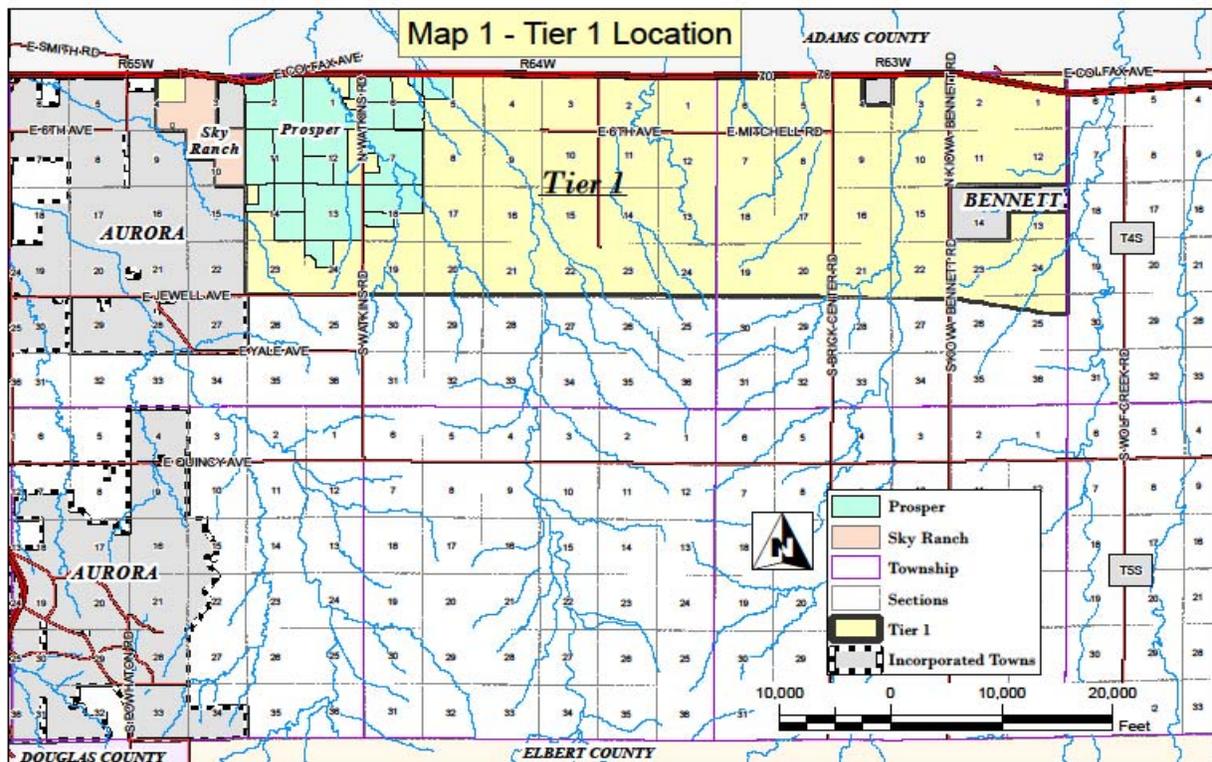


# Appendix C: Tier 1 Analysis

Tier 1 is an area identified in the Comprehensive Plan as having the greatest potential to accommodate future urban growth. This document presents an analysis of the amount of growth that can be anticipated and the factors that may support or constrain that growth. The analysis concludes with recommended actions to address future growth in Tier 1.

Tier 1 is an area to the south of I-70 extending east from roughly Hayesmount Road to Yulle Mile Road (CR 145), three miles west of Strasburg Road. Tier 1 encompasses approximately 56 square miles or 35,840 acres as shown on Map 1. Excluded from Tier 1 are areas annexed to the City of Aurora and portions of the Town of Bennett. Tier 1 includes the approved unincorporated developments of Sky Ranch, Hills at Sky Ranch (hereafter collectively referred to as Sky Ranch), and Prosper occupying a total of 9.5 square miles.



## Zoning

The vast majority of Tier 1 is unincorporated and zoned Agricultural-1 (A-1). This zoning allows a minimum lot size of 19 acres and permits single family dwellings on this acreage. Under State planning enabling legislation for counties, the definition of subdivision expressly excludes the division of land into parcels 35 acres or larger, and as a result, counties are not authorized to review and approve such divisions of land. The A-1 zoning combined with this definition of subdivision have resulted in the creation of several subdivisions and large lot areas served by individual wells and on-site wastewater treatment systems and a disjointed, sparse road network.

Dispersed areas within Tier 1 are zoned Agriculture-2 (A-2) with a minimum lot size of 9 acres and Residential-Agricultural (R-A) with a minimum lot size of 2.41 acres. No areas within Tier 1 are zoned Residential-Estate (R-E) which has a minimum lot size of 1.61 acres.

Without County review of subdivisions, it is difficult to plan for and acquire right-of-way to establish roadway, trails and open space networks, and impacts to school districts and fire districts are not able to be addressed. The County does, however, have the authority to issued building permits, which also involves issuing access permits and requiring approval of the State Engineer for well permits and Tri-County Health Department for on-site treatment system permits. In addition, construction must conform to the County's rural development standards. The County will be collecting a rural road impact fee beginning in 2017 to help address impacts to the rural road system.

## **Current Demographics**

Information included in this section is from the American Community Survey conducted by the Census Bureau in 2014. Though a little dated, the data are believed to be reflective of current conditions in Tier 1.

Tier 1 had a population of 2,941 in 2010 and in 2014 this figure increased to 3,119, an increase of 6%. In 2014, nearly 40% of the Tier 1 population was in the 45 to 64 year old age group, with another 10% 65 and older. The under 18 and 25 to 44 age groups each represented just over 20% of the population, while the 18 to 24 age group made up 9% of the population.

Place of residence the previous year indicates how much of the population may have moved into the area. In 2014, eight in ten (84%) households were living in Tier 1 the previous year. This rate compared to 88% in the eastern part of the County and 82% for the entire County. Those who moved into the area came from somewhere else in the Denver metro area. Approximately two-thirds (68%) of the total number of households consisted of a married-couple family, with householders living alone comprising 16%, and single-parent households comprising 12%. The Tier 1 median household income was \$82,500, compared to \$71,800 for the eastern part of the County and \$62,200 for the entire County.

The total number of dwelling units in Tier 1 was 1,155, with 1,100 occupied. The vacancy rate of 4.7% compared to an overall vacancy rate of 6.3% for the eastern part of the County. Nearly 86% of the dwelling units in Tier 1 were owner-occupied, compared to the countywide figure of 62%.

The median housing value in Tier 1 was \$267,889, compared to \$249,600 for the entire County. Nearly three-fourths of the housing stock consisted of single family detached units, compared to 56% countywide. In 2014 there were 270 mobile homes located in Tier 1, or 23% of the housing stock. Nearly 55% of the housing stock in Tier 1 was built since 1990, meaning 45% of the housing units were over 25 years old in 2014.

Over the past seven years, a total of 175 building permits have been issued in Tier 1; an average of 25 per year. Approximately 90% of these permits were issued for mobile homes; 10% were issued for units on lots greater than one acre in size. Excluding mobile home permits, Tier 1 accounted for 16% of the permits issued in the eastern portion of the County during this period, with all permits for units on lots greater than one acre.

## Population and Employment Projections

Population growth in unincorporated Arapahoe County is projected to increase to 195,000 by 2040, an increase of 111,236 (or 133%) from the 2010 level of 83,764. A majority of this growth will occur in the Urban Growth Area; however, significant growth is projected in all three Tiers used in the Development Framework as shown in the table below. It should be noted that the Tier 3 figures shown in the table do not include the growth projected for the Lowry property or incorporated areas. Should development not occur on the Lowry property, that growth would need to be absorbed elsewhere in the County, most likely in Tier 1.

<b>Tier</b>	<b>Actual</b>	<b>Est.</b>	<b>Projected</b>			
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2035</b>	<b>2040</b>
Tier 1	2,588	3,200	6,346	10,215	21,249	35,200
Tier 2	2,924	3,500	8,464	12,669	22,000	29,000
Tier 3	1,367	1,300	4,460	6,095	6,514	7,400
Total East Plains	6,879	8,000	17,270	25,979	49,763	71,600

Growth in employment is forecasted to increase to 6,000 jobs in the eastern unincorporated portion of the County. Tier 1 employment would grow from 270 jobs in 2010 to 1,300. Tier 2 would gain nearly 1,600 jobs to a 2040 total of 2,400. Tier 3 would have job growth primarily in the southwest corner, reaching 2,300 jobs by 2040.

The I-70 Corridor Study prepared in 2010-2011 for the Regional Economic Advancement Partnership (REAP) provides a somewhat comparable set of population and employment numbers for the eastern plains. That study area is comparable to the total of Tiers 1 and 2 plus a small portion of Aurora and some land in Adams County. The Study anticipates 31,325 people in 2030, compared to the 60,400 forecast for 2040 in this Plan. Similarly, the projection for employment is 2,246 jobs in 2030 in the Tier 1 and 2 combination, while this Plan forecasts 3,700 jobs in 2040. Approximately 1,700 of the jobs in the I-70 Study are projected in Aurora. Although the projection in this Plan is 60 percent higher than the projection in the I-70 Study, it is on a similar trend line and is for a period 10 years later.

The projections used in this analysis and the Comprehensive Plan are lower than those prepared for the 2035 Transportation Master Plan. The Transportation Plan used moderate and high growth scenarios which resulted in approximately 800 to 10,000 more households and 2,900 to 12,000 more jobs being projected in the Watkins Road Corridor, principally due to significant development assumed on the Lowry property. The resultant travel demand and recommended roadway network will adequately serve the level of population and employment growth projected for Tier 1 in this analysis.

Growth in Tier 1 may be affected by plans for Airport City Denver (Aerotropolis) at Denver International Airport, including the Gaylord Rockies development in Aurora, the Spaceport Colorado project at Front Range Airport in Adams County, and the Transport project in Adams County (most of which has been annexed by Aurora). These developments will likely impact Tier 1 with demand for housing for the significant number of employees anticipated in these projects. Supporting retail and commercial uses should be anticipated along with the residential development. The Spaceport project might generate some demand for office and R&D space along the I-70 corridor. This demand could be met in the Sky Ranch and Prosper developments as well as in the Town of Bennett.

## Land Demand

The I-70 Study also included an estimated demand for land to accommodate the projected household and employment growth in the I-70 Study Corridor. Since the analysis in this Plan is only for Tier 1 and the time horizon is 10 years later, new land demand calculations were made. The basic methodology used in the I-70 Study was used to produce updated land demand figures for Tier 1, but with the following modifications: 1) the rural residential densities were changed to more accurately reflect the County's rural zoning categories, 2) the urban densities were adjusted to omit one-acre lot development, and 3) the percentage of households established at rural residential densities (lot size greater than one acre) was increased from 5% to 10%. The Tier 1 land demand figures are shown in the following Table and are based on the Tier 1 population and employment forecasts included in the previous section.

Table 2 Land Demand Forecast for Tier 1 - 2040		
Land Use	Acreage	Dwelling Units
Residential	26,873	13,167
Rural Residential (Greater than 1 acre per d.u.)	20,908	1,316
Urban Residential (Less than 1 acre per d.u.)	5,965	11,848
		Building SF
Commercial	158	1,470,908
Office	18	515,000
Retail	140	955,908
Industrial	50	216,300
<b>Urban Development Acres</b>	6,173	
<b>Total Acres</b>	27,081	

The actual future demand for rural residential development is difficult to estimate as demand depends upon several factors, including availability of buildable lots and water, the proximity of quality public facilities, and ease of commuting to employment. Different household types will have different responses to these factors.

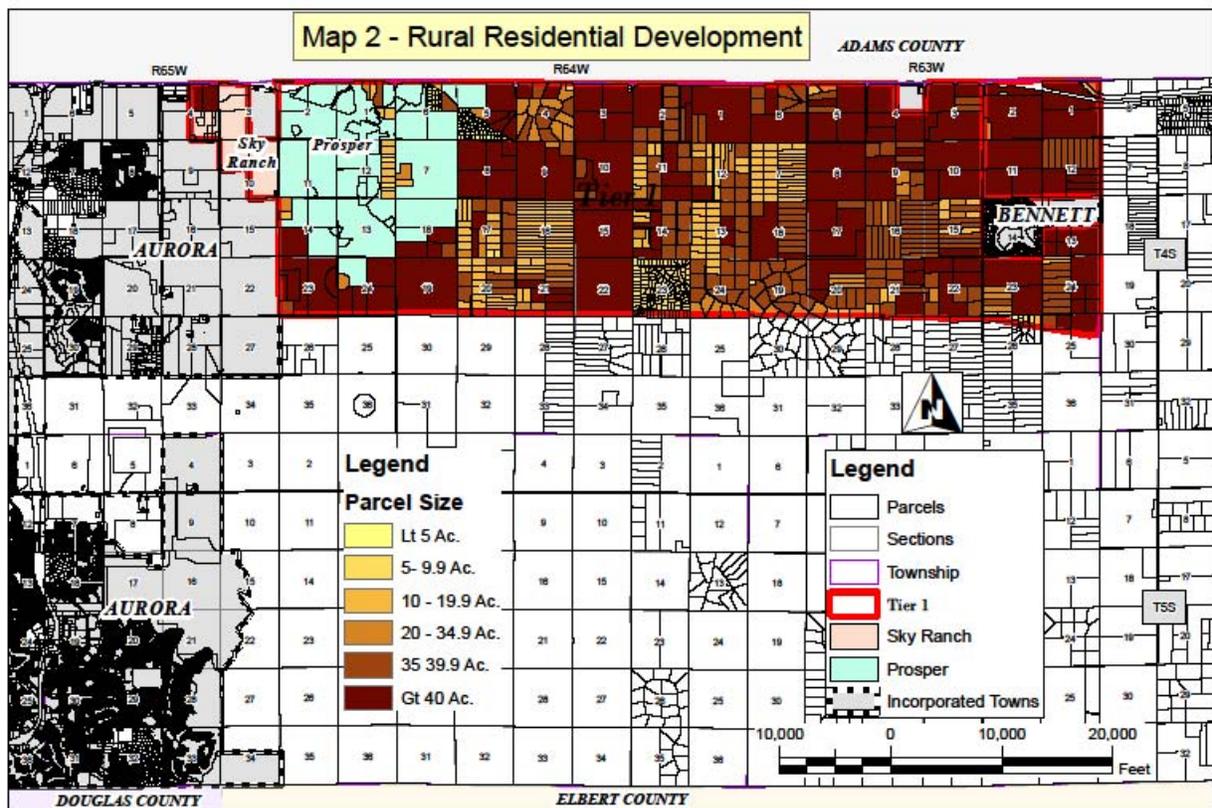
Nearly all of the lots in approved subdivisions and those parcels created outside the subdivision process (larger than 35 acres) are occupied currently with single family dwellings, and in one case, a mobile home park. While many of the single family residences occupy two 19-acre lots and the 40-acre parcels that exist could be subdivided (in both cases providing additional building sites), it was

not assumed that any of the existing lots or parcels would accommodate any future rural residential development.

Rural residential development in Tier 1 is estimated to need approximately 20,908 acres (or about 32.7 square miles) of land to accommodate an estimated 1,316 households over the next 23 years. This is an average of 57 units per year, slightly lower than the past seven-year average in the eastern part of the County. This demand assumes a mixture of lot sizes allowed under current zoning and other lot sizes that would require rezoning, with development occurring at the minimum lot size. It was assumed that no parcels would be rezoned to R-E with a lot size of 1.61 acres.

The demand for development at urban densities for residential, industrial and commercial space is estimated at 6,173 acres, or about 9.6 square miles. In contrast to the 32.7 square miles for rural development, urban scale development would accommodate nearly 11,850 dwelling units and nearly 1.7 million square feet of commercial, office and industrial space.

Approximately 16 square miles are already occupied with rural residential development in Tier 1. These areas are illustrated on Map 2.



The map shows the lot and parcel sizes of these rural developments. Assuming these developments do not re-develop in the future, there are approximately 40 square miles (25,600 acres) to accommodate future growth. Excluding areas already zoned for urban development, there are approximately 19 square miles in close proximity to I-70 and/or the approved urban developments that are available for additional urban development. The presence of floodplains and open space in

Tier 1 will reduce the amount of available land for development, but that figure has not been estimated in this analysis. Three approved developments will have a bearing on the absorption of land for urban uses and the need to plan and rezone other areas for urban development to accommodate projected growth in Tier 1. Table 3 presents approved land use data for these three developments: Sky Ranch, The Hills at Sky Ranch, and Prosper. Sky Ranch and The Hills at Sky Ranch were approved at different times, but are now owned by the same developer and considered as one project, Sky Ranch. While the development plans for these projects may be amended in the future, the residential acreage and the maximum number of units are the key aspects of these development plans in terms of determining the need for additional land to accommodate future growth. Typically the maximum number of units is not reached unless non-residential use areas are converted to residential uses.

It should be noted that the figures in the Total Acres column in Table 3 include acreages for right-of-way, floodplains, open space, schools, and other land uses, but these acreages are not listed separately in the table.

<b>Table 3</b>						
<b>Land Use Summary – Major Projects in Tier 1</b>						
Project	Total Acres*	Residential Acres	Units	Mixed Use Acres	Commercial Acres	Industrial Acres
Sky Ranch	771.9	460.9	4,000	85.5	41.4	18.2
The Hills at Sky Ranch	159.3	108.6	850	9.0	9.5	0.0
Prosper	5,130.0	2,596.0	9,000	264.0	173.0	221.0
<b>Total</b>	<b>6,061.2</b>	<b>3,319.5</b>	<b>13,850</b>	<b>358.5</b>	<b>232.9</b>	<b>236.2</b>
*Includes land for right-of-way, floodplain, open space, schools, and other land uses.						

A comparison of the land demand projections and the project summary above reveals the following:

- The three projects could absorb the entire demand for urban density housing units in Tier 1 if the projects build out to approved totals. If the projects reach only 75% of buildout, there would be an unmet demand for 1,460 units. At a density of 4 du/acre, an additional 365 acres would be needed, or .6 square mile. Should growth not occur on the Lowry property as forecasted, a population of approximately 13,600 would need to be absorbed somewhere in the County. If that growth occurred in Tier 1, a little over two additional square miles would be needed to meet the demand for residential land.
- The Prosper project supplies sufficient land to meet industrial demand in the future, with a surplus of 171 acres. Some of the industrial and commercial demand could be met in Bennett at several interchanges being proposed in the Bennett Comprehensive Plan.
- All of the three projects combined could accommodate demand for commercial and office space, with a surplus of 75 acres, even with acreage in the mixed use category not considered.
- Rural residential development is assumed to occur at an average density of .063 units per acre. This equates to an average lot size of 15.9 acres.
- With Sky Ranch and Prosper accommodating all of the projected urban density residential and employment growth, rural residential development would absorb all of the remaining 30.5 square miles of undeveloped land in Tier 1, with a deficit of approximately two square miles.

The rural residential demand could be met if the average density of rural residential development were increased to .067 units per acre, or an average lot size of 14.9 acres.

Clearly the largest amount of land is consumed by large lot residential development under the assumptions used in this analysis. Continued approval of A-1 subdivisions and Rural Residential (A-2, R-A, and R-E) rezonings in Tier 1 will further reduce the supply of land available for urban development.

Accommodating more urban development in Tier 1 could be accomplished by restricting the amount of rural large lot development approved, requiring rural residential development on smaller lots, and/or by directing rural development to other areas of the County. Even if these avenues were pursued, accommodating future urban development on a large scale in Tier 1 will be challenging. Available land for development is interspersed with rural residential development, making road access, service delivery, and compatibility with existing development critical issues that will need to be addressed.

As the population and housing stock age, there may be some motivation for current owners to sell all or a portion of their larger parcels, creating a supply of land not accounted for in this analysis. While this is a possibility, it is difficult to quantify what may become available. For this analysis, no new development was assumed in these existing areas.

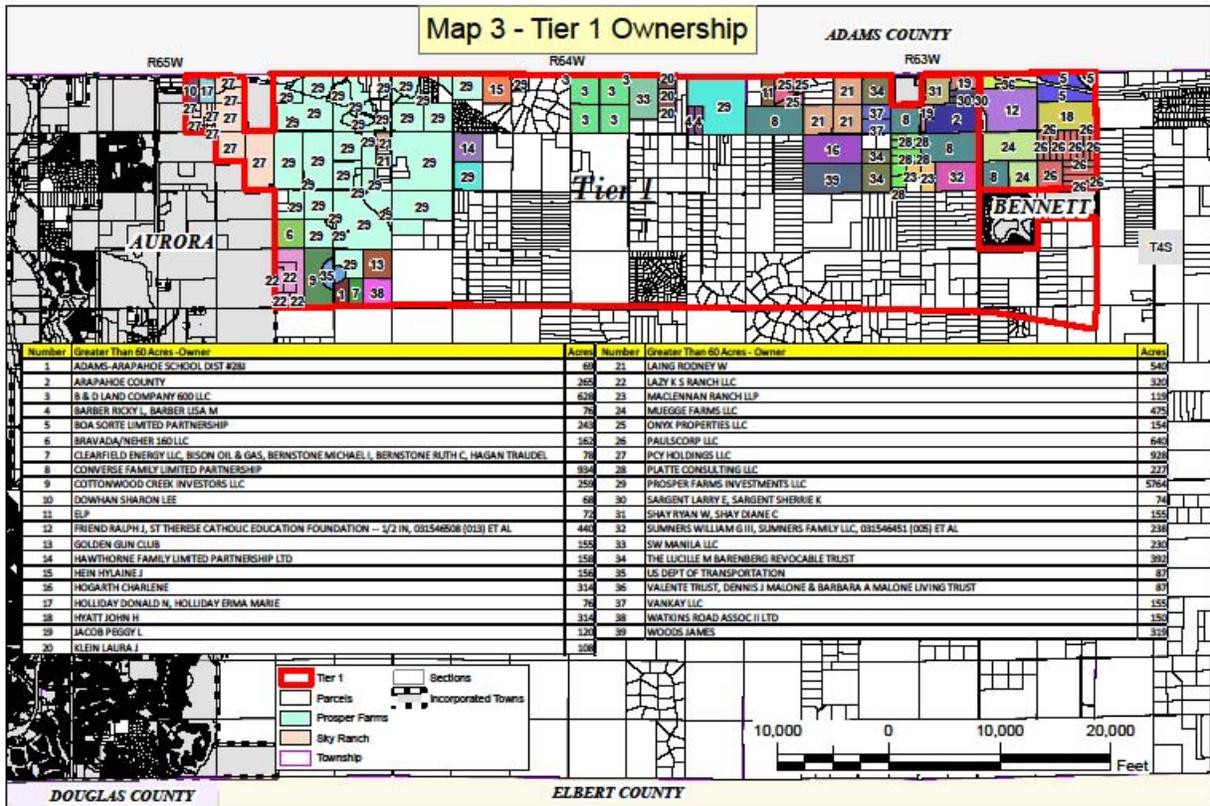
## **Land Ownership**

The ownership of land is one of many factors to consider in future land use planning. Where large parcels are available under one ownership, developers are more likely to purchase and assemble land for possible development. The presence of numerous small parcels under different ownerships makes land assemblage a time-consuming undertaking for developers.

Map 3 shows the ownership of major parcels in the Urban Reserve area of Tier 1. This reserve is generally the first mile south of I-70 to Harback Road, then two miles south of I-70 to the eastern boundary of Tier 1. Owners of major parcels (60 acres or more) are shown on the map along with a list of owners and acreage.

These major ownerships, excluding the Sky Ranch, Prosper and County ownerships, total 9,445 acres, or approximately 14.8 square miles. Not surprisingly, several major parcels along I-70 are owned by land management companies and limited liability companies or partnerships. These ownerships most likely have been established for the purpose of undertaking future development or holding the land for sale for future development. Most of these ownerships are at existing or proposed interchanges on I-70. The Prosper development company owns an additional 653 acres, most of which lies southwest of a proposed interchange two miles east of the existing Manila Road interchange.

Unlike other areas of the County, there are no State Land Board owned parcels in Tier 1. The County owns 265 acres straddling Kiowa Creek between Converse and Kiowa-Bennett Roads as open space.



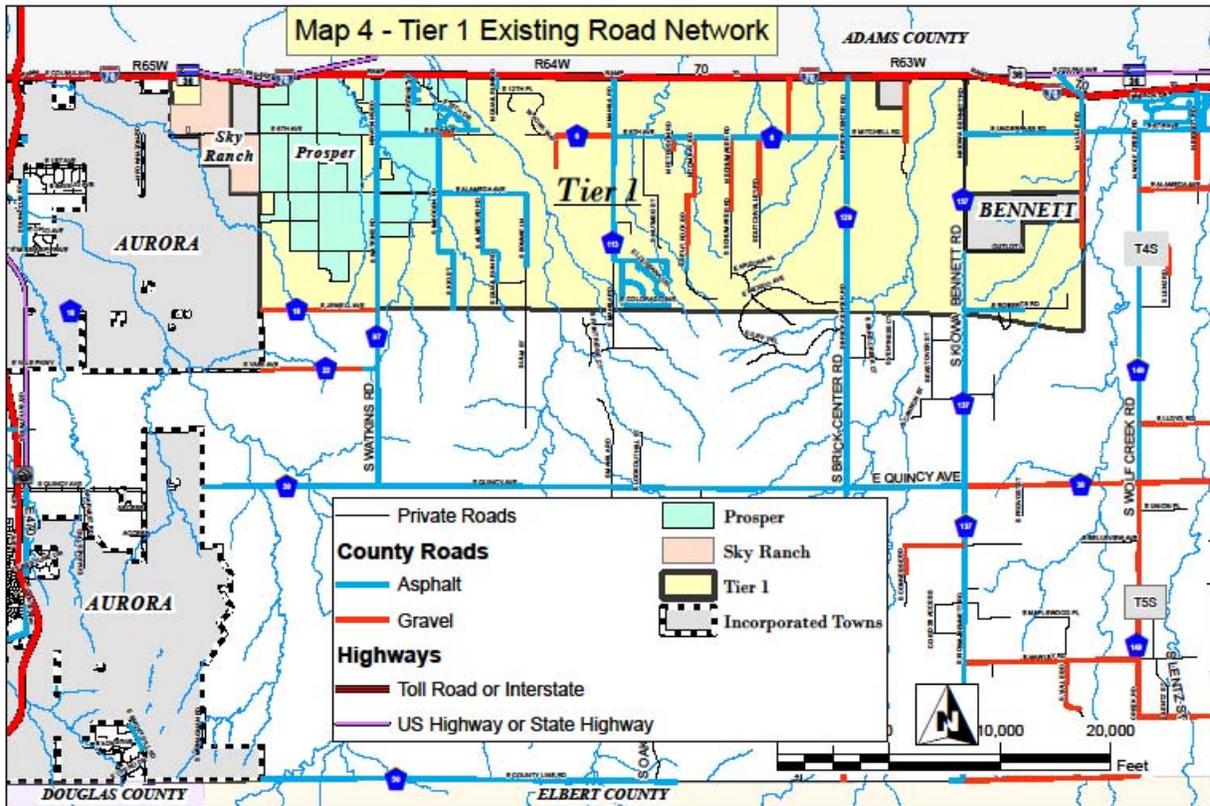
## Infrastructure

### Road Network

The road network in Tier 1 consists of I-70, a small portion of US 36, Watkins Road, Brick-Center Road, State Highway 79 (Kiowa-Bennett Road), a discontinuous 6<sup>th</sup> Avenue (in places named Mitchell Road and Underpass Road), discontinuous segments of Alameda Avenue, paved and gravel County roads and numerous private roads within rural residential subdivisions. The existing road network is shown on Map 4.

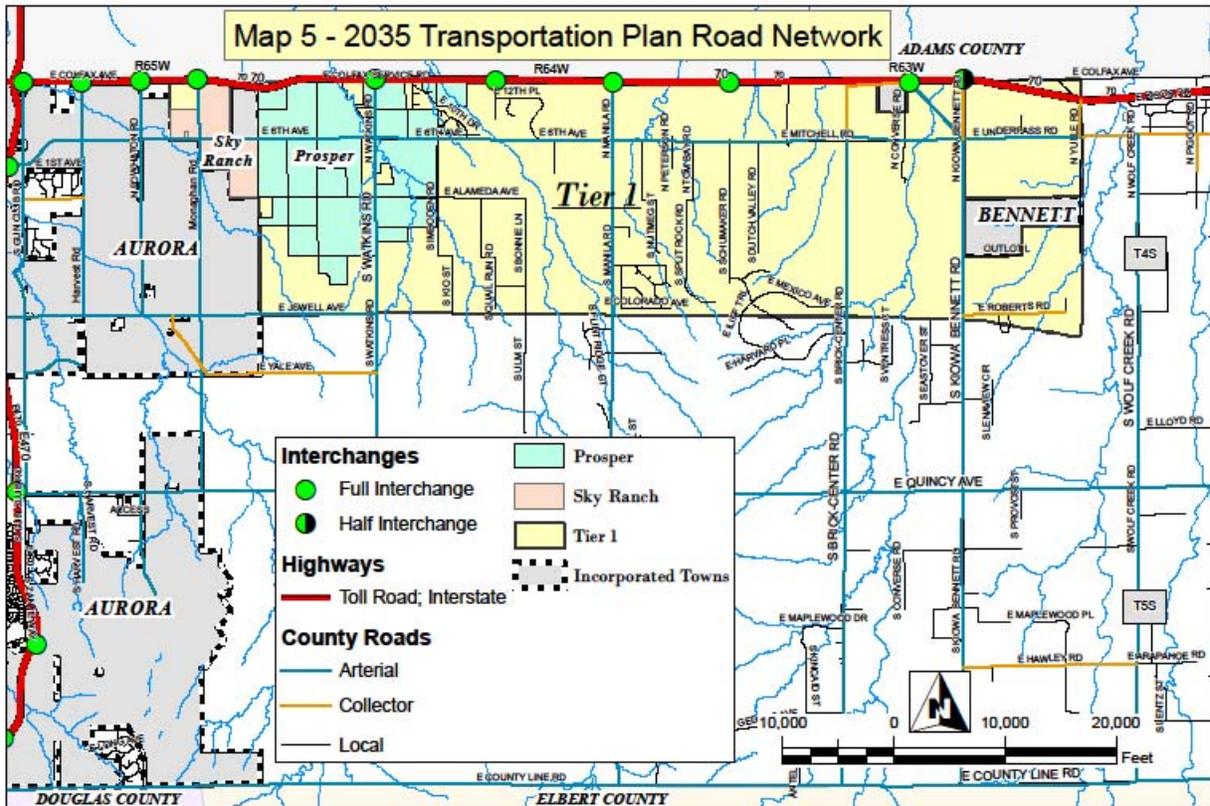
I-70 is the backbone of the roadway network and provides the most convenient east-west route through Tier 1. Full interchanges are located at Watkins Road (CR 97), Manilla Road (CR 113) and Converse Road in Bennett (CR 133). The I-70/US 36 (Colfax Avenue) interchange is a partial interchange limiting movements to westbound US 36 to westbound I-70 and eastbound I-70 to eastbound US 36.

Rural residential subdivisions typically have internal roads to provide access to individual lots and parcels, with these internal roads connecting to County roads. In nearly every instance, these internal roads do not connect to the internal roads in adjacent subdivisions, creating a disjointed and unconnected local road system. Some of these internal roads are private (not County maintained) and were established without County oversight because the subdivisions were exempt from the County's subdivision regulations.



The remainder of the existing County road network is not suited to accommodating urban development. Especially lacking are opportunities to establish east-west connections. Within Tier 1, there are no continuous east-west routes other than I-70. 6<sup>th</sup> Avenue (CR 6, Mitchell Road, and Underpass Road) has the potential to provide east-west continuity if current missing segments are constructed and current gravel segments are paved. The County's 2035 Transportation Plan shows the following planned east-west roadways as shown on Map 5:

- 6<sup>th</sup> Avenue is proposed as a 2-lane arterial extending from east from Powhatan Road to Kiowa Bennett Road (SH 79). An important link in this east-west arterial is being provided in the Prosper and Sky Ranch developments. Traffic studies for these developments indicate 6<sup>th</sup> Avenue will be a four-lane arterial (with turn lanes) west of Imboden Road. Four lanes will be needed east of Imboden if urban development occurs in this portion of Tier 1.
- Jewell Avenue is proposed as a four-lane arterial east of Monaghan Road to Watkins Road. It is currently a gravel road from Aurora east to Watkins Road.
- Quincy Avenue, located three miles to the south of Tier 1, is proposed as a six-lane arterial from E-470 east to Watkins Road, and a two-lane arterial east of Watkins Road. Quincy is currently two lanes east of Gun Club Road.
- Additional east-west routes are not proposed due to the disjointed road segments that exist coupled with the patchwork of existing rural, large lot development.



I-70, 6<sup>th</sup> Avenue, and Quincy Avenue east-west connections are supplemented by the proposed north-south network of roads consisting of:

- Watkins Road (CR 97), six lanes from I-70 to Quincy. It is currently a two-lane, paved road.
- Manila Road (CR 113), four lanes from I-70 to County Line Road. Manila is currently a paved, two-lane road for three miles south of I-70. South of that point to County Line Road, right-of-way will need to be acquired to construct a four-lane arterial.
- Brick-Center Road (CR 129), two lanes from 6<sup>th</sup> Avenue to County Line Road. Currently it is a paved two-lane road for about 3.5 miles south of I-70 and gravel south to County Line Road.
- SH 79, Kiowa-Bennett Road (CR 137), two lanes from I-70 to County Line Road. Kiowa-Bennett is currently a two-lane paved road, but shoulder improvements are proposed along its entire length. The results of a Planning and Environmental Linkage (PEL) Study analyzing alternative alignments for SH 79 to address truck traffic and safety concerns in the Town of Bennett recommended construction of a full interchange where SH 79 now crosses under I-70.
- Wolf Creek Road (CR 149, located just outside Tier 1) is proposed as a two-lane arterial from 6<sup>th</sup> Avenue to County Line Road. It currently is a two-lane paved road from 6<sup>th</sup> Avenue to Quincy.

The recommended improvements are significant and will require substantial investment by the County with assistance from the private sector as development occurs. In addition, the recently

enacted rural road impact fee will be used in Tier 1 to help fund the construction of improvements to 6<sup>th</sup> Avenue as follows: the missing segment between Imboden Road to Manila Road and widening of the segment of 6<sup>th</sup> Avenue from Sky Ranch to Hayesmount Road. Widening of Watkins Road from 2 to 6 lanes south of Mississippi will also be aided by the impact fee.

The improvements noted are based on the household and employment forecasts used to establish travel demand in the 2035 Transportation Plan. Those forecasts are different than the forecasts used in this Comprehensive Plan update, but the higher forecasts used in the Transportation Plan result in travel demand and roadway improvements that should adequately accommodate the growth projected in Tier 1 in this Plan update, with the exception of 6<sup>th</sup> Avenue west of Imboden Road. With the approval of Sky Ranch and Prosper, 6<sup>th</sup> Avenue is planned to be a four-lane arterial with turn lanes. To accommodate urban development in Tier 1, 6<sup>th</sup> Avenue will need to be a minimum of four lanes (plus turn lanes) from Imboden Road east to Kiowa-Bennett Road.

The 2035 Transportation Plan (adopted in 2010) should be updated to reflect the approved land uses for Sky Ranch and Prosper and to reflect the land use recommendations of the Lowry Subarea Plan.

Overall, the County road network lacks the spacing, continuity and capacity to effectively meet the mobility needs of future urban development on a large scale without major investment by both the public and private sector, including the acquisition of right-of-way. It is important to have a network with several north-south and east-west routes in order to provide alternative routes to and from traffic generators and to disperse traffic to lessen congestion and subsequent air quality degradation.

### **Bicycle/Pedestrian Facilities**

Currently there is a demand in Tier 1 for multi modal alternatives to auto travel for commuting and recreation. There is currently disconnected bicycle/pedestrian infrastructure with future plans to connect into a multi-County system. A Countywide Bicycle Pedestrian Master Plan is being prepared which will identify potential rural multi-modal corridors; suggest enhancements needed at key points within the network; and develop a phased plan for implementing the improvements and recommendations. The Master Plan will provide a basis for future decision-making and coordination with transportation and residential/commercial development projects, as well as park and open space land acquisition, development planning and prioritization.

### **Water and Sanitation**

Water and sanitation infrastructure in Tier 1 is provided by the Town of Bennett, the Sky Ranch Metropolitan Districts, and the Prosper Metropolitan Districts.

#### *Town of Bennett*

The Town of Bennett currently has rights for 14 water wells, but only 9 wells are in service. The Town currently has 1,107 water taps that serve the population of 2,484 and 900 residences. The Town has a water and wastewater master plan that includes plans for a future expansion to serve up to 7,500 single family equivalents (SFEs). It is unclear what the water source is for this expansion plan. The Town of Bennett has a lagoon system to treat wastewater.

### *Prosper Metropolitan Districts*

The Prosper Metropolitan Districts were formed to provide services to the 5,111-acre Prosper development. The District plans to construct a central water system for the development, supplied by groundwater (limited to 1,305 acre-feet per year) and renewable sources consisting of surface water, reclaimed wastewater and lawn irrigation return flow. Non-groundwater sources are planned to meet 85% of the estimated annual demand of 5,220 acre feet. Groundwater will be obtained from the Upper and Lower Arapahoe aquifer and the Laramie-Fox Hills aquifer.

The Prosper Metropolitan District also will provide wastewater treatment for the development. A central wastewater collection and treatment system is proposed. The treatment plant at buildout will service 11,850 SFE's with a capacity of 2.98 million gallons per day (mgd). Phase I of the plant is anticipated to serve the development up to 2025, with a capacity of .265 mgd serving 988 SFEs, or a population of 3,162.

### *Sky Ranch Metropolitan Districts*

The Sky Ranch Metropolitan Districts were established to provide infrastructure improvements at Sky Ranch and the Hills at Sky Ranch, including water and sanitation facilities. Water and wastewater service is being supplied through an Intergovernmental Agreement (IGA) with the Rangeview Metropolitan District, which generally encompasses the Lowry Range property. At buildout, the District anticipates meeting Sky Ranch water demands using 30% groundwater, 33% surface water and 37% reclaimed water. Rangeview has sufficient water resources to supply Sky Ranch at buildout, with an estimated surplus of 60,000 SFEs, or 24,000 acre feet per year (AFY).

Water demand is projected to be 2,445 AFY at buildout, or 5.68 mgd. Sources of water are wells located on the Sky Ranch property and the Lowry property which pump groundwater from Denver Basin aquifers, primarily the Arapahoe aquifer. The District has a total of 25,586 AFY of groundwater decreed, with 10,165 AFY non-tributary which requires augmentation. Six additional wells are anticipated to meet demand at buildout. The District has also participated in the regional WISE project, which provides a renewable surface water supply at an average of 500 AFY. Because this supply can be intermittent, the District anticipates constructing two water storage reservoirs on the Lowry property to store this water which comes from Denver and Aurora sources. The WISE water also may be used to recharge the groundwater wells. The District also holds 2,695 AFY of surface water rights to Box Elder Creek and Coal Creek and when sufficient water is present, will be able to divert this water to the Lowry reservoirs. A water treatment plant for the system eventually will be built on the Lowry property down gradient from one of the reservoirs.

The Sky Ranch wastewater reclamation facility will provide for the reuse of all treated effluent, with no discharge to surface water. The initial phase of the facility will have a 400,000 gpd capacity which is one-quarter of the 1.6 mgd capacity required at buildout. Expansion will be undertaken as development warrants. The wastewater will be conveyed to the reclaimed water system to meet non-potable demands and any additional reclaimed water will be stored in the reservoir used to capture and store local surface water and also in reclaimed water ponds located within the development.

### *On-site Wastewater Treatment Systems*

Tri-County Health Department does not have a regulatory minimum lot size requirement for the use of on-site waste treatment systems (OWTS). The County has not adopted minimum lot size requirements for the use of OWTS. Tri-County generally recommends that lots using an OWTS have a minimum of one acre for lots supplied by central water and 2.5 acres for lots with wells.

### *Lost Creek Groundwater Management District*

The Lost Creek Groundwater Management District was created to manage groundwater resources within the District. The District is not a water provider, but works to preserve the quality and quantity of groundwater within its boundaries. In Arapahoe County, the District lies between roughly Manilla Road and Brick-Center Road and extends into Adams County to the north.

### **Fire Protection and EMS**

Fire protection and emergency medical service is provided by the Bennett and Strasburg Fire Districts.

#### *Bennett Fire District*

The Bennett Fire District has 11 career staff and 57 reserve staff. Most of the reserve staff serves scheduled shifts and some commute into the district to serve. The District maintains three engines, two tenders, three brush trucks, three ambulances and six command vehicles, plus a hazardous materials truck. The district has its own maintenance facility.

Bennett Fire District has four stations, two in Bennett, one in Watkins near the I-70 interchange and one at the Arapahoe County service center. The public water supply system in Bennett is adequate for fire fighting purposes but has not been tested for pressure. A cistern is available at Watkins Farm and a water tank at St. Isadora church. Orica and Conoco-Phillips allow the district to access their water systems. Outside of Bennett and these other sources, the district has to shuttle water to a fire location using the tenders. Antelope Hills (in the part of Bennett in Arapahoe County) has city water and hydrants.

Response time in Bennett is under 8 minutes (city standard) from the main station in Bennett. The other stations are not staffed with career personnel 24/7 which affects the response time in the south part of the district, outside of Tier 1. In 2008, the District signed a mutual aid agreement with Sable Altura, Strasburg and Byers (called the I-70 agreement). They are also part of the metro Denver mutual aid agreement.

The Bennett Fire District has an IGA with Arapahoe County to allow the district to recommend standards for projects in the County. The District is concerned about the poor maintenance of public and private dirt roads because of the impact on its trucks. The Bennett Fire District serves the Sky Ranch and Prosper developments.

### *Strasburg Fire District*

The Strasburg Fire District serves the extreme eastern portion of Tier 1. The District has a total of 33 firefighters, including 3 career positions. The District operates with two mini pumper attack trucks, two tenders, one brush truck, one rescue, three ambulances, one 1995 engine, and one 1995 aerial.

Only the station in Strasburg is available to serve Arapahoe County; the other station is in the north part of Adams County. The district also has a helipad, located at Section 5, T4, R62W in Arapahoe County. Water supply is best in the Adams County portion of Strasburg. Water pressure is best, exceeding 500 gpm, near the water tower located north of I-70. The water district is attempting to make improvements as funding allows, but old infrastructure means pressures are often low away from the tower. With the tower and town wells running, the fire district believes they have the capacity to fight a typical fire.

The District does not have any fire hydrants or water storage facilities in Arapahoe County. The District would need to haul water and use portable ponds to fight a fire south of town. Ideally, the District would like to see hydrants at 500' intervals consistent with NFPA standards.

The lack of road maintenance in Arapahoe County is a concern because of the wear and tear on the District's vehicles. The District is a participant in the I-70 Mutual Aid Agreement, and also has mutual aid agreements with SE Weld to the north of I-70 and the Rattlesnake and North Central districts in Elbert County.

### **Schools**

The primary school district serving Tier 1 is the Bennett School District 29-J. Aurora School District 28-J serves the western portion of Tier 1, including a small portion of Sky Ranch and Prosper. Currently the Bennett School District provides an elementary, middle and high school, all located in the Town of Bennett. School sites have been set aside in Sky Ranch and Prosper in order to mitigate potential impacts to the District from increases in enrollment. Although sites will be dedicated for schools, the dedications do not address construction, staffing, maintenance and operational costs involved in serving additional students.

### **Parks, Recreation and Open Space**

Park and recreation facilities in Tier 1 are provided primarily by Arapahoe County and special districts. To date, the County has purchased the 265-acre Kiowa Creek North Open Space located at the northwest corner of 6<sup>th</sup> Avenue and Kiowa-Bennett Road. This parcel includes some of the Kiowa Creek floodplain. The Kiowa North Open Space is an undeveloped park that will be developed in 2018 for access. This park is at the far eastern end of Tier 1 and was planned to provide passive use recreation for users in Bennet more than it will for Sky Ranch or Prosper, unless connectivity to those developments is improved.

The Strasburg Metro Park and Recreation District lies just east of the eastern boundary of Tier 1. The District operates a community center.

The Sky Ranch Metropolitan Districts are authorized to provide park and recreation services and facilities as are the Prosper Metropolitan Districts. No facilities yet exist within these districts. These

two metro districts were established to develop, maintain and manage parks and recreation facilities and programs for these two developments.

The County does not have the funds or resources to create and maintain parks to meet the scale and demands of these and other potentially large scale residential developments, especially to accommodate active park/recreation. The County can only use Open Space sales tax revenue for passive recreation, not active recreation such as ballfields or tennis courts.

Future parks and recreation facilities in Tier 1 could be provided in a number of ways: 1) partnering with future developers, 2) creating additional metropolitan districts, 3) based on direction in the Comprehensive Plan and Open Space Master Plan, County Commissioners could prioritize funding for maintenance and create a passive use open space, or 4) to provide active recreation facilities, expand the Arapahoe County Recreation District and increase the mill levy.

### **Natural Features and Resources**

Natural features and resources affect land use patterns by presenting hazards that should be avoided, features that should be preserved, or which contain resources available for extraction. The information which follows is taken from the Eastern Arapahoe County Greenprint Analysis maps prepared by the Trust for Public Land. These maps are included in Appendix B of the Comprehensive Plan.

**Sand and probable aggregate mineral deposits** are shown along Box Elder Creek and Kiowa Creek. None of these deposits has been proposed for extraction. No **oil and natural gas deposits** are identified in Tier 1, although oil and gas wells have been approved in the Prosper development northeast of the 6<sup>th</sup> Avenue/Hayesmount Road intersection.

Much of the lower-elevation and level land received a high rating for **non-irrigated agricultural use and prime farm land if irrigated**. Dry land agriculture is occurring where rural residential development has not occurred and there are scattered areas of irrigated agriculture.

**Floodplains** are identified along Box Elder Creek, Kiowa Creek and Wolf Creek. A flood hazard area delineation (FHAD) analysis is being conducted for Kiowa Creek in 2017 to more accurately determine the extent of the floodplain. Funding is available for undertaking a FHAD study for Wolf Creek in the later part of 2017.

**Areas of high to moderate visibility** are identified between Watkins Road and Box Elder Creek, between Box Elder Creek and Kiowa Creek west of Brick-Center Road (CR 129), and on the eastern edge of Tier 1 between Kiowa Creek and Wolf Creek.

No **historic or archaeological sites** were identified in Tier 1.

The Trust for Public Land mapped various wildlife habitats and created a composite map showing greatest, moderate and fewest number of overlapping habitats. **Greatest and moderate number of overlapping wildlife habitats** are extensive in Tier 1, generally one mile south of I-70. **Greatest number of overlapping wildlife habitats** are generally along box Elder Creek, Kiowa Creek and Wolf Creek, with other concentrations around the intersection of Imboden Road/CR 10 (Alameda) and Brick-Center Road/6<sup>th</sup> Avenue.

Areas impacted by **Front Range Airport** include the 55 DNL (acronym for Day-Night Average Sound Level) and the Airport Restricted Area #2 to the east of Manilla Road. Future residential development is not allowed within the 55 Ldn boundary and all development is restricted in Restricted Area #2. These areas encompass approximately 1.5 square miles on the south side of I-70.

## **Other Jurisdiction Plans**

### **Town of Bennett**

Much of the land suitable for future urban development in Tier 1 lies within Bennett's "Area of Planning Influence" and may also be considered by Aurora for possible annexation. The Bennett Comprehensive Plan indicates the Town will not annex rural residential areas unless the areas are in critical need of sewer and/or water service. That leaves the same areas noted as suitable for urban development as areas likely to be considered for annexation by Bennett. The County should work with the Town of Bennett to jointly plan this area and arrive at agreed-upon land use and annexation goals.

### **City of Aurora**

The 2009 Aurora Comprehensive Plan shows an annexation area that is coincident with the current Aurora city boundary at Hayesmount Road north of Yale Avenue. The annexation area includes Sky Ranch. The annexation area also includes the area between I-70 and 6<sup>th</sup> Avenue from Hayesmount Road east to Schumaker-Gotlob Road, including a portion of Prosper, which is the area identified in this analysis as most suitable for urban development.

In 2016 the City of Aurora undertook the "East Aurora Annexation Study" to determine the feasibility of annexing areas to the east of Aurora in Arapahoe County. The study area was proposed as the revised planning area and annexation area to be used in the City's Comprehensive Plan update. The area generally included undeveloped parcels north of Quincy to the west of Cavanaugh Road (excluding the cluster of rural residential development bounded by Cavanaugh, Jewell, Imboden and Alameda) and the two miles south of I-70 between Imboden Road and Schumaker-Gotlob Road. Included were the Sky Ranch and Prosper developments. The Aurora City Council did not adopt the ordinance revising the planning/annexation area boundary. Aurora is currently undertaking an update to its Comprehensive Plan and presumably the boundary remains as shown in the 2009 Comprehensive Plan as described above.

The City of Aurora has a history of objecting to the approval of urban density projects on and near their boundaries, but there are landowners and developers who prefer to remain in unincorporated Arapahoe County. If annexation to Aurora is not pursued, the County will continue to process applications it receives for urban development consistent with the Comprehensive Plan and zoning and subdivision standards and requirements. The County should work with the City of Aurora to jointly plan this area and arrive at agreed-upon land use and annexation goals.

## **Summary of Findings**

Tier 1 is the path of continued eastern expansion of the Denver metro area. There are approximately 40 square miles of undeveloped land in Tier 1 for future development, although this

figure will be reduced by restricting development in floodplains, airport restricted areas, and other sensitive areas. The floodplains also provide wildlife habitat and are possible sources of sand and aggregate mineral resources. Box Elder and Kiowa Creeks are the primary drainageways in Tier 1, with Wolf Creek lying just outside the eastern boundary. Areas of moderate to high visibility may also lend themselves to preservation, further reducing the amount of developable land.

Of the 40 square miles, approximately 9.5 square miles are already committed for urban development in Sky Ranch and Prosper, leaving 30.5 square miles of undeveloped land. Sky Ranch and Prosper can accommodate all of the projected urban household and employment growth. Even if these projects build out to only 75%, only another .6 square mile would be needed to accommodate projected growth. The issue then becomes one of determining future land uses in the remaining  $\pm 30$  square miles.

Future land uses will have a dramatic impact on the amount of land consumed for development and subsequently how much land is available for development beyond the time horizon of this Plan, or if growth exceeds the forecasts in this Plan. Continued large lot development, with or without County approval, could consume all of the remaining  $\pm 30$  square miles, thereby reducing the land available to accommodate future growth. Either less rural residential development or smaller-lot rural development than is assumed in the land demand analysis would be needed in order to accommodate additional growth.

Subdivisions containing 19-acre lots at a minimum are currently allowed under the R-1 zoning of much of Tier 1. Rezoning to R-A and R-E (2.41 and 1.61-acre lot sizes, respectively) would allow more units on less acreage. While consuming less land, these zone districts allow the use of individual wells and OWTS and continued large lot residential development, with or without rezonings, will result in the proliferation of individual wells and OWTS that raise health and groundwater supply and quality concerns.

Existing A-1 subdivisions and 40-acre parcels could accommodate additional rural residential units (through subdivision of 40-acre parcels or by building new units where currently one owner owns two 19-acre lots), thereby reducing some of the demand for rural residential acreage. These acreages also could be sold and assembled by a developer for urban density development, but land assemblage would be a tedious and expensive process. Given the age of current residents and housing, this is a potential outcome in the longer term. In the short term, the rural residential land use pattern will remain.

Urban development will be faced with the costs and challenges of providing access to an adequate road network, a reliable water supply and adequate wastewater treatment. In addition, undeveloped land parcels in Tier 1 are fragmented and interspersed with existing rural residential developments and land assemblage to create large-scale urban projects will be difficult. Smaller, individual urban density projects are the likely result, especially with the current ownership pattern.

The proposed road network is not sufficient to adequately serve urban densities, except in a few locations. Providing an adequate network to serve urban densities with suitable access and minimal impacts to the existing rural residential areas would be difficult and costly, especially considering improvements and right-of-way acquisition would be needed adjacent to existing rural developments.

Taking the existing land use pattern, the proposed road network and the current ownership pattern into account, a relatively small amount of land (19 square miles) is available to accommodate urban growth in an efficient, more cost-effective manner in Tier 1. Areas in Tier 1 where urban development could be served are principally along I-70 and to the south of the Prosper development to either side of Watkins Road. The areas along I-70 include areas around and between the existing interchanges at Manilla Road and Converse Road (in Bennett) and the proposed new interchange for Kiowa-Bennett Road (in Bennett). Future urban growth beyond what can be accommodated in Sky Ranch and Prosper would be curtailed if large-lot residential development is allowed under the current A-1 zoning in these areas.

These same areas are included in plans of Aurora and Bennett. Annexation of these areas may be pursued by these jurisdictions if approached by landowners.

Existing districts do not have the capacity in water or wastewater treatment systems to absorb additional growth at urban densities, with the exception of the surplus water potentially available through the Rangeview Metro District and through annexation by the City of Aurora. While Aurora is in a position to serve these areas, existing infrastructure is located some distance away and development would be several years in the future. Aurora requires landowners to dedicate all water rights to the City upon annexation. The Town of Bennett has a relatively small amount of excess capacity at the present, but not in an amount to accommodate any large scale development. If not served by Aurora or Bennett, future urban growth will need to be served either by existing districts expanding their capabilities to serve, or by new districts. Rangeview may be able to provide water under any or all of these scenarios.

Because land assemblage will be difficult, it is likely numerous smaller districts will be needed to serve future development unless existing districts expand their capacities to provide services, or if the areas are annexed by Bennett or Aurora. Expansion of existing districts or annexation are the preferred alternatives to creating new districts to provide urban services to future development.

Market conditions and the development of employment-generating uses, such as the nearby Transport project in Adams County and plans for Spaceport by Front Range Airport, may increase demand for housing at urban densities in Tier 1 beyond the projections used in this analysis. The County should prepare for this potential growth by reserving areas for future urban growth and by restricting rural residential development in Tier 1, especially within one to two miles of I-70 and along Watkins Road.

## **Recommended Actions**

Based on this analysis, the following actions are recommended:

1. Expand the Planning Reserve to a two-mile corridor in selected areas along I-70 which includes the areas that could accommodate future urban development as described above. Re-name it Urban Reserve. (See Map 6.)
2. Restrict the approval of rural residential developments (rezonings and subdivisions) in the Urban Reserve. This could be accomplished by creating a new "urban reserve" zone district. The goal is to preserve this corridor for future urban development.

