AGENDA

- TCO Background
- What Impacts TCO
- Case Studies
- Modeling Tool
TOTAL COST OF OWNERSHIP

10-20%
Initial Construction

80-90%
Ongoing Cost
Societal Benefits?
MEASURABLE SOCIETAL BENEFITS

- Preserving funds
- Generational commitment
- Energy conservation
- Carbon footprint
- Financial sustainability
- Facility equity
MOST IMPACT ON TCO?

- Energy
- Initial cost
- Life cycles
- Maintenance
- Space efficiency
- Strategic renewal

Pick two
WHAT IMPACTS TCO?

Google Experience

- Initial Cost: 2%
- Energy: 4%
- Maintenance: 6%
- Life Cycles: 7%
- Strategic Renewal: 17%
- Space Efficiency: 9%

Case Studies
CAMPUS RENEWAL

- Renovate 4 Older Schools
- 2 New Schools

30 Year Cost of Ownership

$23,194,607

$34,477,423

$105,156,784

$186,609,804
SOCIETAL BENEFITS

$81M 18 1/2 41

CO2
<table>
<thead>
<tr>
<th>Year</th>
<th>Strategic Renewal</th>
<th>Traditional Approach</th>
<th>Bond Capacity</th>
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<td>2016</td>
<td>$105,264,468</td>
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TEXAS SCHOOL SPACE TRENDS

SF per Student

District SF vs Test Scores

Campus SF vs Test Scores

194

185

90%
DISTRIBUTION SPACE

$753M
14% above

$807M
15% below

R² = 0.9637
SOCIETAL BENEFITS

$807M  80  11  1,537

CO2
DISTRICT SPACE

- District SF: 8,742,351 in 2017, 9,052,130 in 2018, 10,634,351 in 2024
- Peer Trend SF: 10,969,917 in 2024

2.9% below trend
SOCIETAL BENEFITS

$233M

38

4

712
SPACE EQUITY

Elementary Space Trend

17% above

$9M

16% below

$10M
FROM 10,000 FEET
Renewal & Replacement Schedule

Inflation 40% 20 YR Renov ratio Replace at 60 yrs or renovate at 20 years for newer buildings

Bonham ES
Bowie ES
Bunche EC
Burnet ES
Bush ES
Carver ES
Crockett ES
DeZavala ES
Emerson ES
Fannin ES
Greathouse ES
Henderson ES
Houston ES
Jones ES
Lamar ES
Long ES
Milam ES
Parker ES
Pease ES
Rusk ES
Santa Rita ES
Scharbauer ES
South ES
Travis ES
Washington ES
West EC
Lee Fresh
Lee HS
Midland Fresh
Midland HS
Abell JH
Alamo JH
Goddard JH
San Jacinto JH

VARIABLES

- Construction cost
- Inflation
- Bond terms
- Adaption rate
- Facility age
- Renewal ratio
- Maintenance cost
- SF per student

TCO ANALYTICS
### Facility SF Peer Benchmark

<table>
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<tr>
<th>District Enrollment</th>
<th>15,000</th>
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<tr>
<td>Peer Trend District SF</td>
<td>2,535,412</td>
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\[ = 154 \times \text{enrollment} + 225,412 \]

### 30 Year TCO

<table>
<thead>
<tr>
<th>Building SF</th>
<th>90,000</th>
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<tr>
<td>Facility Age</td>
<td>25</td>
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<tr>
<td>TCO per SF</td>
<td>$903</td>
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<td>30 year TCO</td>
<td>$81,270,000</td>
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\[ = 22 \times \text{facility age} + 353 \]

\[ = \text{TCO per SF} \times \text{Building SF} \]
WORKSHEET QUALIFICATIONS

**SPACE**
- General district space guidance
- Districts > 2,000 enrollment
- All facility SF including portables
- Refine with subgroup trends

**TCO**
- Mid-range conceptual model
- Buildings only, no site work
- Use adjusted building age
- Can vary 40% either way
- Refine with 9 variables
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