KEYSTONE
POLICY CENTER

Colorado Water and Growth Dialogue
CWCB 50% Progress Report
June 2016

I. Project description:
Colorado is projected to experience a sustained increase in population and with it a substantial increase in demand for water. In a state with limited supplies, this increase in demand will result in a well-known water supply gap. This pressing problem for the future of Colorado has thus far been managed by developing new supply and water storage projects, implementing reuse projects, and encouraging water conservation. The Colorado Water and Growth Dialogue intends to explore and demonstrate how the integration of water and land use planning should be utilized to reduce water demand from the development and re-development associated with the projected population increase. This approach to planning aims to direct and incentivize smart, water-wise growth in lieu of allowing only market conditions to guide how Colorado grows.

Thus, the purpose of the Colorado Water and Growth Dialogue is three-fold:

- Quantitatively demonstrate how much water can be saved through the integration of water and land use planning for homes and neighborhoods that will be developed or redeveloped in the future;
- Qualitatively develop a consensus-based set of recommended management levers/mechanisms/strategies for communities that can be incorporated into their planning that recognizes the uncertainties of how and where people in the future will want to live;
- Disseminate these recommendations, and demonstrate the potential for achieving water savings through strategic land use planning decisions while still meeting the current and future needs of the community.

Project Successes and Progress toward Achieving Goals and Objectives:
The Colorado Water and Growth Dialogue is looking to complete its first phase by the end of 2016. Phase I of the Dialogue is defined as developing the data and information that can be disseminated to land and water planners, developers and policy makers that will answer the high-level questions:

- Why integrate land and water planning, what are the range of potential water demand savings from urban form and landscaping practices?
- What are the management levers/mechanisms/strategies for achieving these water demand savings?

Answering these questions includes both the qualitative and quantitative components described below. We have been focusing on the Exploratory Scenario Planning process most recently as the quantitative analyses have been continuing. Thus this report will focus on the Exploratory Scenario planning process with brief descriptions and updates on the quantitative analyses.

In addition to these analysis, we are looking ahead at a dissemination plan for the results. These include a series of regional meetings that will share the final report, summarize the findings and train planners on how to use the Residential Land Use and Water Demand Tool – *described below.* There may also be potential in using the Senate Bill 15-008 program as a dissemination venue for the findings and training on the tool in addition to, or lieu of, regional meetings.

II. Qualitative Analysis:

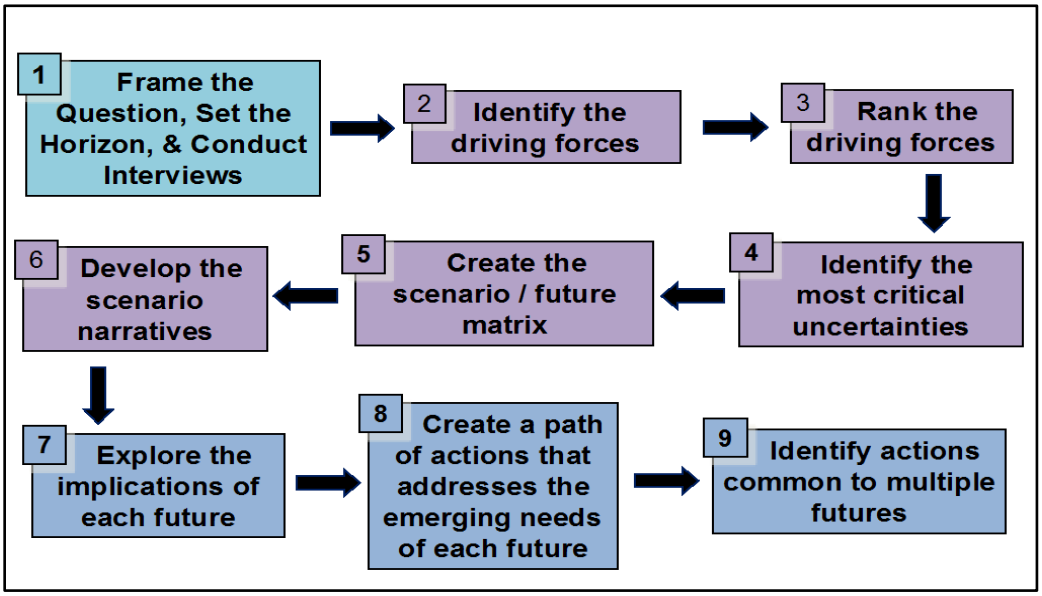
Exploratory Scenario Planning

Exploratory Scenario Planning is commonly used by organizations or forward-looking stakeholder groups which operate in highly-dynamic planning environments. These are environments where significant change may be occurring and where there is uncertainty about the emerging opportunities and challenges that lie ahead. This is most certainly the case as participants in the Colorado Water & Growth Dialogue consider ways to promote land-use planning options that could lead to significant reductions in projected residential water demand.

As a point of contrast, the Scenario Planning approach being executed for this effort is not concerned with forecasting the most likely future or building stakeholder consensus on how to achieve an aspirational future. Instead, the objective is to develop an implementable approach with enough flexible capacity that it can adapt to whatever growth pattern occurs in the future in urban areas on the Front Range.

The Colorado Water and Growth Dialogue is applying the deliberative nine-step process illustrated in the figure below. This process will take taking approximately six months to complete. From April – May, 2016 the Steering Committee and the Working Group completed steps 1-5 below. This initial set of meetings included a full-day workshop of the Working Group followed by a half-day Steering Committee meeting to sort through the collected data and key driving uncertainties.

The results of steps 1-5 of the scenario planning process are below the process chart and included: developing the focal question; identifying and ranking the driving forces of both future uncertainties and certainties; and finally developing a scenario matrix that creates a set of plausible, divergent and compelling future scenarios.



As an output from Phase I of the Scenario Planning process the group agreed to the following:

Focal Question – The initial framing requirement was to formulate the Focal Question as it centers the process on the overriding issue and goal. The Focal Question is a concise question developed by the Steering Committee specifying the primary purpose of the exercise. The agreed upon focal question is as follows:

How can changes in urban form and landscaping practices for new growth and redevelopment assist in meeting future urban water demand along the Colorado Front Range?

Identifying and ranking the driving forces of future uncertainty: During the May workshop the Working Group discussed at length the range of factors that can most influence the focal question. These were to be narrowed down to the most critically important as well as the most uncertain/certain. The group agreed to the following key drivers of uncertainty:

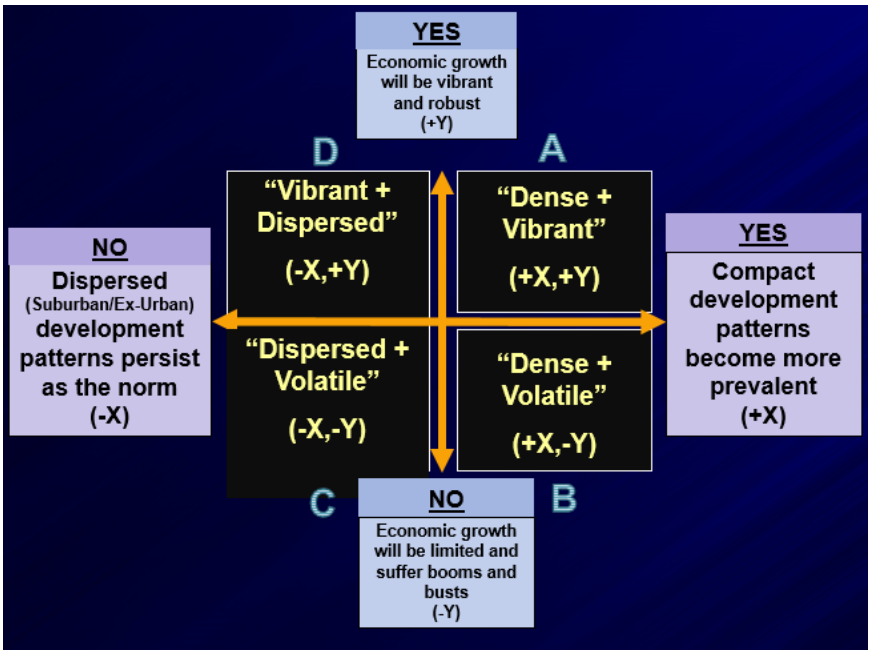
- **Housing affordability**
- **Cost of oil and gas**
- **Technology effects on transportation preferences**
- **The economy: Perceived strength of job market/Economic opportunity/vibrancy**
- **Flexibility in working environment/telecommuting**
- **Lifestyle including transportation and housing preferences**

Key drivers that are certain: The group also identified critical drivers that are certain to be very important to answering the focal question. These are to be incorporated into all scenarios. The group agreed to the following certainties:

- **Net Population Growth**
- **Impact of distributed employment centers (T.O.D.'s)**
- **TABOR (Legacy/Repercussions if ever repealed)**
- **Access to outdoors/recreational opportunities (local and tourism)**

Identification of the most important and uncertain driving forces related to the focal question, and finally creating scenario matrix: The Working Group and Steering Committee narrowed the critical drivers of uncertainty down to the 2 most important and most uncertain as they relate to the focal question. These are then put into a matrix with the positive/negative or Yes/No states as the ends of the axis. The group agreed that the most critical and uncertain drivers are **Economic Health and Lifestyle Preferences.** Note that 'Technology effects on transportation preferences' (i.e. driverless cars) also rose to the top and will filter into the narratives.

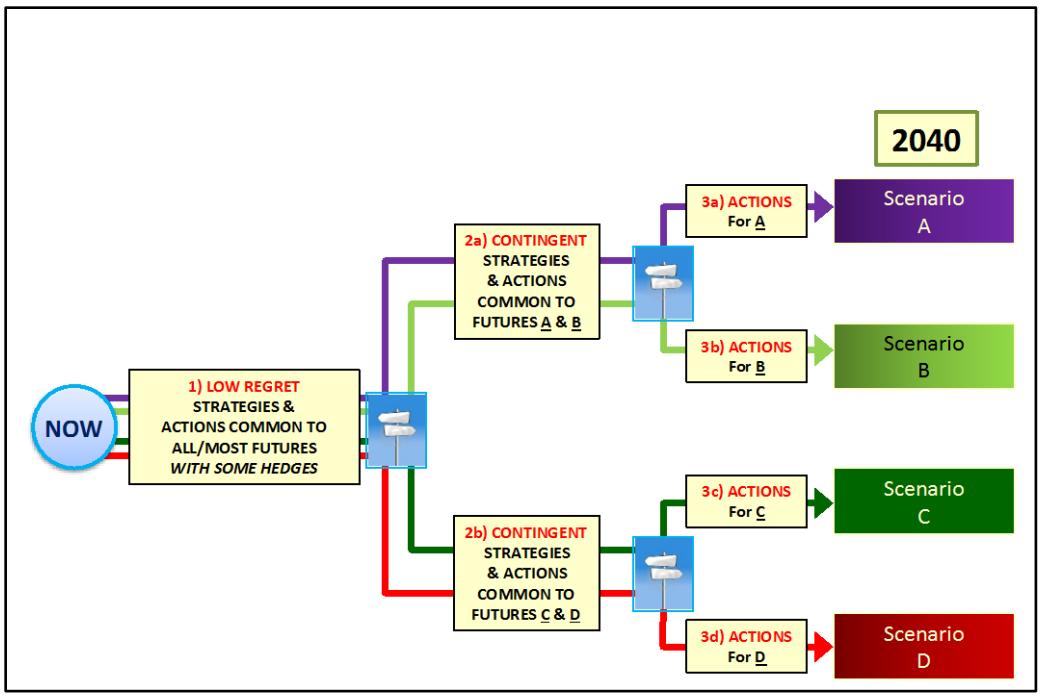
These were then put into the matrix below and used to develop narratives that describe plausible changes and evolving events which could occur over time from 2016 through 2040.



These narratives will serve as tools designed to be credible, highly diverse, and challenging in order to engage participants in Workshop #2. Each scenario is a unique combination of key planning uncertainties developed in Step #5 and further refined in Step #6. These are the scenario "end states" which collectively define the range of future possibility with regard to the specified Focal Question in 2040. For example, the Y-axis above represents Economic Health. The positive end state is, "Economic growth will be vibrant and robust" and the negative end state is, "Economic growth will be limited and suffer booms and busts."

Next steps:

Steps #7 through #9, shown in the flow chart above, collectively constitute the second phase of the process. These steps utilize the scenario narratives developed in the first phase to engage stakeholders during Workshop #2, scheduled for late July 2016. The primary purposes of these steps are to note the operative implications of each scenario as it relates to the focal question and to identify potential options/strategies that could prepare or address (i.e. correct, mitigate, or circumvent) those implications in various combinations of ways. These steps can also be used to strategically map out key decision (tipping) points in the future, identify important indicators/precursors of impending change for future monitoring, and develop preliminary sets of prepositioned actions that may come into play as future events tip toward one side of the matrix or possibly even toward one of the end-member futures as illustrated in the figure below.



II. Quantitative Analyses:
Three concurrent quantitative analyses are exploring the question,

"Why integrate land and water planning, what are the range of potential water demand savings from urban form and landscaping practices?"

The following three quantitative analyses/data collection processes are on-going, and results are designed to integrate with the Exploratory Scenario Planning results within the areas of urban form and landscaping.

Integration of Denver Water Demand Model and UrbanSim
Aurora Water, Denver Water, DCDC and DRCOG are working to calculate the increase in water demand that will accompany the increase in population projections between now and 2040. This Technical Subgroup is utilizing model runs from DRCOG's UrbanSim and bridging these results with protected customer demand data. Model runs are being analyzed that show a baseline distribution of growth patterns (i.e. what is our best projection for how will people live and where under current planning) and a second model run that incorporates the higher density goals and accompanying Transit Oriented Development of DRCOG's MetroVision 2040. This will enable us to provide our audiences with a range of water demand impacts from the impending population growth.

This exercise is complicated by the fact that UrbanSim was not designed to include a water component. We are pleased to be able to utilize the modeling expertise of the Decision Center for a Desert City (DCDC) out of Arizona State University to help us bridge or crosswalk this data conversion.

Residential Land Use and Water Demand Tool
Denver Water has developed a Residential Land Use and Water Demand Tool that can be used by local planners to create their own scenarios of growth and development by varying growth estimates and the distribution of the housing product-type in which people will live. There is also a landscaping component based on gallons/square foot of pervious area.

Landscaping policies
Aurora Water has advanced innovative landscaping policies since 2007. As part of their own internal reporting, but also as a benefit to the Dialogue, they are developing and providing data on the range of efficacy of various landscaping and urban form policies they have enacted in the last 10 years.

III. Future reporting timeline

- 75% report - October, 31
- Final report – December 31

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