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Creating Energy Independence

The Economic Impact of Building Code Change Requiring a 2nd Fire Access Elevator in Florida High Rise Structures

Rob Vieira

June 3, 2016

A Research Institute of the University of Central Florida

Acknowledgements

- Thanks to
  - The Florida Building Commission for selecting this research project.
  - The Department of Professional and Business Regulation who administers the project.
  - Mo Madani, Program Manager, Building Codes and Standards at the Florida Department of Business and Professional Regulation.

Acknowledgements

- We also appreciate the 1000+ individuals that took time to respond to our survey requests.
- Florida Fire Marshal's and Inspectors Association and local AHJ's –Central Florida.
- Special thanks to Wanda Dutton at FSEC who helped immensely in the preparation of this report.

Background

- Three requirements that were brought in with the 2012 ICC and made part of the Florida Building Code 5th Edition were delayed for implementation by one year by the 2015 Florida legislative session.

Delayed Code Requirements

- Mandatory Residential Air Tightness Testing (i.e., blower door testing) as found in section R402.4.1.2, Energy Conservation volume
- Residential Whole House Mechanical Ventilation Requirements as found in Section R303.4, Residential volume
- The requirement for two fire service access elevators in Section 403.6.1, Building volume

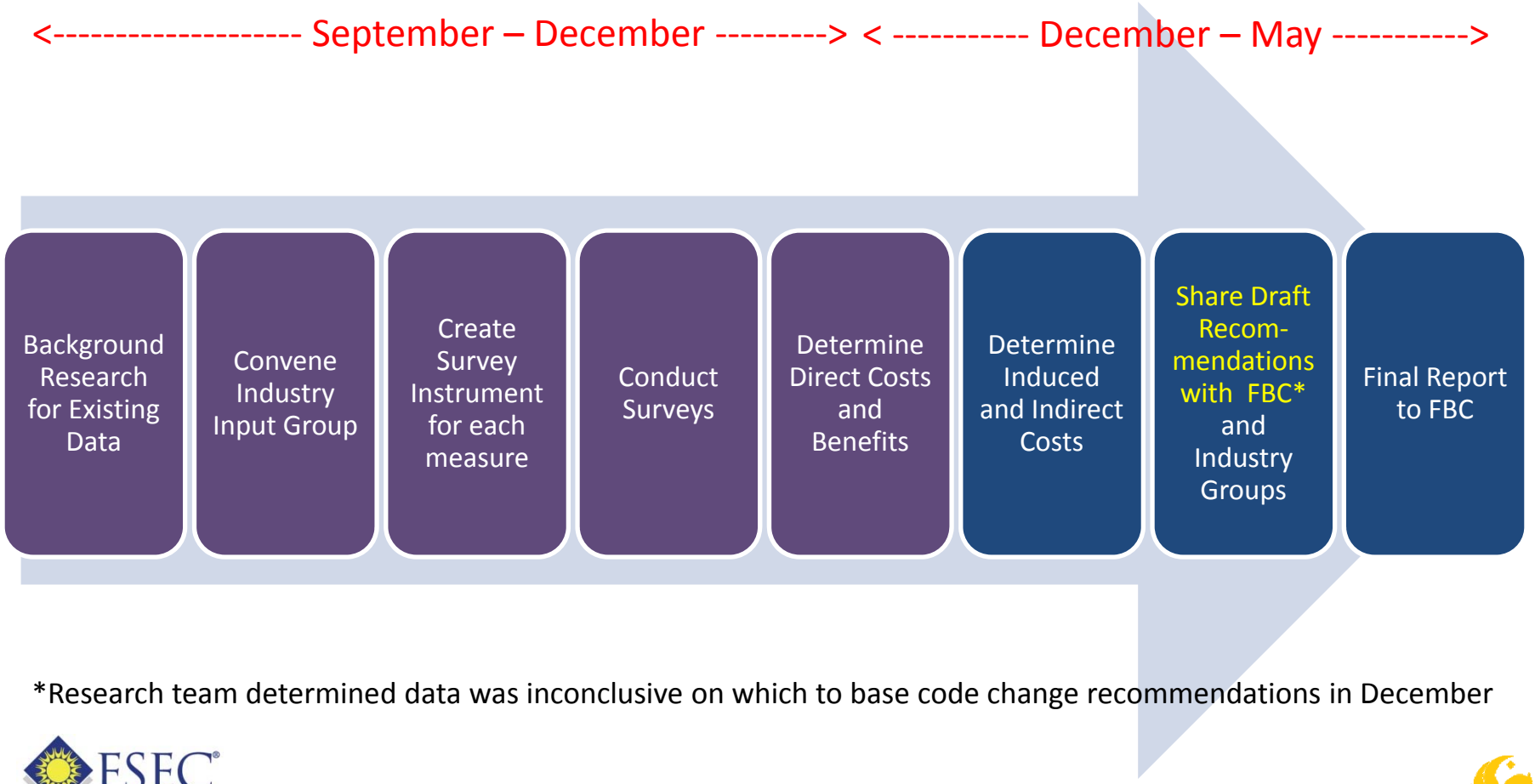
Research Team

- Rob Vieira, Director, Buildings Research Division, FSEC, UCF - Cocoa, FL
- Karen Sutherland, Research Analyst, FSEC-UCF
- Michael Houston, Architect and Builder - Orlando, FL
- Vernet Lasrado, Ph. D, Assistant Director, Office of Research & Commercialization, UCF - Orlando, FL
- Sharon Gilyeat, PE, Principal, Koffel Associates - Columbia, MD
- Lauren Schrumpf, Fire Protection Engineer, Koffel Associates - Columbia, MD

Objectives

- Determine the direct costs and economic impact of each of the three requirements in order for the Commission to make a more informed decision.
- This research will not cover costs of changing projects already in design. The industry expressed those costs at the June 2015 FBC meeting.

Work Scope



*Research team determined data was inconclusive on which to base code change recommendations in December

Background Research

- The literature search has included a review of related code modifications from multiple code organizations, including the National Fire Protection Association (NFPA) and the International Code Council (ICC), as well as some local jurisdictions that adopt the ICC family of code.
- The research also included a review of the history of the requirement, fire related data, and other factors.
- Cost data for the requirement was not found. Data presented to the FBC had estimates from $770,000 to $1.3 million for structures 12 to 16 stories tall.

Background

- The purpose of having a second fire access elevator in a high-rise building is to facilitate the rapid deployment of firefighters.
- Firefighters are responsible for assisting in occupant evacuation and fighting the fire. Adding the second fire service access elevator allows them to do both tasks, if needed.
- If one fire access elevator is out of service, the other one can still be used.

IBC 2012 Code Requirements

- The area required for a fire access elevator lobby is 150 sq. ft. **One lobby can be used for more than one fire access elevator without having to be enlarged.**
- Fire access elevator lobbies are required at each level other than the level of exit discharge.
- **An additional elevator is not required if the building will contain only one elevator.**

Fire Service Access Elevators (FSAE) Code Requirements

- Elevator must hold a minimum of 3,500 pounds.
- Emergency lighting along the entire elevator hoistway (lighting may not have to be doubled if it meets the 1 ft.-candle requirement).
- Both elevators must be continuously monitored from the Fire Command Center.
- Type 60/Class 2/Level 1 standby source of power for both elevators.
- Wiring and cables must be either 2-hr rated CIC or enclosed in 2-hr construction.

Why was the second FSAE was put in the 2012 ICC?

- The final provision calling for two FSAE was added to the ICC and the need is based primarily on a survey conducted by the proponents, which includes the National Elevator Industry and the International Association of Fire Fighters.
  - Their survey resulted in 35 responses all indicating that the number of elevators used for firefighting operations varies from 2 to 6. Only one respondent, in a suburban bedroom community, indicated one elevator is sufficient for firefighting.

Other 2012 IBC Changes

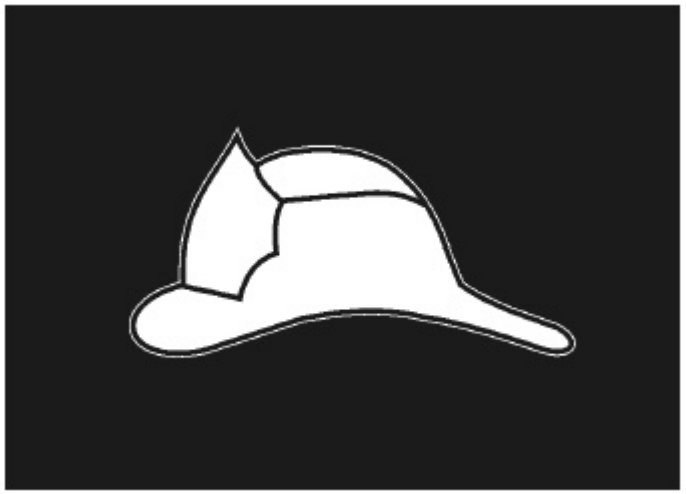
- Minimum capacity of 3,500 pounds (403.6.1).
- Building be equipped with an automatic sprinkler system, which shall have a sprinkler control valve supervisory switch and waterflow-initiating device provided for each floor that is monitored by the building fire alarm system (3007).
- The locations prohibiting sprinklers consist of elevator machine rooms, elevator machine spaces, and elevator hoistways of FSAEs (3007.3.1).
- There also needs to be an approved way to prevent water from entering the hoistway enclosure from the automatic sprinkler system outside the enclosed FSAE lobby (3007.4).

2012 IBC FSAE Changes (continued)

- Another requirement states that any means for elevator shut down in accordance with 3006.5 shall not be installed on FSAEs (3007.5).
- Structural integrity of hoistway enclosures also must comply with Sections 403.2.3.1 through 403.2.3.4 (3007.6). This means that the hoistway must match the structural integrity of interior exit stairways and elevator hoistway enclosures.

2012 IBC FSAE Changes (continued)

- The FSAE symbol was also introduced as a requirement in this edition (3007.7.5).
- The protection of the wiring and cables was increased from 1 hour to 2 hours in Section 3007.9.1.



New 2015 IBC Fire Service Access Elevator Requirements

- Need to be able to fit a 24in. by 84in. stretcher.
  - Most 3500 pound elevators may not meet this requirement with typical center sliding doors. Can meet it with single opening door.
  - Typical 4000 pound elevators will meet this requirement. Added weight requires significant cost increase from some manufacturers.

Local Jurisdictions

- New York City's code is based on the ICC but the City has not yet adopted the 2012 Edition of the IBC. As such, the City has not weighed-in yet on whether they believe this requirement is cost effective and if they will adopt it.
- Chicago does not yet adopt the ICC family of codes and has their own Building Code. Currently they require only one FSAE and no documentation was found that indicates they have considered providing the second FSAE.

Elevator Reliability –expert 1

- A typical elevator for a high rise is out of service 2 to 4% of the time. Expect 4 to 6 short-term regular shutdowns a year (not due to external factors i.e. water damage, vandalism, etc.).
- A typical repairs takes a few days, with major repairs taking two to six weeks, or longer with taller/older buildings. An elevator could be out of service for 6 months, depending on vintage, parts availability, obsolescence.
- Some customers have maintenance contracts that pay for expedited repairs.

Mario Pereira, Otis Elevator Sales Representative, Miami Lakes, Fl.

Elevator Reliability – expert 2

- An elevator should be in service 99% of the time.
- There is a monthly preventive service that is usually about 1.5 to 2 hours.
- A ten-story elevator may have 6 to 7 failures/year.
- Extended outage time depends type of damage and age of equipment. It might take 3-4 hours, or a week or more, to repair an elevator.

  Email communication with Robert (Bob) Dieter, Vertical Transportation Consultants, Apalachicola, FL

Fire History

- No research found in buildings with FSAEs or how FSAEs were used. Possibly still too new.
- One report, not cited in FSEC's final report, *HIGH-RISE BUILDING FIRES*, John R. Hall, Jr. September 2013, from the National Fire Protection Association, Fire Analysis and Research Division does not discuss fire service access elevators.

Legislative and Code Process

- 2016 Florida Legislature Passed HB535
- Florida Building Commission Has Entered Their Code Review and Modification Process for the 2017 Florida Building Code

Legislature – HB535

- *The Florida Building Code shall require two fire service access elevators in all buildings with a height greater than 120 feet measured from the elevation of street-level access to the level of the highest occupiable floor. All remaining elevators, if any, shall be provided with Phase I and II emergency operations.*
- *Where a fire service access elevator is required, a 1-hour fire-rated fire service access elevator lobby with direct access from the fire service access elevator is not required if the fire service access elevator opens into an exit access corridor that is no less than 6 feet wide for its entire length and is at least 150 square feet with the exception of door openings, and has a minimum 1-hour fire rating with three- quarter hour fire and smoke rated openings; and during a fire event the fire service access elevator is pressurized and floor- to-floor smoke control is provided.*

Legislature – HB535 (continued)

- *However, where transient residential occupancies occur at floor levels more than 420 feet above the level of fire service access, a 1-hour fire-rated service access elevator lobby with direct access from the fire service access elevator is required. Standpipes in high-rise buildings of Florida Building Code—Building Occupancy Group R1 or R2 must be located in stairwells and are subject only to the requirements of the Florida Fire Prevention Code and NFPA 14, Standard for the Installation of Standpipes and Hose Systems, adopted by the State Fire Marshal.*

Florida Building Commission

- Starting point is 2015 IBC with supplements.
  - Supplement changed stretcher requirement from 84” to 76” length.
- Code modifications were received through Dec. 31, 2015.
  - 31 changes referred to Building Fire Technical Advisory Committee (TAC) of the FBC.
  - Review minutes of April 7 Building Fire TAC meeting at FloridaBuilding.org

Florida Building Commission

- Links to agendas for all FBC meetings can be found on their home page calendar.
- *FloridaBuilding.org*

Development of Cost Survey Instrument

Access Elevator Industry Advisory Group

- Sheldon Powell, Gables Development - Boca Raton, FL
- Ralph Hippard, Cost Estimator - Tallahassee, FL
- Bruce Faust, Fire Marshal, Orange County, FL
- Stu Cohen, Architect, Cohen, Freedman, Encinosa & Associates - Miami, FL
- Les O'Bryan, Vice President, Coastal Construction Group – Miami, FL

Input to Project

- Advisory Group weighed in on the planned survey and discussed the items that lead to cost and situations where more than one elevator lobby may be required.
- Research team, advisory group and Mo Madani of DBPR attended teleconference on October 22, 2015.
- Revised survey was sent by email and more comments received.

Survey Tool

- Objective is to understand costs associated with second fire service access elevator.
- Research team drafted the survey and edited it a number of times prior to October industry meeting.

Survey Tool – Anticipated Difficulties

- Expected difficulty - limited number of people with experience designing and constructing high rises in Florida.
- Due to no code change yet, very few would have done buildings with two FSAEs.

Survey Tool – How to get at Cost?

- Method 1 - ask about a hypothetical building so that all respondents are answering about the same building.
- Method 2 - ask about the respondents last high rise building with a FSAE. Added information needed:
  - number of stories, the project budget, the number of FSAEs, number of total elevators, the building use, the corridor type, role, project status.

Survey Tool - Logic

- Survey tool is included in the final report appendix.
- Those with no experience with high rise elevators were skipped down to the opinion and comment section and were not asked about costs.

Survey Tool Process

- Survey was vetted by UCF's Institutional Review Board and deemed to not be human subject research.
- Survey was entered into UCF's Qualtrics system for electronic completion.

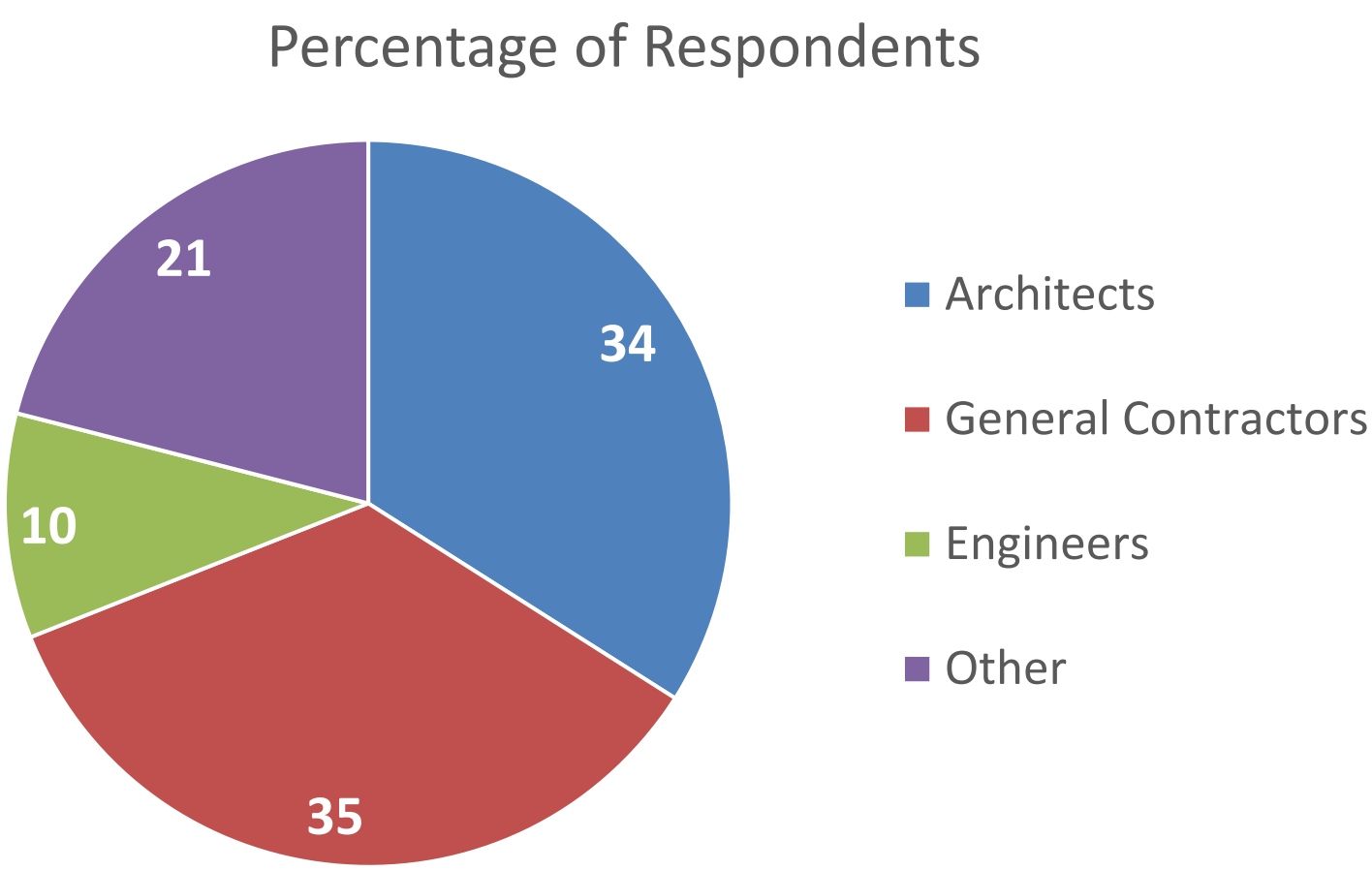
Survey Tool Distribution

- Lists of professionals were provided by DBPR.
  - These included architects, engineers, general contractors.
- Also reached out to known Florida high rise developers by phone and postcard.
- Sent link to survey to 42,000 email addresses.
  - Anticipated that most of the emails were to people who did not work in high rises but no way to filter that out.

Survey Responses

- Survey period was Nov. 5 to Nov. 20, 2015
- Officially closed survey on Nov. 23
- Elevator Survey Responses:
  - 342 respondents (people going to the survey)
  - 327 answering first question
  - 127 indicated they helped design, build or specify a fire service access elevator for a building
  - 36 had done buildings with more than one FSAE

Survey Responses



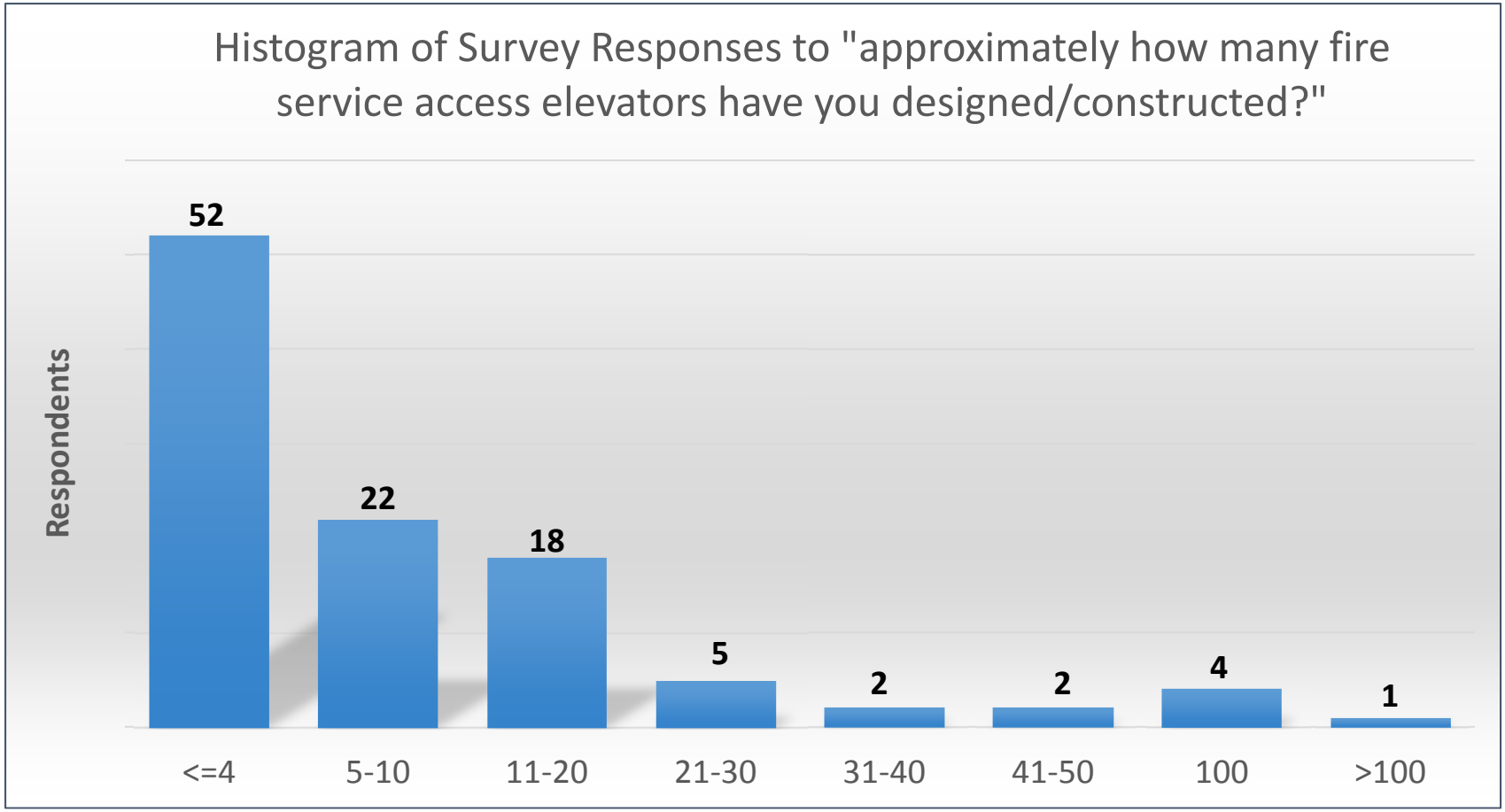
Geographic Area Served

*** Number of People Listing the County as an Area They Serve**

Each person could write in the counties they served. In addition to the 26 indicating all counties, there were 7 who simply listed regions, e.g., North Florida. For brevity, this table only shows counties specified by ten or more respondents.

County	Area Served*
All of Florida	26
Brevard	18
Broward	73
Charlotte	10
Collier	18
Duval	17
Hillsborough	27
Indian River	10
Lee	17
Manatee	13
Martin	13
Miami-Dade	91
Monroe	11
Orange	41
Osceola	10
Palm Beach	47
Pinellas	23
Polk	11
Sarasota	23
Seminole	17
St. Lucie	13
Volusia	15

FSAE Designed/Constructed



Responses

- Thirty six (36) out of 117 respondents (31%) indicated they worked on projects that had more than one fire service access elevator.

Why More Than One FSAE?

- The follow–up question was “If yes, why were they equipped with more than one fire service access elevator?” There were 35 responses.
  - Code where it was built: 18
  - Building Size/Layout: 8
  - Redundancy: 3
  - Safety: 2
  - Owner Wanted: 1
  - Other: 3 (Yes; Plenty of Them; Hospitals)

Survey Project Examples

- Based on Minimum Height for FSAE -12 stories (120’)

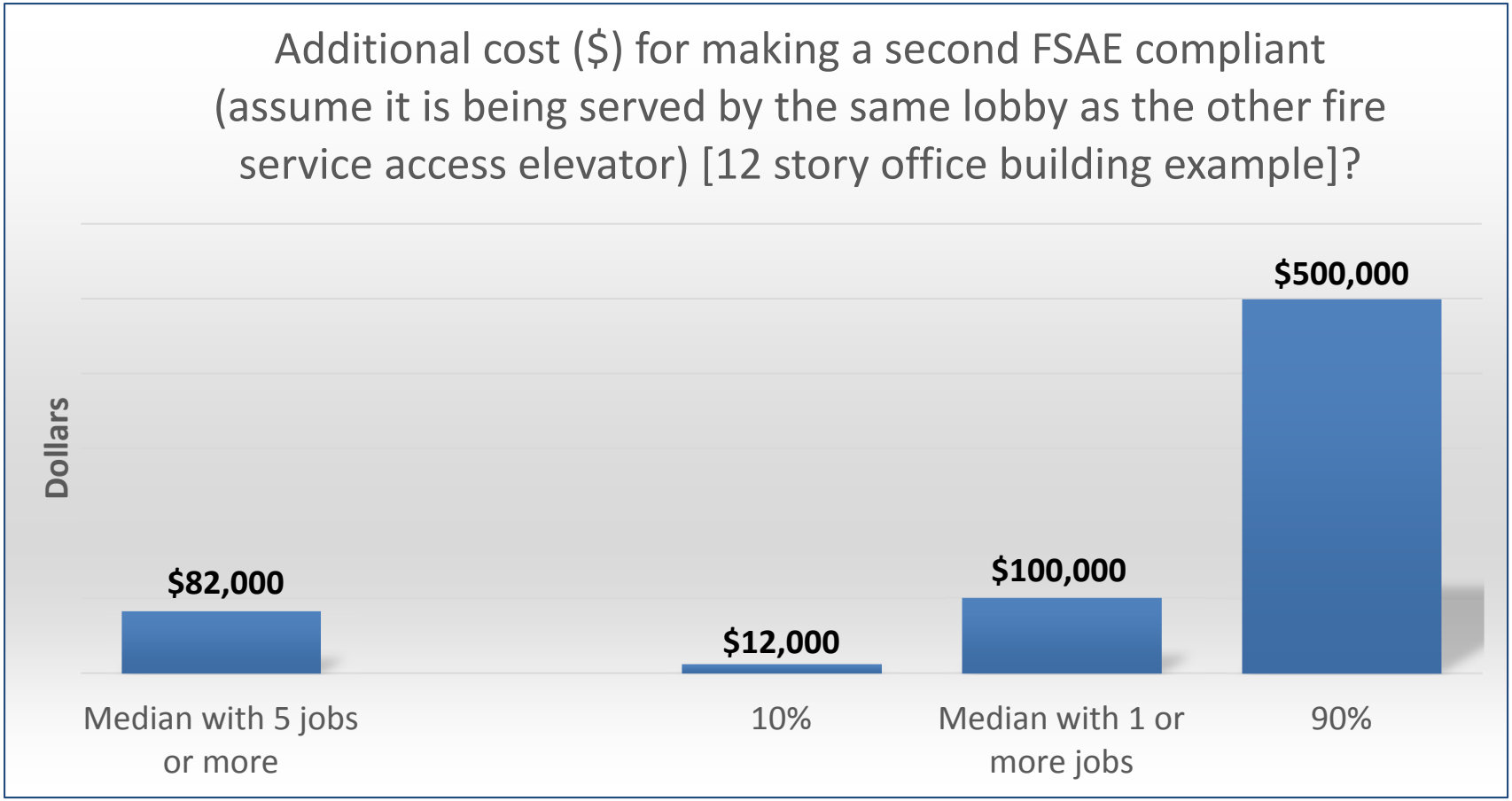
Survey Project 1 Example

- Project Description: Please provide an estimate of additional cost for a new project for which planning is just beginning. The project calls for three elevators for a 12-story office tower with interior lobbies and corridors. Under Florida 2010 code, one elevator would be required to be a fire-service access elevator and the other two could be non-fire-service-access elevators. Under the 2014 Florida code language (the part delayed by the legislature), there would need to be 2 fire service-access elevators for this project.

Answer 8:

- For this project then, what is your best estimate of the additional cost ($) for making a second elevator fire-service access compliant (assume it is being served by the same lobby as the other fire service access elevator)?
- Median of 25 respondents with 5 or more FSAE jobs: $82,000
- Median of 52 respondents with 1 or more FSAE jobs: $100,000

Answer 8 – Costs of 2nd FSAE



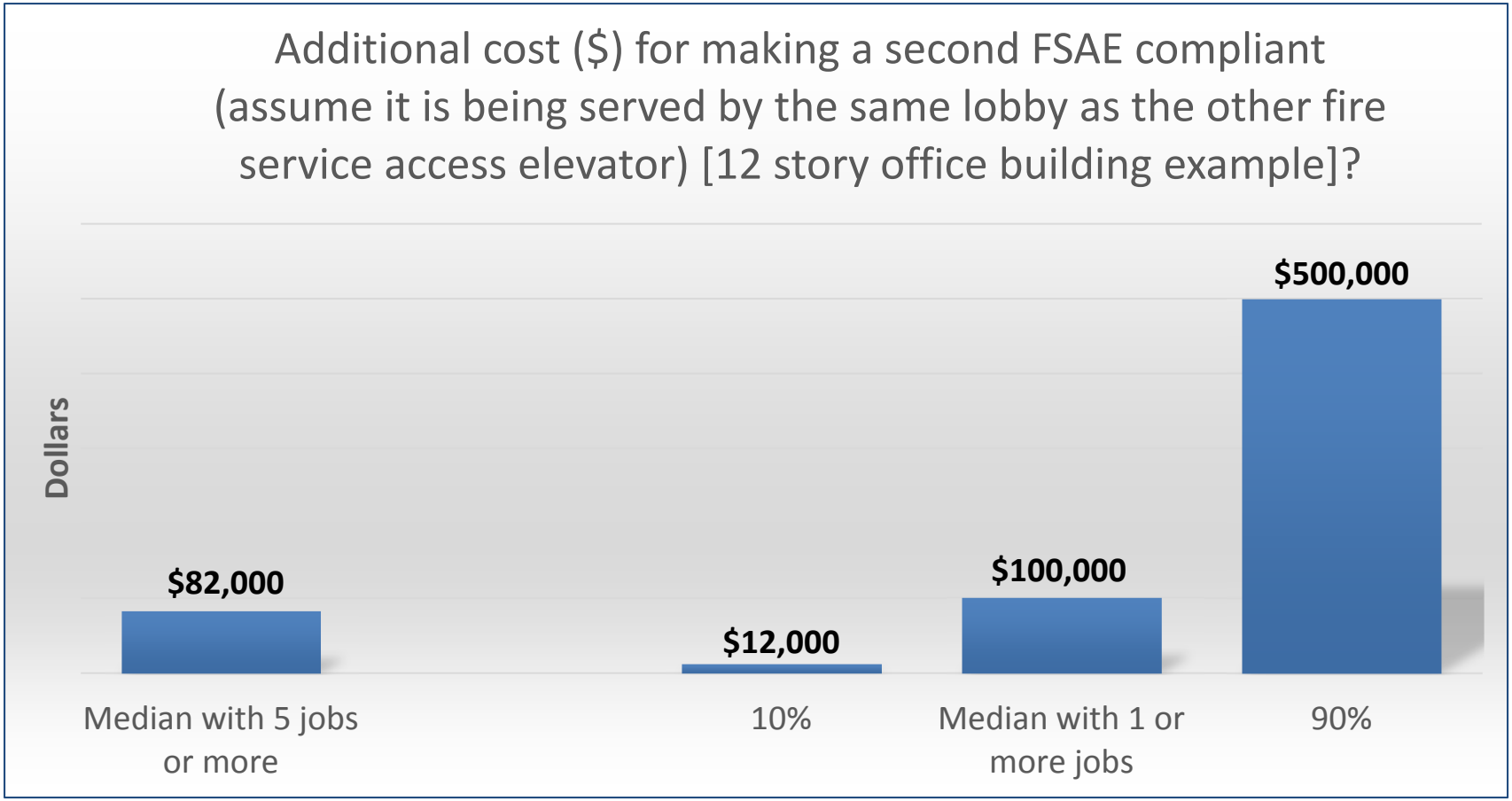
Cost Presentation - Data

- Large range of costs received
- Nonsensical responses removed (e.g.., $0 for something with costs, $7654321 responses)
- Median average (midpoint of responses) is used to avoid skewed influence of very high answers that would effect a mean average

Cost Presentation – Medians and Ranges

- Medians of Experienced Group were those with 5 or more FSAE jobs. Medians also shown for those with 1 or more FSAE jobs
- Values shown on bar charts marked 10% refer to a response whereby 10% of all responses with 1 or more FSAE jobs were at that value or lower.
- Values shown on bar charts marked 90% refer to a response whereby 90% of all responses with 1 or more FSAE jobs were at that value or lower.

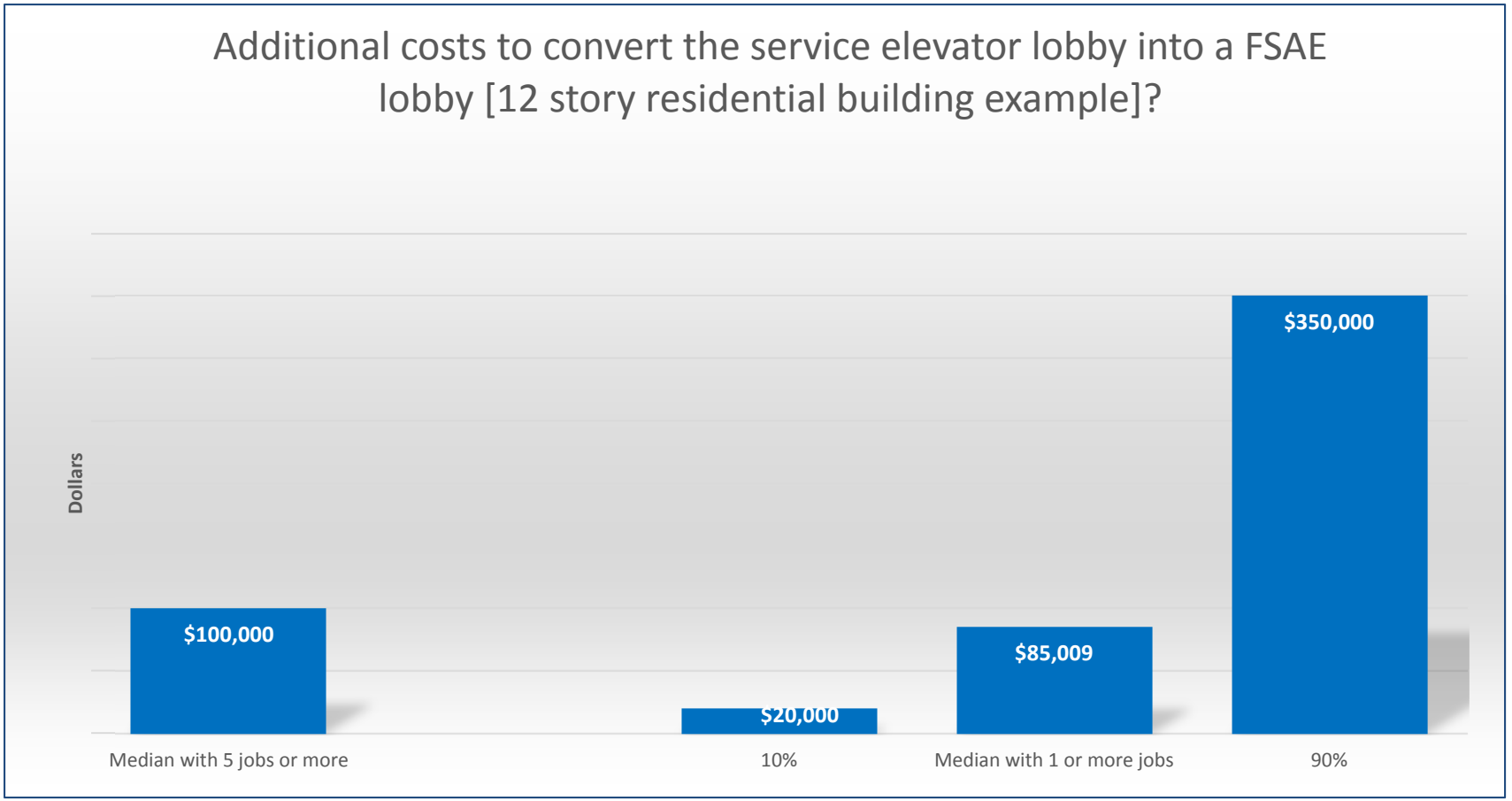
Answer 8 – Costs of 2nd FSAE



Lobby Cost – Project 2:

- What if there was another 12-story project being planned with one passenger elevator (a fire service access elevator) and one service/maintenance elevator serving a different lobby. What would be your estimate of the additional costs to convert the service elevator lobby into a fire service access elevator lobby?
- Median of 22 respondents with 5 or more FSAE jobs: $100,000
- Median of 49 respondents with 1 or more FSAE jobs: $85,009

Answer 11 – Cost of Lobby



How Often is a Second Lobby Needed?

- If the code already required two fire access elevators at the time a project begins, how often would a second lobby for a fire service access elevator be required for your typical projects (estimated % of projects requiring an additional fire service access lobby)?
  - Ranged from 0 to 100%
  - 22.7% mean average of 56 respondents

Combined Average Cost of Elevator and Lobby

- Calculated as the respondent's answer to the example problem as 2nd FSAE plus (the cost of lobby times the fraction of times a lobby would be required). Not exactly what was asked in any question, but provides a rough estimate.
- Median of 22 respondents with 5 or more FSAE jobs: $122,250
- Median of 48 respondents with 1 or more FSAE jobs: $131,250

Their Most Recent Job

- "What was the approximate additional construction cost ($) to make the elevator(s) fire service access compliant? Include all associated construction costs."
- The median of the 17 respondents with 5 or more FSAE experience was $100,000.
- The median rose to $112,000 if the 37 respondents who had 1 or more FSAE experience were included.

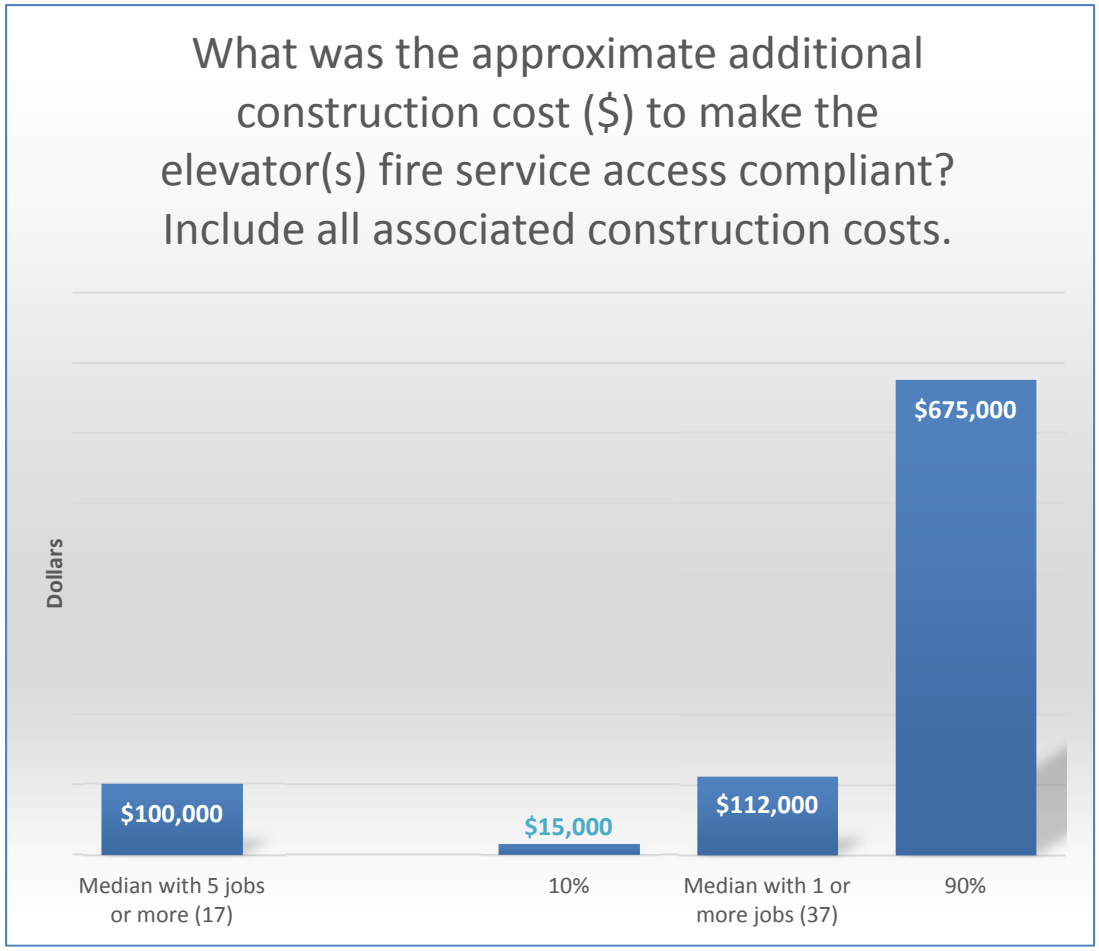
FSAE Compliance Cost (Q15)	Total Project Cost (Q16)	No. of Stories (Q17)	No. of FSAE Installed (Q18)	No. of Elevators Installed (Q19)	Expected Use (Q22)	FSAE to Total Project Cost Ratio
0		15	1	15	Retail Mixed Use/Hotel	
0		42	2	2	Mixed Res/Retail	
0	17,500,000	45	2	6	Mixed Res/Retail	-
0	130,000,000	30	1	4	Residential	-
0	250,000,000	50	1		Retail/Office	-
0	280,000,000	20	1	10	Institutional / Business	-
4,200		20	2	7	Mixed Res/Retail	
8,000	2,000,000	17	2	6	Residential	0.0040
12,000	13,500,000	14	1	3	Mixed Res/Retail	0.0009
15,000	10,000,000	10	2	4	Mixed Res/Retail	0.0015
25,000	65,000,000	6	1	7	Government	0.0004
28,000	22,478,500	8	1	1	Residential	0.0012
30,000	650,000,000	19	2	25		0.0000
40,000		8	1	3	Residential	
40,000	80,000,000	24	12	12	Residential	0.0005
40,000	90,000,000	46	2	10	Self Storage	0.0004
43,000	63,000,000	25	1	6	Mixed Res/Retail	0.0007
50,000	10,000,000	8	1	4	Medical	0.0050
50,000	40,000,000	15	1	4	Retail/Office	0.0013
50,000	60,000,000	23	2	4	Residential	0.0008
59,000	9,000,000	18	1	2	Residential	0.0066
65,000	32,985,000	19	1	4	Residential	0.0020
80,000	24,000,000	30	2	4	Mixed Res/Retail	0.0033
100,000	15,000,000	40	2	8	Hotel	0.0067
100,000	60,000,000	26	5	10	Residential	0.0017
112,000	77,315,000	14	1	6	Mixed Res/Retail	0.0014
125,000	50,000,000	15	1	5	Retail/Office	0.0025
150,000	55,000,000	15	1	6	Retail/Office	0.0027
150,000	75,000,000	25	1	3	Mixed Res/Retail	0.0020
150,000	96,000,000	10	1	4	Institutional	0.0016
190,000	55,000,000	24	1	6	Hotel	0.0035
200,000	20,000,000	12	1	4	Retail/Office	0.0100
200,000	72,000,000	25	2	4	Residential	0.0028
250,000	50,000,000	18	1	3	Residential	0.0050
265,000	36,000,000	19	1	6	Mixed Res/Retail	0.0074
300,000	96,000,000	30	2	5	Residential	0.0031
320,000	60,000,000	16	2	2	Residential	0.0053
350,000	45,000,000	12	1	3	Mixed Res/Retail	0.0078
400,000	90,000,000	24	1	4	Residential	0.0044
456,000	12,000,000	15	2	5	Hotel	0.0380
650,000	65,000,000	42	2	7	Hotel	0.0100
675,000	55,000,000	20	2	5		0.0123
700,000	120,000,000	30	2	21		0.0058
1,000,000	200,000,000	60	2	20	Mixed Res/Retail	0.0050
2,000,000	100,000,000	36	1	4	Residential	0.0200

Their Most Recent Job

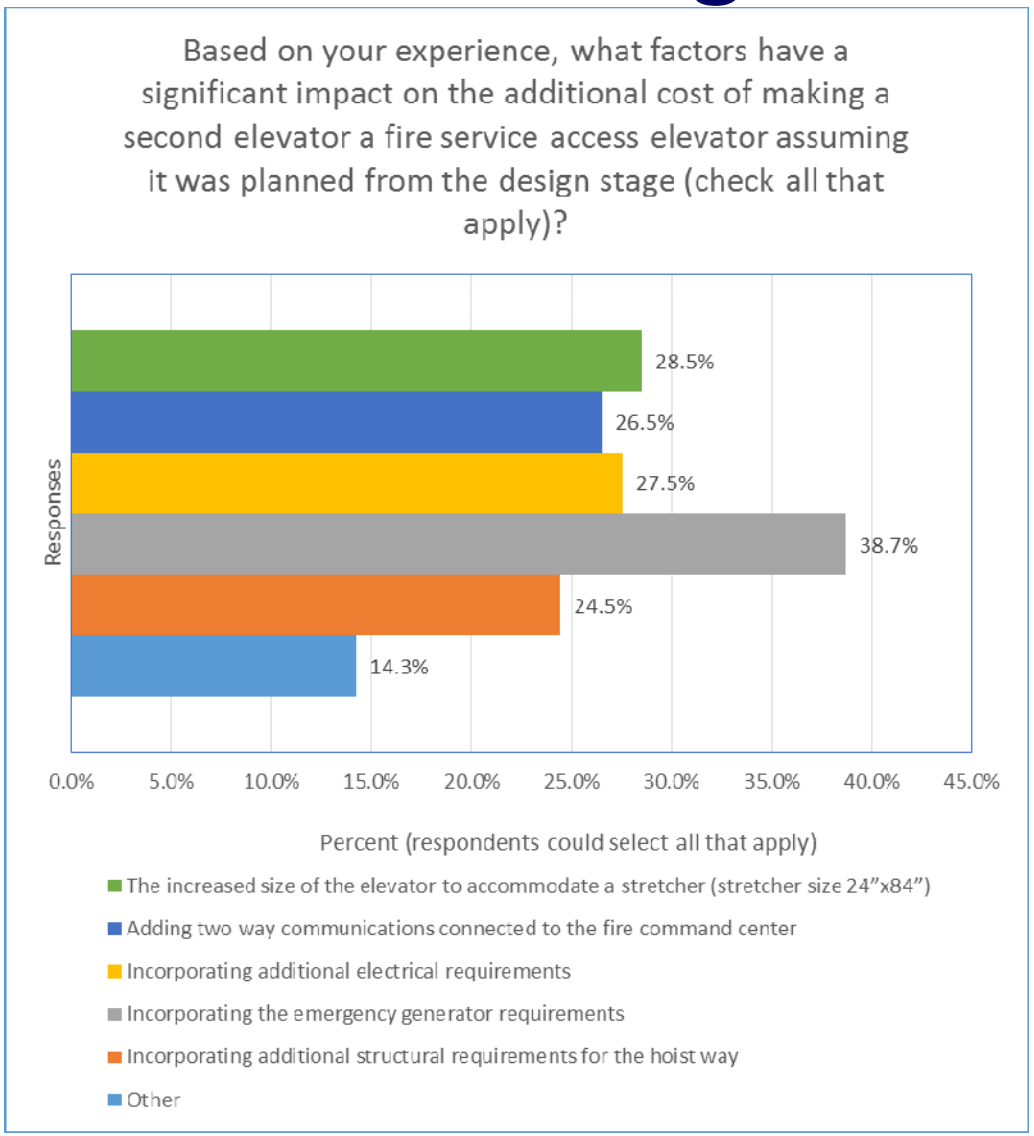
The cost to provide FSAEs on most recent job varied from a reported $0 to $2 million.

- This included projects with from 1 to 12 FSAEs
- Projects had from 6 to 60 stories
- Project costs were $2 million to $650 million
- FSAE to Project Cost ratio was 0.0032 among experienced respondents

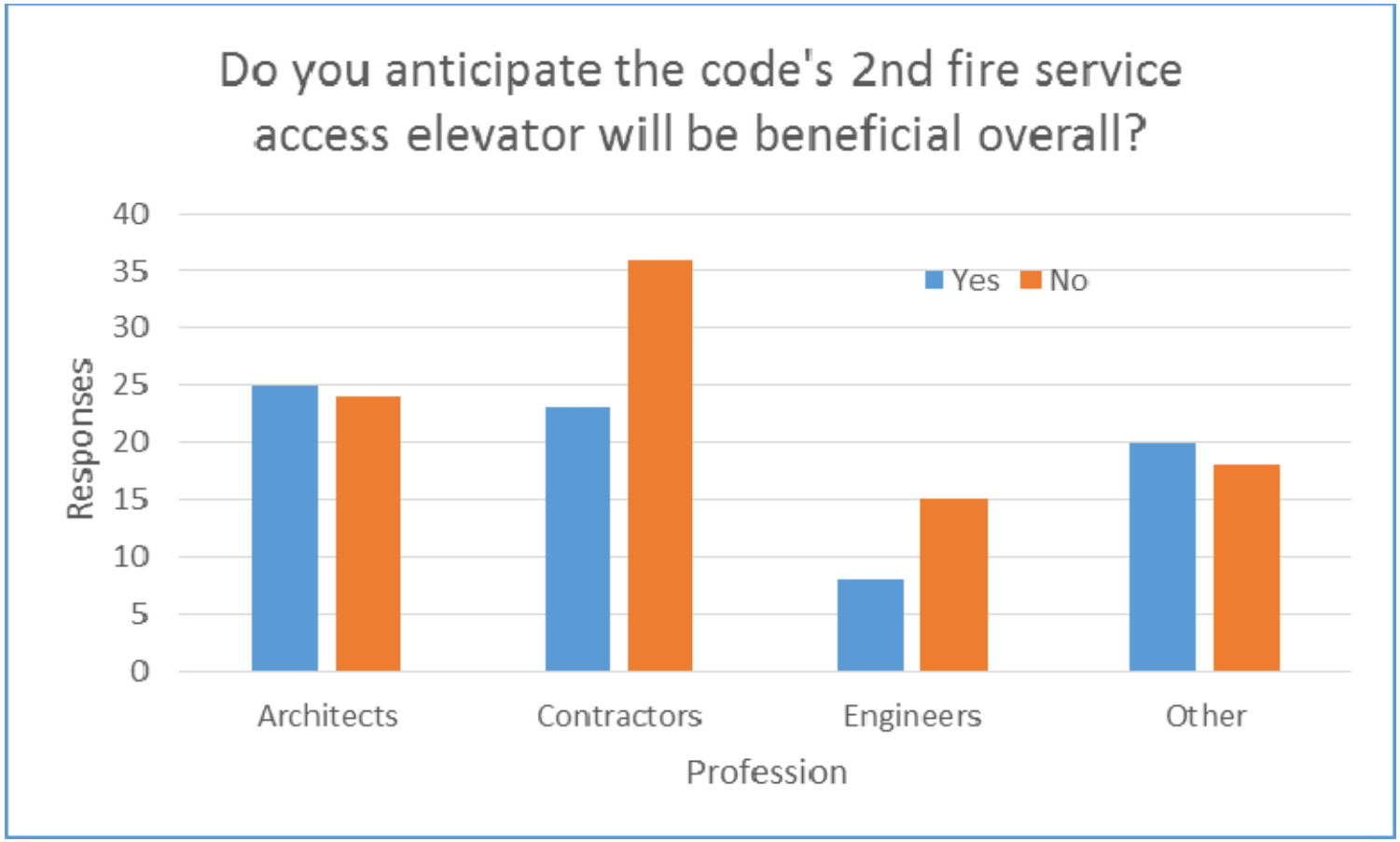
The Most Recent FSAE Job



Which Factors Have Significant Cost?



Is This Code Change Beneficial Overall?



Total: 76 Yes (45%), 93 No (55%)

Do You Have Any Specific Comments about this Requirement?

- No (18)
- It is needed (5)
- Not needed (9)
- Should be only for taller or bigger buildings (10)
- One is better than two (1)
- Two are better than one (5)
- Costly (26)
- Other (26)

Sample Comments – Cost Concerns

- “Always adding to what is wanted with vast increase in cost and limited improvement or limited safety help. Focus should be on 'reasonable' and safety and usefulness”
- “Don't elevators shut down during a fire? Why do we need a second elevator? You guys are going to increase the price of construction so much, investors are going to go to Georgia.”

Sample Comments – Safety First

"Most ten story and higher structures that we have worked are designed with more than one isolated elevator shaft providing a viable fire service access elevator in the event of an emergency. Although the price to provide a second fire service access elevator on some smaller buildings would be prohibitive, I feel that the over-all safety of the building occupants should be the over-riding criteria in the development of new codes."

Sample Comment – Should Only be for Taller Buildings

"A second fire-service elevator would be obviously beneficial if the first were inoperable due to a fire. However, the instances of its necessity are extremely rare in 10-20 story buildings. The requirement adds significant cost to a relatively small building of Type I construction that has a very good life safety history. I think the requirement would be more in line with taller buildings (20+ stories) where risk may be greater."

Open Ended Question

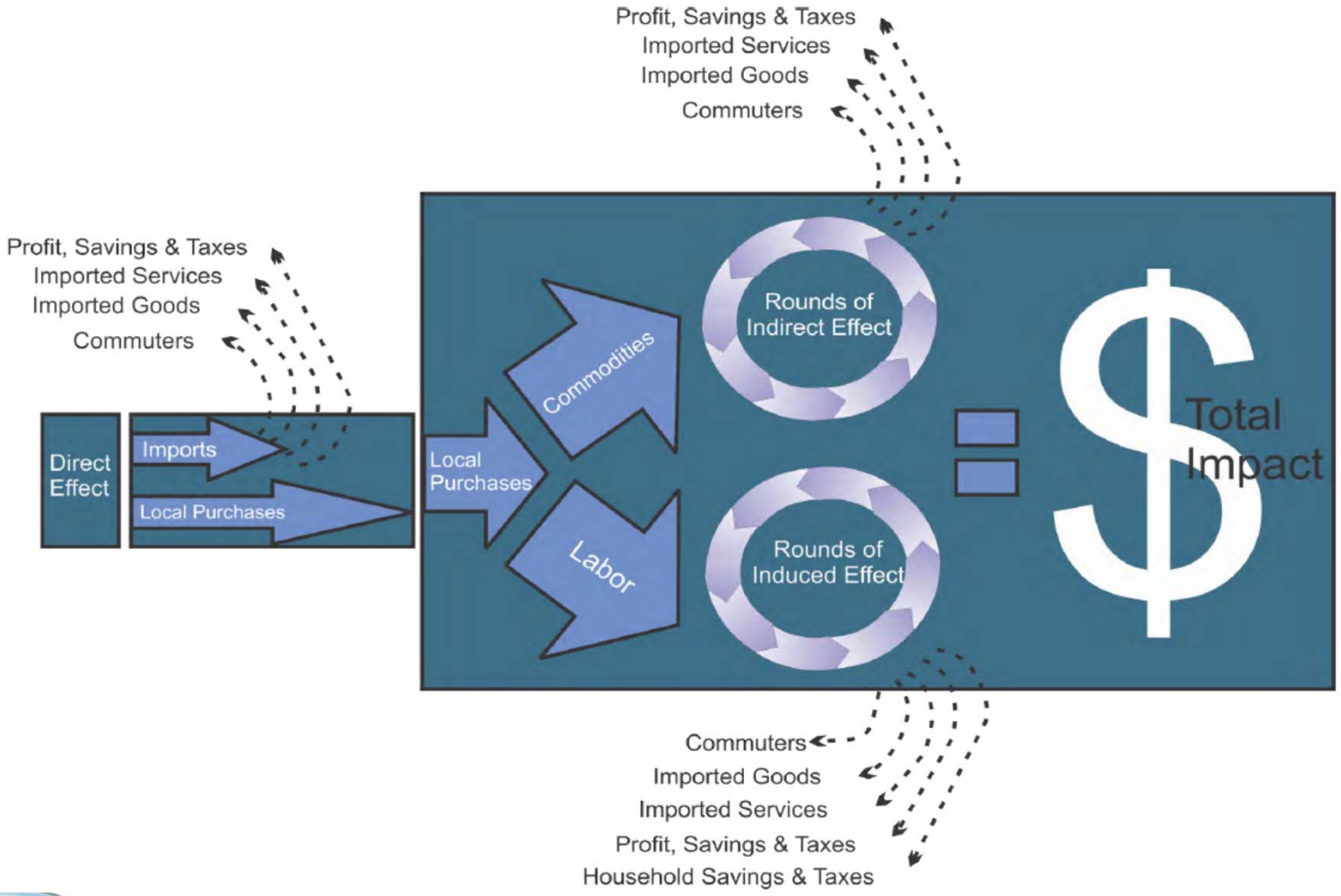
- Additional Comments?
- 26 responded
  - 4 simply wrote “no”
  - 4 indicted it was not beneficial
  - 5 indicated concerns of trade off

Additional Comments - Sample

- “Over and above adding significant dollars to cost of the construction of a Tower, the guidelines and requirements of the second elevator has made the design of residential towers less efficient, and leaving cumbersome amounts of inefficient space. I endorse appropriate safety regulations for those living in a residential tower as saving lives is more important that saving construction costs. But I am not sure that some of these new "safety" building codes are initiated because of an unusual circumstance, rather than from reasonable practicality.”

End of Cost Survey Instrument

Economic Impact



Economic Definitions

Direct Impact	**The initial expenditures, or production, made by the industry experiencing the economic change.**
Indirect Impact	The effects of local inter-industry spending through the backward linkages.
Induced Impact	The results of local spending of employee's wages and salaries for both employees of the Directly Impacted industry, and the employees of the Indirectly affected industries.

Economic Analysis

- Increases in Cost of Building
  - Small relative to overall project, hard to estimate it as much of a factor per overall square footage –too small to determine losses
  - No estimate for fewer buildings being constructed for 2nd FSAE
- Increased Construction Spending
  - Job increases
  - Money spent in Florida's economy

Cost of 2nd FSAE relative to leases

- According to LoopNet.com, with over 800,000 online listings, the average asking rental rate per sq. ft./year for office properties in Florida was $17.28 as of Feb 16, 2016.
- Daytona Beach listed as $15.46, Jacksonville $15.60, Orlando $20.13, Miami $27.34, Tallahassee $17.49, and $19.56 for Tampa.

Increase required to make up for square footage

- Lost lease space example -20 stories, 50 square feet per floor loss, high rent district:
- Leasable space: 10,000sf/floor x 20 floors = 200,000sf
- Lost leasable space: 50sf/floor x 20 floors = 1,000sf
- Magnitude of the lost sf: 1,000/200000 = .005
- Lease rate: @ $35/sf [current state average is $17.28 for office buildings]
- Lost lease: 1000*35 =$35,000
- Original Total lease: 200,000*$35= $7,000,000
- Total lease if loss of space 199,000*$35= $6,765,000
- Increased lease rate required to make up for loss: $35,000/199,000sq ft.= $0 .1758/sq. ft. which is less than a quarter and well within the range of monthly fluctuation of rental rates.

Florida High Rise Construction

Annual Average	All Construction	≥ 12 Floors
All years	17.1	14.8
2016	44.0	44.0
2000-2016	34.1	30.6
1980-1999	19.9	17.7
1960-1979	21.0	17.9
Before 1960	2.5	1.5

Florida High Rise Construction

- The average number of high rise structures the last 16 years (34) was chosen as the value to use for economic analysis.
- Results are scalable so to use an estimate of 50, simply take a ratio of 50/34 to the results.

Direct Annual Costs - Florida

	Projects	Use %	Median Cost	Local %	Total Cost
FSAE Answer (8)	34	100	$82,000	100	$2,788,000
Lobby Answer (11)	34	22.7	$100,000	100	$771,800

Jobs Sustained -Florida

	Direct	Indirect	Induced	Total
Cost of 2nd FSAE from example -12 story Answer (08)	27 Jobs Sustained	7 Jobs Sustained	12 Jobs Sustained	46 Jobs
Cost of 2nd FSAE Lobby from example -12 story answer (11)	7 Jobs Sustained	2 Jobs Sustained	3 Jobs Sustained	12 Jobs

Economics of Increased Construction Spending on Labor Income -Florida

	Direct	Indirect	Induced	Total
Cost of 2nd FSAE from example - 12 story Answer (08)	$1,352,198	$378,536	$544,958	$2,275,692
Cost of 2nd FSAE Lobby from example -12 story answer (11)	$374,328	$104,790	$150,860	$629,978

Benefits of Increased Construction Spending

	Gross State Product	Regional Sales	Taxes Generated
FSAE	$2,984,138	$5,548,953	$156,822
Lobby	$826,097	$1,536,112	$43,413

Industry Presentations

- Statewide webinar, *The Economic Impact of Building Code Change Requiring a 2nd Fire Access Elevator in Florida High Rise Structures*
- Held March 29, 2016
- 95 people signed up (full capacity)
- Only 42 attended
- Presentation available at Vimeo

Industry Presentations

- Repeated the Statewide webinar, *The Economic Impact of Building Code Change Requiring a 2nd Fire Access Elevator in Florida High Rise Structures*
- Held May 2, 2016 –advertised to those 95 who had signed up and those on waiting list for Mar. 29
- Only 4 attended

Industry Presentations

- *The Economic Impact of Building Code Change Requiring a 2nd Fire Access Elevator in Florida High Rise Structures*
- Florida Fire Marshal's and Inspectors Association and local AHJ's –Central Florida (about 25), Sanford, FL
- April 13, 2016
- 25 attended

Sanford Meeting Feedback

- For extra-large people, EMTs may need large stretchers and elevators that can accommodate;
- Not convinced that there was sufficient reason to put the 2nd FSAE in the ICC, particularly for sprinkled buildings as low as 120'. Maybe 240' would make more sense;
- FSAE help get personnel up and down quickly and they carry heavy equipment and without elevators you need more personnel as even firemen in good shape get winded climbing the stairs. There is economic cost to having more personnel;
- Need to educate fire emergency personnel about fire service access elevators and how they differ from standard elevators with fire personnel keys. Most firemen don't know.

Conclusions

- 2nd Fire Service Access Elevator was put in IBC code as part of proponents effort
  - Only applies to buildings with at least two elevators
- Main Benefits - ability to more rapidly move firefighters and victims; redundancy
- No fire case record found since FSAEs are new
- No data on costs found

Conclusions

- Survey Results
  - There is a large range of cost estimates for FSAE and lobbies
  - For 12 story example buildings, experienced practitioners estimated $82,000 for the second FSAE and $100,000 for lobby expenses where needed
  - Extra FSAE lobby may be needed 22.7% of the time

Conclusions

- The cost to provide FSAEs on most recent job varied from a reported $0 to $2 million
  - median of $100,000 of the experienced respondents
  - This included projects with from 1 to 12 FSAEs
  - Projects had from 6 to 60 stories
  - Project costs were $2 million to $650 million
  - FSAE to Project Cost ratio was 0.0032 among experienced respondents

Conclusions

- Difficult to conclude revenue loss from code change representing such a small fraction of project costs
- Increased construction spending on 2nd FSAE and lobbies will result in positive effects on economy

Conclusions

- Mixed feelings among industry whether code change for 2nd FSAE will be beneficial
  - 45% say yes, and 55% say no
- Florida legislature in HB535 offers flexibility in lobby structure

Deliverables

- **Deliverable #1 Interim Report**
- *A draft report providing technical information on the problem background and resulting economic information gathered for each of the three delayed code requirements will be submitted by November 15, 2015. The report will be presented to the Commission or Commission's appropriate Technical Advisory Committee at a time agreed to by the Contractor and the Department's Project Manager.*
- - Interim report was delivered November 13, 2015.
- - Presentation to Mechanical, Fire and Energy TACs were conducted in December, 2015. The presentations included the interim report and highlights of the survey returns.

Deliverables

- *A final report providing background data/information, analysis, results, minutes from the stakeholder events and implication by May 15, 2016. The report will be presented to the Commission or Commission's appropriate Technical Advisory Committee at a time agreed to by the Contractor and the Department's Project Manager.*
  - The final report was sent in May 13, 2016.
  - TAC Presentations were made June 3, 2016.
  - Minutes were not always taken by the meeting organizers at stakeholder meeting but comments were gathered and included in the final report.

Acceptance

- Request the recommendation for acceptance of the final report and all deliverables.

Thank you

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