



Collin College Trane Comprehensive Solutions Detailed Energy Study

July 30, 2019



Collin College/Trane Energy Project Overview

AGENDA

- Introductions
- Energy Project Origin
- Timeline – Development Process
- Detailed Study Goals
- Facility Scope Matrix - Savings Summary
- Executive Summary - Project Highlights
- Financials, 15-Year View
- Questions and Next Steps

Colling College Energy Project Initial Questions

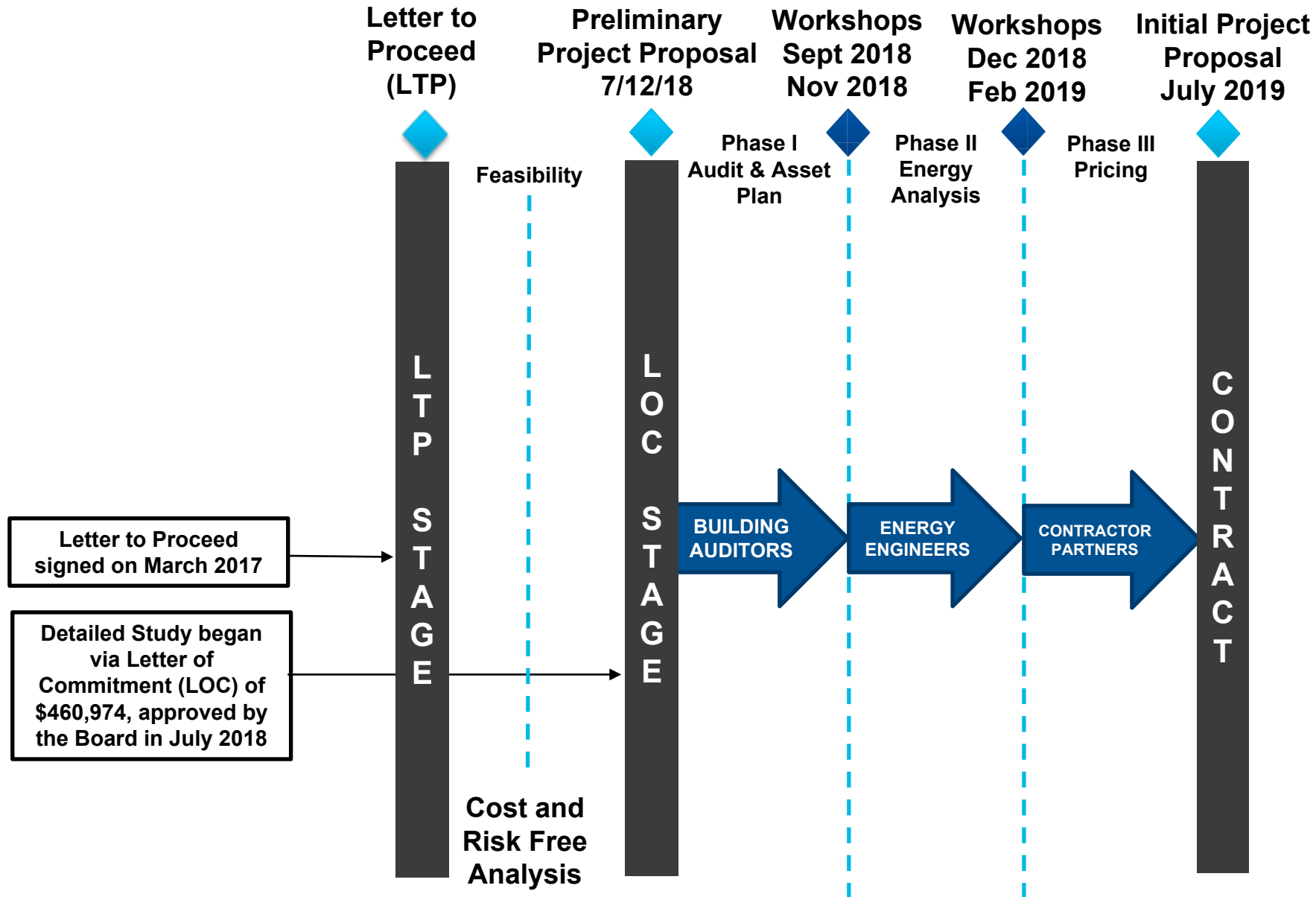
➤ *“Where do we start?”*

Many of the existing building and facility infrastructure systems are in **need of upgrade and/or replacement** as they are at (or past) their useful and economic life.

➤ *“Why act now?”*

It is important to act now to **maintain technical compatibility** with the planned new construction, improve the **learning environment**, maintain **student and faculty satisfaction**, and **reduce the risk of outages** due to issues with aging infrastructure. It will also reduce utility and routine maintenance costs.

Development Process Overview



Detailed Study Goals & Financial Requirements

- **Key Project Goal:** Preserve preliminary study guaranteed energy savings and simple payback – **\$736,064 savings per year with breakeven at 8.8 years.**
 - Validated and verified **corrective measures costs & savings**
 - Identified **additional “critical”** corrective measures and maintenance needs with the Facility Team
 - Worked with the Financial Team to **assure achievement of Collin College’s economic requirements**

Phase I - Audit and Asset Plan Scope Matrix

DETAILED PROJECT SCOPE OF WORK DESCRIPTION - BY CAMPUS BUILDING																																																	
ENERGY CORRECTIVE MEASURE (ECM) DESCRIPTION	Plano Campus (PC)																	Frisco Campus (FC)							McKinney Campus (MC)							Collin HIED Ctr. (CHEC)																	
	Courtyard Center (CYC)	Bldg. A	Bldg. AA	Bldg. B	Bldg. BB	Bldg. C	Bldg. D	Bldg. F	Bldg. G	Bldg. H	Bldg. I	Bldg. J	Bldg. K (Central Plant)	Bldg. L (Library)	Visual Arts	Mall Commons	Campus Site	Tennis Courts	Parking Lots	Central Utility Plant	Alumni Hall	University Hall	Founders Hall	Library	Lawler Hall	Heritage Hall	Conference Ctr	Campus Site	Parking Lots	Parking Garage	A Wing		B Wing	C Wing	D Wing	E Wing	F Wing	Health Science Ctr.	Conference Center	Learning Center	Grounds Maintenance	Campus Site	Parking Lot	Parking Garage					
Interior Lighting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X					X	X	X	X	X	X			X	X			X	X					
Exterior Lighting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												X	X	X	X				
Plumbing Fixtures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X				X	X	X	X	X	X			X	X							X		
Site Irrigation	X																												X																	X			
Building Controls	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X				X	X	X	X	X	X			X		X						X		
Power Factor Corr.	X		X		X								X							X										X																	X		
HVAC Equipmt. Upgrades	X	X	X	X	X	X	X	X	X	X	X	X			X	X				X				X																							X		
AHU Replacement																																																	
AHU Upgrades	X	X	X	X	X	X	X	X	X	X	X	X			X	X				X	X	X	X	X	X	X	X																						
Central Plant Mods													X		X					X																													
VAV Box Upgrade		X	X	X	X	X	X	X	X	X	X	X	X		X	X																																	

Collin Goes Green

➤ Key Energy Conservation Measures

- Water: Update plumbing fixtures to **reduce both indoor and outdoor water usage**
- Electricity: Install efficient lighting to **promote energy savings**, productivity, and comfort
- Mechanical Systems:
 - **Optimize energy performance**
 - Standardize systems that enable **“Train once, fix many”**
 - Enhance **indoor air quality** management
 - Improve **efficient thermal comfort** across campus facilities

➤ Pays for Itself Over a Relatively Short Time

Project Specific Highlights

Life Cycle and Energy Corrective Measures

Global Projects - Existing Campuses (Red Indicates Critical Items)

Exterior Site Lighting Retrofit/Security Lighting Upgrades

Select Campuses Air Handler Refresh Program– Apprx \$4.5 to \$6.0M savings refresh existing vs replacing with new AHUs (77 AHUs)

Building Lighting Retrofit & Controls - System Wide - Apprx 20K Interior fixtures, 2K Exterior fixtures

Plumbing Fixture Water Conservation - System Wide – 764 flush valves (all campuses), 687 sinks (all campuses), 26 showers (2 campuses)

Trane HVAC Controls & Energy Management System Upgrade – System-wide

Irrigation Controls – System-wide

Power Factor Correction

McKinney Campus Chiller Plant Optimization

Project Specific Highlights

Life Cycle and Energy Corrective Measures

Corrective Measures by Campus (Red Indicate Critical Items)

Plano Campus

Remove 2-80 ton Air Cooled Chillers @ Fine Arts (Connect AHUs served to CUP CHW Piping Loop)

Replace/Retrofit Approximately 570 Fan Powered & Variable air Volume Boxes (Approx. 80%/20% on count)

McKinney Campus

Replace 1 –Air Handle Unit & 16 Fan Coil Units in main bldg. "D" Wing

McKinney Campus Chiller Plant Optimization

Frisco Campus

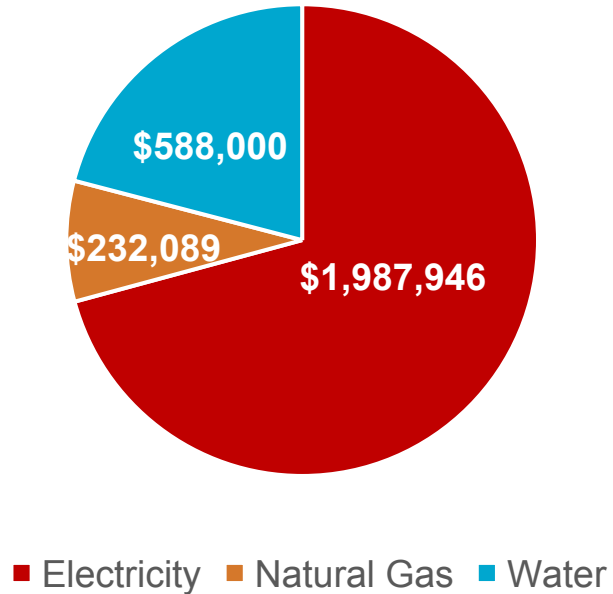
Replace 2-250 ton Carrier Chillers with 500 ton Trane Units & Partial Thermal Energy Storage - (Plant Opt)

Replace Boilers B1, B2 & B3 - Plant Optimization

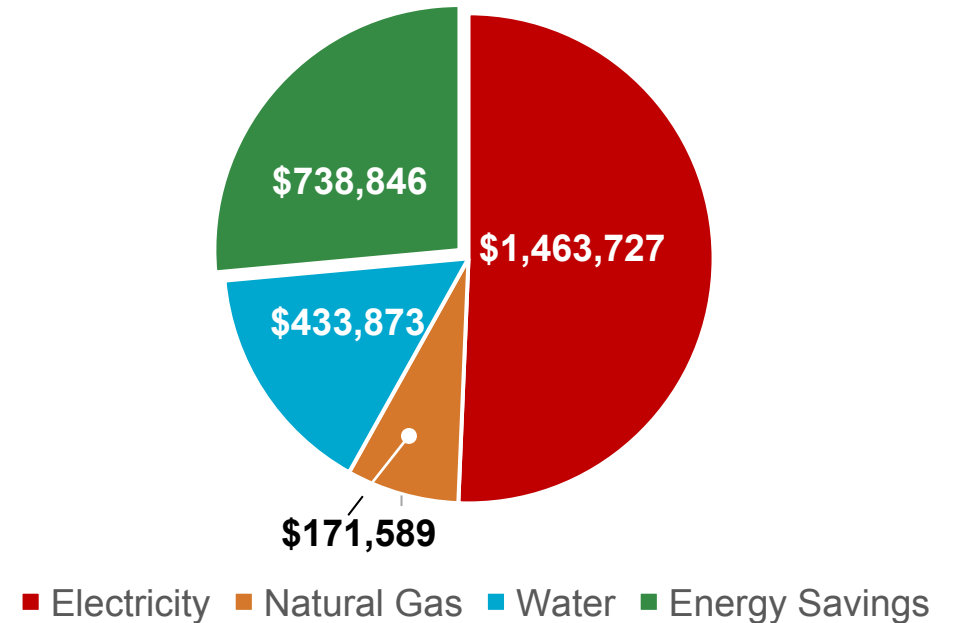
Integrate/Upgrade to Trane Controls

Phase II - Energy Savings Analysis

Existing Energy Spend (2017) -
\$2,808,035



Future Energy- Year 1
\$2,069,189



Total “Trane Guaranteed” Energy Savings, **\$738,846** per year (26.3%)

Financial Analysis

- **Base Project (Do Nothing)**, Negative 15-year cash flow
Projected Cumulative **Costs** over 15-years (\$16,608,568)
- **Energy Enhancement Project**, Positive 15-year cash flow
Projected Cumulative **Savings** over 15 years \$11,201,959

Benefits from Energy Enhancement Project over Current Baseline			
	5 Years	10 Years	15 Years
Cash	(\$8,325,762)	\$6,375,742	\$11,021,959

Construction Cost Schedule

Projected Gross Billing by Budget Year
3-Year Total = \$21.8M

2019 Projected	2020 Projected	2021 Projected
\$7,194,000 (33%)	\$10,900,000 (50%)	\$3,706,000 (17%)
<p>System Wide Energy ECMs</p> <ul style="list-style-type: none"> Engineering/Design Equipment Release Lighting Interior/Ext Security Lighting Domestic Water Power Factor <p>Plano Campus</p> <ul style="list-style-type: none"> Critical AHU Refresh Fine Arts Chillers 	<p>Frisco Campus</p> <ul style="list-style-type: none"> Central Plant Upgrade/TES BAS/Control Upgrades AHU Refresh <p>McKinney Campus</p> <ul style="list-style-type: none"> AHU Refresh BAS/Controls Plant Optimization <p>Plano Campus</p> <ul style="list-style-type: none"> VAV Replacement and T&B BAS/Controls AHU Refresh Completion 	<p>Frisco Campus</p> <ul style="list-style-type: none"> AHU Refresh BAS/Controls <p>McKinney Campus</p> <ul style="list-style-type: none"> AHU Refresh BAS Controls <p>Plano Campus</p> <ul style="list-style-type: none"> VAV Replacement AHU Refresh <p>Courtyard Center</p> <ul style="list-style-type: none"> AHU Refresh BAS/Controls <p>CHEC</p> <ul style="list-style-type: none"> Power Factor

Questions and Next Steps

