

## Complexities in Water Planning for Small Cities

Submitted to

Dr. Alejandro Rodriguez and Dr. Joseph Portugal

Department of Public Affairs

College of Architecture, Planning and Public Affairs

by

Porscha Brown, Luis Grangerio, Susanna Feather, Holly Fortes, Martha  
Minjarez, and Alyson Whitefield

December 3, 2018



UNIVERSITY OF  
TEXAS  
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# Scientific Methods

- 1. Observation
- 2. Question
- 3. Hypothesis
- 4. Prediction
- 5. Experiment
- 6. Analysis
- 7. Conclusion
- 8. Communication

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## Table of Contents

Executive Summary .....	5
Introduction and Background .....	6
The Methodology .....	8
Conclusions and Recommendations .....	10
Appendix .....	12
Online Research Template .....	12
Phone Dialogue and Questionnaire .....	13
Work Plan .....	20
References .....	31

## Executive Summary

This project will explore the Regional and State Water Planning Process in Texas as it relates to the role of cities and their required involvement throughout the water planning process. Specifically, the research will target cities that have a population of 10,000 or less in Tarrant, Parker, and Ellis counties, all of which are located in the water planning district Region C. The goal of the research is to uncover strategies and solutions for smaller populated cities to utilize when developing a water plan for their jurisdiction.

These cities have unique issues and concerns that may differ from the wider scope of Region C due to area size, geographical location, access to water resources, water usage, costs, and population. Research was conducted to identify what these cities are currently doing to meet water planning requirements and what specific challenges and/or lack of resources smaller cities have in creating and implementing a plan that meets the needs of their jurisdiction. Additionally, this project will design a tool to measure the effectiveness of the individual city's current water plan. The combined result of research findings and the performance measurement tool may be used in the future to recommend policy changes for smaller communities attempting to meet the same requirements, as their more heavily populated counterparts.

This project showed that local government transparency was a major factor in all facets of our research, analysis, and conclusions, among the majority of small cities. Accordingly, our findings varied depending on the particular city. The availability of data from a particular city was not determined due to size but related to that particular local government's level of transparency regarding their water system practices. For example, a city with 1,000 residents in Tarrant County may provide more access to water information, such as its water rates in bold print on its city's

website; whereas, a larger city of 8,000 resident may only provide the phone number of a Public Works manager, without any information regarding how much a prospective resident would expect to pay for on their water bill.

The level of transparency also affected our ability to gather data. For example, the aforementioned city with 8,000 residents, although a large city within our data group, struggled to deliver a person whom could provide information regarding any type of implemented water plan. Therefore, our research efforts were affected by the transparency of the different cities in regard to their own residents, as well as the general public.

Although, most cities tended to meet the required criteria for posting water quality reports, there is still a lack of overall consistency with local transparency regarding water planning. The following report shows the findings of our research, analysis, and recommendations on the existing infrastructure for water systems of cities with less than 10,000 residents within Region C.

### **Introduction and Background**

The University of Texas at Arlington (UTA) College of Architecture, Planning and Public Affairs, in conjunction with Dr. Alejandro Rodriguez and Dr. Joseph Portugal and the Texas Water Development Board, has submitted a capstone proposal to test the hypothesis that cities with a population of under 10,000 residents face higher barriers to developing and implementing a suitable strategic water plan. The 2017 State Water Plan calls for 16 individual regions across the state of Texas to develop plans that address the growing demand for water in the near future. This project looked specifically at Tarrant, Parker, and Ellis counties, all located within Region C.

While Region C has developed a regional water plan, the different municipalities within this region will face varying obstacles and demands when creating and implementing a water plan specific to their area within the region. It is thought by this project team, however, that small cities often have limited resources and may be defaulting to the Region C plan which would not necessarily serve as an efficient or practical plan for the city in question. This results in cities that are ill-equipped to handle increased demands for water use and is especially relevant for the cities in question due to the projected population growth of 70% between 2020 and 2070 in the state of Texas (TWDB, 2017).

As expected, the Project Team faced difficulties in communication with Public Works Departments and additional Water counterparts. Some of the smaller cities have no municipal employees assigned to or a water department in charge. In several of the cities, it was impossible to obtain information from a public employee, due to excess of responsibilities. Research showed this to be the number one obstacle in trying to obtain information from municipalities. Some of the smaller cities, those with under 500 inhabitants, lack public offices and usually rely on bigger entities to provide water services.

One of these entities, is Community Water Supply Corporation. In part of our research, we found that this company provides water services to communities like Briar. However, communication with these big corporations is another burden, since they seem to also lack the capabilities or even worse, an interest in the research.

The Project Team also found that while some cities have a water plan, most of them rely on water conservation and drought contingency plans to preserve water. Most of the cities offer information on water saving plans and give instructions for residents to follow when water

restriction is in effect via website to their constituents. The research also showed that cities obtain water from a wide variety of sources that go from lakes, rivers and reservoirs, to wells, aquifers and the purchase of ground water from other municipalities. Cities also rely on water/trash charges to residents in order to fund their water departments.

### **The Methodology**

The Project Team will use knowledge gained through the 2017 Texas State Water Plan and the 2016 Region C Water Plan to develop a list of questions to use as a template for each city in regard to their community's individual water planning process. These questions will be developed in consultation with Dr. Rodriguez and Dr. Portugal and will be designed to provide valid and reliable data. Once the survey questions have been designed, the project team will contact the 48 cities it has identified as meeting the project criteria of a) being located within Tarrant, Parker, and Ellis counties and b) having a population of less than 10,000 residents to administer the survey questions. In instances where appropriate personal is not able to provide the requested information, the Project Team will seek secondary information from municipal websites and other data available to the public. Once the research phase has been completed, the Project Team will analyze the results using appropriate tools based on the type of questions administered and will look for existing trends and relationships. One example of how the Project Team will organize the data to look for these relationships will be to develop a scale in which to measure each city's water planning efforts in relation to the State and Regional Water Plan. In addition, the project was able to identify throughout correlation, using a SPSS method. Where somehow, most rating from the cities proved to be falling around 0.83, comparing to the amount of population from each city. By using the two t-sig test, we were able to determine that there was no correlation between the data. However, when comparing the water rates from each city



with the total amount of population, it seems like there is a small correlation between the data, as it falls around .442. The project team will look for any noticeable areas needing improvement and will ensure each city planning process adheres to the State and Regional Water Planning and Development requirements. The analyzed data will be presented to and reviewed by UTA faculty and will be made available to the Texas Water Development Board.

To complete this project in an efficient and timely manner, the Project Team will develop a Task Assignment Matrix (TAM). The TAM will clearly notate the necessary tasks, persons responsible for completed said tasks, and the timeline in which the tasks should be complete. This will allow the Project Team to organize team member roles and ensure the project stays within the intended scope and nature of its original purpose.

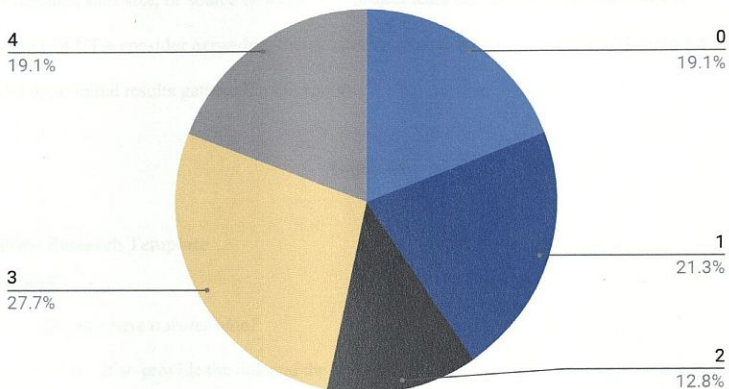
After thoroughly researching each of the 48 identified cities, the Project Team was able to uncover an adequate amount of information. Although some smaller populated cities did not have a prominent online presence, the Project Team was able to uncover data through primary research outlets; including telephone conversations and email correspondence between city public works staff and TRWD staff. In an effort to rate each city's performance as it relates to Water Planning, the Project Team developed a performance metric. The performance metric consisted of an overall rating score of five points. The metric considered the following components (water plan, drought contingency plan, water quality report, water conservation plan, conservation tips and or irrigation restrictions). The goal of the performance metric was to highlight each component and procedure required of cities for water planning in order to provide an accurate conclusion and recommendation to TRWD and city staff.

## Conclusions and Recommendations

As predicted during the risk assessment, obtaining information from the identified cities proved to be the most challenging aspect of the project. In order to address this risk, team members conducted research regarding best practices in obtaining results and consulted with stakeholders to create a relevant and engaging questionnaire to be conducted through brief phone interviews. These methods proved to be effective when team members were able to reach designated public works staff, however, an overwhelming percentage of the cities did not respond to multiple attempts of contact by team members. While a marginally higher percentage of cities responded to email inquiries, these responses were often brief and did not answer the questions posed. Due to this lack in consistency and overall response rate, the Project Team decided that information gathered in this portion was unreliable. After consulting with stakeholders, it was decided to place a higher emphasis on the amount of information available through public records. This allowed the Project Team to obtain much more information across all forty-eight cities and provide stakeholders with a more in-depth analysis of available data.

Through the use of a metric created by the project team to rate cities based on availability of information, the team found that the amount of information available varied across the different cities. The Project Team developed 5 points of interest and measured cities on a scale of 0 to 5, with 0 being no information available and 5 being that all points of interest were available. The project team found that 19% of cities had no information available either online or through contacting city personnel, no cities had all 5 points of interest available, and the remaining cities varied between 1 to 4 points of interest available as shown in Table 1 below.

## Points of Interest Available



Of the three counties, Tarrant and Parker counties seemed to have higher scores overall with 68% of cities within Tarrant County and 47% of cities within Parker County scoring a 3 or above while only 15% of Ellis County cities scoring a 3 or above. Further, over half of the cities that had no data available were located in Ellis County. The team then tested for correlation between information availability and population and found that there was no significant correlation. The project team also tested for correlation between population and water rate and found that, again, there appeared to be no significant correlation. Using these sources of information as a baseline measure, as though smaller cities have a lack of information available and may not be complying with Texas Water Development Board requirements. The project team recommends that further research be done to measure these results against information available in larger cities within Region C to test whether this is unique to cities with a population under 10,000 or if it is more wide spread throughout the region. The project team also

recommends that test be conducted to determine what other factors may come into play such as tax revenue, staff size, or source of water. The project team recommends that the CAPP program at UTA consider expanding this project to upcoming capstone teams in order to further build upon initial results gathered in this report.

## Appendix

### Online Research Template

#### Checklist

- *Do they have a water plan?*
  - If so provide the link and the year of the plan.
- *Do they have a Drought Contingency Plan?*
  - Provide the link and the year of the plan.
- *Water Conservation Plan?*
  - Provide the link and the year of the plan.
- *Water Quality Report?*
  - Provide the link and the year of the plan.
- Some smaller cities may not have a water plan but look for their *Comprehensive Plan Report*. Water information will be found there.
  - Provide the link and the year of the plan.

Template

City Name:

Water Plan:

Drought Contingency Plan:

Water Conservation Plan:

Water Quality Report:

Comprehensive Plan (only if you can't find a water plan):

Any additional info list here (for example the water provider or water source etc.):

### **Phone Dialogue and Questionnaire**

Dialogue:

Hello, my name is \_\_\_\_\_ and I am conducting research on water planning in small cities for the University of Texas at Arlington. Would now be a good time to ask a few quick questions about your city's water planning efforts?

- If yes: Proceed with questions
- If no: Ask, "who would be the best person to speak to about this? Could you please share their contact information with me?"
- If no answer: Leave message "Hello, my name is \_\_\_\_\_ and I am conducting research on water planning in small cities for the University of Texas at Arlington. If you could please give me a call back at your earliest convenience I can be reached at \_\_\_\_\_"

Questionnaire:

1. Which part of the water planning process do you and your staff find most challenging?  
(Such as water management, obtaining funds for public works, or informing the public about water conservation measures)

2. Are there any additional resources you wish you staff had access to in order to make water planning easier?
3. Do you feel that you and your staff are familiar with regional water planning requirements?
4. Which regional water planning requirements utilize the highest percentage of your resources?
5. Does your city outsource any water planning tasks to outside consultants, subject matter experts, or other sources?
6. Is there anything else that you feel is important to consider when implementing water planning strategies in your city?

# Tracking Spreadsheets

City - Water Spreadsheet												Overall Rating	
Team Member	City	County	Population	Water Source/Type	Surface Water (SW)	Ground Water (GW)	Water Plan (1 yr)	Drought Contingency Plan (2yr)	Water Quality Target (1yr)	Water Conservation Plan (1 yr)	Conservation Type and/or Incentive Restrictions (1 yr)	Notes	Overall Rating (Out of 5)
Holly	Blue Mound	Tarrant	2,452	Bluebonnet Water & Wastewater		Twin Mountain & Palmy Aquifer			x				1
Percha	Beanslie	Tarrant	6,135	Fort Worth	Eagle Mountain Lake, purchased from CFW	SW ONLY		x	x		x		3
Percha	Dalworth/Garden	Tarrant	2,357	Fort Worth & City of Arlington	Service Water only purchased from CFW and Arlington	SW ONLY		x	x	x	x		4
Alyson	Edgemoor Village	Tarrant	3,622	Fort Worth	Purchased from City of Fort Worth	SW ONLY			x				1
Holly	Everman	Tarrant	6,348	Fort Worth	Ground Water (GW) ONLY	Twin Mountain & Palmy Aquifer			x		x		2
Alyson	Rader	Tarrant	1,884	Fort Worth		Trinity Aquifer & Palmy Aquifer	x	x	x	x			4
Suzanna	Kennedale	Tarrant	6,336	Fort Worth	Surface water sources: Lake Worth, Eagle Mountain, Lake Briggsport, Richard Chambers Reservoir, Clear Fork Trinity River, Cedar Creek Reservoir	3 wells that pull from Trinity Aquifer TWIN MT, TRAVIS PEAK, & HELLGUY	x		x	x	x	83% Ground Water 17% Surface Water	4
Suzanna	Lake Worth	Tarrant	4,960	Fort Worth	Surface water sources: Lake Worth, Eagle Mountain, Lake Briggsport, Richard Chambers Reservoir, Clear Fork Trinity River, Cedar Creek Reservoir	Produces their own drinking water comes from 2 wells used from Palmy & Trinity Aquifers	x		x	x			3
Alyson	Lakeside Town	Tarrant	1,391		Ground Water (GW) ONLY	Trinity Aquifer, Palmy Aquifer, Twin MT Aquifer	x		x		x		3
Alyson	Parago	Tarrant	2,543	Fort Worth might just be wastewater?	Ground Water (GW) ONLY	Trinity Aquifer, Palmy Aquifer	x	x	x		x		4
Percha	Pelican Bay	Tarrant	1,736		Ground Water (GW) ONLY	Trinity Aquifer			x				1

City - Water Spreadsheet												Overall Rating		
Trains Mile/Year	City	County	Population	Water Service Area	Surface Water (SW)	Ground Water (GW)	Water Plan (1 pt)	Thought Contingency Plan (1pt)	Water Quality Report (1pt)	Water Conservation Plan (1 pt)	Conservation Taps and/or Infiltration Basins (1 pt)	Notes	Overall Rating (Out of 5)	
	Susanna	Richard Hills	Tarrant	8,052	Part Worth	Surface water sources: Lake Worth, Eagle Mountain, Lake Bridgeport, Richard Chambers Reservoir, Clear Fork Trinity River, Cedar Creek Reservoir	Trinity & Pulney Aquifers			x	x	x		3
	Helly	River Oaks	Tarrant	7,703	Part Worth	Lake Worth	Surface Water (SW) ONLY			x	x	x	FW serves as emergency provider	3
	Luis	Sansam Park	Tarrant	5,836	Part Worth	Ground Water (GW) ONLY	Have 12 of their own wells		x	x	x	Reported 21% Water Loss in 2017 Water Quality Report	4	
	Susanna	Wesover Hill	Tarrant	884	Part Worth	Surface water sources: Lake Worth, Eagle Mountain, Lake Bridgeport, Richard Chambers Reservoir, Clear Fork Trinity River, Cedar Creek Reservoir	Surface Water (SW) ONLY		x		x		FW serves as emergency provider	3
	Susanna	Westworth village	Tarrant	2,728	Part Worth	Surface water sources: Lake Worth, Eagle Mountain, Lake Bridgeport, Richard Chambers Reservoir, Clear Fork Trinity River, Cedar Creek Reservoir	Surface Water (SW) ONLY			x		x	Upgrading water meters	2
	Alyson	Pecan Acres	Tarrant	4,099		Eagle Mountain Lake??								0
	Parasha	Newark	Tarrant	1,583		GW ONLY	Trinity Aquifer, Pulney Aquifer	x	x	x	x			3
	Helly	Westlake	Tarrant	1,683	Part Worth					x	x	x	Rockwell SUD serves as emergency provider; enclosure their water to BICE WSC	3
	Parasha	Alma	Elli	379		Lake Barbel??			x		x			2



City - Water Spreadsheet											Overall Rating		
Team Member	City	County	Population	Water Service Area	Surface Water (SW)	Ground Water (GW)	Water Plan (1 pt)	Drought Contingency Plan (1pt)	Water Quality Report (1pt)	Water Conservation Plan (1 pt)	Conservation Tips and/or Incentives Restrictions (1 pt)	Notes	Overall Rating (Out of 5)
Luis	Bardwell	Elis	689	Buys water from Rural Bardwell WSC		Calhoun Aquifer			x				1
Alyson	Bristol	Elis	668	Rocket SUD??									0
Luis	Ferris	Elis	2,822	Buy from Rocket SUD, Middleham, TRWD, Washachie		Woodbine Aquifer			x				1
Luis	Garrett	Elis	1,461	Garrett Water System, buys from city of Emis	Lake Bardwell	Service Water (SW) ONLY			x				1
Porsha	Ovilia	Elis	4,114	Buy from Dallas Water Utility		Woodbine Aquifer	x		x	x		City of Dallas serves as emergency provider	3
Alyson	Venus	Elis	3,501	Buy Surface Water from city of Middleham and TRWD	SW Only		x		x			Mountain Peak Water Utility services outskirts of city. They hardly run their own well, maybe two months out of the year. Everything comes from City of Middleham.	2
Alyson	Italy	Elis	1,935	Washachie	Ground Water (GW) ONLY	Trinity Aquifer, Woodbine Aquifer							0
Porsha	Maypearl	Elis	1,033	Fort Worth, Buys GW from Mountain Peak SUD, buys from city of Middleham, TRWD		Trinity Aquifer			x				1
Martha	Milford	Elis	747	Buy from Aquila WSD and Pitts Valley WSC				x	x		x		3
Luis	Oak Leaf	Elis	1,436	Rocket SUD	GW ONLY	3 wells from Trinity Aquifer		x				Glenn Heights?	2

City - Water Spreadsheet													Overall Rating
Team Member	City	County	Population	Water Service Area	Surface Water (SW)	Ground Water (GW)	Water Plan (1 pt)	Drought Contingency Plan (1pt)	Water Quality Report (1pt)	Water Conservation Plan (1 pt)	Conservation Type and/or Irrigation Restrictions (1 pt)	Notes	Overall Rating (Out of 5)
				Buy SW from Rachtel SUD, Midwestern, TRWD									
Porscha	Palmer	Ella	2,075			Woodbine Aquifer			x				1
Luis	Pecan Hill	Ella	665	Rachtel SUD		Woodbine Aquifer							0
					Surface water sources: Lake Worth, Eagle Mountain, Lake Briggspart, Richard Chambers Reservoir, Clear Fork Trinity River, Cedar Creek Reservoir, Bentrock Lake	Trinity & Palmy Aquifer							
Suzanna	Aledo	Parker	4,232	Fort Worth				x	x	x	x		4
Luis	Annetta north	Parker	546		Lake Bentrock??		x	x	x				2
Luis	Annetta south	Parker	590		Lake Bentrock??		x	x		x	x		4
Martha	Annetta	Parker	3,080	Deer Creek & Lakes of Aledo provide treated water from Trinity	GW only?	Trinity Aquifer: Deer Creek, Lakes of Aledo		x	x		x		3
Martha	Coal	Parker	130		Lake Mineral Wells??								0
Holly	Cresson	Parker	875		4 wells in and run by Cresson							New Trinity Aquifer Development project 2020	0
Holly	Hudson Oak	Parker	2,335	Weatherford	Purchased from Weatherford	Purchased from Weatherford		x	x	x	x		4
Martha	Milzap	Parker	435	Parker County Water Supply District	Parker Co. Water Supply buys Surface Water from Mineral Wells and 3 other of Districts personal wells in Greenwood area			x	x	x	x	excess use of water up to 80% - plans to reduce it by 20% with irrigation restrictions allowed only once a week	4
Martha	Western Lake	Parker	1,525		GW ONLY	GW ONLY							0

City - Water Spreadsheet													Overall Rating
Team Member	City	County	Population	Water Source/Zone	Surface Water (SW)	Ground Water (GW)	Water Plan (1 pt)	Drought Contingency Plan (1pt)	Water Quality Report (1pt)	Water Conservation Plan (1 pt)	Conservation Type and/or Irrigation Restrictions (1 pt)	Notes	Overall Rating (Out of 3)
Martha	Reno	Parker	2,894	Lamar County Water Supply District - LCWSD purchases water from City of Paris - also buys from Springtown	Eagle Mountain Lake??	Twin Mountain Aquifer			x				3
Holly	Sanctuary	Parker	313		Eagle Mountain Lake??							<a href="https://2017.texasstatewaterplan.org/items/2034">https://2017.texasstatewaterplan.org/items/2034</a> 1. New Trinity Aquifer Well 2020 2. Lake Modifications 2035	0
Susanna	Springtown	Parker	2,911	Springtown	Eagle Mountain Lake	Trinity Aquifer			x	x	x	Has suffered from main water line breaks in 2018	3
Macha	Willow Park	Parker	5,340		Lake Weatherford??	Palmy Aquifer and Trinity Aquifer		x	x	x			3
Holly	Briar	Parker	5,665		Eagle Mountain Lake								0
Martha	Horseshoe Bend	Parker	789	Texas Rain Management					x			Residents reported having low water pressure	1

## **Work Plan**

### **Abstract**

The Project Team has devised a work plan to assist in the capstone proposal to test the hypothesis that cities with a population of under 10,000 residents face higher barriers to developing and implementing a strategic water plan. The work plan is divided into nine sections in order to breakdown the actions required for fulfilling the capstone proposal. The actions are broken down into tasks that are influenced by the goals and objectives of the capstone project. Each task is created and implemented with the goals and objectives in mind that are to be carried out by each individual team member. The work plan consists of a communication protocol, Gantt Chart, and Task Assignment Matrix in order to ensure all team members are contributing equally and completing their tasks in a productive and efficient manner. The Project Team has researched and analyzed all areas of the project while also assessing the resources and constraints of the work plan. The risks of the research project were thoroughly examined within the scope of the project as well. In order to undermine the risks that might pose a threat to the validity of the research, The Project Team was efficient in creating a back-up plan to ease the burden of potential risks. In conclusion, the work plan ensures effective communication, equal distribution of all tasks in relation to the research assignment, and minimization of risks in order to ensure a successful completion of the capstone proposal.

### **Introduction and Background**

The University of Texas at Arlington (UTA) College of Architecture, Planning and Public Affairs, in conjunction with Dr. Alejandro Rodriguez and Dr. Joseph Portugal and the Texas Water Development Board, has submitted a capstone proposal to test the hypothesis that cities with a

population of under 10,000 residents face higher barriers to developing and implementing a suitable strategic water plan. The 2017 State Water Plan calls for 16 individual regions across the state of Texas to develop plans that address the growing demand for water in the near future. This project will look specifically at Tarrant, Parker, and Ellis counties, all located within Region C.

While Region C has developed a regional water plan, the different municipalities within this region will face varying obstacles and demands when creating and implementing a water plan specific to their area within the region. It is thought by this project team, however, that small cities often have limited resources and may be defaulting to the Region C plan which would not necessarily serve as an efficient or practical plan for the city in question. This results in cities that are ill-equipped to handle increased demands for water use and is especially relevant for the cities in question due to the projected population growth of 70% between 2020 and 2070 in the state of Texas (TWDB, 2017).

### **Goals and Objectives**

Goal #1 - Test the hypothesis that cities with a population of under 10,000 residents face higher barriers in developing and implement a suitable strategic water plan.

Objective 1.1 - Obtain understanding of state of regional water planning requirements through reading most recently published water plans;

Objective 1.2 - Gather primary and secondary data measuring smaller populated city water plans against state and regional plans;

Objective 1.3 - Develop performance measurement tool to rate effectiveness of smaller populated cities' current water plan.

Goal #2 - Present research findings to University of Texas at Arlington faculty

Objective 2.1 Analyze primary and secondary research findings;

Objective 2.2 Use performance measurement tool to rate cities based on findings;

Objective 2.3 Organize and present findings in final project report.

### **Project Tasks and Milestones**

The Project Team has broken down the goals and objectives into a series of time bound tasks and milestones with the use of a Task Assignment Matrix (TAM) which can be found in Appendix A. In addition to the TAM, the Project Team has also created a Gantt chart to track project timelines in an efficient manner. The Gantt chart can be found in Appendix B.

### **Resources and Constraints**

The Project Team will utilize the Texas Water Development Board (TWDB) website and their online resources for directional guidance on the designated research efforts, including the 2017 State Water Plan and the 2016 Region C Water Plan. A strong emphasis will be placed on the information found in the 2017 State Water Plan and the 2016 Region C Water Plan located within the TWDB website. These documents will assist the Project Team in identifying the specific criteria needed to comply with the TWDB requirements and Region C Water Plan. The aim of this task is to ensure alignment between the city water planning process and the State and Regional planning process. There will be additional research done by the Project Team by referring to each city's website, as well as reach out to the individual cities directly to speak with their Public Works and Water Department.

The Project Team will examine secondary data available through the Texas Municipal League (TML) website, as well as the aforementioned resource outlets. Primary data will be collected through the use of a questionnaire when speaking to each city's Public Works and Water Department. Additional information and concerns not addressed through these resource platforms

will be clarified by contacting either UTA faculty or TWDB staff by phone or by email correspondence.

Some potential constraints that may arise or impede the accomplishment of our project goals and objectives would include: limited primary data, and limited secondary data, inadequate information accessible on city websites, poor phone interviews and responses that may not contribute our performance metric, and difficult time management constraints for the project team members. If constraints do arise, the project team plans to maintain active communication with one another to redirect our research focus.

### **Risk Assessment**

After pinpointing project resources and constraints, the Project Team concluded that the following factors could cause a potential risk in conducting our research: 1) Lack of Response from Cities, 2) Inadequate Information, 3) Schedule Constraints, and 4) Time Management.

#### **1) Lack of Response from Cities**

The Project Team's greatest concern is the possibility of a lack of information uncovered through questionnaire responses and phone interviews. The Project Team has identified 48 cities meeting the research parameters. Given the time and difficulty in reaching city officials, one of the concerns is that the questionnaires will not yield relevant information or will not be conducted in a timely manner. In order to avoid the former, the team will create a brief, relevant and engaging questionnaire that will generate a response from the majority of the cities. In order to address the time constraint, the identified cities have been divided evenly among all Project Team members to ensure ample opportunities for each team member to gather the adequate information. Additionally, a script will be created in an effort to guide team members when reaching out to city officials. This will eliminate any uncertainty of how to guide the conversation, will provide

consistency throughout the research phase, and will assist in Team Project members in representing the project in a professional and engaging manner. The script will also include a message to leave in the event a city official is unable to be reached, as well as a follow-up email if it is deemed necessary to continue the research approach via email. Additional tasks may include conducting a follow-up call or email in the event that initial efforts are unsuccessful.

### 2) Inadequate Information

Due to the small size of the cities identified in this research, there is a possibility that many of the cities contacted will not have a department or staff member dedicated to public works. In this event, team members will consult with the appropriate staff available and will supplement any primary research gathered with secondary research found through public records, municipal websites, and other available resources.

### 3) Schedule Constraints

Business hours for a city office are Monday-Friday, 8 to 5pm. However, this does not mean city officials are easily accessible or are able to be reached during these times. In general, this is also the time when most Project Team members are working in their other professional capacities. Schedule constraints could cause a time conflict with individual team members professional work hours. In order to avoid scheduling conflicts between city official and Project Team members, Project Team members will maximize the efficiency of research calls by planning ahead, being well prepared, and communicating challenges with Project Team. Drawing on professional experience, the Project Team has identified the optimal time to try and reach city officials as 10am and 2pm. Project Team members will coordinate outside responsibilities around these times in order to have a set time available to contact city officials. Before making calls, Project Team members will collect relevant information related to the city such as phone number, person of



contact, and any information on the questionnaire that can be found on the city's website. If a Project Team member is unable to make calls or experiences any other related challenges, the team member will notify the Project Team immediately so that other arrangements can be made.

#### 4) Time Management

Project Team members might experience emergency situations where they are not able to perform their assigned tasks. If this should arise, Project Team members inform the Project Team about the situation as soon as possible in order for their tasks and assignments to be delegated to other members. If deemed necessary, the Project Team will then designate a member to notify UTA faculty about the situation so that appropriate action is taken in regard to the grade and performance of any Project Team members unable to complete their assigned tasks.

#### **Communication Protocol**

The Project Team uses email, class meetings, Google Drive, Blackboard, and WhatsApp messenger for communication. The communication plan will be periodically reviewed and updated as needed.

<b>Message</b>	<b>Audience</b>	<b>Method</b>	<b>Frequency/Date</b>	<b>Responsible</b>
Draft Problem Statement	Team members	WhatsApp, Google Drive	09/20/18	Holly, Susanna
Draft Work Plan	Team members	Google Drive, Blackboard, WhatsApp	10/01/18-10/15/18	All team members
Submit Work Plan for Review	Faculty	Blackboard	10/15/18	Holly
Revise and Finalize Work Plan	Team members	Google Drive, WhatsApp	10/20/18	Martha, Porscha, Luis

Identify Research Questions and Methods for Each City	Team members	WhatsApp, Google Drive	10/14/18	Susanna, Holly, Martha, Luis
Research and Identify Each City's Water Plan and Strategies	Team members	Google Drive, WhatsApp	10/24/18	Porscha, Luis, Holly, Martha, Alyson
Summarize Research Findings for Project Plan	Team members	Google Drive, WhatsApp	11/19/18	Porscha
Rate Each City Based on Performance Measurement Tool	Team members	Google Drive, WhatsApp	11/19/18	Susanna, Martha, Alyson
Draft Project Plan	Team members	Google Drive, Blackboard, WhatsApp	Weekly starting 11/19/18	All team members
Draft Presentation Materials	Team members	E-mail, Blackboard, WhatsApp	11/22/18	All team members
Present Drafted Project Report to Teams and Faculty	Team members, Peers, Faculty	Campus meeting	11/26/18	Holly, Susanna
Final Project Review and Editing	Team members	Google Drive, Blackboard, WhatsApp	12/02/18	Alyson

Present and Defend Final Project Report to Faculty Forum, Client and Class	Team members, Client, Peers, Faculty	UTA Campus or other designated area	12/03/18	Holly, Susanna, Martha
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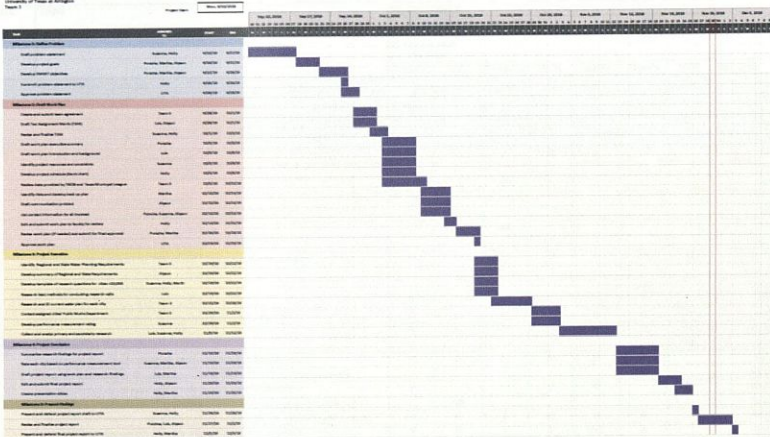
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**Gantt Chart**

# Task Assignment Matrix

## Region C, 15K, Water Plan

Summary of Tasks in Region



## Task Assignment Matrix

DELIVERABLE	TASK	RESPONSIBLE							Due Date
		Porscha	Luis	Susanna	Holly	Martha	Alyson	UTA	
Milestone 1 Define Problem	Draft Problem Statement			R	AR	I		CI	9/17/11
	Develop project goals	R				AR	R		9/21/11
	Develop SMART objectives	R				AR	R		9/29/11
	Submit Problem Statement to faculty for review and approval				AR			CI	9/29/11
	Approve Problem Statement							R	9/29/11
Milestone 2 Draft Work Plan	Create and submit team agreement	AR	R	R	R	R	R	I	10/1/11
	Draft Task Assignment Matrix (TAM)		R		I		AR	C	10/1/11
	Revise and finalize TAM	C	C	AR	R	R	C	I	10/3/11
	Draft work plan executive summary	AR	I						10/9/11
	Draft work plan introduction and background		AR	I					10/9/11
	Identify project resources and constraints			AR	I				10/9/11
	Develop project schedule (Gantt chart)				AR	I			10/9/11
	Review data provided by TWDB and Texas Municipal League	R	R	R	R	R	R	R	10/10/11
	Identify risks and develop back up plan					AR	I		10/14/11
	Draft communication protocol						AR		10/14/11
	List contact information for all involved	AR		R			R		10/14/11
	Edit and submit work plan draft to faculty for review	C	C	C	AR	C	C	I	10/15/11
	Revise work plan and submit for final approval	R	C	C	C	AR	C	I	10/19/11
	Approve Work Plan							AR	10/19/11
	Milestone 3 Project Execution	Identify the Regional and State Water Planning Requirements	R	R	R	R	R	R	
Develop summary of Regional and State Water Planning Requirements				I			AR		10/22/11
Develop template of research questions for cities <10,000		I		AR	R	R		C	10/22/11
Research methods for getting best results when conducting research calls			AR			I			10/22/11
Research and identify each city's current water plan and planning strategies		AR	R	I	R	R	R		10/28/11
Contact the assigned cities Public Works/Water Department		R	R	R	I	AR	R		11/2/11
Develop performance measurement rating for city's current water planning				AR				C	11/2/11
Collect and analyze primary and secondary research		CI	R	R	AR	C	C	C	11/12/11
Summarize research findings for project report		AR	C	I	C				11/19/11
Role each city based on performance measurement tool			I	AR		R	R		11/19/11
Milestone 4 Project Conclusion	Draft project report using work plan and research findings		AR			R	I	C	11/19/11
	Edit and submit project report draft	C	C	C	R	C	AR	I	11/23/11
	Create presentation slides								11/25/11
Milestone 5 Present Findings	Present and defend project report draft to UTA faculty		I	R	AR			C	11/29/11
	Revise and finalize project report	AR	R	C	C	CI	R		12/2/11
	Present and defend final project report to UTA faculty	I	I	R	I	AR	I	I	12/3/11

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# PERFORMANCE METRIC

City	County	Population	Water Plan (1 pt)	Drought Contingency Plan (1pt)	Water Quality Report (1pt)	Water Conservation Plan (1 pt)	Conservation Tips and/or Irrigation Restrictions (1 pt)	Overall Rating (Out of 5)
Blue Mound	Tarrant	2,482			x			1
Roanoke	Tarrant	8,135		x	x		x	3
Dalworthington Gardens	Tarrant	2,387		x	x	x	x	4
Edgecliff Village	Tarrant	3,021			x			1
Everman	Tarrant	6,348			x		x	2
Haslet	Tarrant	1,844	x	x	x	x		4
Kennedale	Tarrant	8,338	x		x	x	x	4
Lake Worth	Tarrant	4,960	x		x	x		3

Lakeside Town	Tarrant	1,391	x		x		x	3
Pantego	Tarrant	2,543	x	x	x		x	4
Pelican Bay	Tarrant	1,750			x			1
Richland Hills	Tarrant	8,052			x	x	x	3
River Oaks	Tarrant	7,703			x	x	x	3
Sansom Park	Tarrant	5,836		x	x	x	x	4
Westover Hills	Tarrant	694		x	x	x		3
Westworth village	Tarrant	2,726			x		x	2
Pecan Acres	Tarrant	4,099						0
Newark	Tarrant	1,161	x	x	x			3

Westlake	Tarrant	1,483			x	x	x	3
Alma	Ellis	378			x		x	2
Bardwell	Ellis	689			x			1
Bristol	Ellis	668						0
Ferris	Ellis	2,622			x			1
Garrett	Ellis	1,461			x			1
Ovilla	Ellis	4,114	x		x	x		3
Venus	Ellis	3,581	x		x			2
Italy	Ellis	1,935						0
Maypearl	Ellis	1,033			x			1

Milford	Ellis	747		x	x		x	3
Oak Leaf	Ellis	1,486	x		x			2
Palmer	Ellis	2,073			x			1
Pecan Hill	Ellis	685						0
Aledo	Parker	4,232		x	x	x	x	4
Anneta north	Parker	546	x		x			2
Anneta south	Parker	550	x	x		x	x	4
Anneta	Parker	3,090		x	x		x	3
Cool	Parker	180						0
Cresson	Parker	875						0

Hudson Oaks	Parker	2,335		x	x	x	x	4
Millsap	Parker	435		x	x	x	x	4
Western Lake	Parker	1,525						0
Reno	Parker	2,494			x			1
Sanctuary	Parker	313						0
Springtown	Parker	2,911			x	x	x	3
Willow Park	Parker	5,340		x	x	x		3
Briar	Parker	5,665						0
Horseshoe Bend	Parker	789			x			1