Fire Station 6 Reinvestment

Category: Public Safety

Department Lead: Public Works

Type: Ongoing Project

Project Description, Benefit, Estimate, and Schedule

Per the 2014 Fire & EMS Service Agreement with Arlington County, the City of Falls Church is responsible for funding Capital Improvements to Fire Station 6. In FY2015, the windows were replaced throughout the facility and repairs to the Apparatus Doors were performed. FY19 Update: HVAC Replacement: Arlington County completed Phase 1: 2nd floor HVAC replacement with electrical modification for the new units and new BAS system. FY20 Phase 2: 1st floor HVAC replacement started new BAS system on November 11th, 2019 and should be completed by January 27th, 2020. Remaining funds from FY20 will start the work on the new infrared heaters at the apparatus bays. This work will allow the new doors Apparatus bay door to be installed in FY21. This five-year CIP plan is based upon prioritization of deficiencies that were identified in a 2013 condition assessment and subsequently identified needs. In the coming years, Arlington County will continue to monitor and identify deficiencies on yearly bases. The intent is to provide a thorough visual assessment of all architectural, civil/structural, mechanical, electrical, fire, plumbing and sewer components/systems of the facility. This will allow us to better plan future projects/funding.

The proposed plan includes in priority order:

1. FY20: 1st floor HVAC replacement started new BAS system and infrared heaters in the apparatus bays
2. FY21: Apparatus bay door (10 Four-Fold doors, $55,000 each) and infrared heaters replacement
3. FY22 - 23: Unfunded due to Apparatus bay door project
4. FY24: Generator replacement
5. FY25: Bathroom renovations 2nd floor: 2 bathrooms; 1 bathroom with showers and lockers
6. FY26: Bathroom renovations 2nd and 1st floor: 1 bathroom with showers and lockers; 2 ADA bathrooms
7. FY27: Complete Bathroom renovation.
8. FY28: Kitchen Renovations
9. FY29: Fire Alarm replacement
10. FY30: Roof replacement

Capital Funding Plan

Funding Source	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027-30	10-YR Total
Local (Debt)	$ 550,000	$ -	$ -	$ 150,000	$ 150,000	$ 150,000	$ 600,000	$ 1,600,000
Unfunded	$ -	$ 150,000	$ 150,000	$ -	$ -	$ -	$ -	$ 300,000
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total:	$ 550,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 600,000	$ 1,900,000

Funding Notes: Cost estimates for all projects have been provided by the Arlington County Facilities Maintenance Bureau.

**if no activity per City Charter (Section 6.19) in 3 years note as re-appropriation action*

Impact on Operating Costs

Per the 2014 Fire & EMS Agreement, Arlington County is responsible for maintenance and operating costs at this facility, so there will be no impact upon Operating Costs to the City.

Conformity with Comprehensive Plan and Council Strategic Plan

Investment in City facilities meets the goals of Comprehensive Plan Chapter 8 "Community Facilities, Public Utilities and Government Services". Relevant goals include:
"Public services are an integral component of a healthy community structure. They support existing and future development and contribute to the health safety, education and welfare of citizens and businesses in the community."

Research on Four-Fold Apparatus Bay Doors

Background

Chesterfield County (VA) Fire & EMS is in the process of designing one new station and replacements for two existing stations. Due to various reasons (projected lower life-cycle costs, faster opening speeds, apparatus crash avoidance, and increased options for meeting architectural standards in historic and emerging growth areas) the department included four-fold apparatus bay doors as a "deduct option" in the bid documents for the new fire station with the intent of carrying the specification forward with each new and replacement station contingent upon the bid prices and project budgets.

New Chesterfield County Fire & EMS Station #25 (Magnolia Green)

Due to the much higher up-front costs for these doors and need to provide additional bay space to accommodate interior door swing (+640 square feet), the department has been getting significant push-back on the concept. Accordingly, Chief Senter reached out via email and phone to other metro-chiefs who have experience with four-fold doors for feedback that could be taken into consideration in discussions with county leadership involving new fire station design elements.

Survey Response

Email responses were received from 11 metro-sized fire departments from the United States and Canada (see Appendix A for complete email responses), and phone interviews were conducted with seven other metro-chiefs in the United States who have experience with four-fold doors. Phone interviews were also conducted with: a risk control specialist with VFIS regarding property loss experience involving apparatus striking bay doors; the president of Atlantic Emergency Solutions, the Mid-Atlantic dealer for Pierce Manufacturing; a construction management specialist with a Northern Virginia local government who has experience with installing four-fold doors in new stations and retro-fit applications at existing stations; and a representative of a local door vendor that sells the Door Engineering brand four-fold door.

Findings

Concept: Four-fold doors have gained widespread use in recent years in new fire station construction across the United States, based on a proven design with historical origins from the horse-drawn era.

Cost: Four-fold doors involve much higher up-front costs than overhead sectional glass doors (2x higher than overhead sectional glass doors; 2.5x higher when adding approximately 640 square feet of bay floor area in a 3-bay station for unrestricted circulation around doors when open).

- Recent estimates provided to Chesterfield for interior folding four-fold doors include $272,160 for six doors plus $73,600 for the additional bay space square footage (640SF x $115/SF) for a total of $358,356 or $59,726 per door. In contrast, the estimate received for six "high-rise" overhead sectional glass doors was $139,860 or $23,310 per door. As such, the estimated total cost of four-fold doors for Chesterfield (to include additional apparatus floor area) was $218,496 more (+156.2%) than overhead sectional glass doors, representing an additional cost of $36,416 per door (see attached estimate provided by Guernsey Tingle Architects). It should be noted that additional costs are driven by the number of windows and energy efficiency ratings specified, as well as frame dimensions and any other customization needed to meet architectural styles or standards.

- In June 2018, a Northern Virginia locality received a quotation for six exterior folding four-fold doors (Door Engineering Model FF100XT) for $309,874 or $51,645.67 per door.

Benefits: Four-fold doors provide multiple benefits as compared to overhead sectional glass doors including:

- Only bay door needed for the 50+ year life of a fire station (i.e., operates reliably for over 1 million open/close cycles vs. 50,000 to 100,000 cycles for an overhead sectional glass door).

- Minimal maintenance and repair costs over the life of the door. In comparison, the major components of an overhead sectional glass door have a 10 to 15-year life expectancy (contingent upon use) with major repairs of $2,000 to $5,000 that are typical every five years.

- Provide clear sight lines for operators when leaving and entering station, thereby reducing risk for costly collisions (i.e. average loss for vehicle striking overhead door is $8,000 to $12,000 per VFIS; damage to apparatus alone can range in the tens of thousands of dollars for ambulances and fire engines to nearly $100,000 for aerial platforms per Atlantic Emergency Solutions, an east coast Pierce dealer).

- Improved energy efficiency (insulated frames and up to 1" thick glass in four-fold doors vs. ½" maximum thickness of glass in un-insulated sectional overhead doors).

- Faster opening (7 seconds with four-fold doors vs. 20 to 30 seconds w/overhead sectional doors); easier opening during power outages.

- More options for meeting architectural standards in historical areas.

Sampling of Installations in New Fire Stations in Metro-sized Fire Departments: Mesa, Phoenix & Tucson, AZ; L.A. County, Long Beach, Sacramento & San Francisco, CA; Colorado Springs, CO; Washington, DC; Fort Lauderdale, Orlando, Palm Beach & Miami-Dade counties, FL; Atlanta, GA; Howard, Montgomery & Prince George's counties, MD; Minneapolis & St. Paul, MN; Charlotte, NC; Memphis & Nashville, TN; Arlington & Dallas, TX; Alexandria, Arlington & Fairfax counties; Henrico & Loudon counties; Norfolk, Richmond & Prince William County, VA; Seattle, WA.

Retrofits in Metro-sized Fire Departments: Howard County, MD; Arlington County, VA.

Conclusions

The biggest reason stated about why most fire departments are switching to the four-fold doors is for crash-avoidance (i.e., "I am tired of our crews hitting bay doors"). The second biggest reason cited for selecting the four-fold doors was speed of opening when compared to typical overhead sectional doors. All departments using the four-fold doors acknowledged that they were satisfied with the reliability and low maintenance frequency and costs of these doors. Some departments (including those in areas that experience accumulating snowfall) were beginning to use the exterior folding doors, particularly when performing retro-fits of existing stations or to avoid the cost of designing an additional 5' of depth at the front and rear of the apparatus bay of new stations to accommodate inward folding doors. A salient point worth further analysis is that the higher energy efficiency provided by the four-fold doors could be a major element in attaining LEED certification for a new fire station.

While many departments have made the decision in advance (and have the support of their elected leaders) to include the four-fold doors as a functional aspect that is automatically included in the design of any new station, other departments have made the final decision on these doors once the construction bids are received and it becomes evident that the project budget will support the higher up-front costs for both the front and rear of the station, or front of the station only. Because the four-fold doors are relatively new on the market (10 years or less) there is minimal analysis available to clearly demonstrate the long-range cost/benefit of these doors in comparison to overhead sectional glass doors. Accordingly, many departments may be hard pressed to objectively demonstrate to elected officials and taxpayers the return on investment for these doors until more empirical data becomes available and/or the difference in price-point between these doors and sectional overhead doors narrows.

Appendix A:

Email Responses Received from Metro-sized Departments

From: Navarro, Manny <mnavarro@MenloFire.org>
Sent: Monday, June 18, 2018 4:43 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Subject: Bi-Fold Doors

We did not perform a financial analysis. However in 2013 received a bid for 6 bi-fold doors which cost $46,000 per door. In 2016 we received a bid for 4 roll up doors which cost $32,500 per door.

Pros:
The doors open quicker
The doors can be manually opened if power is lost.

Cons
Large control boxes
Sensor placement can be an issue
Need additional interior depth and width for a bi-fold door unless the door swings outward.
Safety issue

Many departments that want bi-fold doors tend to install them on the front of the station where they can receive the benefits that a roll up door does not provide. In the rear roll up doors are installed.

Cost per sq.ft. for bi-fold doors
2018 current cost per sq.ft. has raised to about $1000 sq.ft.
The interior opening doors take up to 5' of space when they open.
A three bay station with 14' wide doors is approximately 60' wide
If bi-fold doors are installed in the front and the rear of the station the cost would be $600,000.
60' x 5' x 2 x $1000 = $600,000

As a post scrip, we have to reverse the doors to fold out ward to accommodate a tiller ladder truck. Swinging inward with the bollards for protection took up to much space. Poor planning on our part.

From: Lane, John <JLane@winnipeg.ca>
Sent: Monday, June 18, 2018 4:46 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Cc: Sanders, Russ <RSanders@NFPA.org>; Wallace, Tom <twallace@winnipeg.ca>; darrell.reid@vancouver.ca
Subject: RE: Metro Request for Assistance: Fire Station Bi-Fold Doors

Hi Loy,

We don't have any of these doors in service, but we have spec'd them for a new station for which we hope to break ground next year. I have copied Deputy Chief Tom Wallace, our lead on the new station project, who might be able to provide some of our reasoning for these doors. I have also copied Vancouver FRS Chief Reid, whose previous department built a beautiful HQ station with bifold doors, to see if he can provide any insights.

John

John A. Lane, BSc, PBDM
Chief
Winnipeg Fire Paramedic Service
P: 204-986-4081

From: COLLAS, Ted J <TCollas@SpringsGov.com>
Sent: Monday, June 18, 2018 6:12:51 PM
To: Senter, Loy
Subject: Apparatus Doors

Chief Senter,

The Colorado Springs Fire Department has only one of our 22 stations that has bi-fold doors. Initially, we had some resistance too, but the construction of the station came in under budget, so the concerns related to cost soon went away.

We do find that they open a lot faster, and our crews at that station now prefer the bi-folds to overhead doors. We have a single engine company running out of the station, but I think these doors would offer additional benefits for stations with aerial apparatus. We have, over the years, clipped our share of doors with the portion of the ladder that extends beyond the cab. With bi-fold doors it is much easier to determine when the doors are fully open.

When they were first installed, we had an issue with a snow storm that was blowing snow directly into the station. The photo cell that operated the door was too sensitive and would not allow us to close the door. The door had to be disconnected from the power and closed manually. We were ultimately able to rectify the situation and now they operate fine in the snow.

Bottom line for us is, they are different, a little more expensive to install, but have not increased cost for maintenance, and they have not been hit by a truck yet!

Best of luck. If you need greater detail, I will be happy to provide it to you.

Respectfully,

Ted Collas, Fire Chief
Colorado Springs Fire Department
(719) 385-7201 office
(719) 238-4335 mobile
TCollas@springsgov.com

From: Warren, Gary <gary.warren@leaguecitytx.gov>
Sent: Tuesday, June 19, 2018 11:08 AM
To: Senter, Loy <SenterL@chesterfield.gov>
Subject: Bi-fold Doors

Chief,

We are putting bi-fold doors in our new station but we have room for that. My colleague, Chief Tom George in Nassau Bay, Texas, has just built a new station and he has his bi-fold doors set to fold outward instead of inward. He has an overhang above the doors to help keep some weather off of them though. Another colleague of mine is Stuart Blasingame in Prosper, Texas. Chief Blasingame says that maintenance on his bi-fold doors is much less than for his existing overhead rolling doors and he is hoping to convert them to the bi-fold in the future. I hope that helps some. Good luck.

Gary Warren
Fire Chief
Fire Department
City of League City
555 W Walker
League City, TX 77573
Phone: 281-554-1478

From: Rivera, Anthony (FIR) <anthony.rivera@sfgov.org>
Sent: Tuesday, June 19, 2018 7:09 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Cc: Mwanga-Conley, Nalungo (FIR) <nalungo.conley@sfgov.org>
Subject: Bi-Fold Doors

Chief Senter,

The San Francisco Fire Department currently uses “Bi-Fold” apparatus bay doors at three fire stations. The Bi-Fold doors were purchased to replace some of the older “Telescopic” style doors that were predominately used in our firehouses. The decision to purchase the Bi-Fold doors was made before I was assigned to this position. I was informed that the reason to purchase to the Bi-Fold doors was, that in case of a power failure, the Bi-Folds have a mechanical release that is easily and quickly deployed. The doors also have less moving parts which should translate into maintenance savings. I’m not aware of any financial analysis associated with the decision making process. The Bi-Fold doors are considerably more expensive than other commercial doors and need a larger amount of square footage to operate, (the latter being why they are not used at most of our stations). We have not had the Bi-Fold doors long enough to understand any other benefits, or realize any maintenance savings. The Bi-Fold doors are also proprietary and we currently only have one vendor for installation and repair. The Bi-Fold doors have performed well thus far, but I am reluctant to fully endorse them until we install them in our busier stations and have had longer usage times.

The SFFD also uses “Sectional" and “Coil-Up" commercial grade doors at some of our stations, both have very low maintenance costs and failure rates. Please feel free to contact me with any questions or comments regarding this issue.

Respectfully,

Anthony Rivera
Assistant Deputy Chief
San Francisco Fire Department
698 2nd Street, Room 305
San Francisco CA 94107-2015
Office 415-674-5066 **Cell** 415-439-3783

From: Mondragon, Ronald <Ronald.Mondragon@seattle.gov>
Sent: Tuesday, June 19, 2018 6:23 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Cc: Scoggins, Harold D <Harold.Scoggins@seattle.gov>; Hastings, Bryan <Bryan.Hastings@seattle.gov>
Subject: RE: Metro Request for Assistance: Fire Station Bi-Fold Doors

Chief Senter,

In response to your questions regarding realized benefits of installed Bi-fold Apparatus Bay Doors,

1. What benefits have you realized from switching to these doors vs. overhead doors?

   - We have experienced almost zero maintenance with Bi-fold Doors as opposed to traditional overhead doors with chain drive openers.
   - Quiet, smooth and extremely fast operation reduces response time and creates rapids awareness of exterior conditions.
   - Bi-fold Door horizontal opening virtually eliminates accidental overhead contact as incomplete vertical opening is inherently eliminated.
   - Bi-fold Door manufacturers construct their product to exacting measurements allowing perfect fitment in any building opening.

   We would support Bi-fold Doors whenever they can be introduced within future Fire Station Capitol Improvement or Reconstruction. The reduction in down time increases unit in-service availability, station security, and reduces potential loss from theft.

2. Do you have any financial analysis used in reaching the decision to switch to these doors that you could share with me?

   I will have to do some digging through the architectural specifications to determine what (if any) analysis was used to justify the expense. Regardless, these are top of the line, low maintenance, low incident and high security doors. Please see the attached photos of Fire Station 10 and 31.

Deputy Chief Ron Mondragon
Seattle Fire Department
Deputy 2 - Operations
301 Second Ave South
Seattle, WA 98104
ronald.mondragon@seattle.gov
206-386-1060 (office)
206-255-8535 (cell)
206-233-2755 (fax)

Seattle Fire Stations w/Four-Fold Doors

From: Taylor, Maria <Maria.Taylor@loudoun.gov>
Sent: Wednesday, June 20, 2018 12:26 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Subject: Metro Request for Assistance: Fire Station Bi-Fold Doors

Chief,

Chief Johnson requested I sent you some info about bi-fold doors. I asked our Facilities manager and he provided the details below. Let us know of any questions or if we can elaborate on any of the points he makes.

We have one station (Station 09 @ Brambleton) with bi-fold doors installed at the three front facing apparatus bay doors. Regarding the inquiry:

1) Far fewer service calls (7 Work Orders related to 3 sets of bi-fold doors since 11/2012), open/closed status visible to driver, quicker actuation time opening or closing, simpler mechanically (fewer overall parts, fewer moving parts), enhanced appearance (more traditional appearance, vertical orientation was easier to accommodate architecturally, doors look 'substantial').

2) I do not have any financial analysis that was used in reaching design decision.

I would like to point out an exception to the statement that was in Chief Senters' email below: "need to build approximately 840 square feet more in the apparatus bays to accommodate the 5 foot clearance for door operation without loss of storage space for apparatus." We have elected to incorporate outward folding bi-fold doors at currently under construction Loudoun County Fire and Rescue Station 27 @ Kirkpatrick Farms in response to just this issue. By utilizing outward folding doors, we were able to shrink the overall size of the apparatus bay and thus lower required square footage. Station 27 outward folding doors were manufactured by Door Engineering and Manufacturing of Kasota, MN. 800-959-1352.

I'm also hearing great things about Rytec Spiral Rigid Rolling Doors. These are vertical moving doors, similar to traditional panel roll-up doors, but with a much quicker opening and closing time (similar times to bi-fold doors) and much lower maintenance requirements than traditional panel roll-up doors. Rytec High Performance Doors, Jackson, WI. 888-467-9832

Thank you!

Maria

Maria Figueroa Taylor
Fire-Rescue Planner
Loudoun County Fire and Rescue
801 Sycolin Road, Suite 200 (MSC # 61)
P.O. Box 7000
Leesburg, VA 20175

703-777-0333 (main)
703-737-8772 (direct)
571-233-0126 (cell)
703-771-5359 (fax)

Teamwork * Integrity * Professionalism * Service

From: Henry, Kevin <FD1571@howardcountymd.gov>
Sent: Thursday, June 21, 2018 2:35 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Cc: Butler, John <JButler@howardcountymd.gov>; Anuszewski, William <FD1506@howardcountymd.gov>
Subject: Request for Information

Good afternoon Chief Senter, my name is Kevin Henry. I'm a Captain with Howard County Fire & Rescue in Howard County Maryland. Chief John Butler asked me to respond to your request for information about the bi-fold doors we use here in Howard County. Our first bi-fold door installation was 11 years ago and we now have a total of 33 Bi-fold doors located in 6 of the 12 stations we operate 24/7. We've installed these doors in both renovated stations and incorporated them into the design of 3 new stations.

Probably the best piece of news I can provide to you, is you don't have to add the 840 sq ft. to your new station apparatus bay to make room for the "inward" opening bi-fold doors. They now make bi-fold doors that mount to the outside of your building and open outward. We recently removed the sectional doors on the front of 2 of our stations and replaced them with outward opening bi-fold doors, completely changing the look of the station's, this was done without adding any additional square footage to the building. (See the attached photos)

We have been purchasing our doors from Door Engineering which is located in Minnesota. This is the only company we have any experience with, but this is mainly because we are very satisfied with the quality of their product. If you are considering outward opening doors please look the FF300 XT model. This model keeps the motors and operating mechanisms inside the station and out of the weather. I have provided a cut sheet from our most recent renovation along with some literature from Door Engineering about the outward opening doors. And of course check out their website at www.doorengineering.com

The benefits are numerous as you mentioned in your email. The most important feature for us, is not having to wait for a slow sectional door to open, which gets our vehicles out the door faster thus decreasing our response times. In addition, our vehicle operators can see the entire path the door travels from fully closed to fully open making it safer for our personnel.

Our previous Fire Chief came from a department that was very familiar with bi-fold doors and they had been using them for years. He handled the cost justification and was able to sell the idea to our County Administration and now they are as impressed with them as we are. From a maintenance standpoint, I can tell you our maintenance costs on these doors are almost nothing. There just aren't that many moving parts. The motors incorporate new technology variable frequency drive and the doors and hardware are all made from heavy duty robust materials. We are expecting our doors to outlast the 50 year lifespan of our buildings.

As I mentioned, we are located in Howard County Maryland which is about half way between Washington and Baltimore. We would love to have you come up so that we can show you and anyone you would like to bring, why we're so impressed with these doors. I've included my contact information. Please feel free to contact me if you think a road trip would be beneficial. Or just give me a call I'd be happy to assist you any way I can.

Kevin Henry, Captain
Bureau of Logistics Howard County Fire & Rescue 410-206-5479

Howard County (MD) Fire Stations w/Four-Fold Doors

10
DCFR

10

From: Laura Baker <Laura.Baker@tucsonaz.gov>
Sent: Friday, June 22, 2018 6:00 PM
To: Senter, Loy <SenterL@chesterfield.gov>
Subject: Fire Station Bi-Fold Doors

Loy,

Tucson Fire put in the bi-fold doors in our newest station-Fire Central.

1. What benefits have you realized from switching to these doors vs. overhead doors?

   BENEFITS-
   Speed of the doors opening
   Visual clearance by the drivers
   Reduced maintenance reduction
   CONS-
   Crush and pinch points of the doors
   Heavy and can crush things in the way
   Upfront cost is higher BUT the maintenance costs are lower

   Safety procedures and clearance of the doors is critical.
   I recall the death of a toddler by these doors in another City.

2. Do you have any financial analysis used in reaching the decision to switch to these doors that you could share with me?

   Unfortunately, I do not have any analysis readily available.

See below some comments from our Safety section:
On the Bi Fold doors, back in 2007 and 2008 TFD had a wave on Bay door strikes, the cost was large, which increased due to the age of some of the doors. The bi fold doors to my under standing we have not had ANY damage do to apparatus hitting them.

In 2010 Safety Identified a crush concern at station 1 and working with OPS to came up with some station visitor rules to open and lock doors open and killing the power as well as increased visual reminders and safe zone floor marking. I believe as we move forward in station design crush areas should be considered with air pockets about 24 inches to reduce these crush areas and continue the open and powered off policy.

Feel free to call if you have any questions.

Laura

Laura Baker
Assistant Chief
Tucson Fire Department
Fire Central: (520)837-7085
Cell: (520)275-6496
laura.baker@tucsonaz.gov

From: Downey, David (MDFR) <david.downey@miamidade.gov>
Sent: Wednesday, June 27, 2018 8:10 AM
To: Senter, Loy <SenterL@chesterfield.gov>
Cc: Sanders, Russ <RSanders@NFPA.org>
Subject: FW: Metro Request for Assistance: Fire Station Bi-Fold Doors

Loy;

We have started using these doors in all of our new or rebuilt stations. This is now the standard for MDFR. Currently in 5 stations and in 3 more being built right now. We did not do any official cost analysis but anecdotally, we have experienced ZERO accidents with these doors as compared to the same period of time (last 5 years) we have had 64 overhead doors struck, an average of almost 13/year.

DD

Dave Downey, MPA, CFO
Fire Chief
Miami - Dade Fire Rescue
(305) 984-0124

LOW MAINTENANCE CASE STUDY

Door Engineering's Four-Fold door systems require only minimal preventative maintenance (PM) to keep them performing year after year, including greasing the hinges and inspecting the operator arms. By comparison, sectional doors require constant maintenance and typically fail before anything is done to them. Failure of the high tension springs can lead to damage to equipment and apparatus, delays in response to an emergency, or worse, injury to personnel. The four-fold door is the solution to these issues.

"The Four-fold doors have been on Station 1 since 1995 when it opened and we have spent $2,528.53 on door maintenance and repair since that time."

"The doors have been in Station 3 since 2004 and we have incurred $790.48 in maintenance and repair in that time period."

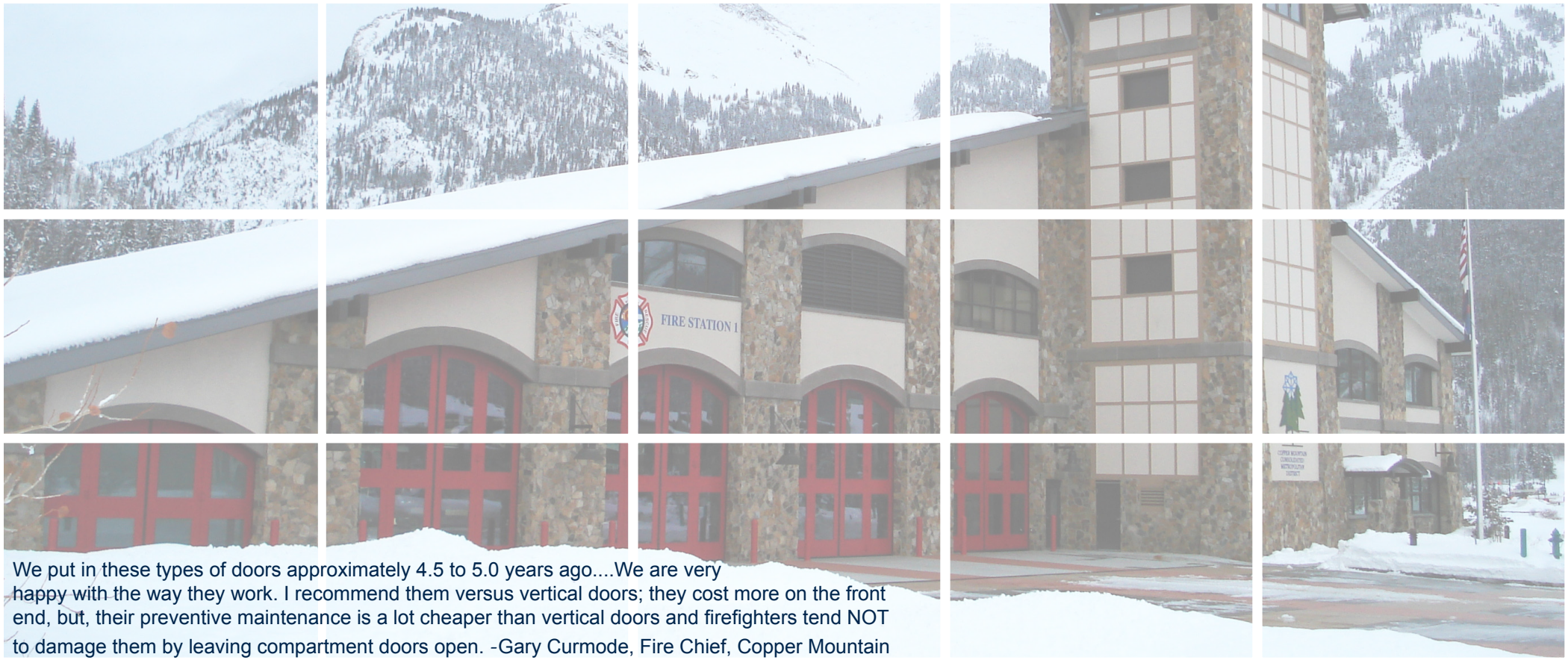
"The doors have been in Station 4 since 1999 and the amount of maintenance and repair for the doors has been $1209.67."

"The doors overall have been very durable and prompted us to come back and have them installed in our latest station project which is the relocation of Fire Station 2."

Curt Pronk,
Administrative Services Manager
City of Rochester, MN

Station 5

DOOR ENGINEERING AND MANUFACTURING



We put in these types of doors approximately 4.5 to 5.0 years ago....We are very happy with the way they work. I recommend them versus vertical doors; they cost more on the front end, but, their preventive maintenance is a lot cheaper than vertical doors and firefighters tend NOT to damage them by leaving compartment doors open. -Gary Curmode, Fire Chief, Copper Mountain Fire Dept, CO

FEATURES	FOUR-FOLD DOOR	SECTIONAL DOOR	WHAT IT MEANS FOR YOU
SPEED	6.5 seconds (at 16' wide)	15-20 seconds (at 14' tall)	FF-Door reduces response time & minimizes heating/cooling loss
OPENING/CLOSING MOVEMENT	Horizontal movement means door is always visible	Vertical movement causes blind spot for driver	FF-Door minimizes risk to door, equipment & personel
GLASS	1" inlsulated Low-E glass	1/4" single pane & 1/2" insulated glass	FF-Door minimizes heating & cooling loss when closed
HARDWARE	Designed & tested for over 1 million cycles	5-10 year use before replacement needed	FF-Door=$0 replacement maintenance parts Sectional Door= $500-$1000 every 5-10 years
SPRINGS	No Springs needed	Springs required for door operation	FF-Door=$0 and no risk of not being able to use the door, even in manual operation Sectional Door=$500-$1000 every 5-10 years. Spring failure can endanger equipment & personel, manual operation becomes impossible
MAINTENANCE	Grease hinges & inspect operators annually	Light weight parts & high tension springs require replacement or lead to failure	FF-Door annualy maintenance costs are siginicantly less and require considerably less time than a sectional door.

Space Limitations?

DOOR ENGINEERING AND MANUFACTURING

Opening to Your Standards.

INTRODUCING: FOUR-FOLD XT™

Door Engineering introduces their new Four-Fold XT™. Limited space in the apparatus bay can be concerning, but with Door Engineering's new inside-out design it is no longer an issue. The Four-Fold XT™ operator is interior mounted while the door panels fold to the exterior. This eliminates the bay space that is needed with the regular Four-Fold design.

FEATURES

The Four-Fold XT™ door system is still built with all the benefits of our standard Four-Fold door. The heavy-duty design and construction of our Four-Fold door enables it to function under high cycle and other severe conditions, which create chronic service and maintenance problems for the conventional door alternatives.

Now You Have OPTIONS

Opening horizontally, and in less than seven seconds, means faster and safer utilization for your vehicles.

doorengineering.com

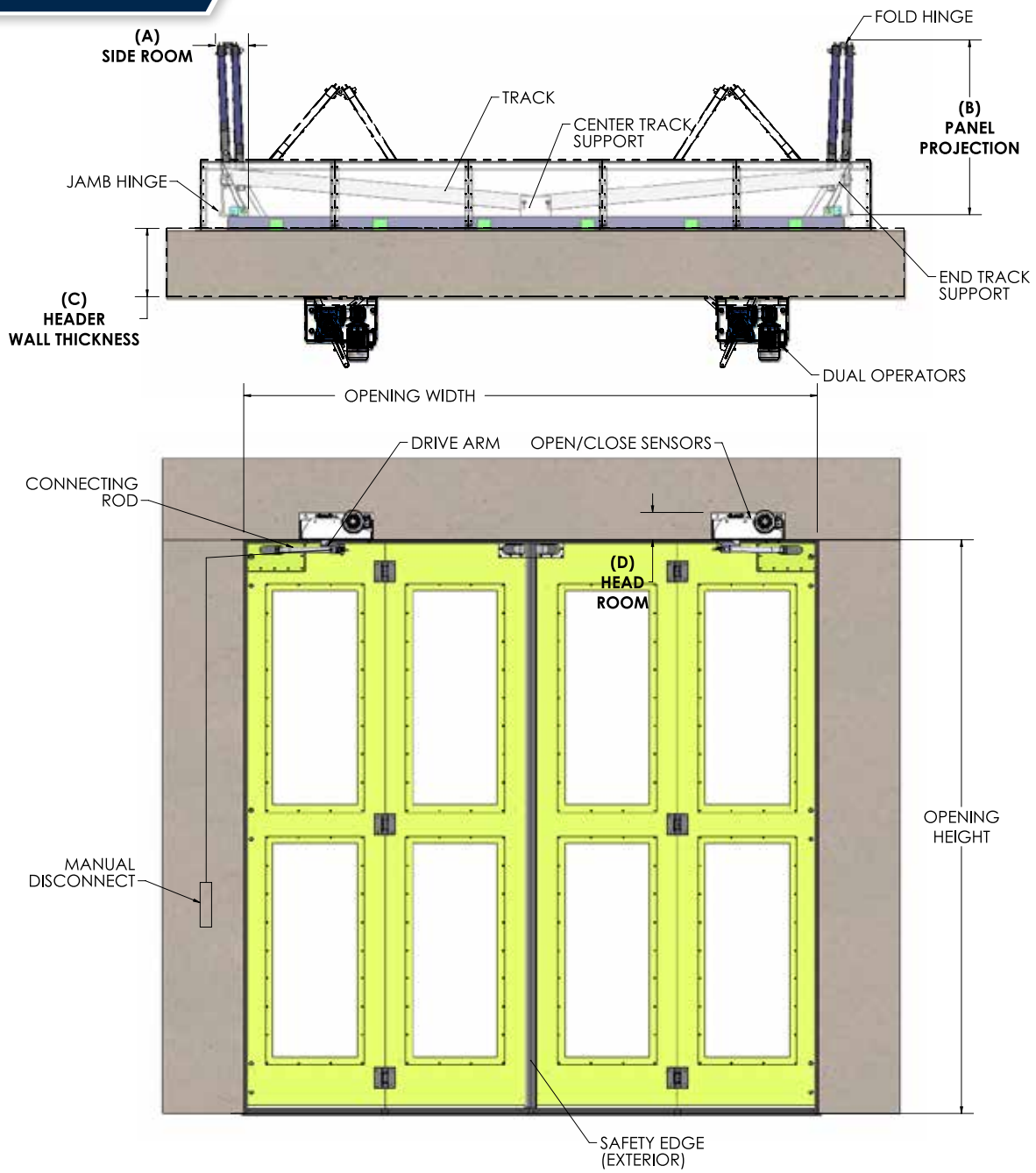
400 West Cherry Street | P.O. Box 5 | Kasota, Minnesota 56050
Ph (507) 931.6910 | TF (800) 959.1352 | F (507) 931.9318

DOOR ENGINEERING AND MANUFACTURING

Opening to Your Standards.

FOUR-FOLD XT™

PLAN VIEW



OPENING WIDTHS	APPROX. CLEARANCES				MAX TIME TO OPEN	MOTOR HP	OPERATOR STYLE
	A	B	C	D			
7'-6" to 10'-6"	12"	1/4 OPENING PLUS 12"	8"-20"	10"	6.6 sec	3/4	XT1
10'-6" to 16'-6"	12"		8"-20"	10"	10.6 sec	3/4	XT2
16'-6" to 20'-0"	12"		8"-20"	10"	13.2 sec	1	XT3

This layout is designed as a guide for required clearances for our typical Four-Fold Door Systems. Contact us to discuss the wide variety and options available for custom clearance requirements or nonstandard opening sizes. **PATENT PENDING.**

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Fire Station Door Performance -- Executive Summary

A Comparison of Four Fold Doors manufactured by Electric Power Door (EPD) With Other Conventional Doors

An Independent Study by a California Fire Department

Profile of EPD

EPD engineers its doors for high cycle applications. Users include DCFD, LA County FD, Minneapolis FD (20 stations), Glendale FD (AZ), Federal Reserve Depositories, Coronado PD, Twin Towers Jail, Metro-Rail, the US military, and mining operations in Chile (39 doors), Argentina (26 doors), and Alaska (30 doors). Other fire departments considering their use include: Chicago, Virginia Beach, and Ft. Lauderdale.

EPD History

The company was founded in Chicago in 1923 and has been in Minnesota since the 1930s. Its workforce of 45 boasts a variety of engineering degrees and patents, as well as an impressive average tenure of 15 years with EPD.

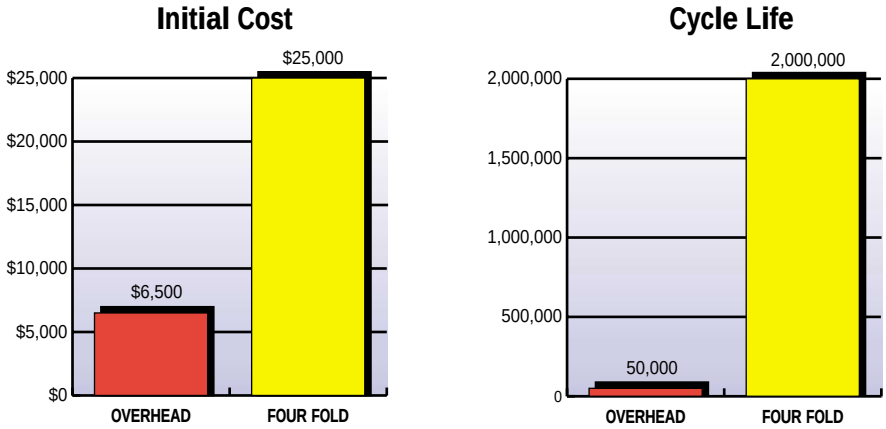
Recommended FD Specification

A 14' X 14' hydraulically operated four fold door powered by a 460 V, 3-phase current. Each panel would have 18" W X 48" H glazing, 1/4-inch thick, Standard UV-rating, located 4 feet from the bottom of the panel.

Specification Rationale

A hydraulic operator requires less limit-switches and possesses a 2 million-cycle rating. All components may be reached with a six-foot ladder vs. electric operator components located above the 14-foot opening. 3-phase current is ideal, if available, since it imposes the least wear on any electrical motor it supplies.

Overhead vs. Four Fold Door



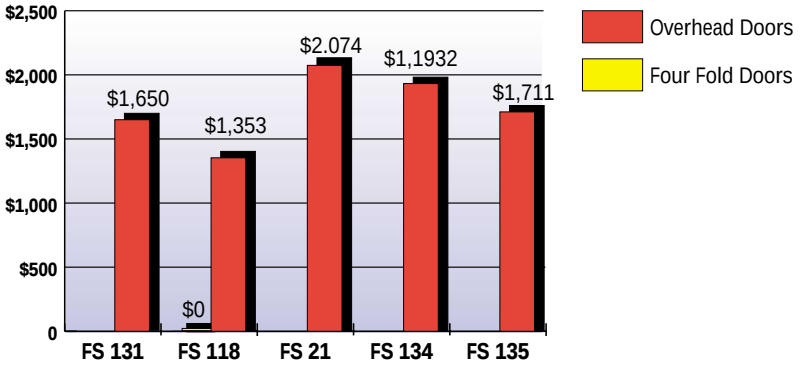
Current FS Location With EPD Doors

The current FS used in the comparison has six electrically operated four fold doors. The two captains emphatically state these doors are superior to sectional overheads. Reasons include: 7-second opening, safety of the door always being in sight because of its horizontal opening and closing, silence of operation, and ease of manual operation during loss of power. ***Note:*** *One accidental door closure on a truck resulted in NO damage to the steel framed and sheeted door.*

Current FS Location Door Costs

In FY 98 / 99, one roll-up door (utility area) and one sectional overhead door for emergency vehicles generated $1,353 in repairs and required electrical work from a C&M electrician. Meanwhile, the six four fold doors were trouble-free *(see bar chart).*

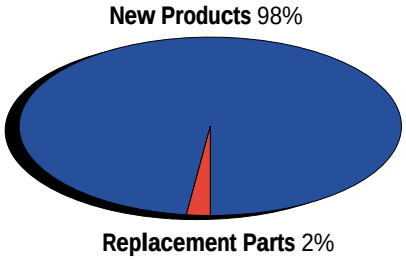
Apparatus Door Repair Costs FY 98 / 99: Overhead vs. Four Fold



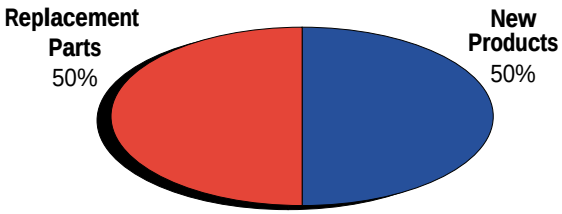
Conclusion

Four fold doors are engineered for high cycle applications i.e. fire service, bank depositories, and correctional facilities. Finally, one can deduce product quality by examining a door manufacturer's source of revenues *(see pie charts below).*

Source of Four Fold Door Revenues



Source of Sectional Overhead Door Revenues



FS Staff Contact With EPD

FS Staff has interfaced with EPD's headquarters and factory personnel to ensure our Department's transition from sectional overhead doors to four fold doors is effective.

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Contact: Electric Power Door
PO Box 126 • Hibbing, MN 55746-0126,
Call 800-346-5760 • E-mail: mail@electricpowerdoor.com.
Web site: www.electricpowerdoor.com.

Public Facility Security

Category: Public Safety

Department Lead: Public Safety

Type: Ongoing Project

Project Description, Benefit, Estimate, and Schedule

In the City of Falls Church government buildings, health and safety regulations are paramount to the well-being of the employees and the community members engaging in government/civic activities. Many hazards, risks and evolving threats are present in today's work environments, and it is the City's responsibility to keep their work groups and community members safe from these hazards. The current climate of high risk threats posed throughout the nation and internationally are highlighted each day.

This project will upgrade security measures across all city-owned public facilities. The intent is to create one centric system (Card Access, Alarms and Cameras) that can be monitored in the Public Safety Dispatch Center. City buildings included in the over all system are: Property Yard, Community Center, Aurora House, Cherry Hill Farm House, Cherry Hill Barn, Gage House, and Fire Station 6. Also included are the Library and City Hall whose facility security measures where financed under their respective CIP projects. Improvements to the system would include: 40 locking access control doorways, eight alarms (e.g., intrusion, panic and fire), and 81 interior and exterior cameras. Many security measures exist within the listed facilities; however, the centralization of all security measures would allow for much needed updates that would optimize the facilities' systems with a comprehensive, customized solution of cameras, alarms, and pass card systems all tied back to public safety; one system that makes employee work groups and buildings safe, productive, efficient. This overall security system will also optimize the response (time and type) of all public safety disciplines responding in an emergency event, potentially saving lives. Several of the existing systems within the eight buildings outside of City Hall are at the end of their useful life cycle.

Capital Funding Plan

Funding Source	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027-30	10-YR Total
Local (Debt)	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ 750,000
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total:	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ 750,000

Funding Notes:

**if no activity per City Charter (Section 6.19) in 3 years note as re-appropriation action*

Impact on Operating Costs

The conversion of all City buildings networked on one system will alleviate the expensive replacement of separate and antiquated life safety systems at a pressured cost in failure or in an emergency. Having a single, centralized system will also reduce costs to operate vs managing several discrete systems.

Conformity with Comprehensive Plan and Council Strategic Plan

Investment in City facilities meets the goals of Comprehensive Plan Chapter 8 "Community Facilities, Public Utilities and Government Services." Relevant goals include:
"Public services are an integral component of a healthy community structure. They support existing and future development and contribute to the health safety, education and welfare of citizens and businesses in the community."