Fire Department Operations In Transition

Fire Departments across the country are in transition. The three main reasons include challenges in:
- recruiting and retaining non-career firefighters
- achieving best practices for firefighter health and safety
- accommodating modern firefighting equipment, training, and operations

Golden Valley’s fire stations were established to support a paid on-call staffing structure, which is no longer sustainable in today’s culture. Fire departments nationwide are finding it more and more difficult to recruit and retain paid on-call firefighters due to increased family and job obligations. This is also making it more difficult to respond to fire calls within Industry response-time standards.

As a result, suburban cities are moving to the more modern duty crew staffing model, which creates part-time jobs with predictable scheduled shifts and allows firefighters to use their training on a regular basis, so retention increases.

The 2016 study concluded Golden Valley needs to move from a three-station paid on-call staffing model to a two-station duty crew staffing model. To accommodate this, the City needs facilities to house firefighters 24 hours a day.

Firefighting Equipment, Training, & Operations

Facilities must accommodate contemporary firefighting equipment and enable best firefighting practices. This includes:
- drive-through truck bays
- space to avoid conflicts with large vehicles and pedestrians
- a protected space for firefighters to dress for calls
- equitable facilities for male and female staff
- improved spaces for maintenance, hands-on training, and physical fitness training

GVFD By The Numbers

<table>
<thead>
<tr>
<th>Active Paid-On-Call Firefighters</th>
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Firefighter Recruitment & Retention

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Firefighter Health & Safety

All fires produce toxic smoke and debris from burning materials. Exposure from the field can continue when contaminated gear and equipment are brought back to the station. Firefighters are also exposed to diesel engine exhaust in their station, which can travel to where firefighters eat, train, and sleep.

Firefighters have a 9 percent higher risk than the general population of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general population, including:
- 32 percent higher brain cancer risk
- 39 percent higher skin cancer risk
- 102 percent higher testicular cancer risk
- 62 percent higher esophageal cancer risk

Fire Stations planned with distinct hazard zones reduce exposure to cancer-causing chemicals:

1. Hot Zones: Areas likely to be contaminated with diesel exhaust or fireground carcinogens (apparatus bays, firefighter turnout gear storage, decontamination areas)
2. Warm Zones: Airlocks between Hot and Cool Zones, with facilities for quick cleaning of hands and shoes likely to have incidental contamination from passing through the Hot Zone
3. Cool Zones: Firefighter living areas (kitchen, bathrooms, offices, sleeping quarters) with separate ventilation from other zones
Fire Facilities Project

Fire Department Operations In Transition

Golden Valley Fire Department

Station #1
1966/1995 expansion

Station #2
1979

Station #3
1979

Firefighter turnout gear stored in apparatus bay; little room for turnout

Apparatus bay undersized for current vehicle sizes and operating clearances

Firefighter day room and meeting room share one space; also used for elections/voting

Drive-through apparatus bay with exhaust removal systems and natural daylighting

Dedicated locker area for firefighter turnout gear

Administrative office space with sufficient work areas, daylight and views

Day room and kitchen with features to support healthy eating and camaraderie-building

Training opportunities integrated into apparatus bay architecture

Well-designed sleeping quarters provide privacy and high-quality sleep for 24/7 resiliency

Contemporary Fire Stations For Duty Crew Service

Intentional design techniques can address these key issues at their source, with approaches to overall design, building systems, and material and furnishings.

- **Contaminant Management**: Create boundaries between each zone and design mechanical systems for separate service to each zone.
- **Sleep Deprivation**: Provide privacy, dimmable lighting and blackout shades, individual control of temperature and air speed, and acoustic separation from other spaces.
- **Building Personal Connections**: Encourage socialization with communal spaces, and visibly celebrate and honor a department’s history and sacrifices to establish a common sense of identity.

Fire station design that supports effective and efficient operations while also prioritizing firefighter health and wellness considers the following key issues.

- **Contaminant Management**: Building plan zoning to restrict movement of contaminants within the building reduces firefighter exposure to carcinogens.
- **Sleep Deprivation**: Sleep deprivation and sleep disorders impact firefighter cognition, behavior, motor function, reaction time, long-term health, and readiness and preparedness to do their jobs.
- **Building Personal Connections**: Because of trauma experienced on the job, first responders are at an elevated risk for post traumatic stress and suicide.

Visit the City’s website for more information

Example Fire Station Floor Plan with colored zones for contamination management and function

Components Of Best-Practice Fire Station Planning & Design
City Facilities Project

Fire Department Operations In Transition

Across the Twin Cities metro area, fire departments are transitioning from paid on-call service to 24/7 duty crew and full-time operations.

Facilitating the Operational Transition

To ensure the Fire Department’s continuity and resiliency, Golden Valley has already committed to the operational transition to a duty crew model. This change will include:

• carrying forward the 2022 implementation of five-day-a-week duty crew staffing by core team members, complementing existing paid-on-call staff out of all three stations
• completing the Fire Station Location Analysis Project
• project funding and planning for the new fire station
• completing a design and construction project for the new fire station with facilities to support duty crew operations
• project funding and planning for Fire Station 1 improvements with facilities to support duty crew operations
• complete operational transition to duty crew model

Facility Improvements and Investments

The map at right represents an approximation of facility investments by Golden Valley neighboring cities in their fire stations. Project quantities listed are a preliminary approximation of new construction buildings and/or major renovations, typically in service of best practice contemporary fire station planning and to support operational transitions to duty crew service.

Visit the City’s website for more information
City Facilities Project

Fire Department Operations In Transition

The National Fire Protection Association (NFPA) identifies a response time goal of 5 minutes and 20-seconds for fire departments to reach 90 percent of reported incidents. This includes a 4 minute travel time, and 80 seconds of turnout time.

- In a paid on-call model, response times are measured from the time firefighters leave the station but do not include the additional time it takes for firefighters to arrive at the station from their homes or work places. For Golden Valley, that adds approximately 4 minutes.

- Response time analyses for Golden Valley demonstrate a two-station model, with locations designed to cover the city from east to west and north to south, protect 8.6 square miles of the city, and reach 88.5 percent of the city's historic calls within the NFPA's 4 minute travel time.

Response Time Maps

This set of maps uses NFPA guidelines to map Fire Department response time coverage of Golden Valley based on various quantities of stations.

- The City does not have enough firefighters to operate 24/7 duty crews out of three stations.
- It is not financially responsible to build three new stations with the required overnight accommodations, when equivalent or better coverage of the city can be achieved with two well-positioned stations.

- This model protects 8.5 square miles and reaches 90.2 percent of the historic calls analyzed within a 4-minute travel time, but response-from-home (paid on-call model) adds 4 minutes+ to overall response.

- This model protects 8.6 square miles and reaches 88.5 percent of the historic calls analyzed within a 4-minute travel time. With a 24/7 duty crew model, this actually improves coverage of the city without requiring any response-from-home time.

- This model protects the smallest amount of the city, 5.07 square miles and reaching only 58.9 percent of calls, with almost no coverage east of Highway 100. While this location is valuable for a centralized Public Safety building, it cannot provide a consistent level of service to all properties across the city.

- This model protects only 6.1 square miles and reaches only 69 percent of the city within a 4-minute travel time. This demonstrates that even the most ideally-located single station could not provide the same or sufficient coverage of the city as a two-station model.
Development Corridor For Two-Station Model

This project’s core focus is a location analysis for the recommended second station. To most fully complement the existing location of Fire Station 1, a new second station should be located to:

- provide maximized coverage of the city’s residential and commercial properties
- use Highway 100 and key feeder roads, such as Duluth St, Glenwood Ave, and Douglas Dr, for the most comprehensive access on that side of the city
- be located to provide NFPA-compliant response times for as much of the city as possible, in conjunction with Fire Station 1

The proposed development corridor for the new fire station (shown in red) runs parallel to Highway 100, extending a half a mile E and W of the highway, from Douglas Dr N to Noble Ave N. A station located in this zone would provide complementary coverage of the E, NE, and SE parts of the city, as Fire Station 1’s coverage encompasses central Golden Valley as well as the NW, W and S portions of the city.

The City Council has stated a fire station should not be located in Scheid Park. That area is excluded from this study and from future planning.

Proposed Site Selection Criteria

This proposed site selection criteria identifies critical attributes of potential sites, and allows for objective scoring and comparison of potential locations

What selection factors would you add? Which would you prioritize?

<table>
<thead>
<tr>
<th>CORE VALUES</th>
<th>CRITERIA</th>
<th>CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>1.1</td>
<td>Is the site located to maximize response to the E side of the city?</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>Is the site well-connected to allow for access to multiple areas of the city?</td>
</tr>
<tr>
<td>Buidable Land</td>
<td>2.0</td>
<td>Does the site have sufficient area for the building, parking, vehicle access, and best-practice pull-through layout?</td>
</tr>
<tr>
<td>Cost</td>
<td>3.1</td>
<td>What costs are associated with this site: Land or building purchase? Land or building demolition?</td>
</tr>
<tr>
<td></td>
<td>3.2</td>
<td>Would site features like difficult soils increase construction costs?</td>
</tr>
<tr>
<td>Impact</td>
<td>4.1</td>
<td>Would the site offer visual prominence for a municipal facility?</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>What impacts would the station have in a particular neighborhood?</td>
</tr>
<tr>
<td>Traffic</td>
<td>5.0</td>
<td>Are site traffic patterns, management, and volume safe for integration of Fire Department response?</td>
</tr>
<tr>
<td>Sustainability</td>
<td>6.0</td>
<td>Does the site offer useful attributes for passive design, stormwater management, and site reuse?</td>
</tr>
</tbody>
</table>
City Facilities Project

Fire Department Operations In Transition

Fire Truck Comparison

<table>
<thead>
<tr>
<th>Year</th>
<th>Model</th>
<th>Height</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>Ladder Truck</td>
<td>11' 2&quot;</td>
<td>30' 3&quot;</td>
<td>37,180 lbs</td>
</tr>
<tr>
<td>2018</td>
<td>Ladder 11</td>
<td>11' 9.5&quot;</td>
<td>39' 5&quot;</td>
<td>57,500 lbs</td>
</tr>
</tbody>
</table>

4.8% Taller  
30% Longer  
54% Heavier

Fire Station 1 (Public Safety—1966 / 1995)

Fire Station 2 (1979)

Fire Station 3 (1979)