td>
<td></td>
<td></td>
<td>$500,000</td>
<td></td>
</tr>
<tr>
<td>Holly Street SW west side</td>
<td></td>
<td></td>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td>Gun Club Coal Creek Bridge</td>
<td></td>
<td></td>
<td></td>
<td>$2,700,000</td>
</tr>
<tr>
<td>I-25/Belleview Construction</td>
<td></td>
<td></td>
<td></td>
<td>$250,000</td>
</tr>
</tbody>
</table>
Intersection Street Lighting  $0  $100,000  $100,000  
Total  $5,700,000  $5,680,000  $5,700,000  $5,700,000  
Total After Deferral  $4,970,000

As can be seen with information presented above on network performance, there is an increasing demand as growth occurs. Examples of this will be increased demand on Gun Club Road south of the Quincy/Gun Club intersection, which is shown above for some of the required funding, but does not represent all of the County’s share (the South Aurora Regional Improvement Authority – SARIA is partner). We have recently been advised that Aurora will be building a new maintenance facility on Quincy east of Gun Club. This plus the increased demand of the Fairgrounds and surrounding area (new Cherry Creek Middle School) will drive the need for Quincy improvements, which the County share is not accounted for in future year planning at this point.

Other currently unknown demands, but likely will require County funding is the possible federal funded projects that could be selected as part of the Sub-Regional Federal funds. While selection of these type of projects, require County funding, it also infuses additional funds into the County’s infrastructure (typically upwards of 60%-80%) of a project cost.

Increased cost by deferral of projects is not only the cost to the County by delaying capital projects, but the problems get worse, with these other effects. These impacts are:

- **Health and Safety Effects** – Health-related environmental impacts continue such as increases in traffic accidents, injuries, deaths, etc.
- **Community and Citizen Benefits** – Congestion continues which leads to economic impacts such as property values, the future tax base, added jobs, income to citizens, changes in business income, and the stabilization (or revitalization) of neighborhoods.
- **Environmental, Aesthetic, and Social Effects** – Delayed project implementation can have significant quality-of-life impacts, this includes community appearance, noise, air and water pollution effects, effect on commuters, changes in recreational opportunities, etc.
- **Public Perception of Need increases, complaints go up** - This effects refers to project assessment of either (a) the extent of public support; (b) interest group advocacy and/or opposition; (c) Specific request of the BOCC; (d) Knowledge of public perception of needs; or (e) increase the inconvenience to the public by not completing the project
- **Increase current operating and maintenance costs** – Capital projects provide new infrastructure which have lower maintenance and operation cost.
- **Effect on Relationships with other Agencies** – Possible beneficial/adverse effects on relationships with other jurisdictions or quasi-governmental agencies in the area. Such effects, e.g., such as need for shared funding on common projects, are likely to require special regional coordination. Success in this area has been good in the past, and other agencies, such as City of Aurora or Douglas County, have found new funding streams. The City of Aurora has significant development occurring in the near future east of E-470, and the County may struggle to fund our portion of those projects, let alone other County projects/needs.
Efficient/Leverage Measures

- **Road and Bridge**
  Over the years, Road and Bridge has implemented different techniques and programs to become more efficient with the services they provide. One recent example is the acclaimed and recognized wide-crack repair program that has saved the County over $700,000 in 2018. These savings were used to enhance rural road maintenance, contracted trucking, as well as supplementing the funding for street sign fabrication and the placement of durable pavement markings.

  Cost reductions were also implemented including:
  - Incrementally created an asphalt patching crew with subsequent equipment by down grading positions and normal attrition.
  - Between 2012 to present, several positions were downgraded 1 pay grade while others were downgraded several pay grades
    - downgraded 20 positions for a total of 31 pay grades decreased
    - During that same time we have upgraded 3 positions for a total of 3 pay grades increased
  - Savings estimated on the 2018 pay scale at midpoint is $156,254 annually
    - Savings estimated on the 2019 N scale at midpoint is $164,632 annually

  Partnerships with other entities to perform maintenance have been used for years. On such example is the relationship built with the Inverness Metropolitan Improvement District that desires a higher level of service and is willing to pay for such. In 2019, Inverness will add approximately $420k to the Road and Bridge maintenance budget. Without this partnership with Inverness, an alternative resurfacing program would have to be eliminated and add to the further decline of Lane-Mile Years.

  Finally, innovation in the way Road and Bridge does business has allowed Staff to extend the limited resources allocated for maintenance. This includes such items as:
  - The purchase of the jaws-of-life to straighten and rehabilitate an estimated 300 galvanized steel culverts will save an estimated $288,000 in materials and labor over the life of this asset purchase.
  - Placing millings on gravel roads
  - Repurpose old aluminum signs
  - More efficient equipment purchases – while the equipment may be more expensive initially, the cost savings and efficiencies realized over the life of the equipment equates to savings in the millions.

- **Capital/Network Operation**
  Some examples of efficiencies measures that have been implemented and will continue into 2019 are
  - In house designs on smaller projects, CIP Staff have been performing in-house design with CIP Engineering staff performing the design. This saves on costs, as staff has shown that they can perform such cheaper than consultants on small
projects. Also, it saves on time preparing proposal and the consultant selection process.

- When staff resource availability does not allow for in-house design on smaller projects, we have developed, with the Purchasing Division, an On Call Services Process to selected consultants based on their short-listing process within PWD. This process will allow CIP Staff to obtain a single proposal from a consultant who is on-call, again for smaller projects but beyond the scope of in-house resource availability. This initiative saves time and reduces burden on the consultant community in requiring them to prepare a proposal, which is costly and time consuming.

- In 2019, PWD along with the Purchasing Division will be developing an On-Call Services Process for contracting with contractors to construct smaller projects. These type of projects provide a huge benefit to the community but often times we have not been able to attract contractors due to their size. This process will allow us to obtain a single quote from a contractor who is on call, again for smaller projects that may not attract contractors in a conventional bid process.

Furthermore, as mentioned previously Federal funds and partnerships have been essential for what has been accomplished in the past as it is difficult for any one entity to fund a project solely with their own resources. The following graph reflects nearly $400M of transportation projects over a roughly 10-year period. The power of this leverage with the County resources only being less than $5M annually and depicts how staff has extended this limited resource. We have shown that by having funding brings funding and is an efficient use of County available funds for its citizens.

![Leverage Impact Graph]

Other examples of efficiencies in the Traffic Operation Program, include:

- Fire lane program formalized process for consistency and tracking of such.
- Traffic coordination Service Request process including routing internally, externally, inter agency tracking and timeliness.
Utilization of the Traffic Management System for diagnostics and reduction of reliance on vendor, improve operations, reduce any down time and or can coordinate for incidents with Sheriff Office

For block parties/parade/race request staff will bring before the BOCC in 2019 a recommendation for adoption of a nominal fee to cover the cost of administering this program

Arapahoe County arterial travel time information via internal Blue Toad technology was activated on Broncos, Iliff, Arapahoe, Buckley. This system ultimately will work with CDOT to share County data and receive others data. Once accomplished, additional devices/intersections may be proposed to densify arterials and cover arterials on one regional map.

Finally, PWD will bring forth to the BOCC approval in 2019, the proposal for the County to join the SMART City Alliance. This concept has been discussed before the BOCC during the update on the Transportation Plan Update and received concurrence to move forward with the concept. This partnership will be another avenue to build relationships and utilize innovation in solving the County transportation challenges.

**Legislative Impacts**

During 2018, several transportation funding initiatives we pursued. One of which created new funding for the County and the state and there were two voter propositions turned down in the November 2018 election. The following is a summary of these initiatives.

**SB18-001**

Signed by the Governor May 31, 2018, this Act provides General Fund support for transportation project construction and maintenance in Fiscal Year 2019 and 2020. The funding in these two years allocated additional funding to the State and to local governments (Counties and Cities). The amount of funding and the purposes for which it may be used depends on the outcomes of different ballot measures below. The Act requires the state putting a revenue anticipation note (bonding) ballot measure on the 2019 ballot for bonding without raising taxes, as more specifically explained here:

- The legislation requires two years of transfers from the State General Fund for transportation purposes and conditionally creates 20 years of additional General Fund transfers to the State Highway Fund. If an initiated ballot measure authorizing state debt for transportation is not approved in 2018, this bill refers a ballot measure to do so at the 2019 election.

- Conditional on approval of the 2019 measure, the bill requires the issuance of Transportation Revenue Anticipation Notes worth up to $2.337 billion. Executions of lease-purchase agreements under Senate Bill 17-267 for years beyond FY 2018-19 are conditionally repealed. The bill conditionally increases state and local revenue from debt issuance and state expenditures for debt service over a 20-year term.
As mentioned, local governments will receive additional funding from this legislation based on the following transfers.

- For FY 2018-19, $495.0 million, of which $346.5 million is transferred to the State Highway Fund (SHF), $74.25 million is transferred to the Highway Users Tax Fund (HUTF) for allocation to counties and municipalities, and $74.25 million is transferred to a new Multimodal Transportation Options Fund (Multimodal Fund) created in the bill.

- For FY 2019-20, $150.0 million, of which $105.0 million is transferred to the SHF, $22.5 million is transferred to the HUTF for allocation to local governments, and $22.5 million is transferred to the Multimodal Fund.

The allocations to Arapahoe County is based on the Tier III portion of HUTF and therefore, the County will receive an estimated **$1,344M in FY 2019** and **$409,560 in FY2020**. Also, since this legislation allocated funding to a Multi-Modal Fund, the overall County will benefit by an allocation of **$7.7M** to the Arapahoe County Transportation Forum for distribution along with federal funds (Total roughly $45M).

**Proposition 109 – Fix Our Damn Roads**
This proposition did not pass during the November 2018 election. This measure would require the Colorado Department of Transportation to issue $3.5 billion in bonds, also known as revenue anticipation notes, to be used exclusively for the repair, maintenance, expansion, and construction of state only roads and bridges. There was no funding that would be allocated to local governments with this initiative and there were no state projects in Arapahoe County identified with this proposition.

**Proposition 110 – Colorado Sales Tax (0.62)**
The proposition proposed raising the state sales tax by 0.62% or 6.2 cents on every $10, from 2.9 percent to 3.52 percent. It would have generate more than $766 million a year starting in 2019, and authorize the state to issue $6 billion in transportation bonds. The funding would be split, with 45 percent going to state highway projects, 40 percent to local governments and 15 percent to alternate forms of transportation, such as mass transit. The state payback of bonding is not to exceed $9.4 billion over 20 years, including interest. Arapahoe County would have received an estimated $5.558M annually starting in FY2020 with estimates increasing from there based on the amount of sales tax received.

**SB18-167 CO811 Legislation**
This legislation requires a new type of 811 request for utility locations that will need to be responded to within 10 days by utility owners – Subsurface Utility Engineering Locate or SUE. As Arapahoe County is a utility owner (Fiber and storm drainage), this could easily double the number of positive locates that PWD has to respond to that occurred in 2018. This legislation basically requires that all utilities have electronically locatable (could be metal or tracer wire – and generally this is more impactful on plastic pipe utility owners.) and requires locate information to be disclosed to with higher degree of
accuracy. It also requires all utility owners be Tier 1 members, which requires providing physical locates, by Q4 of 2019, which will impact County owned storm water facilities and non-traffic fiber (IT). PWD’s traffic signal fiber is already in the Tier 1 members. These cost implications are:

- The current 2018 Average Locate Cost per Month (YTD) - $2,984. In 2018, the annual cost (including CO811/vendor positive locates) on track to be 36K.
- In 2017, the annual cost was $73K; but this was before we issued an RFP and awarded a separate contract to locate service, which saved the County money in 2018
- As a project owner/designer, the County is facing possible increased costs for identification of utilities. The legislation requires project owner/hired certified engineers to provide detailed subsurface utility plan, which inventories all existing utilities in project area, preparing stamped utility plans, and/or relocation of any utility conflicts. While this has been the practice for the County historically, the level of detail and certification of location is increased with the legislations. To provide this detail, the project owner/engineer must get locates (at surveyor accuracy – SUE) and coordinate with all utilities on a locate plan prior to a notice to proceed and any excavation. Locates are then confirmed by contractor/excavator during excavation. Essentially what this legislation did was shift liability for conflicts to project owner’s engineer to locate correctly for plans. Contractors are no longer responsible for delays if locates are incorrect on plans.

**Economic Impacts**
A good multi-modal transportation system has been identified as a key economic factor for the economic vitality, business retention and attraction. The other factors employee talent pool and affordable housing. The reality is that transportation plays a broad role in shaping economies by the following:

- increases productivity;
- enhances jobs and labor market accessibility;
- opens new markets for businesses; and
- enhances supply chain efficiency.

As can be seen in the Colorado Construction Index graph below, index is up 45% above the base year of 2012 for the 2nd quarter of 2018. Essentially this means that the buying or purchasing power in 2018 is 45% less than in 2012. This has a direct effect on the maintenance and capital projects we can provide with a relatively flat budget.
Other economic impacts that we are starting to see effects on the purchasing power of doing business is with the current steel tariffs. Cost impacts are only beginning, but will be an ongoing factor in the near future, which not only affects the cost of projects, but also equipment purchases. History shows the imposition of tariffs has the potential to increase the price of imported commodities and products. Steel is an important input for transportation construction and the industry has estimated for every $1 spent on highway and bridge construction, 10 cents goes toward steel-related materials. This is a concern because if prices increase for imported steel because of the tariff, economic theory suggests prices would also increase for domestic steel. This would cause a direct increase in project and equipment costs at a time when transportation infrastructure investment dollars are currently constrained and stagnant.

While growth within the County most certainly affects the County’s transportation infrastructure, it is also affected by growth in surrounding counties, as well as cities within the County. This growth is a function of the current good economy and the growth expected to continue into the future. The good economy is overall good, but certainly has its detriments when it comes to transportation impacts and demands.

**Transportation Forum**

DRCOG has recently adopted a Dual Model TIP for allocation of federal funds provided to DRCOG as the Metropolitan Planning Organization (MPO). The Dual Model consists of regional and sub-regional funding shares. The DRCOG Board will utilize a new funding allocation model for the 2020-2023 Transportation Improvement Program (TIP). The primary premise of a dual model project selection is that it has two project selection elements: Regional and Sub-regional. This is intended to provide flexibility and allow Sub-regional values and context be considered in project development and recommendations.
With the creation of the Dual TIP Model and specifically the Sub-regional share, the local agencies within Arapahoe County have held monthly meetings to establish the governance and process in order to coordinate transportation planning and funding requests for the TIP. The result of these meetings is the Arapahoe County Collaborative Transportation Forum. The Forum establishes a process to review and recommend projects to DRCOG through Executive and Technical Committees of the Forum. To be a voting member of the committees, an agency must enter into the Arapahoe County Collaborative Transportation Forum Agreement Intergovernmental Agreement (IGA). Any eligible agency within Arapahoe County and the DRCOG boundary may apply for funding, but only governmental agencies that have signed the IGA will have a vote on the projects that will be submitted for consideration into the TIP as part of the Arapahoe County Collaborative Transportation Forum. It should be also noted that the Colorado Department of Transportation (CDOT), Regional Transportation District (RTD), and DRCOG representatives will be invited to attend the Forum Committees, but will not be eligible to vote. To date all entities except for Glendale have executed the IGA and are voting member of the Forum.

The Sub-regional County Transportation Forum is responsible for soliciting, selecting, recommending, and submitting a list of projects to the DRCOG Board. This process required developing a governance framework (IGA) that details how transportation projects/programs are developed and the associated funding requests submitted to DRCOG. In addition to the distribution of federal funding the Forum provides a platform and structure for the jurisdictions in the County to prioritize and collaborate on transportation needs/projects within the County in off-TIP years. To date, the County has taken the lead of the Forum both on the Executive and Technical Committee and the Cities believe this is the role of the County.

The Regional Call for projects has occurred and two projects from Arapahoe County were selected (US 85 PEL and High Plain Trail) to receive Regional Federal funds in the total amount of $3.5M of the total project costs of $10M. The Arapahoe County Forum is expected to be allocated roughly $45M of federal funds for distribution to project and that call for projects will start January 2, 2019.

2019 Initiatives/Plans
In 2019, PWD initiatives will include the following. These are just a few of the high level plans PWD have scheduled.

- **PWD Annual Report** – 1st time PWD has done this as a way to educate the public on what PWD does and does not do. We would plan to also highlight accomplishments, awards, and how we do business.

- **Transportation Plan Update** – While it will be necessary to coordinate with incorporated municipalities in the County to ensure a comprehensive transportation system is provided, the **PRIMARY FOCUS** will be in unincorporated Arapahoe County, BUT will identify regional improvements throughout the County as County citizens and businesses depend on a reliable/efficient transportation system no matter their location. The County, as well as cities, would like to see what the needs are for the County (incorporated and unincorporated) and then incorporate other elements necessary to finalize the transportation system based on fiscal, political, jurisdictional, and other constraints. In addition, the Plan will consider the necessary connections between
various other jurisdictions outside of Arapahoe County such as Adams, Denver, Jefferson, Elbert, and Douglas Counties. This concept is a logical extension of the Board of County Commissioner and Public Works assuming a regional perspective when it comes to transportation planning improvements. Also the cities believe the County should take a leadership role and have a regional perspective on transportation within the County.

- **Oil/Gas Impact Fee** – The final study and recommendation from the study will be presented to the Board for adoption.
- **Metro District Service Plans** – As presented to the BOCC in a previous study session, Staff will evaluate the template service plans that the City of Aurora has been using that includes a mill levy for regional transportation improvements. We will also see if maintenance can be included in this template.
- **SMART City Alliance** - This partnership will be another avenue to build relationships and utilize innovation in solving the County transportation challenges.
- **Projects – High Level**
  - **Quincy/Gun Club** Final Design and Construction of a Partial Continuous Flow Intersection at Quincy Avenue and Gun Club Road. Project is planned to be bid in Early 2019. Associated improvements to the E-470 NB off ramps are being designed and will be in place shortly after the PCFI is completed.
  - **Iliff** - Operational Improvements along Iliff between Quebec and Parker, as recommended in Iliff Corridor Study. Project will begin construction later in 2019.
  - **Local Road Safety Plan** - The project entails the creation of a Local Roadway Safety Plan that will evaluate County roadway infrastructure and assist in determining low cost – high reward projects at high risk locations as well as proactively looking at other locations that have similar design parameters
  - **MINOR Projects** – Remedial design projects in 2018 (anticipated cost that in most cases only a few thousand dollars - cap of $100,000 for Minor). It is anticipated these projects will be completed for inclusion into the Road and Bridge Concrete Rehabilitation Program work.
    - C18-038 “Piccadilly at Layton medians”
    - C18-026 “Aspen Crossing Pedestrian Crossing”
    - C17-016 “Quebec Way North Sidewalk”
  - Other design/study projects include:
    - Partner with Inverness – Lima Sidewalk
    - I-70 1601 with Developers
    - 6th Ave. (Stephen Hogan Parkway) E-470 to SH 50.
    - Gun Club widening south of Quincy
    - Quincy Widening east of Gun Club

- Traffic-
  - Florida/Highline Trail crossing RRFB pending deployment in early 2019.
  - School flasher technology (clock/communication) upgrade (some upgraded assemblies) planned in 2019.
  - RRFB deployment continues – anticipated 3 additional in 2019 for improved pedestrian safety.
- Iliff Corridor – Fiber connection and collaboration/sharing arrangement with Denver and CDOT underway and is promising to become a regional arrangement for better access/sharing of fiber ring capacity in 4 Square mile area.
- Corridor signal coordination/timing plans (update) in 2019 to be implemented for Parker Road, Arapahoe Road, Smoky Hill Rd corridors (partial on Buckley and Broncos). Arapahoe County Traffic participating with other local agencies and CDOT via DRCOG contractor)

Alternatives
As this study session is for the purpose of informing, Staff is not presenting alternatives for the BOCC to make decisions. Included in this report and the presentation at the study session are predictions on the transportation system going forward with status quo funding. As can be seen however, status quo funding allows the deterioration of the County assets to continue to a point that would be difficult if not impossible to recover from. Additionally, growing congestion will be such as it will adversely affect the economic vitality and quality of life for County citizens and businesses.

Fiscal Impact
There is no direct fiscal impact associated with this study session as it is for information. However, we offer the following in terms of the history of the budget for both Road and Bridge and Capital Program. As can be seen the budgets have slightly increased from 2010, but not significantly with regard to the needs, demands for services, and the cost of doing business.
Attorney Comments
The County Attorney Office has reviewed this summary report and has no comments at this time.

Reviewed By
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