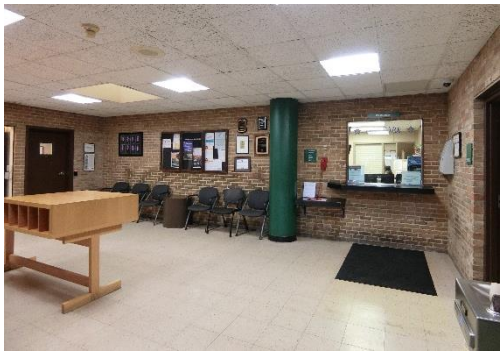
FGM ARCHITECTS

VILLAGE OF OAK PARK




OAK PARK POLICE DEPARTMENT

SPACE NEEDS ASSESSMENT

SUBMITTED TO:
Village of Oak Park
123 Madison Street
Oak Park, IL 60302

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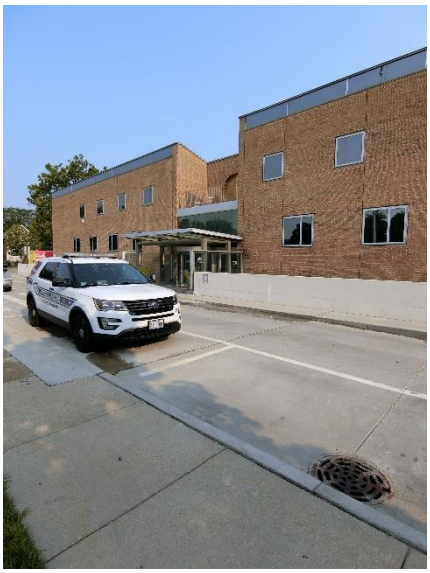


Public entry

View looking North East

Introduction

The Village of Oak Park commissioned FGM Architects to prepare a Space Needs Analysis for the Oak Park Police Department. The goal of this study is to provide the Village with information on how to best solve its facility needs for the next 30 years.

During the course of this study, it became clear that the existing building is working against the Police Department. Not only is the building too small, but the design of the building is negatively affecting the Police Department's operations.

The space needs analysis finds that 78,112 sq. ft. of space is necessary for the Police Department to operate effectively. The existing police station is only 35,688 sq.ft. This means the Department is currently operating with a 42,424 sq.ft. deficit. Increasing the square footage of the building by 119% will provide the optimum amount of space for the Department and includes provisions for long-term growth.

The issues of space and police operations will be discussed further following this section and in the report.

Summary of Needs Analysis

During the course of the study, FGM observed how staff members operate within in the building to witness first-hand how dysfunctional the building is for the Department. It is unfortunate how the Police Department has had to adapt their procedures to work around building deficiencies, including safety and security issues. Many of the issues identified have a direct correlation with the amount of space required.

Many factors contribute to the need for additional space and the major points are as follows:

- Police operations have changed since the building was constructed in 1975.
- Many spaces in the police station are inadequate and require additional space.
- Meeting accessibility requirements will require additional space.

Police Operations Have Changed

Policing has changed dramatically since the building was constructed in 1975. These changes include statutory (legal), technological, and procedural changes, which require additional space. Some examples of spaces affected by these changes include:

View looking South West

View looking South West

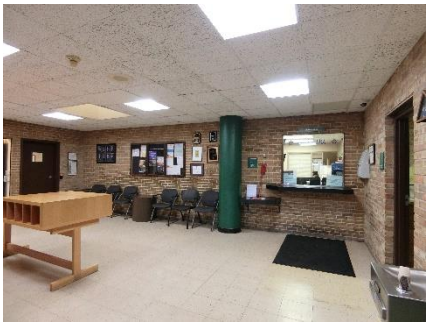
View looking South

- **Arrest Procedures:** When the Police Station Lockup area was designed in 1975, arrest procedures were much simpler and not as much paperwork was required. Over time, as more information was required during an arrest, more space was needed to process an arrestee's paperwork.
- **Evidence Processing (Identification):** When the Police Station was designed, there was no dedicated space for analysis of evidence. The current evidence processing lab was created in a former Photo Dark Room and is too small.
- **Evidence and Property Storage:** Statutory changes have greatly increased the length of time that evidence must be kept; in some cases, evidence is now required to be kept forever.
- **Computer Forensics:** In 1975, computer/cybercrime was unheard of. The current space, located in Investigations, is shared with other functions and is extremely small, with no additional space for emerging technology.
- **Training Requirements:** The amount of mandatory training required of police officers is increasing. Training spaces need to provide greater flexibility for different types of training programs, including classroom, defensive tactics, and scenario-based training.
- **Safety and Security:** The importance of building safety and security has greatly increased since the building was constructed, especially with recent active shooter incidents occurring within public buildings. Modern police stations are designed with multiple levels of security depending on the security requirements. For example, the lobby areas are very public, and the evidence storage is very secure.

  There are many safety and security issues that affect both officers and arrestees illustrated throughout this report. Examples include:

  - The access into the booking room from the sally port has steps, which can be dangerous for both officers and arrestees, especially if the arrestee is intoxicated.
  - Cells are not designed with anti-ligature (hanging) doors and fixtures.
  - Officers take prisoners outside of the lockup area to process them. The major flaw of doing this is that it is located outside of the lockup area. If a detainee were to escape from an officer's custody, they can access many other areas of the Police Station, creating a potentially dangerous situation.

Main entrance to Police Department



Police lobby and front desk

Police lobby and front desk

See Section 4 on beginning on page 21 and Section 6 on page 50 for more information on safety and security issues.

Many of the original spaces in the police station are now inadequate and require additional space.

Some examples are as follows:

- **Sally Port:** A sally port is a secure garage used for safe transfer of detainees from a vehicle to the lockup area. The current sally port does not easily allow SUV patrol vehicles to maneuver into it and there is not enough clearance ambulance. If a detainee needs to be transferred to an ambulance, they must be carried up the ramp as there is the elevator cannot accommodate a stretcher.
- **Booking Room:** This space was designed at a time when ink fingerprints and Polaroid Cameras for mugshots were the norm. Now, the Police Department uses electronic fingerprinting and digital photography for mugshots, which are entered into the Department of Justice database.
- **Locker Rooms:** Since the building was constructed, the amount of gear issued to police officers has increased. Lockers now must store a multitude of items, including training manuals, bulletproof vests, specialized protective equipment, and weapons. This has necessitated a need for larger lockers.

Accessibility Requirements have changed

- The existing building was designed at a time when accessibility was not a significant concern. Laws governing the accessibility requirements have since been enacted, including the Illinois Accessibility Code, which has been in effect since 1997, and the Americans with Disabilities Act (ADA) adopted in 1990 (with subsequent revisions). These laws require more space for accessible routes, (entries, corridors and stairways) workspaces, and support spaces (toilet and locker rooms).

Our analysis shows that even if enough space existed in each of the functional areas, the floor plans of the existing building would still need to be revised to provide a building that will meet the needs of the Police Department.

Parking Requirements

Peak demand for the Police Department is during the afternoon shift change, between 2:00 pm and 4:00 pm. At this time parking is at a premium at the Village Hall and Police Station and street parking is utilized throughout the neighborhood. If either the Village Hall or the Police Department hosts a training class or

Evidence Processing Room

community function during this time, parking issues are exacerbated.

Parking at the existing building is located is several areas. Total off-street parking available for the Village Hall and Police Station is 154 spaces. There are also 8 staff parking spaces in the lower level parking garage and 3 spaces reserved for arrest processing. Therefore, the total off-street parking available is 158 spaces.

During peak demand, the total parking required is 288 parking spaces. Total parking requirements include:

- 112 spaces for Police Department vehicles and staff
- 121 spaces for Village Hall vehicles and staff
- 55 parking spaces for public parking (visitors)

Police Department Growth Potential

The Police Department has identified potential future staff growth of 4-6 sworn officers, and 1-2 civilian positions. Staff growth would occur for a number of reasons, such as an increase in programs or responsibilities undertaken by the Department, an increase in demand for services, changing types of crimes, or an increase in population which increases the calls for service. See page 20 for additional information regarding potential growth.

Evidence Processing Room

See Section 4 on page 20 for additional information regarding the space needs requirements of the Oak Park Police Department.

Project Goals

The primary goal of this study is to provide the Village with options on how to solve the space needs requirements for the Police Department, which will meet the Village's needs long term (30 years +).

See Section 3 on page 16 for additional information regarding goals and questions the Village wanted addressed in the study.

Sally Port

Methodology of the Study Process

Needs Analysis

FGM obtained information for this study through information provided and through a series of interviews and discussions with staff that took place over seven days. The interviews consisted of meetings with individuals and groups representing all divisions and shifts of the Police Department and Village staff to obtain direct feedback from the users and staff responsible for maintaining the facility. FGM toured the existing building and observed how staff members operate within it to gain further insight into operational

Video Computer Room

issues and space needs requirements. See Section 2 beginning on page 13 for additional information.

All information was gathered and then analyzed to determine the Police Department's space needs requirements. The analysis was then summarized into a projection of space requirements called a Program Statement. The Program Statements located in Section 4 of this report on page 33, are the final product of the space needs analysis portion of the study.

While this study was performed in a very collaborative manner with staff members, FGM consistently reviewed space requests and operating assumptions to ensure that the recommendations reflect the true needs of the Department.

Analysis of Existing Police Station

FGM's team, including architects, structural, mechanical, electrical and plumbing engineers, and security consultants reviewed the existing drawings and conducted field surveys of existing building to determine the overall general condition. The field surveys were conducted in conjunction with Village Facilities Maintenance Staff who were familiar with the building and provided valuable insight into maintenance requirements and issues.

Video Computer Room

History

The existing 76,506 sq.ft. Oak Park Civic Center is located at 123 Madison Street in Oak Park and was designed by Harry Weese & Associates. The Police Department is in the basement of the Civic Center and occupies 35,688 square feet. The timeline for the project was as follows:

Design of the Project	1973
Construction	1974
Construction Completion	1975

In 2014, the Civic Center was added to the National Register of Historic Places

Booking Room

Since the building was constructed, minor improvements have been made to the building in an attempt to accommodate the Police Department's operational changes. At this time, the existing facility is less than ideal in terms of interior space, work flow, parking, and safety and security.

See Section 4 beginning on page 21 for additional information.

Roll Call Room

Reception

Staff Break Area/Gun Cleaning

Existing Condition Analysis

As part of this study, a review of the building's current condition identified many specific issues that need to be addressed.

1. There are numerous accessibility issues. Since the building was constructed, accessibility requirements have changed with the Americans with Disabilities Act and the Illinois Accessibility Code. The accessibility guidelines mandate that all public facilities in the State of Illinois are to be designed, constructed or altered to assure equal accessibility to all members of society including visitors, vendors, and other users, employees, and even detainees and persons under arrest. The laws are applicable to police departments as there may be civilian employees with a disability or sworn staff on light duty with a temporary disability

   If any type of building renovation were to occur, accessibility violations would need to be addressed. The violations range from minor issues to larger problems that would require significant renovation work.

2. Building code issues observed include issues related to fire rated doors, which have been modified or removed since construction, fire ratings of storage rooms, and lack of fire suppression systems.

3. The mechanical systems have had some major equipment upgrades, but the overall design of the system is not energy efficient by today's standards. It was noted that several parts of the Police Department were noticeably devoid of air movement resulting in uncomfortable spaces. This is a common issue within basement spaces. Without external cooling or heat gain sources, such as exterior walls in winter, or windows in summer, the spaces tend to be neutral in temperature and there is little need for the HVAC system to heat or cool. Therefore, the ventilation system does not operate, and the air becomes stagnant. Modern systems maintain a fixed amount of air circulation regardless of heating or cooling need and provide air movement without the use of space mounted oscillating fans.

4. Domestic Plumbing Systems have been recently renovated. The plumbing fixtures are newer and meet current code requirements. The condition of the main hot and cold-water lines are unknown, but are likely galvanized pipe due to the age of the building. Over time the pipes deteriorate. If the main lines have never been replaced, they will likely need replacement in the near future.

5. Electrical systems appear to be in fair condition for the age of the building, but some systems are nearing end of expected

Women's Locker Room

service life. The electrical service is overdue for routine maintenance to be performed on the switchboard and all panel boards. The lighting fixtures and system throughout the facility are of varying age, condition, and type. The average lighting fixture is in fair condition. A lighting upgrade was performed in 2011, which replaced much of the older lighting with newer, indirect fluorescent troffer fixtures.

6. The structural assessment identified the condition of the parking structure was good. The condition of the basement structure of the building is in very good condition. The few items noted above are not structurally significant.

If all of the deficiencies identified in the existing condition analysis were corrected, the Police Department would still have a building that is too small and does not function in a manner that will support the needs Department now or in the future.

Evidence Packaging

For more detailed information on the condition of the existing building, including recommendations and costs, see Section 6 beginning on page 50.

Potential Solutions

Prior to developing actual solutions to solve the space needs issues of the Police Department, it helps to identify what the potential options are.

Potential Options

1. Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.
2. Build a new police station somewhere else in the Village.
3. Renovate the existing basement areas occupied by the Police Department.
4. Keep the existing building as is with the understanding that this will not correct any of the space or operational deficiencies identified.

Investigations

Initial concepts were developed and reviewed with the project team. To develop the final concept, FGM worked with Village and Police Department staff and utilized feedback from the initial conceptual solutions to refine functional layouts and site efficiencies

For additional information, see Sections 7 on beginning on page 78 and 8 beginning on page 98.

North Hallway

East Hallway

South Hallway

Project Budgets

As part of this study, FGM has provided conceptual budgets to implement a project.

Costs are based on a quality municipal structure that will be serviceable for 30+ years assuming an appearance and use of materials that are complimentary to other municipal facilities in Oak Park. Also included are costs to implement green building initiatives to achieve a basic level of United States Green Building Council LEED Certification.

Costs are based on a spring/summer 2020 construction start. Budgets will need to be escalated for inflation as required annually after that time frame. Cost ranges have been provided as design work is no actual design work has been performed.

Project Budgets are located in Section 8 on page 106.

Recommendations

Only two of the options discussed in Section 8, beginning on page 99, will meet the long-term needs of the Police Department:

Option 1 Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.
This option assumes that 16,382 sq. ft. of the existing police station will be renovated and a 64,111 sq.ft. addition will be constructed on the existing site to meet the space needs requirements of the Police Department.

This solution takes advantage of existing space and renovates it to correct accessibility, safety and security concerns, heating and cooling issues, and other items identified in Section 6. By taking advantage of the existing space, the size of the addition can be reduced, which will reduce both land requirements and costs.

This option will require a parking deck to keep the parking situation status quo, with a significant amount of visitor and staff parking on the adjacent residential streets.

Option 2 Build a New Police Station
This option assumes a new police station on a new site with all required areas together. This will provide the most functional police station, but it is also the costliest.

An adequately sized parcel of land will need to be provided. If a three-level building is assumed, a building of this size will require a site of 3.44 acres. For reference, the existing Village Hall and Police

Station site is 3.6 acres.

This study is to be utilized as a starting point and is intended to provide the Village with the necessary information to make an informed decision on which direction should be taken to address the space needs issues of the Police Department.

Once the space needs are approved and the Village is ready to move forward, FGM Architects is prepared to assist the Village of Oak Park with the next steps.

SECTION 2
PROJECT UNDERSTANDING AND METHODOLOGY

Overview of Study Process

For over 25 years, FGM Architects has provided consulting and architectural design services to municipalities for public safety projects and has worked on more than 150 police station projects. FGM brings a vast amount of knowledge and understanding to this project through previous experience but understands that each Village has its own unique challenges and goals. Therefore, there is no cookie-cutter project or client and we must work with Police Department staff members to understand their operational issues.

The goal of this study is to provide the Village with information on how to best solve the Police Department's facility needs long term (30 years+). The existing police station is located in the basement of the Oak Park Civic Center at 123 Madison Street and was originally constructed in1975. Presently, there are numerous operational, space, safety and security, and system issues. Since the building was constructed, only minor improvements have been made in an attempt to accommodate the changing needs of the Police Department. At this time, the building is negatively affecting the Police Department's operations.

The Village is pursuing this study because it recognizes that there are many operational issues caused by the building. In addition, many of the building systems are approaching their "end of life," and the frequency of large cost maintenance items and equipment replacements is increasing due to the building's age. Therefore, instead of just making the necessary repairs, it makes sense to review the Police Department's overall facility needs so a holistic solution can be determined.

Analysis of Space Needs

FGM obtained information for this study through data and documents provided and through a series of interviews and discussions with staff. The information provided included:

General Information

- Existing Building Drawings

Police Department Information

- Staff Organization and Functional Organization Charts
- Police Department General Orders
- Police Department Vehicle List
- Oak Park Village Hall Property Condition Assessment prepared by Wiss, Janney, Elstner Associates, Inc., dated November 9, 2015
- IAQ / Exchange Rate Testing Report for the Shooting Range, prepared by Midwest Environmental Consulting Services, Inc., dated February 28, 2017

- Lead Air and Surface Wipe Sampling Report for the Shooting Range, prepared by Midwest Environmental Consulting Services, Inc., dated March 13, 2017

The interviews consisted of meetings with individuals and groups representing the Police Department and Village that took place over seven days and included the following:

Police Department
- Police Chief
- Executive Secretary
- Internal Affairs Sergeant
- Deputy Chief, Support
- Records Supervisor
- Records Clerks
- Investigations Commander
- Investigation Sergeants
- Investigators
- Crime Analyst
- Operations Commander (interim)
- Community Policing Sergeant and Officers
- Budget & Revenue Analyst / HR
- Training / Quartermaster
- Evidence Custodian
- Evidence Technicians
- Deputy Chief, Field (interim)
- Patrol Commanders
- Patrol Sergeants
- Patrol Officers (all shifts)
- Community Service Officers
- Parking Enforcement
- Firearms Range Manager
- Historian

Village Departments
- Emergency Management Coordinator
- Fleet Manager
- Information Technology

FGM toured the existing building and observed how staff members operate within it to gain further insight into operational issues and space needs requirements.

All information was gathered and then analyzed to determine the Police Department's space needs requirements. The analysis was then summarized into a projection of space requirements called a Program Statement. The Program Statements, located in Section 4

of this report, are the final product of the needs analysis portion of the study.

While this study was performed in a very collaborative manner with staff members, FGM consistently reviewed space requests and operating assumptions to ensure that the recommended space size allotments reflect accurate needs.

Analysis of Existing Police Station

FGM's team, including architects, structural, mechanical, electrical, and plumbing engineers reviewed the existing drawings and conducted field surveys of the existing building to determine the overall general condition. The field surveys were conducted in conjunction with Village Facilities Maintenance Staff, who were familiar with the building and provided valuable insight into maintenance requirements and issues.

SECTION 3
PROJECT GOALS AND QUESTIONS TO BE ANSWERED

Project Goals

For every project, it is important to establish clear goals which will be utilized to guide the direction of the solutions and decisions throughout the project. The following goals were identified by Village and Police Department staff.

The primary goal of this study is to provide the Village with options on how to solve the space needs requirements for the Police Department, which will meet the Village's needs long term (30 years +). Other goals established by the Village include:

1. Clearly present options to the Village. Options should include renovation with an addition and new construction.
2. Understand that the Police Station is open 24 hours and needs to be welcoming for all.
3. Address safety and security concerns for staff, visitors, and detainees.
4. Plan for the Police Station to be a safe haven for child drop off/surrenders.
5. Use the Police Department's guiding principles and core values to guide recommendations made in the study.
6. Provide community space and space for outside agency cooperation, such as in the Metra/Union Pacific train station and Cook County State's Attorney. Currently, the Department works with the Chicago Regional Computer Forensics Laboratory and the Internet Crimes Against Children Task Force.
7. Plan for sustainability as it is important to the Village.
8. Provide spaces for officer wellness, including fitness, break/lunch rooms, and first aid/safe rooms.
9. Provide a firing range that permits varied training. This is a space priority.
10. Technology needs to be flexible to accommodate present and future needs.
11. Provide proper evidence storage and evidence processing facilities, including vehicle processing.
12. Addressing computer crimes need to be at the forefront of future spaces required.

Questions to be Answered

To allow for an informed decision-making process, it is important to identify the questions the Village requires answers to as part of this study. The following questions were identified from meetings with the Village. A brief answer to each question has been provided in *red italic* type.

- How can a facility be made efficient and effective for police use?

  Our analysis finds that 78,112 sq. ft. of space is necessary for the Oak Park Police Department to operate effectively. The existing police station is only 35,688 sq.ft. The existing facility is missing many functional areas common to modern police stations.

  It is not possible to make the existing police station efficient and effective without providing the Police Department additional space.

- Which Police Station spaces are sub-standard, and which are good in the existing police station?

  Unfortunately, a majority of the police station spaces are sub-standard and include:

  - *Detainee processing and lock up.*
  - *Evidence processing*
  - *Evidence storage*
  - *Records work areas*
  - *Investigations work areas*
  - *Training spaces such as the firing range*
  - *Locker rooms*

  See Sections 4 and 6 for additional information.

  The Police Station is also sub-standard because it is completely devoid of natural light with the exception of a storage room. The absence of natural light affects an employee's performance and feeling of well-being. Many Police Department staff members believe the building is negatively affecting their health.

  The spaces that are acceptable include the server room which is adequate in size and systems that support it, such as HVAC.

- What are the trends in policing and how do they affect space?

  Policing has been changing rapidly and some of the most current trends include:

  - *The increase in computer and cybercrime. Police departments have responded by increasing their computer forensics capabilities which requires additional secure space due the evidentiary nature of the work.*

- *Social service needs have increased. Historically, these services have been provided on the County or State level but have been relegated to municipalities, who for the most part have assigned this to the Police Department. This means that counseling and referral services are being overseen by the Department and often, space is being provided for social and mental health workers, clergy, and counselors.*
- *State mandated training has increased for police officers. Training is now required on an annual, bi-annual and tri-annual basis and includes annual use of force and scenario-based training. Training spaces are needed to accommodate the different types of training programs, including classroom, defensive tactics, and scenario-based training.*
- *Scientific evidence is increasing in importance for prosecuting offenders. Eye-witness testimony is easier to refute, therefore the need for scientific analysis of evidence continues to increase. Processing of evidence becomes more sophisticated and significantly more space is required.*
- *The use of mobile video devices, including cell phones, body cameras, in-car cameras, and surveillance video cameras, is increasing exponentially. This has caused a strain on departments as they work to process digital media to respond to attorney, court, and FOIA requests. Many police departments have found it necessary to add staff just to process digital media.*
- *Community relations has become very important to police departments to support a positive relationship with the constituents and entities they serve. Police departments have been augmenting their staff with social media and communications experts.*

See Section 4, beginning on page 21 for additional information.

- What are potential uses for the basement of the Civic Center if the Police Department is relocated?

  The project team discussed potential uses for the basement. Ideas including adding training space for IT, storage for village departments, and even having West Suburban Consolidated Dispatch Center (WSCDC) relocate.

  - *Being in the basement without any natural light is a deterrent for staff workspaces.*

- *Storage use is a strong possibility.*
- *Re-purposing the space for training functions is a possibility as training functions are of limited duration and having natural light is not as important.*
- *Use the space as part of a comprehensive solution to address the space needs as part of the police department. Renovations will be required to correct deficiencies.*
- *A meeting with members of WSCDC, including the Village Administrators from Forest Park, River Forest and the Village Manager from Oak Park concluded that the space is not useable for WSCDC for numerous reasons, which included the space being in the basement.*

- What will the cost of necessary building repairs and maintenance be to keep the building "as is"?

  If the Village elects to only address the necessary building repairs, the Police Department would still have a building that is too small and does not function in a manner that supports the needs of the Department now or in the future.

  The study identifies the costs will be between $5,669,100 to $8,119,000 to correct deficiencies. See Section 6, beginning on page 50, for additional information regarding existing building conditions and items that require correction.

- How much will potential solutions cost?

  There are two basic options that will meet the long-term needs of the Police Department:

  Option 1 Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.
  This option assumes that 16,382 sq. ft. of the existing police station will be renovated and a 64,111 sq.ft. addition will be constructed on the existing site to meet the space needs requirements of the Police Department.

  By building the addition on the existing site, a parking deck would be required to provide the required parking.

  Option 2 Build a New Police Station
  This option assumes a new police station on a new site with all required areas together. This will provide the most functional police station, but it is also the costliest. An adequately sized parcel of land will need to be provided. If a three-level

  building is assumed, a building of this size will require a site of

3.44 acres.

See Section 8, beginning on page 99, for additional information regarding options and potential costs.

SECTION 4
ANALYSIS OF SPACE NEEDS

Summary of Analysis

As of the date of this report, the Oak Park Police Department has an authorized strength of 121 sworn police officers (currently staffed at 106) and 31 civilian employees (currently staffed at 26), for a total of 152 staff working on three shifts. For the near term, the Police Department is working towards getting back to authorized strength. The potential for long term growth in the Department is modest and includes the addition of 4-6 sworn officers, and 1-2 civilian positions. The potential for growth has been factored into the space needs analysis and will be discussed later in this section.

During the course of this study, it became clear that the existing building is working against the Police Department. Not only is the building too small, but the design of the building is negatively affecting the Police Department's operations.

The space needs analysis finds that 78,112 sq. ft. of space is necessary for the Police Department to operate effectively. The existing police station is only 35,688 sq.ft. This means the Department is currently operating with a 42,424 sq.ft. deficit. Increasing the square footage of the building by 119% will provide the optimum amount of space for the Department and includes provisions for long-term growth.

Police Department Growth Potential

When discussing growth potential, it is helpful to understand the historical staffing of the Oak Park Police Department.

- From the 1982 Annual Budget, the authorized strength of the Department was 125 sworn police officers and 45 full time equivalent civilian employees, for a total of 170 staff. At that time, the Police Department had a 911 Dispatch Center with a total of 16 employees. Without the Dispatch Center employees, there were 29 civilian employees.
- In 2006, before the 2008 recession, the Department had 129 sworn officers.
- In 2010, during the recession, the Department's authorized strength of sworn police officers declined to 116. It was very common during the recession for municipalities to reduce their workforce.

To sum up the staffing of the Police Department, from 1982-2006, the number of sworn police officers varied from between 125-129. Currently at 121 sworn officers, with long term potential growth, the number of sworn police officers could be between 125-127. For civilian employees, the long-term staffing may be between 33-34. These staffing numbers do not vary greatly from historical staffing.

The Police Department has identified potential future staff growth of 4-6 sworn officers, and 1-2 civilian positions. Staff growth would occur for a number of reasons, such as an increase in programs or responsibilities undertaken by the Department, an increase in demand for services, changing types of crimes, or an increase in population which increases the calls for service. It is extremely difficult to project increases in future programs and responsibilities and crime. However, It is possible to review potential population growth.

From a historical perspective, the population of the Village of Oak Park in 1970 was 62,511 and fell to 51,878 in 2010. The population then began to increase. We estimate the population when the Oak Park Civic Center was constructed at 58,700.

The Village's population is expected to continue to grow at a modest pace. The Village is fully developed; however, there are areas that may be re-developed with higher density residential units. The growth potential is supported by the following data:

United States Census Bureau Data

- 2010 Census Bureau Population: 51,878
- 2017 Census Bureau Population Estimates: 52,261

Chicago Metropolitan Agency for Planning (CMAP)

- 2050 Forecast of Population, Households and Employment 56,932

If the CMAP forecast is accurate, the Village's population will increase by 8.9% over the next 31 years. This would support the modest potential growth anticipated by the Police Department that has been factored into the space needs projections.

After reviewing the Police Department's growth potential, a critical question arises:

Why is so much more space required when the Village's population is lower now than when the building was built and when there are fewer Police Department employees than in previous years?

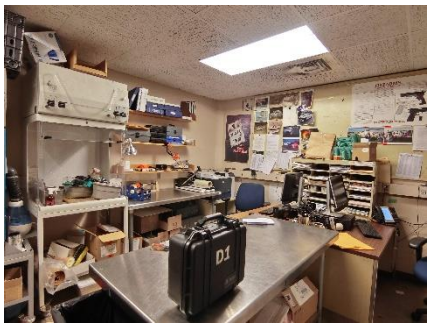
The answer to this question will be addressed in the following section.

Why More Space is Necessary

During the course of the study, FGM observed how staff members operate within in the building to witness first-hand how

Evidence packaging area

Evidence lockers located in hallway



Evidence processing area

Evidence and property storage room

dysfunctional the building is for the Department. It is unfortunate how the Police Department has had to adapt many of their procedures to work around building deficiencies. Many of the issues identified have a direct correlation with the amount of space required.

Many factors contribute to the need for additional space and the major points are as follows:

- Police operations have changed since the building was constructed in 1975.
- Many spaces in the police station are inadequate and require additional space.
- Meeting accessibility requirements will require additional space.

Police Operations Have Changed

Policing has changed dramatically since the building was constructed in 1975. These changes include statutory (legal), technological, and procedural changes, which require additional space. Examples of spaces affected by these changes include:

- **Arrest Procedures:** When the Police Station Lockup area was designed in 1975, arrest procedures were much simpler and not as much paperwork was required. Over time, as more information was required during an arrest, more space was needed to process an arrestee's paperwork.

  The Department adapted by reconfiguring the original Detectives area into a Report Writing space where arrestees can be processed. The major flaw of doing this is that it is located outside of the lockup area. If a detainee were to escape from an officer's custody, they can access many other areas of the Police Station, creating a potentially dangerous situation.

- **Evidence Processing (Identification):** When the Police Station was designed, there was no dedicated space for analysis of evidence. The current evidence processing lab was created in a former Photo Dark Room. The work performed by the police department includes collection of latent fingerprints, presumptive drug testing, collection and preservation of evidence, and forensic photography. Some evidence collected is prepared for outside analysis, for example, fingerprint and DNA identification work is outsourced.

  The existing workspace is very small at 239 sq.ft. and requires 480 sq.ft. to have proper workspace. The current space

Unsupervised public corridor to elevator

severely limits the capabilities of the Police Department and staff are forced to make do by doing things like using the floor as a worksurface. The need for scientific analysis of evidence continues to increase, and as processing of evidence becomes more sophisticated, significantly more space is required.

- **Evidence and Property Storage:** Statutory changes have greatly increased the length of time that evidence must be kept; in some cases, evidence is now required to be kept forever. The increased retention requirements mean that police departments take in much more evidence on an annual basis than they are allowed to dispose of. The Oak Park Police Department is running out of evidence storage space.

Views from front desk are limited

- **Computer Forensics:** In 1975, computer/cybercrime was unheard of. The current space, located in Investigations, is shared with other functions and is extremely small, with no additional space for emerging technology.

  Federal Agencies and regional crime labs assisting municipal law enforcement have been inundated by requests to obtain data from mobile devices, including cell phones, leading to long turnaround times, which is detrimental to solving a crime.

  The growth of cybercrime has been described by security experts as "relentless" and "ruthless", with damages expected to exceed $6 trillion globally by 2021.

  Policing is adapting with increasing use of specialized computers and equipment for data recovery, crime analysis, and on-line crime issues, which requires additional space.

Unsecured parking for squad cars

- **Training Requirements:** The amount of mandatory training required of police officers is increasing. For example, the Illinois Police and Community Relations Act, Public Act 099-0352, has recently been amended to require specific training on an annual, bi-annual and tri-annual basis and includes annual use of force and scenario-based training. Training spaces need to provide greater flexibility for different types of training programs, including classroom, defensive tactics, and scenario-based training.

  Currently, the only dedicated training space within the Police Department is the Firing Range

- **Safety and Security:** The importance of building safety and security has greatly increased since the building was constructed, especially with recent active shooter incidents

Women's locker room

Patrol sergeants work area

Community policing unit work area

occurring within public buildings. Modern police stations are designed with multiple levels of security depending on the security requirements. For example, the lobby areas are very public, and the evidence storage is very secure.

There are several safety and security issues with the existing police station that warrant additional space.

- Once inside the police station, one has access to a majority of the building. There are no separate "semi-public" areas, such as conference rooms, where a person can meet with Police Department staff for a conversation without having access to the rest of the building.
- From the front desk, it is very difficult to monitor the entire lobby. There are blind spots, which cannot be seen, creating a security issue.
- When a person needs to speak to records staff, the conversations are held in the public lobby as there is not a secure transaction counter where this interaction can occur.
- Prisoners are released into the lobby. This procedure requires prisoners to travel through the main corridors of the Police Station, past many offices and work areas, many of which are occupied by civilians. Modern police stations have separate prisoner release and bond out areas, which release away from public spaces.
- Patrol vehicles are parked in an open parking lot with staff and public parking. This leaves the vehicles exposed to the elements as well as to vandalism. Today's patrol vehicles contain equipment that is very costly and sensitive to extreme temperatures. Having at least a portion of the vehicles in secure parking is a best practice.

- **More Female Officers:** In the 1970s, females represented 7% of all sworn police officers. Currently, females account for approximately 13% of all sworn police officers and the percentage is slowly rising. This data represents the need for additional locker room space for female officers.
- **Increased Responsibilities:** Police departments are now responsible for more services to the community including social services/counseling and community relations. As the demand for these services continues to increase, additional space required.
- **Shared Workspaces:** Since the Police Station was built, changes in policing have required more reporting and

Staff Break area shared with gun cleaning

Entrance to Sally Port

Sally Port

Unsecured access from Sally port to building storage

paperwork, which has forced the Department to have many shared workspaces and created serious inefficiencies. All of the following staff / functions have shared workstations / space.

- Community Policing (Sgt., RBOs (6), NROs (2), and Foot Patrol (3) share three desks)
- Sergeants (12) share two desks. Sergeants often are assigned special projects and tasks.
- Patrol Commanders (3) share two desks
- Operations Commander / Budget Analyst share an office. If a private conversation is required, one person has to leave the office.
- Training / Policy shares space with quartermaster functions
- Court / Research and Planning share space.

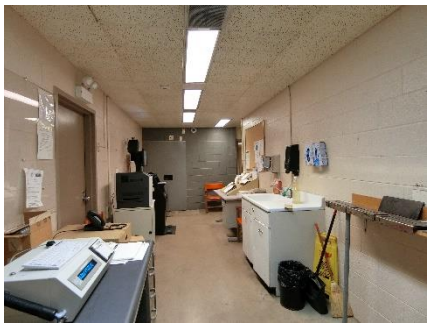
- **Employee Expectations:** With new generations of employees comes increased expectations of job amenities. Spaces such as wellness, breakrooms, and quiet rooms have become Police Department behind when recruiting new employees.

Many of the original spaces in the police station are now inadequate and require additional space.

- **Sally Port:** A sally port is a secure garage used for safe transfer of detainees from a vehicle to the lockup area. The current sally port does not easily allow SUV patrol vehicles to maneuver into it and there is not enough clearance ambulance. If a detainee needs to be transferred to an ambulance, they must be carried up the ramp as there is the elevator cannot accommodate a stretcher.

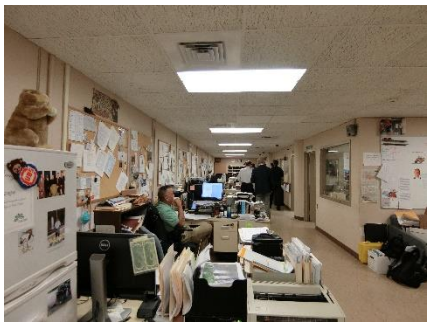
  Other issues with the Sally Port:
  - It is necessary to use steps to access Lockup Areas, which is dangerous when moving prisoners.
  - There are many items stored in the Sally Port which reduces the space available for defensive tactics if a detainee struggles. This poses a liability risk to the Village as it is the Police Department's responsibility for the well-being and safety of detainees.

- **Booking Room:** This space was designed at a time when ink fingerprints and Polaroid Cameras for mugshots were the norm. Now, the Police Department uses electronic fingerprinting (Live Scan) and digital photography for mugshots, which are


Booking Room


Holding Cell

Holding Cells


Investigations

entered into the Department of Justice database. Also located in this room is the Breathalyzer.

- With the equipment now located in booking, the space is small and narrow and would be dangerous if a prisoner struggles.
- Best practices dictates that Breathalyzer testing be separated from other work areas to avoid potential air contamination.
- As discussed previously, the Booking Room needs to be larger to accommodate detainee processing.
- The observation holding cell should be located off of the booking room for security purposes, not in the CSO reception area where it is now.

- **Holding Cells:** While adequate in size, the cells need to be modified to have anti-ligature (hanging) fixtures.

- **Investigations:**
  - Investigators often bring detainees from lockup to interview them in a different environment, which can be very effective when seeking information. The problem is that the interview rooms are located next to the investigator's workstations, which provides detainees the opportunity to see and hear them.
  - There are only two interview rooms, which limits the ability for investigators and officers to separate detainees during the course of an investigation. In addition, dealing with juveniles requires complete sight and sound separation from adult detainees. The current work around when additional interview rooms are required is to use conference rooms, which are not set up for audio/visual recording.
  - Workstations within investigations are very small. With the increase of financial crimes, such as online scams and credit card fraud, investigators now work less in the field and spend more time working on multiple cases in the station. To help Investigators be more effective, larger workstations are required.
  - A soft interview room should be provided. There are many studies that show interrogations within a soft interview room can be more effective that interviews in "hard" or traditional interview rooms. This type of interview room can also be used as a "victim room," where the Department can work with a victim without making him/her feel like a criminal.

Investigations Interview Room

- **Locker Rooms:** Since the building was constructed, the amount of gear issued to police officers has increased. Lockers now must store a multitude of items, including training manuals, bulletproof vests, specialized protective equipment, and weapons. This has necessitated a need for larger lockers. Today, the smallest locker typically provided for police officers is 24"wide x 24" deep.

  The locker room lockers were originally 12"wide x12"deep. At some point, they were changed to 15"wide x12" deep, reducing the number of lockers and necessitating the creation of a male sergeant's locker room and a command locker area in other areas of the Police Station.

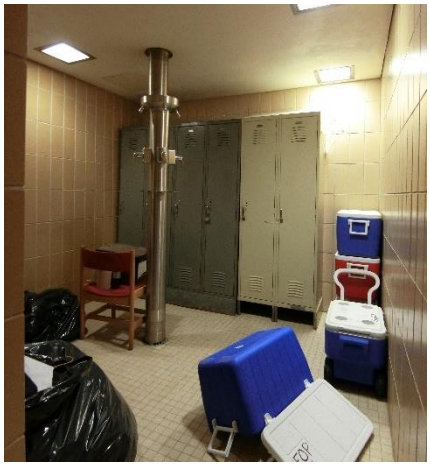
  - Showers are "gang style," which are no longer permitted by code.

Men's Locker Room

- **Records:** The desks that Records Clerks work on are very small. With the volume of reports they handle, "L" shaped workstations are much more appropriate.

- **Firing Range:** The existing Firing Range was originally designed as a "static firing line range." This means Officers stood at a firing line (or booth) and practiced shooting. The type of bullet trap installed can only handle handgun rounds or small rifle rounds (.22 caliber). This type of range has not been used in law enforcement facilities for over 25 years because modern training now requires "tactical training" with the ability to practice shooting from anywhere on the range, utilizing handguns and rifles normally carried by Police Officers.

  - The Firing Range is currently not in use due to HVAC issues.
  - If this Firing Range were converted to a tactical range a new bullet trap capable of accommodating rifles will be required. Modern bullet traps are larger than the current one, so the shooting distance would be less than 25 yards, which is the longest qualifying distance required.
  - A dangerous aspect of the Firing Range is that a person enters directly onto the range. Typically, there is a preparation room or man trap prior to entering a range.
  - There is no storage for range props, targets, and cleaning equipment.
  - The location of the Firing Range causes noise issues to the Village Offices above it, so there are restrictions on when it can be used.



Men's Shower area

Firing Range

Records work station

Records storage

- For a police department the size of Oak Park's, it is important to have a firing range onsite or very close by within the Village. Reasons for this are as follows:
  - The frequency of required has increased significantly and now requires use of force and scenario-based training. The most progressive departments hold firearms training on a monthly basis. To do this at a remote location with number of officers the department has would be difficult.
  - The time to travel to an out of town firing range is a burden on the department. If the firearms training is performed during shift times, the number of officers available for patrol and investigations functions is reduced. If the training is performed on overtime, cost is an issue.
  - Commercial firing ranges are set up for "static shooting" (firing from a fixed position) and do not offer tactical training which allows shooting from various positions on a range. This is very important for police officers.
  - When using another police department's firing range, it can be difficult to schedule as much time is necessary for regular firearms training, especially for large departments like Oak Park.
  - Many police departments are limiting the amount or stopping use of outside agencies using their firing ranges due to liability issues.

Accessibility Requirements have Changed

- The existing building was designed at a time when accessibility was not a significant concern. Laws governing accessibility requirements have since been enacted, including the Illinois Accessibility Code, which has been in effect since 1997, and the Americans with Disabilities Act (ADA) adopted in 1990 (with subsequent revisions).

  The laws apply to municipalities and are intended to provide equal access to services and functions for the public which include visitors, vendors, and other users, employees, and even detainees and persons under arrest. The laws are applicable to police departments as there may be civilian employees with a disability or sworn staff on light duty with a temporary disability.

  These laws require more space for accessible routes (entries, corridors and stairways), workspaces, and support spaces (toilet and locker rooms).

Evidence Storage

Many rules govern when compliance with accessibility standards is required. Generally, if a space is renovated, including any change in flooring, such as a carpet replacement, it is required to be brought into compliance with the Illinois Accessibility Code. Non-compliance with the requirements can subject the Village to a lawsuit by the U.S. Department of Justice or the Illinois Attorney General, who has been aggressively enforcing compliance on municipalities.

See Section 6 for more information regarding accessibility issues within the existing building.

Additional Issues

As stated above, there are numerous issues that contribute to the reasons why the building does not function as an effective police station and why more space is required. The following are other major issues which contribute to why the Police Station does not work well for the Department.

Office of the Police Chief

- **Lack of Natural Light:** The Police Station is almost completely devoid of natural light. The only room with natural light is a storage room with a small skylight. Recent research has found evidence that natural light and views outdoors are important for employee's overall well-being.

  The absence of natural light affects an employee's performance and feeling of well-being, increase stress, disrupts sleep, reduces productivity, and can even contribute to reduction in ethical behavior. See the appendix for articles about the effects of the lack of natural light in work environments.

  During our information gathering interviews, we heard from many Police Department staff members who believe the building is negatively affecting their health. This belief, along with the dingy feeling of the artificial light in the police station may also be bad when trying to hire new employees at a time when skilled candidates are difficult to find.

Parking area

- **Staff and Public Parking:** At the Village Hall and Police Station, parking is at a premium and, often, it is difficult to find parking, especially during the afternoon Police Department shift change. Many staff and visitors park on the side streets around the building.

  We have been told by Police Department staff that their personal vehicles have been vandalized in the past as there is no secure staff parking.

  Due to the lack of personal storage space in the Police Station,

many officers keep some of their gear in their personal cars. During shift change, they drive patrol vehicles to their cars to load their gear, which poses a security risk.

- **Privacy of Citizens Reporting a Crime:** It was observed that when a citizen is making report at the police station, there is very little privacy. If the report is taken in the report office off the lobby, the door is kept open due to the lack of ventilation in the room. If they are brought into a conference or interview room, they must pass through the secure staff work areas of the police station and can possibly overhear sensitive discussions. From a citizen's perspective, it is not a comforting environment for making a report.

- **24 Hour Lobby Use:** The Police Department is expected to provide a high level of service to the community. To help achieve this, maintaining a 24 hour front reception desk and lobby is important. This space will not only serve citizens requiring police services, but provide a safe haven for custody exchanges, refuge for the homeless, and waiting space for people bonding out a detainee or waiting to speak to an officer.

The issues identified above provide an overview of some of the operational and space issues the existing building suffers from. Correcting these deficiencies will require additional space and a reorganization of the floor plans.

SECTION 4
ANALYSIS OF SPACE NEEDS – PARKING

Parking Analysis

As part of the needs analysis, it is necessary to determine the parking requirements for the entire building. To perform this analysis, we reviewed projected parking requirements and then compared the requirements with the actual parking counts.

Summary of Findings

Peak demand for the Police Department is during the afternoon shift change, between 2:00 pm and 4:00 pm. At this time, administrative and daytime personnel are working and patrol shifts coming on and leaving need to be accounted for. At this time parking is at a premium at the Village Hall and Police Station and street parking is utilized throughout the neighborhood. If either the Village Hall or the Police Department hosts a training class or community function during this time, parking issues are exacerbated.

Parking at the existing building is located is several areas. Total off-street parking available for the Village Hall and Police Station is 154 spaces. There are also 8 staff parking spaces in the lower level parking garage and 3 spaces reserved for arrest processing. Therefore, the total off-street parking available is 158 spaces.

Police Department Parking

Department Vehicles and Trailers	**Spaces**
Patrol Vehicles	43
Unmarked Vehicles	20
Transport Van	1
Special Service	2
Seizure Vehicles	10
Trailers	2
Sub-Total	78
Adjustments	
Vehicles / Trailers in Garage	-32
Seizure Vehicles (locate off-site)	-10
Vehicles in use	-10
Take Home Vehicles	-8
Total Police Department Vehicles Required in parking lot	**18**
Police Department Staff Parking	
Required Parking Spaces at Peak Demand	**94**

Total Police Parking Required	**112**

Village Hall Parking

Village Hall Vehicles	**Spaces**
Development Customer Services	8
Fire	3
Public Health	3
Pool Cars	3
Village Managers Office	1
Sub-Total	18
Take Home Vehicles	-2
Total Village Hall Vehicles Required in parking lot	**16**
Village Hall Staff Parking Required	**105**
Total Village Hall Parking Required	**121**

Visitor Parking

Visitors	20
Community and Training Room Parking	35
Total Visitor Parking Required	**55**

Parking Summary

A summary of the minimum required number of parking spaces is as follows:

Description	**Spaces**
• Police Department Parking	112
• Village Hall Parking	121
• Visitor Parking	55
Total Required Spaces	**288**

SECTION 4
ANALYSIS OF SPACE NEEDS PROGRAM

Following this page is the Police Department Space Needs Program referenced in Section 4.

Police Department Space Needs Program Pages 1-12

Note that Space Needs Programs attempt to compare the size of existing space to space required. In many cases, it is difficult to provide an "apples to apples" comparison because many spaces accommodate more than one function in the existing building. Therefore, we suggest using the space comparison as a general comparison only.

Village of Oak Park
Oak Park Police Department

FGM ARCHITECTS

Space Needs Program

June 28, 2019
FGM #: 19-2639.01

Room/Area/Space	Existing	Required	Notes
PUBLIC ENTRY / PUBLIC ACCESS AREAS			
Entry Vestibule		80	
Lobby	570	800	Seating for (6-8)
Historical Displays		40	Built-in display cases
Public Reception Counter		50	One reception position, accessible
Kiosk		50	Kiosk and ATM machine
Citizen Report Room	116	100	Provide seating for (4)
Citizen Report Room	-	100	Provide seating for (4)
Citizen Report Room	-	100	Provide seating for (4)
Public Fingerprinting Alcove	-	20	
Community Meeting/Training Room/EOC	-	1,500	Room to seat (40) in classroom format, (80) seating, dividable with operable partition
Breakout Conference Room	-	300	Seating for (8-10)
ESDA Communications/Video		220	Video Monitoring and communications equipment
Training Storage	-	150	Training supplies
ESDA Storage	-	150	For communications equipment, laptops, etc.
Credenza Storage Counter	-	100	Long counter storage cabinets to support Community Meeting / Training room
Audio/Visual Equipment	-	60	Closet for Audio/Visual Equipment, assumed equipment is on 36" rack
Table and Chair Storage	-	200	
Kitchenette	-	150	Kitchenette to serve Community/Training/EOC. Microwave, refrigerator, etc.
Storage	-	80	
Public Toilets			
Men's	109	220	(2) toilets, (2) urinals and (2) lavs.
Women's	111	200	(3) Toilets and (2) lavs.
Family / Transgender Toilet Room	-	65	Single user toilet room
Public Entry / Public Access Areas Sub-Total	**906**	**4,735**	
Circulation, Wall, and Mechanical Shaft Space	313	1,421	
PUBLIC ENTRY / PUBLIC ACCESS AREAS TOTAL	**1,219**	**6,156**	
RECEPTION			
CSO Counter Position		70	Single reception position
CSO Workstation		60	"L" shaped workstation, provide view to service window
Security Camera Monitor Center		20	CCTV monitoring area, viewable to CSO Counter Position and workstation
Printer/Copier	192	25	Located adjacent Counter Positions
Storage Closet		15	
File Storage		35	(2) 42" lateral files for Forms, binders, etc.
Personal Storage		-	In locker rooms
Reception Sub-Total	**192**	**225**	
Circulation, Wall, and Mechanical Shaft Space	66	79	
RECEPTION - FRONT DESK TOTAL	**258**	**304**	

Village of Oak Park
Oak Park Police Department

FGM ARCHITECTS

Space Needs Program

June 28, 2019
FGM #: 19-2639.01

Room/Area/Space	Existing	Required	Notes
ADMINISTRATION			
Chief of Police Office	171	220	Desk, credenza, guest seating for (2), soft seating, bookcases
Closet		10	
Executive Secretary	150	120	"L" shaped workstation
Secure Files	78	90	(8) letter file cabinets, binders, and general storage
Administrative Waiting Area	-	80	Guest seating for (4)
Historical Displays	-	10	Display cases built into walls
Internal Affairs Sergeant	99	120	"L" shaped workstation, (3) guest chairs, files
Secure Files		40	(4) letter file cabinets
Conference Room	166	310	Conference seating for (10)
Deputy Chief (Support Services)	210	180	Desk, credenza, guest seating for (2), files, bookcases
Closet		10	
Deputy Chief (Field Services)	188	180	Desk, credenza, guest seating for (2), files, bookcases
Closet		10	
Commander (Operations)	192	150	
Closet		10	
Budget Preparation and Fiscal Management Office		120	
Professional Standards Office	235	120	
Training Office		180	"L" shaped workstation, conference table for (4), files
Storage		80	
Open Office Workstations	-	140	(2) "L" shaped workstations for flexible use; social media, interns, part time admins
Chaplain / Peer Support / Counseling	-	-	See Investigations Support Areas - located with Interview Rooms
Coffee Area		85	
Toilet	27	130	(2) single user toilet rooms
Administrative Storage Room	-	50	Secure supply storage
Historian Storage	-	50	(2) 36" x 24" storage cabinets
Copy/Workroom	50	120	Copier and work area with storage cabinets
Coat Closet	-	15	
Administration Sub-Total	**1,566**	**2,630**	
Circulation, Wall, and Mechanical Shaft Space	541	921	
ADMINISTRATION TOTAL	**2,107**	**3,551**	

Village of Oak Park
Oak Park Police Department

FGM ARCHITECTS

Space Needs Program

June 28, 2019
FGM #: 19-2639.01

Room/Area/Space	Existing	Required	Notes
FIELD SERVICES			
Deputy Chief (Field Services)	-	-	Located in Administration above
Patrol			
Patrol Commander's Offices (3) required	241	360	(3) offices, each to have "L" shaped workstation, two guest chairs, files, bookshelves
Patrol Sergeants Workstations	208	700	(14) "L" shaped workstations in open office setting
Conference/Counseling/FTO Room	106	270	Seating for (6-8)
Equipment Issue	179	180	
Armory	36	40	(20) rifles and ammunition
Radio Battery Charging	49		
Support Spaces			
Mud Room	-	100	With area for wet gear
Duty Bag Storage	127	330	Provide(26) three-tier lockers (78 spaces) for duty bags near patrol entry
Report Writing			
Officer Desks (existing in I.D. and Lockup)		290	(6) report writing workstations with mail and form storage
Juvenile Waiting	-	120	Room observable from Report Writing desks
Juvenile Toilet	-	65	single user toilet
Photocopy/FAX/Printer	25	100	Includes supply storage cabinets
Roll Call/Platoon/Briefing Room	523	840	For (24) personnel in flexible format - classroom or conference setting
Interview Rooms - see Investigations	-	-	Interview rooms to be shared with Patrol
Patrol Bureau Sub-Total	**1,494**	**3,395**	
Circulation, Wall, and Mechanical Shaft Space	516	1,188	
Patrol Bureau Total	**2,011**	**4,583**	
Evidence Collection and Processing			
Evidence Technicians Open Office		240	(4) "L" shaped workstations
Vehicle Processing Bay		780	26'w x 30'd Space to process (1) vehicle and store (1) vehicle
Emergency Eyewash/Shower		15	
Washer/Dryer		25	
Evidence Triage Area		40	Sorting area with moveable tables
Drying Cabinets		150	Provide space for (2) double drying cabinets and 8' layout area
Large Item Evidence Storage	312	300	For large temporary evidence storage, locate off Vehicle Processing Bay
Forensic Processing Lab			
Dust/Superglue/Ninhydrin Work Area			Work areas with dusting chambers, sinks, and storage
Fuming Chamber			
Dusting Hood			
Refrigerators	239	400	Provide space for refrigerator
Alternative Source			Storage area

Village of Oak Park
Oak Park Police Department

FGM ARCHITECTS

Space Needs Program

June 28, 2019
FGM #: 19-2639.01

Room/Area/Space	Existing	Required	Notes
Microscopy Area			
Worktables and Counters			
Digital /Photo Lab/Computer			"L" shaped workstation, printer, and workbench
Secure Storage		20	
Drug Testing Area		60	For presumptive drug testing, include work counter and fume hood
Computer Forensics / AFIS (existing in Investigations)		220	Provide secure space for (4) computer workstations with large work surfaces
Secure Storage		25	
Storage		25	For storage of electronics and media within office
Clean Storage Equipment Room		50	Provide 2'deep shelving
Dirty Equipment Storage Room		50	Provide xx ln.ft. of 2'deep shelving and open floor storage area
Evidence Technician Lockers		145	Provide (12) 24" x 24" lockers for evidence technicians
Evidence Collection Sub-Total	**551**	**2,545**	
Circulation, Wall, and Mechanical Shaft Space	190	891	
Evidence Collection and Processing Total	**741**	**3,436**	
Parking Enforcement			
Supervisor's Office	139	216	(3) workstations, files, bookshelves
Parking Enforcement Open Office Workstations			(7) desks in open office setting
Copier / Work Area		290	
Files	231		(2) 42" lateral files
Storage		35	Storage room for miscellaneous equipment
Lockers		112	(9) 18"x24" full size lockers
Coffee Area		50	
Parking Enforcement Sub-Total	**370**	**703**	
Circulation, Wall, and Mechanical Shaft Space	128	246	
Parking Enforcement Total	**498**	**949**	
Tactical Operations Patrol Rifle		-	See Patrol Equipment Issue
SUPPORT SERVICES			
Deputy Chief Support Services		-	See Police Administration
RECORDS BUREAU			
Reception Counter	-	75	Reception positions for (1) and service areas
Records Supervisor's Office	129	120	"U" shaped workstation with (2) guest chairs

Village of Oak Park
Oak Park Police Department

FGM ARCHITECTS

Space Needs Program

June 28, 2019
FGM #: 19-2639.01

Room/Area/Space	Existing	Required	Notes
Records Clerks Open Office	502	640	Open office work area with (8) "L" shaped workstations
Court Liaison Office	150	120	Large "L" Shaped workstation
Intern / Light Duty Workstation	-	-	One workstation is included in Records Clerks Open Office
Conference/Workroom	-	-	Need access to a Multi-Purpose / Conference Room with seating for (8)
Support Spaces			
Officers Counter	-	35	
Mobile Video Review (MVR) / Red Light Review	-	-	Will take place in Patrol Sergeant's Office, Internal Affairs, and Records
Copy/Workroom	49	120	Area with copier, shredder, work counters, supplies storage
Shredder	-	60	
Active File Storage (3) years	-	264	Allow for (12) (4) drawer lateral files
Microfiche Reader	-	-	In Village Hall
Microfiche	46	40	
Long Term Records (archived)	681	680	Existing + 660 file inches of storage per year in high density storage, assume 15 years
Storage Room		80	Miscellaneous large storage items, toner cartridges, etc.
Coat Closet	-	20	
Coffee Area (existing break area)	43	50	
Records Bureau Sub-Total	**1,600**	**2,304**	
Circulation, Wall, and Mechanical Shaft Space	553	806	
Records Bureau Total	**2,153**	**3,110**	
INVESTIGATIONS BUREAU			Investigations and Community Services work closely together
Investigations Commander	102	150	"U" shaped workstation, four guest chairs, files, bookshelves
Closet		10	
Crime Analyst	131	120	"U" shaped workstation with (2) guest chairs
General Investigations			
Sergeant's Offices (2) required	109	240	Each office to have "L" shaped workstation, two guest chairs, files, bookshelves
Detectives Open Office Workstations	1,113	700	(10) "L" shaped workstations
Outside Agency Workstations		140	(2) "L" shaped workstations for shared use (RCFL, DEA, etc.)
Tactial Unit (Gangs and Drugs)			
Open Office Workstations		280	(4) "L" shaped workstations
Open Office File Island	-	170	(8) 42" lateral files in file / work island
Investigations Support Areas			
File Storage		264	Allow for (12) (4) drawer lateral files
Specialty IT Equipment Room (AFIS Computer, etc.)	-	-	Located in Computer Forensics in Evidence Collection and Processing
Storage/Equipment	-	25	Secure equipment storage
Garage Storage	-	-	For shields, rams, etc. See Warm Storage
Secure Juvenile Files	-	-	Locate in Community Policing / Youth Services
Major Case Room	-	-	See Multi-Purpose Room in Staff Support Areas below
Project/Conference Room	200	310	Seating for (10-12)

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Room/Area/Space	Existing	Required	Notes
Coffee Area	-	50	
General Work Area	-	-	Area to review evidence, etc. - use Project/Conference Room or file island
Storage/In-Process Evidence	-	35	Lockers for temporary evidence storage
Interview Rooms			Shared with Patrol, locate so both Investigations and Patrol have easy access
Standard Interview Rooms - Adult (4) required	152	400	
Standard Interview Rooms - Juvenile (2) required	-	200	
Soft Interview Rooms (2 required	-	300	
Childrens Holding Area	-	120	TV/Toys, etc.
Toilet Room	-	65	Locate single user toilet room near Interview Rooms
A/V Monitor Control Room	87	100	A/V controls with work table
Computer Forensics	-	-	See Evidence Collection and Processing
Criminal Investigations Sub-Total	**1,894**	**3,679**	
Circulation, Wall, and Mechanical Shaft Space	654	1,288	
Investigations Total	**2,548**	**4,967**	
OPERATIONS BUREAU			
Operations Commander		-	See Police Administration
Professional Standards	229	-	See Police Administration
Training		-	See Police Administration
H.R. & Board of Police and Fire Commission Liaison	-	-	Located in Village Hall
Budget Preparation & Fiscal Management Office	-	-	See Police Administration
Pension Board Office	-	100	"L" shaped workstation with guest seating for (2) and pension files
Evidence Property Management			
Evidence Custodian Office	-	120	"L" shaped workstation with guest seating for (2)
Evidence Packaging			
Worktable and Barcoding	60	150	(4) sets pass-thru lockers, large counter, storage for supplies, sink
Evidence Drop Lockers	85		Located in Worktable and Barcoding above
Oversize Items	-	120	For large temporary evidence storage
Intake Area/Work Area	-	100	Work Area with sink
Movable Worktables	-	-	Locate in Open Floor Area below
Evidence Area Support Spaces			
General Evidence		1,000	(High Density Storage)
Open Floor		150	
Money Vault		25	
Narcotics Storage	651	75	

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Room/Area/Space	Existing	Required	Notes
Firearms Storage		120	
Refrigerated Storage		-	Not used
Destruction Holding Area		56	Area with shelving
Large Evidence Items	-	-	Locate off Evidence Vehicle Processing Bay above
Bike Storage (indoor/outdoor?)		-	See Outdoor Miscellaneous Spaces below
Secure Storage Shed	-	-	See Outdoor Miscellaneous Spaces below. For secure storage of hazardous items
Seized Vehicles/Impound	-	-	See Outdoor Miscellaneous Spaces below
Evidence Property Management Sub-Total	**796**	**1,916**	
Circulation, Wall, and Mechanical Shaft Space	275	671	
Evidence Property Management Total	**1,071**	**2,587**	
Firearms Range Management			
Firing Range			
Range Control Room	68	100	
Range Staging	-	250	Area for preparation outside of range. (4) gun cleaning stations w/ storage cabinets
Range Lanes	2,260	4,200	(40') Wide range x (75') long, fixed targets, combat walls to 60'
Trap Area			See above
Target Storage	98	200	Storage for targets, props, etc.
Armory Storage (in Equipment Checkout)	36		Ammunition and Weapons Storage
Ammunition Storage		80	Store approximately 80,000 rounds of ammunition for pistols and rifles
Weapons Storage		80	Storage for approximately (50) rifles/shotguns and cases
Weapons Maintenance	74	150	Weapons repair and cleaning room
Range Mechanical		500	Range Supply and Exhaust
Restroom	-	-	Located in Staff Support Areas below
Firearms Range Management Sub-Total	**2,536**	**5,560**	
Circulation, Wall, and Mechanical Shaft Space	876	1,946	
Firearms Range Management Total	**3,412**	**7,506**	
I.D. / Lockup			
Sally Port	776	1,100	(4) car sally port (in drive through configuration)
Vestibule Area	58	60	
Prisoner Search and Personal Effects Lockers	107	50	Include sorting counters and double/triple tiered lockers
Mass Arrest Cell with Mass Arrest Lobby	-	300	To hold up to (10) detainees, with detention toilet
Processing Area (accessible by both adult and JVs)			
Fingerprint Area	234	80	For ink fingerprinting, with sink and eyewash
Suspect Photography		80	Included in Live Scan below
Live Scan Area			Include photo area
Sobriety Testing			Allow work area for (x) Breathalyzers

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Room/Area/Space	Existing	Required	Notes
In-Custody Interview Rooms - (2) required	-	200	Hard interview rooms
Toilet	-	65	Single user detention grade toilet
Janitors Closet	-	50	Secure storage of cleaning supplies
Adult Booking Stations	399	500	Size to allow processing or (4) detainees
Cuff Benches			
Juvenile Processing Area (existing in Juvenile Office)	127	300	Size to allow processing or (2) detainees
Cuff Benches			
Jail Storage	-	50	
Padded Cell	-	80	Padded call with flushing floor drain
Observation Holding (existing)	48	-	
Adult Detention Rooms	930	675	(6) Cells total, including (1) Accessible Cell. Arrange in groups of (2) cells. (1) shower
Juvenile Detention Rooms	107	280	(2) Cells total, including (1) Accessible Cell, shower
Attorney/Client Room	66	60	(Utilize Line Up Room below)
Line Up Room (existing in Investigations)	-	120	Line up and viewing area
Bond Out Vestibule	-	80	Bond out vestibule for release of detainees
I.D. / Lockup Sub-Total	**2,852**	**4,210**	
Circulation, Wall, and Mechanical Shaft Space	985	1,474	
I.D. / Lockup Total	**3,837**	**5,684**	
COMMUNITY POLICING			
Chaplain/Victim Services (counseling)	-	140	Provide office with "L" Shaped workstation, guest seating for (2), files
Counseling Room	-	-	Utilize soft interview room(s)
NRO/RBO Program			
Sergeant's Offices (2) required		150	"L" shaped workstation with (2) guest chairs, files
Open Office Workstations	324	700	(16) 6' workstations
Secure Juvenile Files		132	Allow for (6) 42" wide lateral files, locate in Youth Services
Storage		80	
Community Policing Sub-Total	**324**	**1,202**	
Circulation, Wall, and Mechanical Shaft Space	112	421	
Community Policing Total	**436**	**1,623**	
I.T. Support			
Systems Technician		150	Workroom with (2) workstations for IT staff
Server Room		300	Space for up to (6) (42"d) server racks/cabinets, clean agent fire suppression
Server Room HVAC		100	
Storage Area		80	For storage of equipment
IDF Closets		160	Allowance for (2) network closets throughout building

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Room/Area/Space	Existing	Required	Notes
Vehicle Work Area		-	Utilize garage space
I.T. Support Sub-Total	**1,259**	**790**	
Circulation, Wall, and Mechanical Shaft Space	435	277	
I.T. Support Total	**1,694**	**1,067**	Existing is prorated based on area of VH and PD
Social Media		-	In administrative workstations
STAFF SUPPORT AREAS			
Lunchroom with Kitchenette	124	600	Break area with (5) tables of four
Library / Quiet Room	-	140	Provide space for (2) recliners
Nursing Room		80	
Honor Guard Storage	24	50	(2) 36" x 24" storage cabinets, flag poles
Staff Toilets Allowance	44	800	Allowance for toilet rooms throughout the building
Closet Allowance	-	400	Allowance for closets throughout the building
Staff Support Areas Sub-Total	**192**	**2,070**	
Circulation, Wall, and Mechanical Shaft Space	66	725	
STAFF SUPPORT AREAS TOTAL	**258**	**2,795**	
LOCKER/FITNESS AREAS			
Male Locker Area	912	2,400	Provide (120) 24" wide lockers
Toilet/Sinks/Shower Areas		450	(3) toilets, (3), urinals, (4) lavs, (3) showers
Female Locker Area	413	1,350	Provide (45) 24" wide lockers
Toilet/Sinks/Shower Areas		310	(3) toilets, (3) lavs, (2) showers
Command Lockers	94	-	
Sergeant's Lockers	176	-	
Defensive Tactics Training Room	-	900	(30'x30')padded room
Equipment Storage	-	150	For defensive tactics training aids
Fitness Area	-	1,250	Size for equipment for (6-7) to workout at a time
Locker/Fitness Areas Sub-Total	**1,595**	**6,810**	
Circulation, Wall, and Mechanical Shaft Space	551	2,384	
LOCKER/FITNESS AREAS TOTAL	**2,146**	**9,194**	
WARM / COVERED STORAGE			
Bike Squad	493	190	Storage for (10) bicycles, bike racks, equipment
Segways		-	Located at satellite station

Village of Oak Park
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Room/Area/Space	Existing	Required	Notes
Patrol / Investigations Garage Storage	-	120	For shields, rams, etc.
Patrol Storage	81	-	
Vehicle Garage			
Vehicle Spaces	4,418	8,700	Allow for (30) vehicles
Command Vehicle Storage		-	
Trailers		2	
Vehicle Maintenance Storage		80	10 tires and rims
Parking Enforcement Storage		20	Parking equipment, boots, etc.
ESDA Storage		150	Specialty gear storage (vests, signs, etc.)
Found Bikes	1,273	1,200	
Warm Storage Sub-Total	**6,264**	**10,462**	
Circulation, Wall, and Mechanical Shaft Space	2,164	2,092	
WARM STORAGE TOTAL	**8,428**	**12,554**	
LOADING/FACILITY MAINTENANCE			
Facility Maintenance Office		100	Small office with desk and phone
Facility Maintenance		300	Public Works maintenance work room and supplies
Central Custodial Storage Space		150	
Janitor's Closet Allowance		120	For Janitorial storage throughout building
Loading Dock Area		-	Covered Area with dock leveler
Delivery Storage Room		100	For temporary holding of deliveries
General Building Storage		500	
Loading/Facility Maintenance Sub-Total	**-**	**1,270**	
Circulation, Wall, and Mechanical Shaft Space	-	445	
LOADING FACILITY MAINTENANCE TOTAL	**-**	**1,715**	
MECHANICAL AND ELECTRICAL SPACES			
Emergency Generator		-	Locate in exterior enclosure
Mechanical Room(s)	2,043	1,500	HVAC, Plumbing and Fire Protection Equipment
Electrical Room		800	
Radio Equipment	90	120	Communications equipment
Elevator		-	In multi-floor space factor
Telephone and Data Service Room		50	D-mark room
Mechanical and Electrical Spaces Sub-Total	2,133	2,470	
Circulation, Wall, and Mechanical Shaft Space	737	865	
MECHANICAL AND ELECTRICAL SPACES TOTAL	**2,870**	**3,335**	

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Room/Area/Space	Existing	Required	Notes
NET BUILDING AREA SUB-TOTAL		**75,112**	
Total Existing Police Department Area	**35,688**		
Multi-Floor Factor		3,000	Assume (3) levels at 1,000 sq.ft. per floor
TOTAL BUILDING AREA REQUIRED		**78,112**	
SITE REQUIREMENTS			
Police Department Parking			
Department Vehicles and Trailers			
Patrol Vehicles		43	
Unmarked Vehicles		20	
Transport Van		1	
Special Service		2	
Seized Vehicles		10	Secure storage for up to (10) seized vehicles
Trailers		2	In Vehicle Garage
Sub-Total		**78**	
Adjustments			
Vehicles and Trailers Located in Garage		(32)	
Seized Vehicles		(10)	Assumed located off-site
Vehicles in Use		(10)	
Take Home Vehicles		(8)	
Total Police Department Vehicles		**18**	Required number in parking lot
Staff Parking			
Required Parking Spaces at Peak Demand		**94**	Peak demand is at Patrol Shift Overlap between 14:00 - 16:00hrs
Total Police Parking Required		**112**	Secure parking spaces required
Public Parking			
Visitors		5	
Community and Training Room Parking		35	Parking for Community and Training functions
Total Public Parking Required		**40**	
Total Parking Required		**152**	

Village of Oak Park
Oak Park Police Department

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Room/Area/Space	Existing	Required	Notes
MISCELLANEOUS OUTDOOR SPACES			
Plaza Entrance			With seating
Trash Enclosure	178	200	Use existing/share with Village Hall and Fire Department
Generator Enclosure			Allow area 20'x40'
Transformer Enclosure			
Outdoor Staff Area			
Secure Evidence Remote Storage		150	For secure storage of hazardous items.
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SECTION 5
PROJECT HISTORY AND EXISTING BUILDING PLANS

HISTORY

The existing 76,506 sq.ft. Oak Park Civic Center is located at 123 Madison Street in Oak Park and was designed by Harry Weese & Associates. The Police Department is in the basement of the Civic Center and occupies 35,688 square feet. The timeline for the project was as follows:

Design of the Project	1973
Construction	1974
Construction Completion	1975

In 2014, the Civic Center was added to the National Register of Historic Places

Since the building was constructed, minor improvements have been made to the police station to accommodate the Police Department's operational changes. At this time, the existing facility is less than ideal in terms of interior space, work flow and parking.

SECTION 5
EXISTING BUILDING PLANS

The following diagrams illustrate the building as it currently is being utilized and will provide a frame of reference for the space needs requirements identified in Section 4 of this report.

The Civic Center is 76,506 square feet in area and the police station, located in the basement occupies 35,688 square feet, which includes the underground parking garage.

The site area occupied by the existing building is approximately 3.6 acres

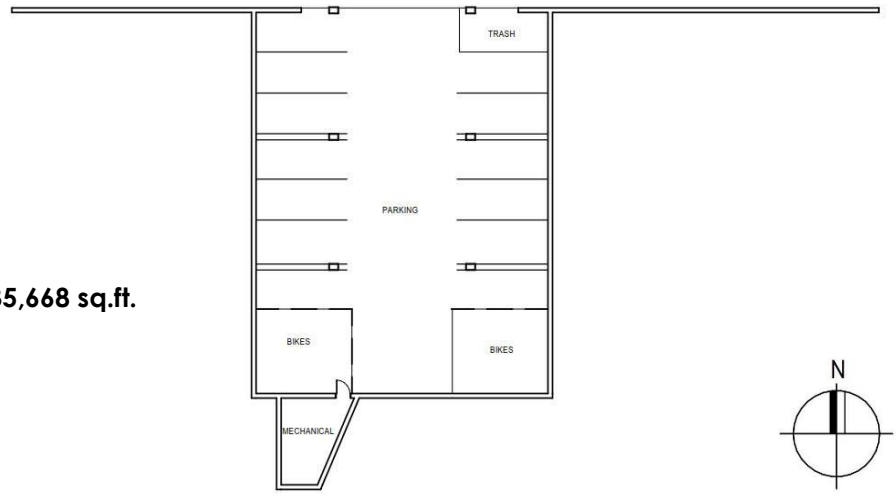
EXISTING SITE

Aerial Photograph of the Existing Village Hall and Police Station

EXISTING BASEMENT FLOOR PLAN

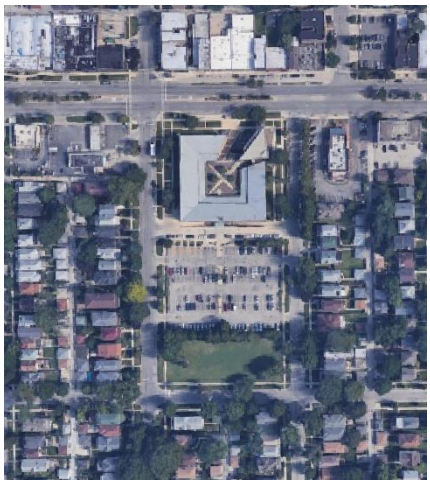
Department Legend

- ADMINISTRATION
- BUILDING SUPPORT
- CIRCULATION
- EVIDENCE
- FIRING RANGE
- ID/ LOCKUP
- INFORMATION TECHNOLOGY
- INVESTIGATIONS
- IT SUPPORT
- LOCKERS/ FITNESS
- PARKING ENFORCEMENT
- PATROL
- PUBLIC ENTRY
- RECEPTION
- RECORD BUREAU
- STAFF SUPPORT



Police Area including Garage: 35,668 sq.ft.

SECTION 6
EXISTING CONDITION ANALYSIS



Aerial view of Police Department

Site Parking Diagram

Introduction

The Oak Park Village Hall and Police Station was originally constructed in 1975. The building is a one-story concrete and timber structure with a full basement and a partial second floor mezzanine. The basement floor level is approximately 35,668 square feet including the parking garage.

The Village Hall and Police Station is a shared facility occupied by the Village Hall on the first floor and mezzanine while the Police Department occupies the basement level.

Site and Parking

The Village Hall is located Southeast of downtown Oak Park on a site of approximately 3.6 acres. The building is bordered by Madison Street to the North, S. Taylor Avenue to the East, Adams Street to the South and S. Lombard Avenue to the West.

The current site provides approximately 154 outdoor parking stalls shared between the police vehicles, Village Hall vehicles, Village Hall staff and visitors. There is an underground parking garage with 18 total spaces, of which only 8 are used for parking shared by police command and Village Hall staff. The remaining spaces are overtaken by other needs. The underground parking spaces are currently used as follows:

Bicycle and Miscellaneous Storage	6 spaces
Garbage Dumpsters	1 space
Temporary Arrest Processing	3 spaces
Police and Village Hall Staff Parking	8 spaces
Total Underground Parking	**18 spaces**

Street parking is available in the surrounding neighborhood.

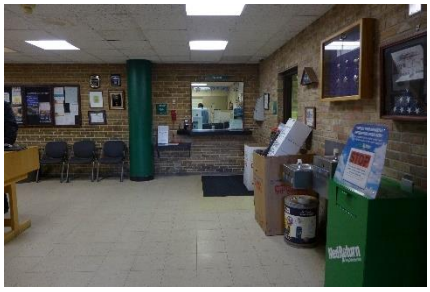
Building Envelope

The building is clad in brick masonry with punched window openings at the exterior perimeter and aluminum storefront window walls overlooking the courtyard at the center of the building. The basement occupies the full area beneath the building and exterior plaza core. The basement and first floor construction consist of cast in place concrete supporting exposed timber framing above grade. The building roof is constructed of standing seam metal panels at the sloped roofs and a single-ply thermoplastic polyolefin (TPO) roof at flat roof areas.

SECTION 6
EXISTING CONDITION ANALYSIS - ACESSIBILITY

Non-functioning ADA chair lift

Non-compliant ADA ramp



Modified front counter

Non-compliant ADA grab bars

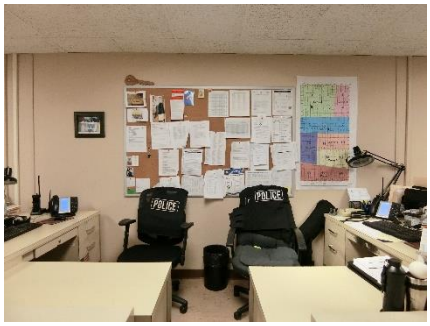
Accessibility

Since the building was constructed, accessibility requirements have changed with the Americans with Disabilities Act and the Illinois Accessibility Code. The accessibility guidelines mandate that all public facilities in the State of Illinois are to be designed, constructed or altered to assure equal accessibility to all members of society. If any type of building renovation were to occur, accessibility violations would need to be addressed. The violations range from minor issues to larger problems that would require significant renovation work. Below is a summary of violations reviewed during the building assessment:

- The ADA chair lift servicing the police station from the front entry is out of order and has been for some time. Currently, the only public ADA accessible route to the police station is from the elevator on the exterior of the building. This elevator is remote from the public lobby and cannot be supervised from the front desk.
- The accessible ramp leading to the ADA accessible elevator is too steep and lacks the required landings every 16'
- The main service counter within the lobby is mounted at 40" above the floor. ADA accessible countertops need to be mounted at 34" above the floor. A secondary countertop was added for ADA accessibility, but it is located to the side of the window and is difficult to observe.
- The doorways to the men's and women's public restrooms lack the required ADA door clearances.
- The ADA toilets within the public restrooms do not have the required vertical or back wall grab bars.
- The toilet seat cover holder within the women's restroom is located above the required ADA reach ranges.
- The paper towel dispenser within the men's restroom lacks the required clear floor space and is above ADA required reach ranges.
- The main staff restrooms are not ADA accessible. The doors are not 36" wide and the rooms themselves are too small to accommodate the required turning radius and clear floor spaces necessary at each fixture.
- Throughout the station multiple doors have non-compliant doorknobs.

No ADA access to Sally Port

Inaccessible toilets in locker rooms

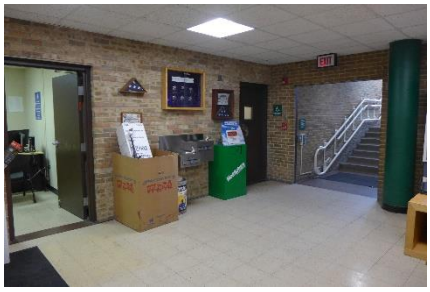


Inaccessible workstation

Non-ADA compliant service window

- Multiple doors throughout the station lack the required ADA push/pull door clearances.
- There is no ADA access to the Sally Port. There is a landing approximately 14" above the Sally Port floor with two steps. There is no guardrail or handrail at the stairs or landing.
- The shower within the lockup area lacks an ADA seat and transfer area.
- There are no required ADA accessible holding cells. Due to the separation of the men and women cells at least one men's cell and one women's cell should be accessible.
- The sink within the staff break lacks the required side approach area is not ADA accessible.
- Within the sergeant locker room there is inadequate floor space for the required 5' turning radius. Additionally, there are no ADA accessible lockers or benches.
- There are no accessible lockers, benches, toilets or showers within the men's and women's locker room.
- The furniture within the Investigations Department is placed too close together violating the ADA required 30" passageway.
- The workstations within the Investigations Department are located too close to doorways infringing on the clear door requirements.
- The Patrol offices are overcrowded, the clear aisles widths have been reduced below the ADA required 30". Boxes and furniture are too close to doorways infringing on the clear door requirements.
- The Administrative Secretary's service window is too high and not ADA accessible.
- There is no ADA accessible route to the maintenance room.

SECTION 6
EXISTING CONDITION ANALYSIS – BUILDING CODE ISSUES



Missing fire doors at stairway

Non-compliant fire rated Dutch door at Parking Enforcement

Non-compliant fire rated wall at record storage.

Building Code Issues

During the building assessment review, it was observed that several fire rated doors had been modified or removed since construction. These modifications to the rated doors conflict with the building code requirements and would need to be remedied.

- The fire doors at the bottom of the main public staircase have been removed thus eliminating the required fire separation between floor levels.
- The fire rated door at the Parking Enforcement Office has been converted to a Dutch door and is usually propped open. This door does not maintain the fire rating that is required at this location.
- Several doors within the Building Maintenance Department are lacking the required fire rating. In one instance the fire rated door is being propped open and in violation of the building code.

The Records Storage Room is not fire rated. The walls do not extend to the roof deck and there are openings to the adjacent mechanical room. There are no fire rated doors separating the storage room from the work area.

The basement is lacking a complete fire sprinkler protection system. Select areas were observed to have fire sprinkler protection, in particular, the parking garage, mechanical rooms, locker rooms, records storage, server room, and IT areas. The following locations were noted as missing the required ADA fire strobes:

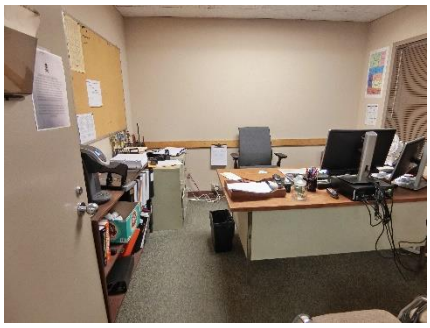
- Investigations Work Area
- Administration Conference Room
- Administration Work Area
- Building Maintenance Workroom
- Juvenile Holding Room
- Lobby Conference Room

Miscellaneous Violations

- Several exit signs throughout were noted as not having lit directional arrows, signs have been modified with tape to indicate direction of exit.

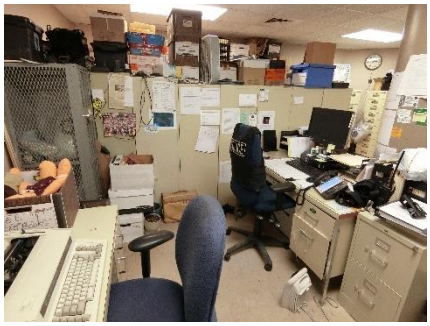
Cords dropped over furniture within Investigation Department

- Due to age of building there is a lack of electrical and data outlets, cords are draped over furniture and across cabinets throughout the building.
- Within the Administration Department extension cords are lying across walkways creating a tripping hazard.
- Within the lobby conference room, temporary partition walls have been added to the west and south walls creating mechanical and electrical closets. These closets lack the required signage and fire ratings.
- A mechanical closet is located within the Crime Analyst's Office. This equipment should be accessible from the main corridor and not require access through a private office.



Extension cords laying on floor due to insufficient electrical outlets

- Files and boxes being stored within 24" of ceiling
- Lighting levels within the Building Maintenance Department are too low.
- There is no free exit from the Mechanical Room. This door requires free egress.



Boxes being stored to close to the ceiling

SECTION 6
EXISTING CONDITION ANALYSIS – BUILDING ISSUES

Lack of wayfinding to ADA ramp

Poor sight lines from the Front Desk

Poor sight lines from Front Desk to Observation Room

Air conditioner overloading the circuit

Building Issues

Overall, the interior of the building has been well maintained and appears in good condition. However, due to the building's age there are some problems that come with an aging building.

- There is a general lack of wayfinding signage throughout building. The Police Department is located in the basement of the building and only identified by a small sign within the entry stairwell. The primary accessible route to the Police Department is provided by a remote elevator located on the west side of the building. Signage identifying the elevator is poor and requires visitors to travel around the exterior of the building in order to access it.

- Sight lines from the front desk are poor, large areas of the lobby are unable to be observed from the front desk. The elevator is located down a long corridor to the west which cannot be monitored from the front desk.

- Due to the basement location of the Police Department, there is a general lack of natural light in all offices and work areas.

Lobby/Front Desk

- There is water damage located at the skylight within the public lobby.

- The door finishes are showing their age with chipping paint and damaged jambs.

- The flooring within the lockup area at the front desk is damaged.

- Due to the layout of the space, sight lines to lobby and the lockup cell are difficult.

Parking Enforcement

- A portable air conditioner has been installed within the Parking Enforcement Department due to improper air flow. The air conditioner, however, appears to be overloading the circuit. There is a sign taped to it indicating not to turn off the unit or it will blow the electric breaker connected to the first floor.

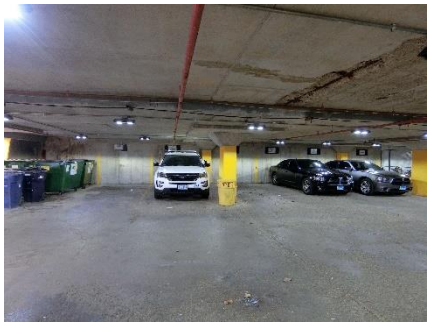
Sally Port

- Vehicular access to the sally port and parking garage is difficult with the current turning radiuses. The ramp is steep and creates issues with access for larger vehicles. The low headroom at the overhead doors leading into the sally port and garage limits the size of vehicles that can enter the area.

Difficult vehicular access to Sally Port

Walls within Sally Port lined with storage

Steep slope and low head clearance at parking garage



Spalled concrete within parking garage

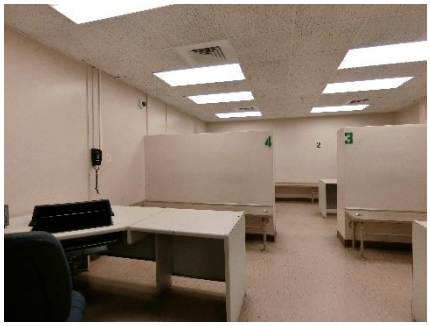
- The floors and ceilings within the sally port are showing signs of damage. There is a large area of efflorescence/moisture visible in the concrete ceiling slab. The concrete slab near the floor drain is cracking and spalling
- Two of the walls within the sally port are lined with storage units creating a dangerous situation when moving prisoners in and out. Some of the storage units hold evidence and hazardous materials that should not in the same area as prisoners.
- The east section of the sally port is caged off for evidence storage. Evidence should not be stored within the unconditioned space of the sally port as it can be subjected to water damage and is not thermally protected.
- There is a lack of security vestibules at all the exits.
- There is no secure separation between the mechanical spaces to the west and the sally port.

Parking Garage

- Snowplows and garbage trucks cannot access the bottom of the ramp and garage due to the steep slope and low headroom clearance.
- The floors and ceiling are showing signs of damage. The concrete around the trench drains is spalling and cracking. The concrete roof deck is spalling, exposing rebar which is rusting and corroding due to exposure to the elements.
- There is seepage in the garage which is likely caused by blocked or collapsed drain tile within the garage.
- The conduit surrounding the main data line connecting the communications tower to the building appears to be severely damage and is exposing the cabling to water.

Report Room/Lockup

- The prisoner processing area is not secure and is remote from booking.
- The security glazing on the lock-up cell is damaged and cloudy making it difficult to monitor prisoners within.
- There is a water leak above the report room as witnessed by damaged ceiling tiles.



Unsecured prisoner processing area

Security Glazing on lock up cell is damaged and cloudy

Insufficient space within Booking Area

Booking

- Overall, the booking area is extremely tight and insufficient for booking prisoners. The equipment is laid out in a galley style without a proper booking desk or place to sit prisoners during processing. Additionally, there are numerous tripping hazards and loose equipment that can be used as weapons located within the room.
- The building electrical panel is located within the secure vestibule, could be a security risk if prisoners were to get free and have access to the panel.
- Cells fronts and doors are older style bars that have been covered with wire mesh to reduce hazards and ligature (hanging) issues. They do not provide any sound separation.
- Steel bunks are not anti-ligature (anti-hanging) design.
- The emergency eyewash is located directly in the main cell corridor and could be a tripping hazard.
- The access panel to shut off valves is not secured.
- Ceiling tiles have been damaged and replacement tiles have been secured in place with duct tape.
- Doorstops have been added to secure doors in order to keep them open.
- The light fixtures are not vandal-proof detention rated fixtures. The booking areas appear to have standard troffer fixtures and the cells appear to have exterior grade lights.

Exposed eye wash within detention corridors

Damaged ceiling tiles within detention area

Unprotected CMU walls in Firing Range

Unsecured door leading to detention area

Staff break area shared with gun cleaning

Lack of seating and natural daylight at staff break area

Lack of storage within sergeant's locker room

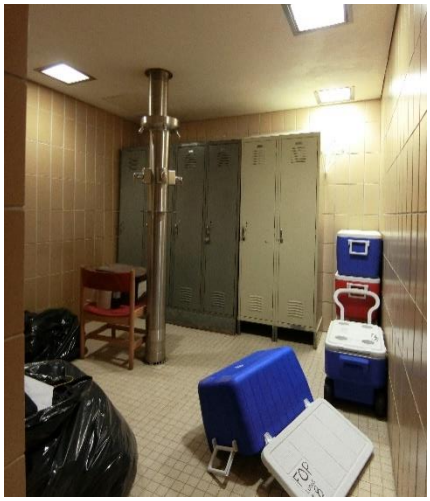
Firing Range

- The firing range is not currently in use because negative air pressure cannot be achieved. Shooting while the range is under positive pressure will result in lead dust contaminating the entire building.
- Because air flow is not throughout the range, it can only be used for static position shooting. It is not designed for tactical shooting, which allows training throughout the range.
- Exposed CMU walls have no protection from stray bullets, which creates a safety issue when a bullet ricochets off the CMU wall.
- Exposed piping is located underneath the safety ceiling that is not protected by the armor plate. If a bullet were to strike the pipe it could either damage the pipe or ricochet the bullet back at the shooter.
- The water and sprinkler risers are located in an unsecured room. Currently, chains and signage are being used to prevent unauthorized adjustments to the system.
- The Range Control Room is accessed through the mechanical/riser room. Mixing the functions of the mechanical spaces with the range control room is not recommended.
- Currently loose ammunition is being stored within the range control room which is left unsecured.
- There is an unlocked door leading directly to the detention cell corridor.

Break Area/Gun Cleaning

- The staff break area is currently being shared with the gun cleaning area. This is not a safe situation. Gun cleaning should be in a dedicated area to prevent an accidental discharge from injuring others. Furthermore, having these functions together creates an unsanitary, hazardous environment with chemicals for cleaning guns comingling with food.
- Overall, the space is inadequate for either function. There is a lack of counterspace for gun cleaning, folding tables have been covered with cardboard to soak up the spills from the chemicals and solvents. There is no seating area or place for staff to gather during break times. The lack of natural light contributes to the overall gloomy feel of the space.

Women's Shower being used for storage



Men's shower being used for storage

- Additionally, the break area/gun clean room is the main corridor to the men's locker room, which is not an ideal location for food preparation.

Sergeant's Locker Rooms

- Due to a lack of space within the main locker rooms, the sergeant's lockers have been located in a separate room.
- There is no shower or toilet located within the locker room, the lockers and benches are outdated and crowded.
- There is insufficient space for storage of boots and radios. The radio charging area is not organized and wires dangle everywhere.

Men's and Women's Locker Rooms

- In both the men's and women's locker rooms, the shower areas are being used for storage.
- The rooms are too small forcing the sergeants and administration lockers to be located elsewhere.
- The lockers are too small to provide proper boot storage and are insufficient in size for the officers.
- There is a lack of storage throughout for radios and equipment.

Lobby Conference Room

- An electrical and a mechanical storage room have been retrofitted to the west and south sides of the room. The result is a very tight space that makes circulating around the conference table extremely difficult. With no sound separation between the equipment and the conference room.
- The flooring has started to chip in the corridor outside the conference room.

Poor layout at vanity within women's locker room

Insufficient space for storage and circulation

Lockers size is insufficient

Chipped flooring outside conference room

Damaged acoustical walls within interview rooms

Lack of storage and break areas

Investigations

- The interview rooms do not have the proper acoustical treatments to reduce sound reverberation while recording interviews. A makeshift solution was to line the walls with Styrofoam. Unfortunately, the Styrofoam has been damaged over time and is starting to deteriorate.
- There is a lack of storage within the department, boxes and files have been stashed everywhere. Overflow filing cabinets and lockers have been placed in the main corridor reducing the width of the egress path.
- Due to the insufficient break area, a makeshift coffee area has been created within the department.

Records

- There are several large pipes running above the main records storage area. The pipes show signs of previous water leaks.
- Within the records department the desks are located close together and do not allow for adequate circulation space throughout the department.
- The air circulation within the department is poor, several fans have been located throughout the space to help move the air.

Evidence lockers located in the main corridor

Water damaged pipes above record storage

Insufficient air circulation

Evidence processing is overcrowded

Evidence processing

Evidence processing

Evidence

- Due to overcrowding, the evidence lockers cannot be located near the bag and tag area and have been put in the main corridor. This location is not recommended as it requires moving evidence through the main circulation corridor.

- The bag and tag area is currently being shared with the evidence processing lab. The space is too small and does not allow for proper layout, circulation or processing space. There is insufficient space for storage and an overcrowding of equipment. In order to perform a task several items need to be relocated in order to access the required equipment.

Patrol/Roll Call

- Due to insufficient space, the main circulation corridors have been lined with filing cabinets reducing the width of the egress path.

- The air circulation within the roll call room is poor.

Administration

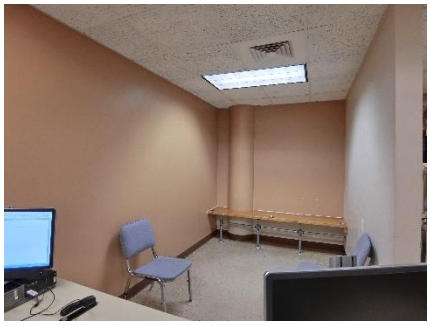
- Due to the insufficient break area, a makeshift coffee area and locker room has been created within the department behind a commander's work area.

- Closet doors have been removed in order to create a copy alcove space.

Juvenile

- There is a building column located at the juvenile booking bench, creating an awkward area for securing a juvenile.

Administration lockers and break area



Awkward layout within juvenile booking

Steel door frame is corroding

Damaged buttons at elevator

Building Maintenance/Mechanical Room

- Throughout the building maintenance area, the lighting levels are too low.
- A pipe penetration shows significant leakage of ground water.
- The main door to the mechanical room is warped and scrapes the floor.

Elevator

- The exterior elevator buttons are damaged.
- The elevator serving the police station is not designed for gurneys (stretcher size). While not a code requirement in Oak Park, a stretcher size elevator is recommended as they are safer for emergency response staff for moving the injured or sick and allow a person on a gurney to be moved without unnecessary trauma, for example, being shaken when carried up a stairway.

Exterior

- There is insufficient space within the parking deck for police vehicles, so they are forced to park in the unsecured lot. This presents a security risk as well as tying up parking spaces for the public.
- The concrete at the accessible entrance is cracking and spalling.
- Water is collecting at the bottom of the ramp. If the trench drain becomes clogged the water can easily infiltrate into the building.
- The bottom of steel door frame at the ADA entrance is corroding.
- The ventilation shaft walls for the chiller extend through the parking lot roughly 4-6" above grade. The curbs have been damaged by vehicles over time and are in rough shape. In addition they create an awkward space for vehicle parking and circulation.

SECTION 6
EXISTING CONDITION ANALYSIS – MECHANICAL

Existing boilers recently replaced

Mechanical Assessment

In 2015 the Village had a comprehensive property condition assessment performed by Wiss, Janney, Elstner Associates which reviewed the major building systems in their entirety. As the focus of this report is regarding the Police occupancy, only a brief commentary is provided regarding the condition of the central systems and their effect overall. The boilers and chiller have been replaced in recent years, a substantial improvement to the building. However, due to existing site conditions, the new chiller could not be enclosed within its own room and monitored by a refrigerant leak sensor which is a recommended standard and best practice.

The eventual replacement of the air handlers poses a much larger task. The dual-duct based system of air conditioning and ventilation is not energy efficient by today's standards and should be converted to a Variable Air Volume (VAV) based system. Whether the building remains occupied during the replacement of air handlers and related systems will dictate the phasing and overall time such a renovation would take. The supply ductwork would need to be replaced as well. Furthermore, the antiquated pneumatic based temperature controls, would need to be completely replaced with modern electronic temperature controls, also known as direct-digital controls or DDC.

The existing mechanical ventilation system is comprised of five built-up air handlers and other equipment, which are original to the building, approximately 45 years old. The Police Department is in the basement and is served by three units, 'S-2', 'S-4', and 'S-5'. Unit 'S-2' is listed for 9,460 CFM based on a "dual-duct" system of distribution and ventilation with pneumatically actuated controls. Unit 'S-4' serves the jail cells located in the basement along with part of the Police Department. This unit is listed for 1,600 CFM constant volume. Finally, unit 'S-5' serves the firing range and is listed for 10,000 CFM constant volume. Units 'S-4' and 'S-5' are original with pneumatic controls.

The server room for the Police Department is cooled utilizing a Liebert specialized computer room air conditioning unit. There is no back-up to the single Liebert air conditioning unit in the event of a primary unit failure.

Supplemental fans located throughout building to help circulate air

Since the original installation and design of the indoor pistol range, studies have which concluded that older installations tend to expose the shooter to unintentional exhaust of lead and other airborne contaminants. Modern ranges are designed to keep contaminants air borne until they can be captured and filtered from the air stream before being exhausted to the atmosphere or re-circulated. There are no such systems present in the current design. Currently, the existing range is inoperable because negative air pressure cannot be achieved. A firing range must be kept under negative air pressure to avoid the spread of lead dust throughout the entire building. If the range were to be renovated or demolished, the range and system components which have been in contact with the range exhaust air stream would need to be abated of lead contaminants.

It was noted that several parts of the Police Department were noticably devoid of much air movement. This is a common issue within basement spaces. Without external cooling sources, such as exterior walls in winter, or external heat gain sources, such as windows in summer, the spaces tend to be neutral. Becase there is little need for the HVAC system to heat or cool the space, the ventilation does not operate and the air becomes stagnant. Modern systems utilize Fan-Powered Terminal Units, which maintain a fixed amount of air circulation regardless of heating or cooling need and provide air movement without the use of space mounted oscilating fans.

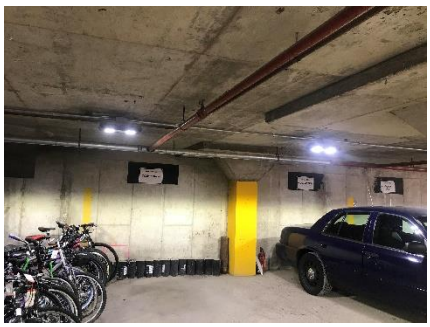
In summary, there have been major equipment upgrades to the boilers and chiller which serve the entire building. Overall thermal comfort using the existing dual-duct air conditioning and ventilation system can be improved somewhat by updating the distribution boxes and replacing the antiquated control system with modern DDC electronic temperature controls. However, it is recommended the system be converted to a VAV based system which is much more energy efficient and will provide greater thermal comfort.

The most difficult part of converting to a VAV system would be replacing the existing air handlers due to the access and building constraints. Additionally, since there are HVAC components which serve the entire building, renovation work to the police station will affect the Village Hall as there is no easy way to independently renovate one part of the building without affecting the other.

SECTION 6
EXISTING CONDITION ANALYSIS – PLUMBING

Existing ejector and sump pumps

Recently updated plumbing fixture



Recently replaced sprinkler piping

Domestic Plumbing System

Overall the toilet rooms have been recently renovated. The plumbing fixtures are newer and up to requirements of the current code.

The existing ejector and sump pumps appear to have been replaced given their moderm appearance. The condition of the main hot and cold water lines is unknown, but likely are galvanized pipe due to the age of the building. Over time the pipes will deteriorate. If the main lines have never been replaced, they will likely need replacement in the near future.

Fire Protection System

Fire protection throughout the Police Department seems nominal except where it is installed and visible within the squad parking garage. The garage is open to the outdoors and deterioration to the sprinkler piping is occuring. Sections of piping have recently been been replaced but this will be an ongoing maintenance item.

SECTION 6
EXISTING CONDITION ANALYSIS – ELECTRICAL

Main electrical room

Main electric service switchboard

Main motor control center

Main Electrical Services

There is one main electrical service for the facility. The service is supplied via a Commonwealth Edison underground feed originating from an underground vault mounted transformer. The vault is located directly west of the building's electrical service room. The main switchboard is located within the main electrical room on the west side of the facility, directly east of the ComEd vault.

The main switchboard is original to the building and is a Square D manufactured assembly labeled with a rating of 2000 amps, 208 volts, three-phase, four-wire. There are two main disconnect switches provided, one 800 amp three-pole switch supplying the facility chiller equipment and one 1200 amp three-pole switch supplying the rest of the building power. Each additional vertical switchboard section is rated for 1200 amps which limits the largest feed the board can supply to 1200 amps. The switchboard is in fair condition. The switchboard, excluding the cooling load, has recently been re-worked to feed through a full building transfer switch at the end of the switchboard lineup.

recommended. Typical expected useful service life of electrical service gear is approximately forty to fifty years. The existing service gear is nearing the end of its expected service life in approximately five years.

Electrical Distribution and Panelboards

There are two motor control centers and approximately twenty branch panelboards throughout the facility, which vary in age and condition from fair to good. The original motor control centers are no longer fully utilized for controls. They are mainly used as power distribution boards, as many mechanical systems now utilize integral disconnects or VFD controls. These panels are at or beyond their typical useful service life and should eventually be rebuilt or replaced with new standard power distribution boards.

Most of the motor control centers and branch panelboards will not be adequate for reuse as part of any building renovation and will require replacement and/or upgrade. The expected useful service life of electrical motor control centers and panelboards is approximately 30 to 40 years, so many of the existing panels are at or near the end of their typical expected useful service life.

The branch circuitry associated with the panelboards was specified as thermoplastic covered copper and should be in fair condition given its current age. The conduit system is in poor condition in several locations. Of concern are the exterior, or covered, parking locations. The conduit and concrete has

Repaired conduit within garage

Main gas-fired back-up generator set

Main emergency transfer switch

UPS battery back-up system

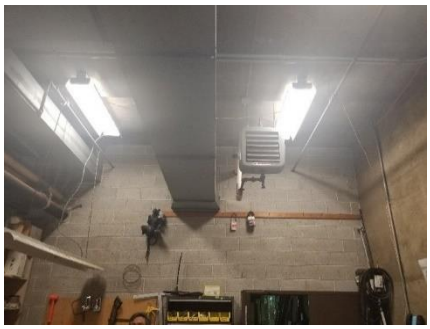
recently been repaired, but water continues to infiltrate the piping which will continue to corrode the boxes and conduit runs. Routine maintenance, including infrared scanning and cable lug torque check for all electrical distribution and panelboards and disconnects, is recommended.

Back-up Generator Systems

There is an 325kw/406kva natural gas fired Cummins Power Generation backup generator set installed in the basement northwest mechanical area. The generator has a start-up date of 11/99 listed on the control cabinet. The 1200 amp, 3-pole transfer switch in the main electrical room appears to be new and recently installed. The generator set is in fair condition at twenty years of age and has a typical expected service life of approximately thirty years. The back-up generator system appears to power the entire facility, excluding the chiller load. The output and loads supplied are adequate for a facility of this type and size.

UPS Systems

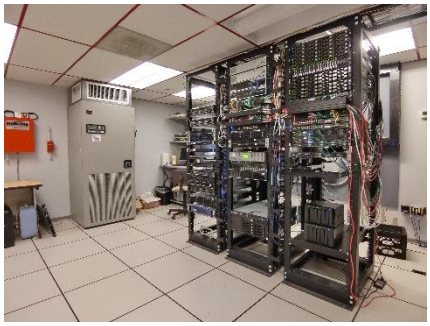
There is an MGE 3500 Schneider central UPS system located within the main electrical service room that provides battery back-up for the critical equipment. The UPS system is newer and in overall good condition. The output and loads supplied appear to be adequate for a facility of this type and size. Typical expected useful service life of electrical uninterrupted power supply systems is approximately 15 to 20 years.



Existing back of house lighting fixtures

Typical detention cell lighting fixtures

Typical updated indirect lighting fixtures



Main server room

Lighting Systems

The lighting fixtures and system throughout the facility are of varying age, condition, and type. The average lighting fixture is in fair condition. A lighting upgrade was performed in 2011, which replaced much of the older lighting with newer, indirect fluorescent troffer fixtures. Most of the back-of-house areas still have older, surface mounted fluorescent strip fixtures. There are still original incandescent dimmer cabinets in place throughout the building. Unfortunately, these dimmer cabinets are incompatible with the newer fluorescent type fixtures so they must be bypassed and abandoned in place. The typical expected useful service life of electrical lighting fixtures is approximately 15 to 20 years. A few locations appear to have been recently fitted with new LED fixtures and updated lighting controls.

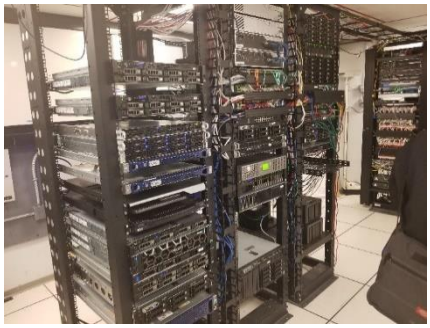
Occupancy/vacancy sensor control was not apparent in most areas. Installing additional sensors is recommended to cover all areas, which would provide additional energy savings and meet the current energy conservation code requirements.

The emergency exit lighting throughout the facility is of varying age, condition, and type. The average emergency lighting fixture is in fair condition. Most of the emergency lighting and exit signs are on the back-up generator power. Additional battery pack emergency lighting fixtures were added in the detention and booking areas.

The booking and detention areas of the police station do not have appropriately constructed vandal-proof detention rated light fixtures. The fixtures in the booking area are standard troffer fixtures and in the cells are exterior grade lights. The fixtures themselves are in fair condition.


Fire alarm main control panel


Fire alarm annunciation panel


Village server room & racks

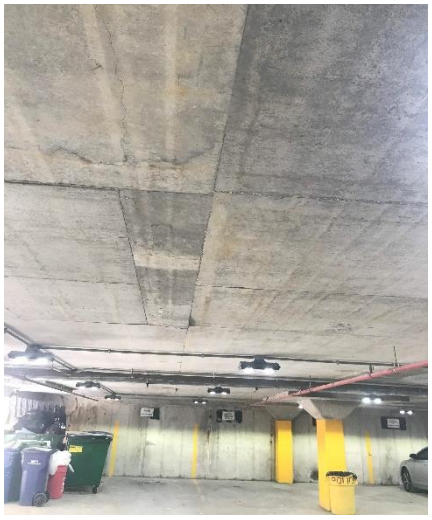

Intercom call and electronic security reader

Fire Alarm Systems
The building has a complete addressable Quickstart electronic fire alarm detection and annunciation system, manufactured by Edwards Systems Technologies. Wireless alarm transmitter(s) were noted as well. The general coverage for detection and annunciation appear typical but minimal for a building of this age, type and use. The system is an older model with mixed manufacturer and age devices installed. The devices are in fair condition. The building does not have any fire sprinkler protection installed in the occupied spaces. Sprinkler protection was visible only within the garage areas so it could be monitored by the fire alarm system. Typical expected useful service life of electronic addressable fire alarm systems is approximately 15 to 20 years.

Voice and Data Systems
There is a main server room located in the basement across from Routine maintenance including lug torque check is the IT department. The room is contained and secured and has a dedicated cooling system. The IT equipment is mounted within six free-standing floor racks. There is a raised access floor that appears to be anti-static. The cabling is well organized on the racks. The voice and data systems within the building are up to date, functional and in fair condition overall.

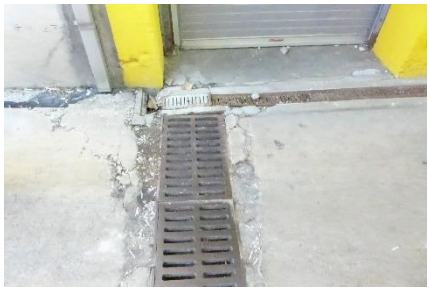
The building has a central sound/paging and intercom system with the head-end unit located at the front transaction counter. The system is quite old and in poor condition. Newer intercom devices, which may have taken the place of the old system devices, have been installed. There are modern card access devices and IP based security cameras installed throughout that are in fair condition. Typical expected useful service life of electronic telecommunications systems and equipment is approximately 7 to 10 years maximum.

SECTION 6
EXISTING CONDITION ANALYSIS – STRUCTURAL



Repaired concrete deck at garage

Area of patched concrete deck at garage



Broken concrete at trench drain

Structural Conditions

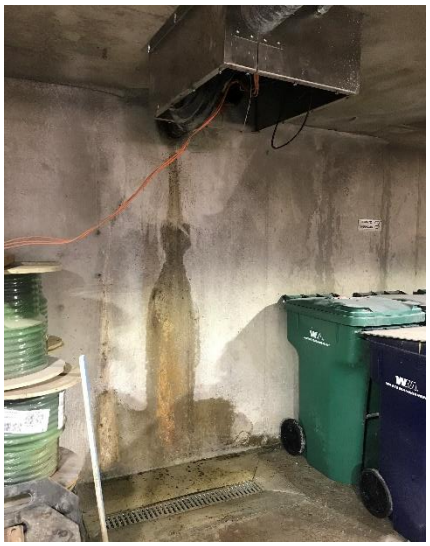
The project site consists of a one-story, concrete and timber structure with a full basement and a partial second floor mezzanine. The building has a "C" shaped main floor plan with an exterior plaza at the center. The building is clad in brick masonry with punched windows at the exterior perimeter and window walls overlooking the courtyard at the center of the building. The basement occupies the full area beneath the building and exterior plaza core. The basement and first floor construction consist of cast in place concrete supporting exposed timber framing above grade. Two levels of parking, below grade and grade level, are located on the south side of the building. The lower level parking is accessible by ramps nested between the parking area and building.

Exterior Observations

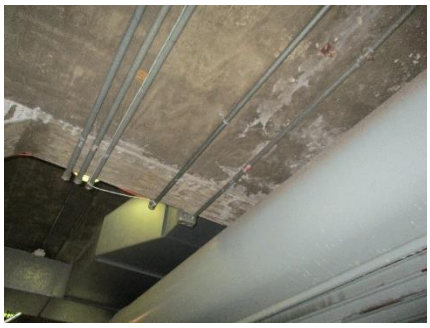
The exterior review was limited to the below grade parking garage. The parking garage is in reasonably good condition. A portion of the concrete deck and localized areas of spalling were recently repaired when the above ground parking lot was repaired. Several areas of corrosion and spalling were repaired and patched. Water infiltration was observed at a pipe penetration on the south end of the lower parking area. This pipe penetration and concrete was recently repaired and a new trench drain was installed to minimize water ponding on the slab.

Interior Observations

Within the building basement area utilized by the Police Department, the extent of visible structural concrete was limited. The areas with accessible concrete include building maintenance, storage, the sally port, the firing range, and the mechanical and generator rooms. Overall, the structure in these areas was in good condition. There is a small area of efflorescence visible in the slab above the sally port and a pipe penetration in the HVAC mechanical room shows significant leakage of ground water.



Water infiltration at pipe penetration



Efflorescence in hall at Sally port

Water infiltration and corrosion at pipe in mechanical room

Conclusion and Recommendations

In general, the condition of the parking structure was good. The water infiltration at the pipe penetration should be monitored to ensure that the water is not creating new spalling.

The condition of the basement structure of the building is in very good condition. The few items noted above are not structurally significant. The efflorescence is the result of water infiltration. It is not known if the water issue is still present. It is recommended that this location be monitored over time to check for water leakage. Preventing water infiltration will stop additional efflorescent from developing. No structural concerns exist currently. Within the HVAC room the leakage at the pipe penetration should be repaired in order to create a seal to prevent possible damage to the concrete.

SECTION 6
EXISTING CONDITION ANALYSIS - RECOMMENDATIONS

Analysis of Village of Oak Park Police Station:

The analysis of the facility focuses on 5 major points of concern:

1. Systems, equipment, spaces, and functions that the building currently has, must comply with the applicable building codes in effect when the building was constructed or last remodeled.
2. Space needs for the current building need to be based upon current operations and requirements.
3. Spatial relationships, staff interaction/separation of spaces should facilitate the Department's operational needs.
4. Items that do not comply with existing building code requirements, discussed in this section, will need to be addressed. Current building code requirements for new construction or alterations will be required to be met when the building is remodeled or added onto.
5. Miscellaneous items, issues and best practices that should be addressed.

Within this section, items that should be addressed are identified. Each item has also been evaluated against life safety requirements. Certain items should be addressed sooner than others based upon the impact they have on the safety of the occupants including employees and the public. Each item is classified as follows:

(a) Urgent – items that present an immediate hazard to the safety of the occupants. We recommend these items be addressed within a 1 - 2 year period.

(b) Required – items that are necessary for a safe environment but present less of an immediate hazard to the safety of the occupants. We recommend these items be addressed within a 2 - 4 year period.

(c) Recommended – items that do not present any immediate hazard to the occupants. We recommend these items be addressed within a 4 - 10 year period if found to be pertinent to the Village's plans for the existing facility.

This classification approach is provided to the Village as a guide for implementing the minimum amount of work required to make the police station safe for its occupants.

Village of Oak Park Police Station		Type of Item	Priority	Estimated Impact	
Item	Issue	1, 2, 3, 4, 5	a, b, c	Low	High
1	Address accessible access issues to the Police Station, includes Lombard Avenue entrance	4	c	$100,000	$250,000
2	Provide an accessible transaction counter at Police	4	c	$80,000	$150,000
3	Make public toilet rooms doors meet ADA	4	c	$75,000	$125,000
4	Provide the required ADA handrails in public toilets rooms	4	c	$5,000	$10,000
5	Relocate public toilet accessories (i.e. towel dispenser, seat cover dispenser, etc.) to meet ADA	4	c	$2,000	$5,000
6	Replace door hardware with ADA accessible hardware	4	c	$20,000	$35,000
7	Renovate Main staff toilet rooms to be ADA accessible	4	c	$150,000	$250,000
8	Correct the ADA push/pull clearance at multiple doors throughout facility	4	c	$500,000	$750,000
9	Provide ADA access at Sally Port	4	c	$20,000	$20,000
10	Provide ADA accessible detention facilities	4	c	$100,000	$300,000
11	Provide accessible sink in the staff break area	4	c	$5,000	$10,000
12	Provide the required ADA lockers, benches, toilets, showers, and access to locker rooms	4	c	$300,000	$400,000
13	Move furniture, storage, and other loose goods from doors and aisleways to meet the required 36" clear space for ADA access in multiple locations	4	c	$1,600	$3,000

Village of Oak Park Police Station		Type of Item	Priority	Estimated Impact	
Item	Issue	1, 2, 3, 4, 5	a, b, c	Low	High
14	Provide ADA transaction at Administrative Secretary window	4	c	$10,000	$15,000
15	Re-install required Fire Doors at public lobby to meet fire separation	1	a	$6,000	$10,000
16	Replace door at parking enforcement with a proper fire rated door to meet requirement	1	a	$3,000	$5,000
17	Replace/ alter doors in building maintenance department to meet required fire separation rating	1	a	$12,000	$20,000
18	Provide proper fire rating at Records storage room partitions	1	a	$30,000	$40,000
19	Provide full fire suppression system	4	b	$500,000	$750,000
20	Provide Fire Alarm visual devices as required by code and ADA	4	b	$10,000	$15,000
21	Provide proper illuminated directional exit signs	1	a	$15,000	$25,000
22	Provide additional electrical outlets and eliminate use of extension cords	5	b	$80,000	$100,000
23	Properly separate mechanical and electrical equipment from Lobby conference room to meet fire separation	2	b	$5,000	$50,000
24	Relocate access to mechanical room not to pass through a sensitive secure office (Crime Analyst)	2	b	$7,500	$10,000
25	Remove all storage located within 18" of ceiling (fire issue)	2	b	$1,000	$2,000
26	Provide free exit egress from mechanical room	1	a	$3,000	$5,000

Village of Oak Park Police Station		Type of Item	Priority	Estimated Impact	
Item	**Issue**	**1, 2, 3, 4, 5**	**a, b, c**	**Low**	**High**
27	Improve wayfinding signage for public	5	c	$15,000	$30,000
28	Improve public lobby and access observation and oversight for safety and control	2	b	$12,000	$100,000
29	Repair water damage at skylight in public lobby	5	b	$8,000	$10,000
30	Sally Port and underground parking is inadequate for current vehicles and equipment. Provide adequate conditions	1	b	TBD	TBD
31	Address spalling concrete in Sally Port	5	b	$25,000	$30,000
32	Remove evidence and storage from Sally Port	2	b	$8,000	$16,000
33	Relocate evidence from Sally Port to a secured conditioned location	3	b	$10,000	$250,000
34	Provide security vestibules at entrances into station from un-secured areas.	3	b	$300,000	$400,000
35	Provide secure separation between Sally Port and adjacent mechanical area	3	b	$20,000	$30,000
36	Repair damaged drive, drains, drain tile, etc. in the garage and ramp	5	b	$150,000	$300,000
37	Secure prisoner processing's connection to booking	3	b	$35,000	$50,000
38	Replace damaged security glazing to make monitoring clear	5	b	$20,000	$30,000
39	Repair water leak and repair tiles above report room	5	b	$3,000	$15,000

Village of Oak Park Police Station		Type of Item	Priority	Estimated Impact	
Item	Issue	1, 2, 3, 4, 5	a, b, c	Low	High
40	Eliminate tripping hazards in Booking and provide adequate secure area for prisoners	2	b	$30,000	$60,000
41	Eliminate ligature issues in detention	4	b	$50,000	$80,000
42	Protect eye wash in detention area to eliminate tripping hazard	5	b	$2,000	$10,000
43	Secure utility controls in detention area	5	b	$2,000	$10,000
44	Repair damaged ceiling tiles in detention areas	5	b	$5,000	$20,000
45	Remove doorstops from secure doors in detention area	3	b	$2,000	$4,000
46	Replace lighting fixtures in detention area with detention-grade quality	5	b	$20,000	$40,000
47	Provide proper ventilation at firing range	2	b	$300,000	$400,000
48	Provide adequate protection on masonry walls of range to prevent ricochet	5	b	$40,000	$80,000
49	Relocate piping above armor plate to protect from damage and ricochet.	5	b	$20,000	$40,000
50	Separate mechanical controls from range control	3	b	$5,000	$50,000
51	Eliminate or provide secure vestibule from range to detention	3	b	$4,000	$40,000
52	Separate/remove gun cleaning from break area	3	b	$4,000	$30,000

Village of Oak Park Police Station		Type of Item	Priority	Estimated Impact	
Item	Issue	1, 2, 3, 4, 5	a, b, c	Low	High
53	Provide properly sized lockers with storage for radios and equipment	5	b	$2,000	$3,000
54	Provide adequate acoustical treatment in interview rooms for recording	5	b	$20,000	$40,000
55	Provide adequate clearance in records around and between desks	3	b	$5,000	$40,000
56	Separate evidence tagging area and evidence processing area	3	b	TBD	TBD
57	Improve HVAC circulation in Records	5	b	see Item 66 below	
58	Improve HVAC in Patrol/ Roll Call	5	b	see Item 66 below	
59	Correct ground water leakage in mechanical maintenance room	5	b	$5,000	$8,000
60	Replace/ repair main door to mechanical maintenance room	5	b	$8,000	$8,000
61	Secure parking lot for officers	3	b	TBD	TBD
62	Repair spalling concrete at accessible entrance/ elevator entrance	5	b	$10,000	$20,000
63	Improve drainage at accessible entrance so water will not enter building	5	b	$10,000	$15,000
64	Replace damaged door frame at accessible entrance	5	b	$5,000	$5,000
65	Repair damaged elevator controls	5	b	$3,000	$5,000

Village of Oak Park Police Station		Type of Item	Priority	Estimated Impact	
Item	Issue	1, 2, 3, 4, 5	a, b, c	Low	High
66	The entire HVAC system is near the end of its useful life and should be upgraded rather than replaced for efficiencies.	5	b	$1,500,000	$2,000,000
67	Replace galvanized plumbing lines from future deterioration given age of lines.	5	c	$210,000	$285,000
68	Replace all fire suppression piping that occurs in the exterior garage.	5	b	$30,000	$40,000
69	Rebuild/ replace distribution electrical panelboards	5	b	$80,000	$100,000
70	Replace lighting and controls with more efficient fixtures	5	c	$50,000	$70,000

Recommendation Cost Summary

A summary of costs for items that should be addressed is as follows.

Item	Low	High
Urgent Items (priority a)	$69,000	$105,000
Required Items (priority b)	$3,356,500	$5,306,000
Recommended Items (priority c)	$1,643,600	$2,708,000
Total	**$5,069,100**	**$8,119,000**

Please note low-high cost ranges have been provided as no actual design work has been performed.

SECTION 7
INITIAL CONCEPTUAL SOLUTIONS

Identification of Potential Options

Prior to developing actual solutions to the space needs issues of the Police Department, it helps to identify what the potential options are and the associated magnitude of costs in a conceptual manner.

Potential Options

1. Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.
2. Build a new police station somewhere else in the Village.
3. Renovate the existing basement areas occupied by the Police Department.
4. Keep the existing building as is with the understanding that this will not correct any of the space or operational deficiencies identified.

Each option will be discussed in this section.

It should be noted that one option was considered and discarded:

- Renovate and add an addition to the existing building to meet the space needs of the Police Department.

There are several reasons why this option was discarded:

1. The existing Oak Park Civic Center is on the National Register of Historic Places and adding an addition to the building would be difficult. By not attaching a large addition to the existing building, the historic significance is retained.
2. An addition could only be placed on the south side of the Civic Center because there is not enough land available elsewhere. Adding an addition to the south side of the Civic Center would make it difficult to preserve the south entrance, which is heavily used by patrons and staff.
3. Because the Police Station is in the basement of the Civic Center, tying in an addition to the space would be difficult.

Initial Site and Building Concepts

Option 1 Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.

This option assumes that 16,382 sq. ft. of the existing police station

will be renovated and a 64,111 sq.ft. addition will be constructed on the existing site to meet the space needs requirements of the Police Department.

This solution takes advantage of existing space and renovates it to correct accessibility, safety and security concerns, heating and cooling issues, and other items identified in Section 6. By taking advantage of the existing space, the size of the addition can be reduced, which will reduce both land requirements and costs.

This option will require a parking deck to keep the parking situation status quo, with a significant amount of visitor and staff parking on the adjacent residential streets.

The major goal of this option is that the police station addition will be respectful of the existing building and the residential neighborhood.

This option explores renovating the Civic Center basement for police functions and utilizing the existing open space and parking lot for an addition to the police station. Using the basement for police functions creates some operational inefficiencies, as it would be separated from the police station addition, but it also reduces the amount of new construction required.

Site Information

Site concept development consisted of analyzing the current Civic Center site, located on Madison Street to determine if this site can effectively accommodate the needs of the police department, or if another site must be acquired by the Village.

The site is bounded by Madison Street to the north, S. Taylor Avenue to the east, Adams Street to the south and S. Lombard Street to the west. The existing Civic Center is located at the north end of the site and is surrounded on the other three sides with residential properties. Parking is located on grade at the center of the site for Village staff, the Police Department, and visitors. Additional parking throughout the neighborhood streets is also utilized. The southern portion of the site is open green space.

Utilizing information from the Space Needs Analysis, FGM began developing potential site diagrams and program adjacency arrangements depicting how the space needs of the Police Department could be accommodated on the existing site. These

diagrams take into account the size of the facility, the parking requirements, and the traffic flow through the site.

Concept Development
Given the limited space available on the existing site, it is advantageous to have some police functions remain within the existing basement space. Which functions to remain were based on safety and security and building code considerations.

From a safety and security viewpoint, it is advantageous to have detainee holding and detention functions away from the Village Hall so detainees who have been released do not comingle with visitors or civilian employees.

As required by the building code, police stations are considered essential facilities and are constructed to a higher structural standard. The existing building is not designed to modern essential facility standards. Therefore, functions that are deemed essential to operations can be located in an addition, while non-essential functions can be kept within the existing basement space. The spaces that can be considered non-essential include training and storage use spaces.

For an addition, a maximum addition footprint of approximately 22,758 square feet was established which was based on the size of the existing green space. Initial plan diagrams were developed, exploring how program elements could be accommodated within the available footprint. Generally, a police department functions most effectively when the number of stories is limited to a maximum of one story above grade, and one story below grade.

In designing a Police Station on a site with limited area available, the first floor is the most critical, so establishing a size for the first floor footprint is an important step in creating a functional plan.

Two initial floor plan concept diagrams were developed;

> **Option 1 – Plan Diagram 1** depicts 10,457 square feet of renovated existing basement space and a 2-story + basement diagram for the addition. The police station addition contains approximately 68,274 square feet.
>
> In order to improve the functionality of the department, this concept incorporates all day to day functional

requirements, the essential functions, in the police station addition and the functions that can operate more remotely remain within the existing basement.

Within the existing basement, the existing firing range would be renovated, a new evidence area would be built to accommodate vehicles, evidence collection, processing and storage, and adequate records storage would be provided. The remainder of the basement would remain as village IT space and additional area could be used for other Village needs.

In the police station addition, the first level accommodates the functions that need first floor access, including the public lobby, reception, records, citizen report rooms, patrol, investigations and lock up. The second level includes an upper lobby, with access to administration and the training room/EOC, as well as, secure areas including community policing, locker rooms, fitness, defensive tactics training, and a break area with outdoor roof patio access. The lower level accommodates a garage for 30 vehicles, mechanical space, and Storage.

Option 1 – Plan Diagram 2 depicts 13,076 square feet of renovated existing basement space and a 2-story plus basement diagram for the police station addition. The addition contains approximately 61,662 square feet.

In order to improve the functionality of the department, this concept incorporates all day to day functional requirements, the essential functions, in the police station addition and the functions that can operate more remotely remain within the existing basement.

Within the existing basement, all the training functions are accommodated, including the training room/EOC, defensive tactics, and the renovated firing range. A new evidence area would be built to accommodate vehicles, evidence collection, processing and storage, and adequate records storage would be provided. The remainder of the basement would remain as village IT space and additional area could be taken over for other village needs.

The first level of the addition, similar to Plan Diagram 1, accommodates the functions that need first floor access, including the public lobby, reception, records, citizen report rooms, patrol, investigations and lock up. The second level, however, is reduced because the training functions are now located in the existing basement. This second level includes an upper lobby, with access to administration and community policing, as well as, secure areas including locker rooms, fitness, and a break area. Because, the second floor footprint is reduced, roof areas are increased. The lower level includes a garage for 30 vehicles, Mechanical space, and Storage.

Several Initial Site Concepts were developed incorporating the established building addition footprint and potential parking decks. Various addition and parking orientations and arrangements were explored.

Based on the initial concepts, it appears that placing a Police Station addition on the existing site could work effectively, however providing adequate parking proves to be challenging.

Option 2 – Build a New Police Station on a Different Site

Diagrams were not developed for this option because a specific site has not been identified.

Option 3 – Renovate the Existing Basement Areas Occupied By the Police Department

A plan diagram was developed to explore if the existing police department were to remain on the basement of the village hall, could the functionality be improved.

Option 3 – Plan Diagram 1 depicts utilizing the existing functional spaces of the department, which is approximately 35,688 square feet, but re-organizing it to make some improvements to the functionality.

Spaces that are severely lacking in the existing police station include the locker rooms. This concept eliminates the firing range and re-purposes the space for the build out of new locker rooms. Existing locker room space is taken over to expand the patrol area to allow for more adequate workspace, roll call, and interview rooms. The investigations area is slightly expanded and reconfigured.

The records area is relocated adjacent to the existing reception area to allow for proper public interface. Community policing moves to the existing records area. lock up is slightly expanded, to improve the booking area. administration and evidence remain the same.

Although some minor improvements to the functionality are possible, the Police Department would still be severely lacking the required space needed to function effectively as a modern-day Police Department. Additionally, the current basement space they occupy will still have no windows, views, or natural light.

Option 4 – Keep the Existing Building As-Is
No Diagrams were developed for this Option.

With the Committee, FGM identified which of these initial plan and site concepts had the best potential for developing a Police Station addition on the site.

On the following pages are our Initial Concept Diagrams:

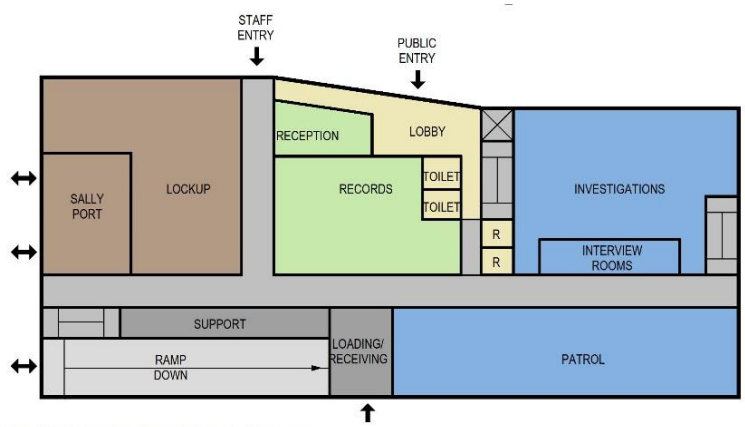
Option 1 **New Addition Plan Diagram 1**
Existing Renovation Plan Diagram 1

Option 1 **New Addition Plan Diagram 2**
Existing Renovation Plan Diagram 2

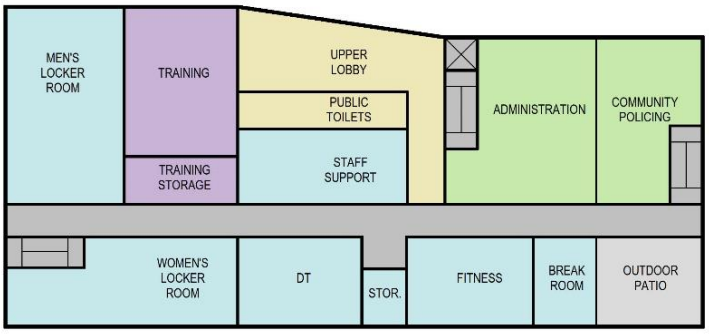
Option 1 **Site Diagrams A through E.**

Option 2 **No Diagrams included**

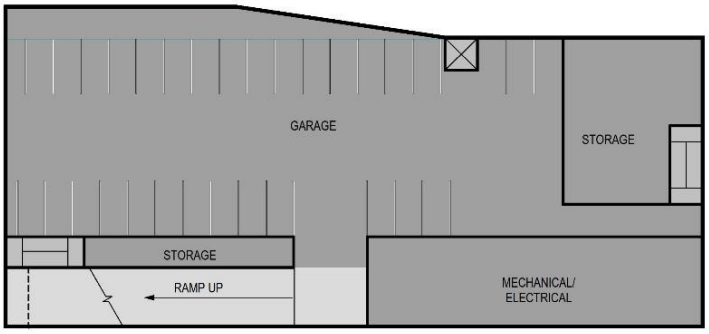
Option 3 **Existing Renovation Plan Diagram 1**



FIRST LEVEL PLAN DIAGRAM

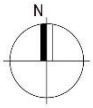


SECOND LEVEL PLAN DIAGRAM



LOWER LEVEL PLAN DIAGRAM

LOWER LEVEL	22,758 SF
FIRST LEVEL	22,758 SF
SECOND LEVEL	22,758 SF
TOTAL	68,274 SF



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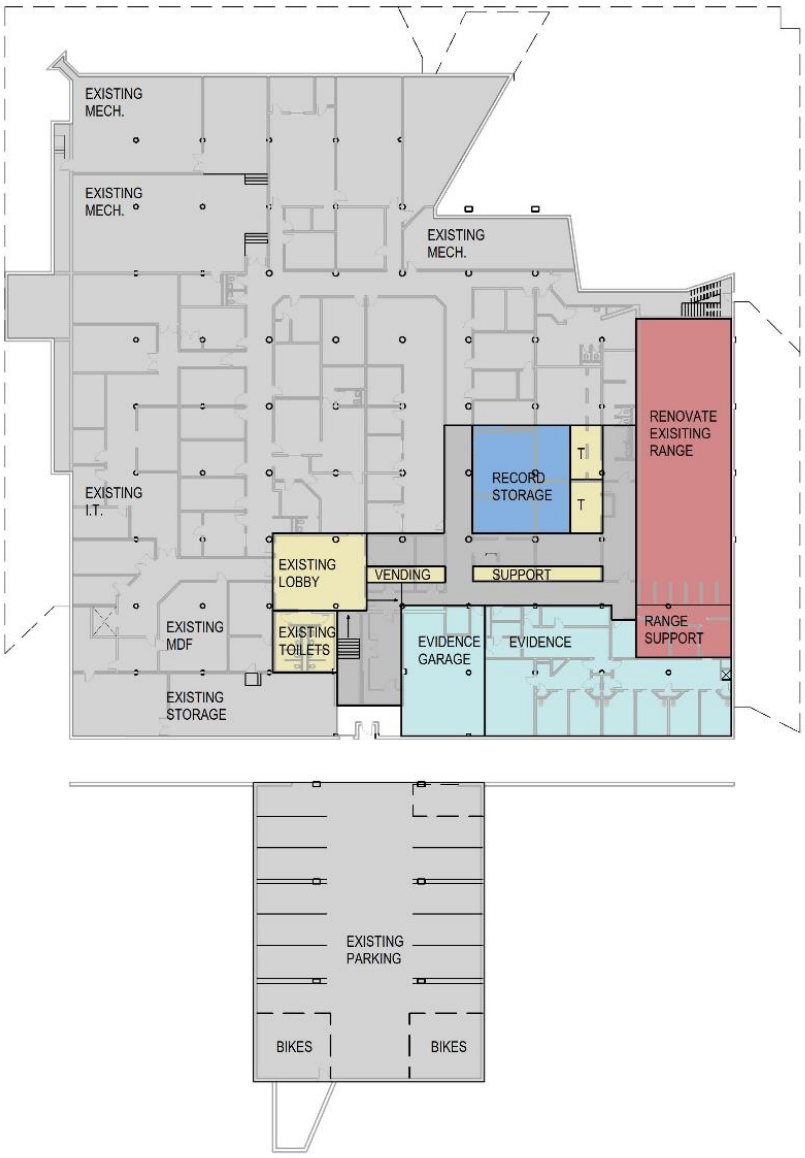
Option 1 – New Addition Plan Diagram 1

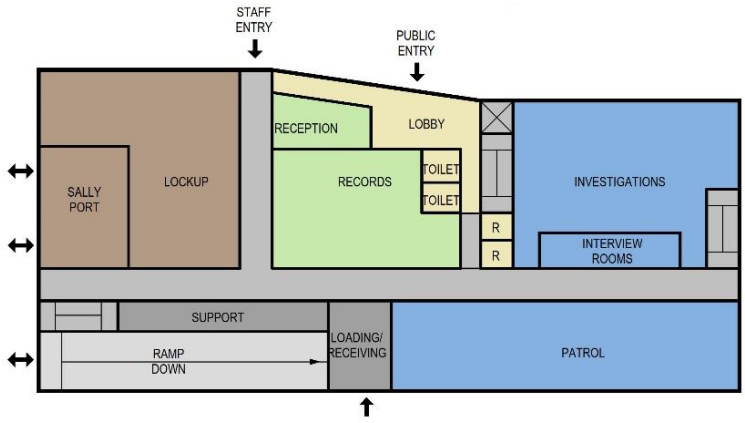


RENOVATED FLOOR AREA: 10,457 SF

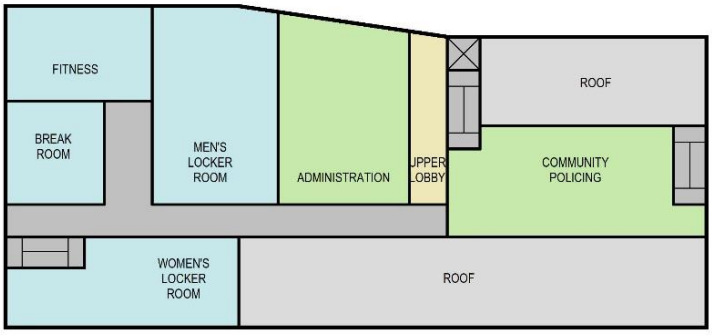
N

APRIL 9, 2019

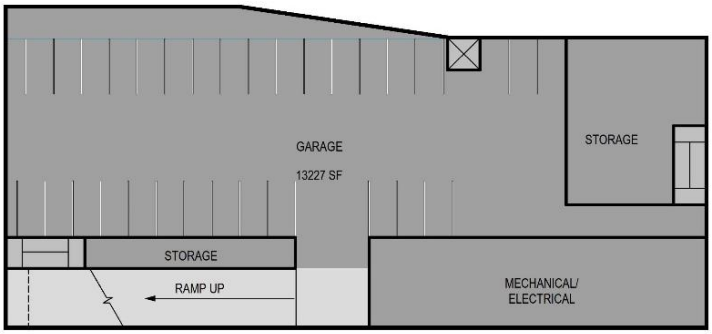
Option 1 – Existing Renovation Plan Diagram 1



FIRST LEVEL PLAN DIAGRAM

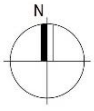


SECOND LEVEL PLAN DIAGRAM



LOWER LEVEL PLAN DIAGRAM

LOWER LEVEL	22,758 SF
FIRST LEVEL	22,758 SF
SECOND LEVEL	16,146 SF
TOTAL	61,662 SF



APRIL 9, 2019

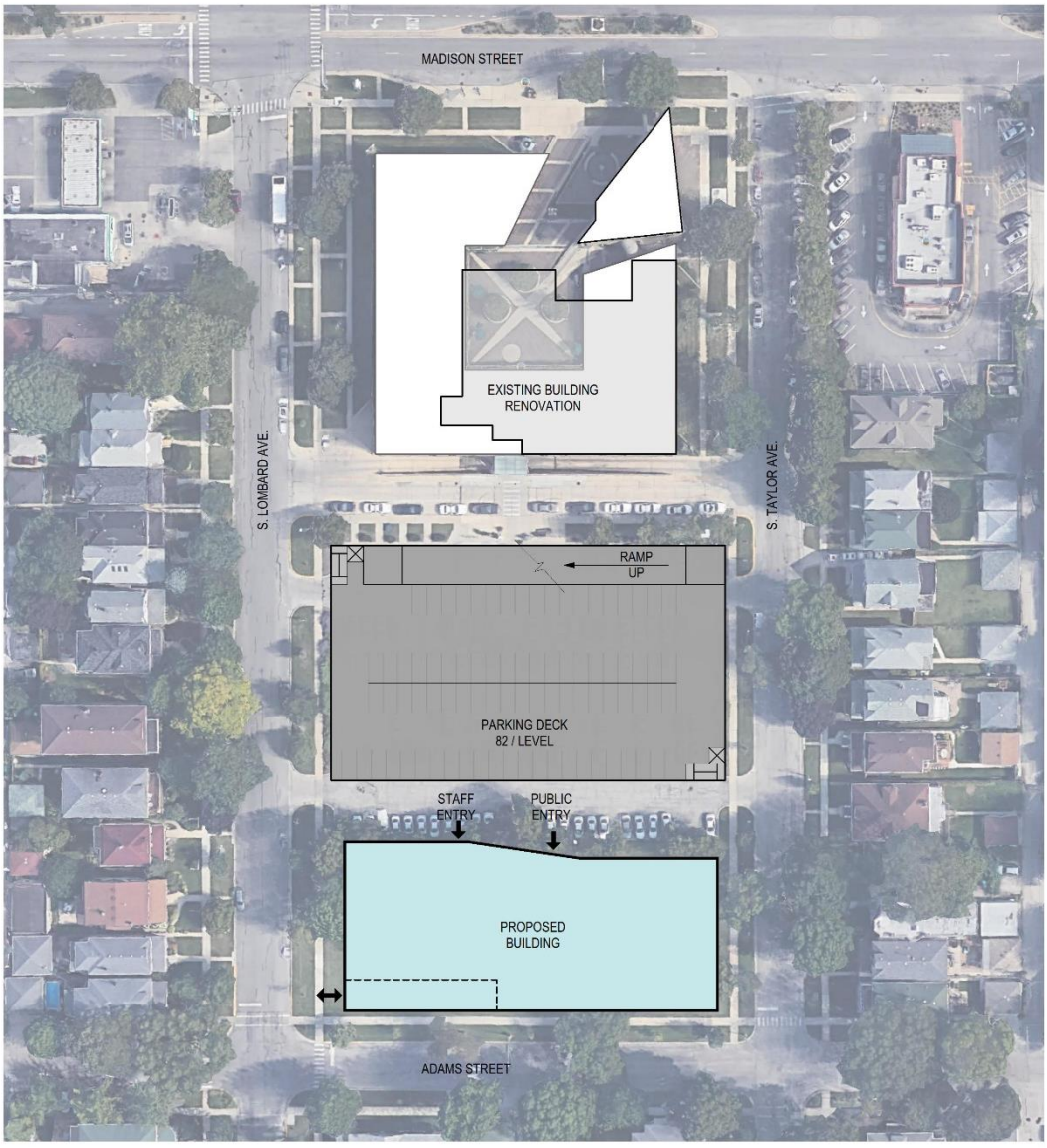
Option 1 – New Addition Plan Diagram 2

N

RENOVATED FLOOR AREA: 13,076 SF

APRIL 9, 2019

Option 1 – Existing Renovation Plan Diagram 2



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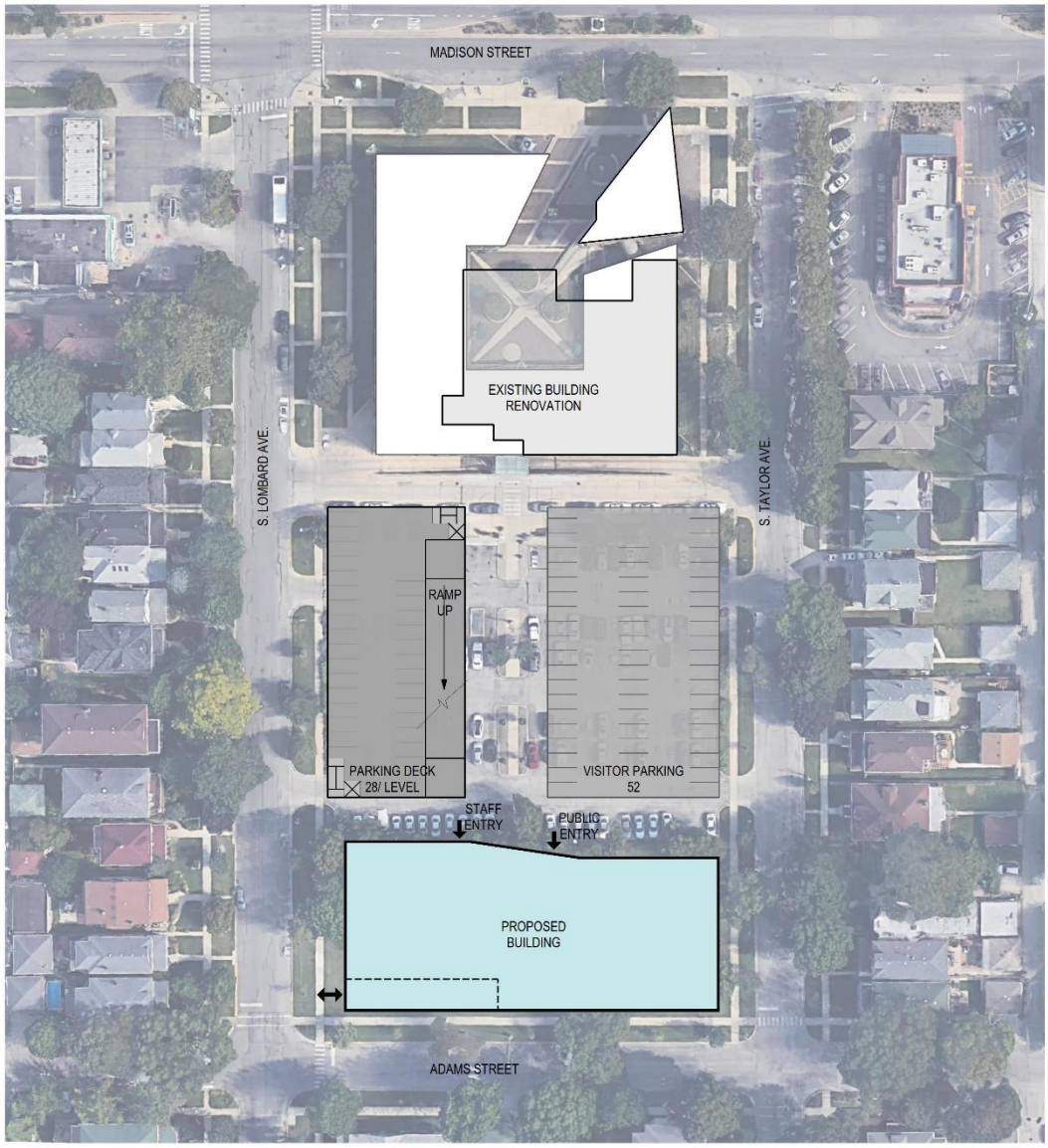
Option 1 – Site Diagram A



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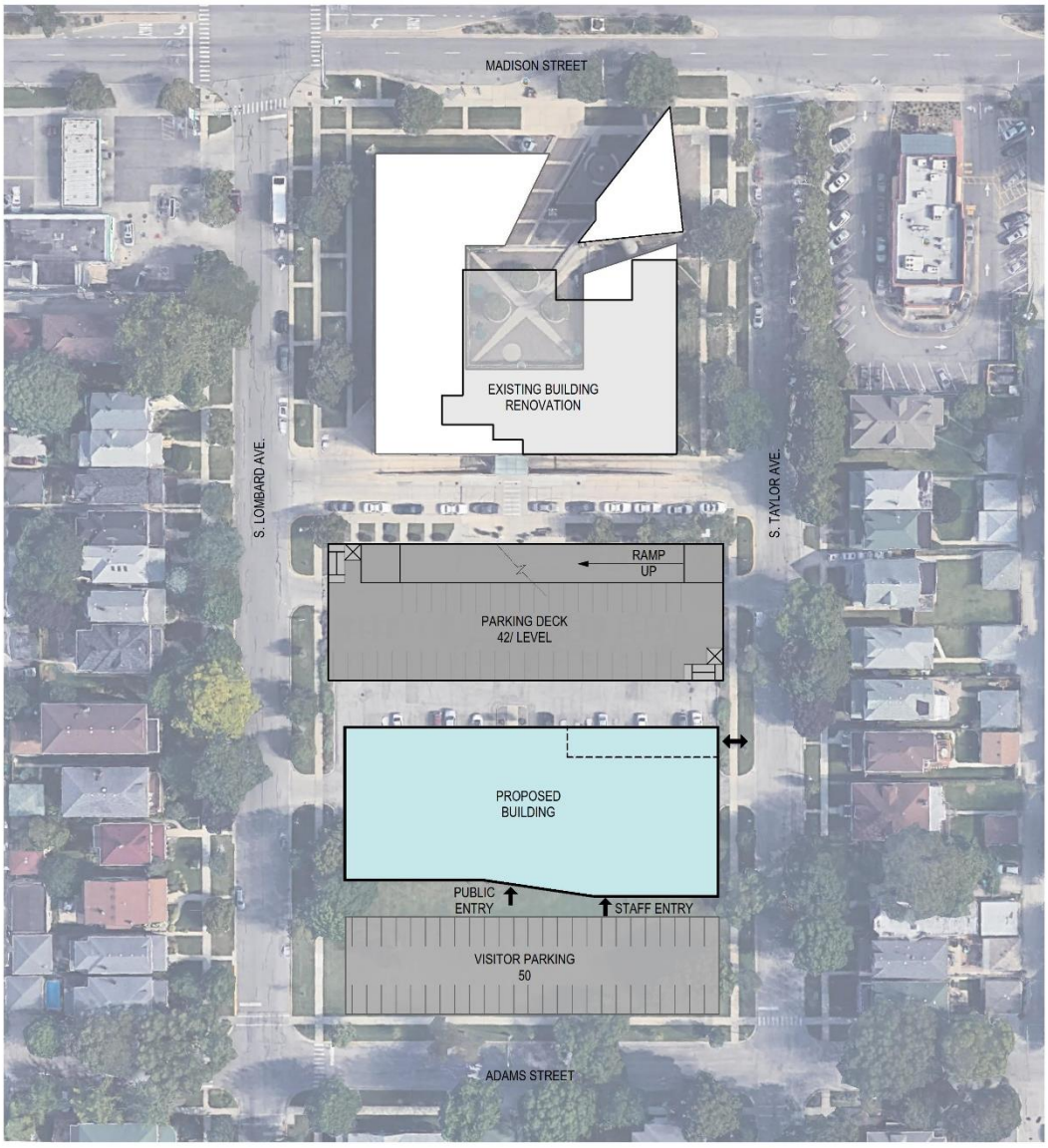
Option 1 – Site Diagram B



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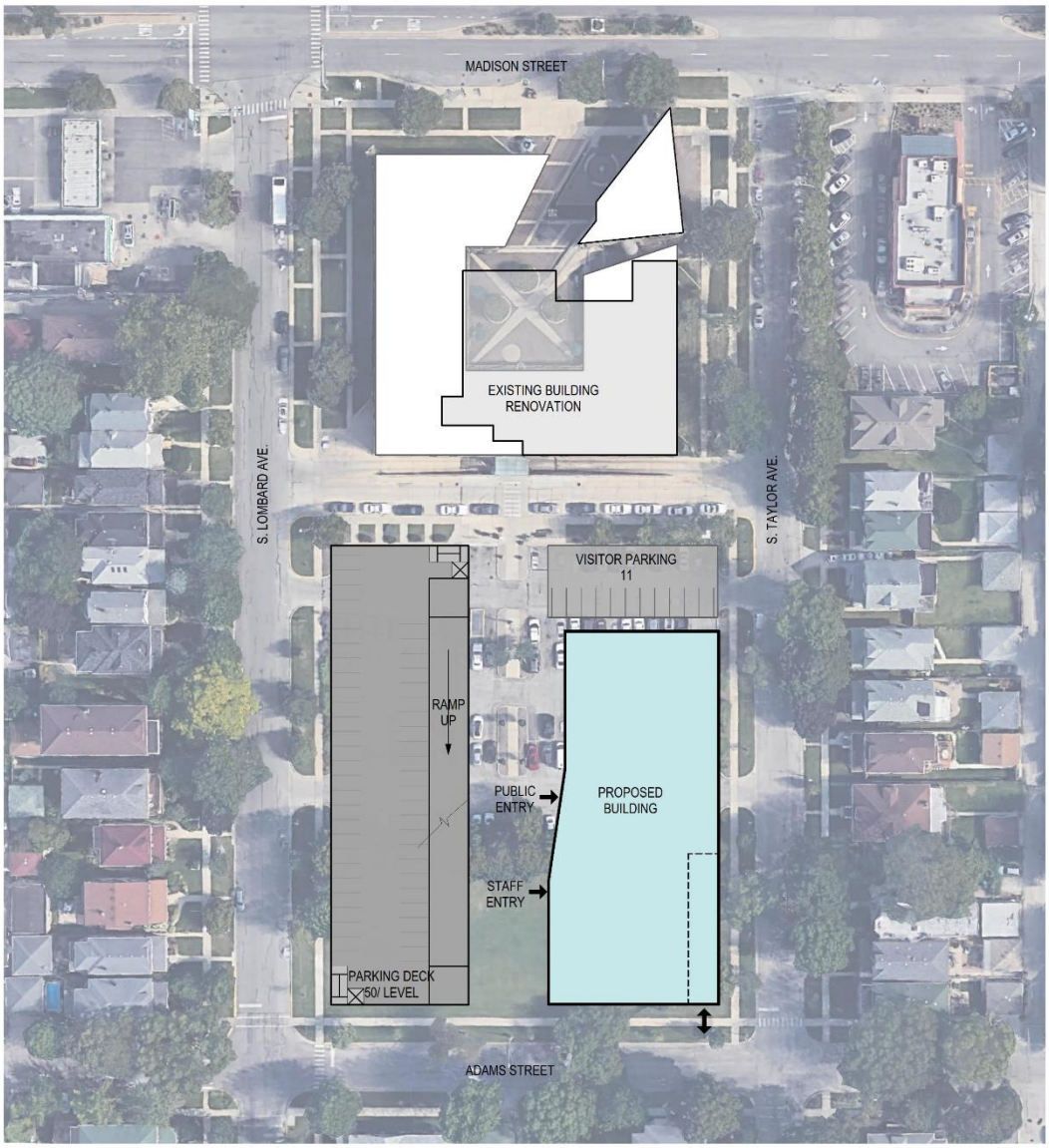
Option 1 – Site Diagram C



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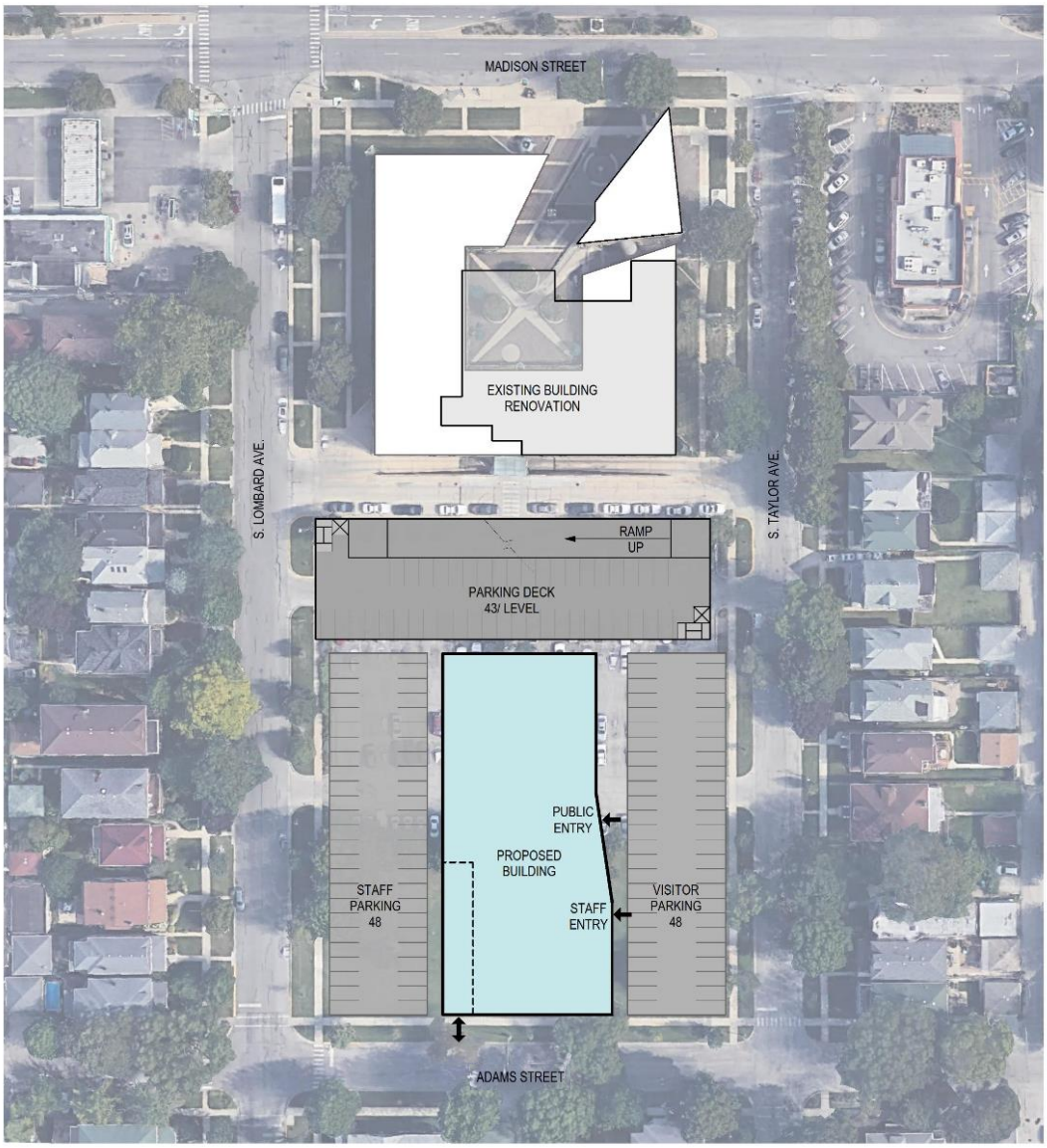
Option 1 – Site Diagram D



APRIL 9, 2019

Option 1 – Site Diagram E

RENOVATED FLOOR AREA: 20,882 SF

N

APRIL 9, 2019

Option 3 – Existing Renovation Plan Diagram 1

SECTION 7
POTENTIAL SOLUTIONS - LOT SIZE REQUIREMENTS

Lot Size

After establishing of the size of the building, parking and site requirements, it is possible to estimate the lot size required for a new police station.

The following is a summation of the minimum lot size requirements assuming a maximum lot coverage area of not more than 80% of the lot. These lot coverage amounts will typically meet requirements for a police station located within the Institutional Zoning District.

Police Department

Police Station – Maximum 80% Lot Coverage 3.44 acres

For this exercise, a three-level police station was assumed, a basement and two levels above grade.

Recommended minimum lot sizes assume that the lot configuration is rectangular in nature and not an unusual or irregular configuration.

For more detailed information, see the Lot Size Requirement Calculations attached to this section.

SECTION 7
POTENTIAL SOLUTIONS – LOT SIZE CALCULATIONS

Following this are the Police Department Size Calculations referenced in Section 7.

Lot Size Calculation Worksheets

Police Station

Police Station – Maximum 80% Lot Coverage

Village of Oak Park
Oak Park Police Department
Lot Requirements - 80% Maximum Lot Coverage

FGM ARCHITECTS

June 28, 2019
FGM #: 19-2639.01

A.	**LOT SIZE REQUIREMENTS FOR POLICE STATION**		
	Zoning Assumptions		No more than 80% impervious coverage
	Programmatic size of Police Station	78,112	Assumes three level building
	Parking Spaces Required	152	Includes Police Vehicles, staff, and public parking
B.	**SITE AREA REQUIREMENTS**	**Sq.Ft.**	
	BUILDING AND PAVED AREAS		
	Assumed Footprint of Building	28,600	Allows for 10% larger main level footprint
	Parking, Walkway and Drives		
	Parking Lot Size	45,600	Allow 300 sq.ft. per space
	Walkways	4,560	Allow for 10% of parking lot area in walks
	Drives	9,120	Allow for 20% of parking lot area in drives
	Miscellaneous Outdoor Spaces	3,000	
	SUB-TOTAL BUILDING AND PAVED AREAS	**90,880**	
	RECOMMENDED LOT SIZE		
	Site size to meet lot coverage requirements	113,600	
	Stormwater Detention	22,720	Assume 25% of Building and Paved Areas (impervious area)
C.	**SUB-TOTAL LOT SIZE**	**136,320**	
D.	**SITE IRREGULARITY FACTOR (10%)**	**13,632**	Allowance for site proportion variations
C.	**TOTAL MINIMUM RECOMMENDED LOT SIZE**	**149,952**	**Sq.Ft.**
D.	**MINIMUM RECOMMENDED SITE ACERAGE**	**3.44**	
	Notes		
	1. Lot size requirement assumes 80% maximum lot coverage by impervious areas		
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SECTION 7
POTENTIAL SOLUTIONS – SITE SELECTION CRITERIA

Site Selection Criteria

If the Village pursues the construction of a new police station, the site selection should take into account the following items:

- **Size of parcel** –The size of the parcel must be adequate to accommodate the assumed building footprint, visitor, staff, and Police Department vehicle parking requirements, setback requirements, maximum lot coverage requirements, and storm water detention requirements.

  The site must be adequate in size to allow for efficient flow and to accommodate proper separation of public and secure areas. Public, or visitor, parking needs to be highly visible, convenient to the entrance, and easy to maneuver in and out of. Staff parking should be located within a secured area since some staff work late at night or early in the morning.

  Police vehicles should be located in a secured area surrounded by a perimeter fence to protect vehicles from vandalism, or in a covered parking area or enclosed garage to keep vehicles ready for immediate use and to protect electronic equipment during times of inclement weather.

  Delivery and service areas should be located away from the public, but not within the secured area.

- **Site access** – Proximity to at least one major thoroughfare is desirable for ease of public access. The configuration of the site should allow for multiple egress/ingress points for vehicles in the event that one is blocked.

  Egress for vehicles onto two different streets is ideal.

- **Location** – For the police station, a site centrally located in the Village, or a location with good access is preferred but not 100% required. If the station is centrally located, it will allow for easy access from all parts of the Village. If the police station is located to the far north or south of the Village, travel time for an officer to the station can be lengthy and reduce coverage on the street.

  Good visibility for public wayfinding should also be considered. Access to the site via sidewalks and public transportation is also a benefit to the community.

SECTION 8
FINAL CONCEPTUAL SOLUTIONS

Final Conceptual Solutions

To develop the final concept, FGM worked with Village and Police Department staff and utilized feedback from the initial conceptual solutions to refine functional layouts and site efficiencies.

Of the Options outlined in Section 7 of this report, Only Option 1 and Option 2 were determined to be viable solutions to solve the needs of the Police Department.

Option 1 Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.

In order to develop the most workable plan for the Police Department and fit it onto the existing site, program elements were reviewed with the Police Department and analyzed to determine where each program function should be located, which functions absolutely had to be located on the first floor for the department to operate effectively, and which functions could remain, or be located in the existing basement.

The final concept for Option 1 was developed based on the preferences from the initial concepts. The diagrams show a potential layout and how the space requirements could be accommodated on the existing site.

Floor Plan Diagram

In order to improve the functionality of the department, this concept, incorporates all day-to-day functional requirements in the new addition and the specialty functions that can operate more remotely remain within the existing basement.

The final plan diagram depicts renovated space within the existing basement and a new 2-story + basement addition

The existing basement has approximately 13,882 square feet of renovated space for the police department and the new addition contains approximately 64,111 square feet and for a total of approximately 78,175 square feet.

The basement of the existing Civic Center accommodates all the training functions, including the training room/EOC, defensive tactics training room, and the renovated firing range. A new evidence area to accommodate vehicles, evidence collection, processing and storage, and adequate records storage would be

provided. The remainder of the basement would remain as village IT space and additional area could be taken over for other village needs.

The conceptual floor plan diagrams for the addition show a cost effective, efficient structure with almost-equal floor plates, "stacked" on top of one another. The program functions are organized to create an efficient work flow through the building and a clear separation of public areas, and secure areas. Some efficiency, however, is diminished by the need to separate some functions between the existing portion of the facility and the new addition.

The first floor of the new police station addition includes the public entry off S. Taylor Avenue and a public lobby, with public service functions, such as the front desk, records, citizen report rooms, and controlled access to the second floor. Secure functions include patrol, investigations, and lock up.

The second floor of the new police station addition includes a small public lobby with access to administration and community policing, as well as, secure areas for staff, including support functions, locker rooms, fitness, and a break area with potential access to a roof patio.

The basement of the addition includes a garage for 30 vehicles, mechanical spaces, and storage.

Site Concept

The concept for the site is based on the goal of being respectful to the neighbors. This is accomplished by orienting the new addition so that the narrow end faces the neighbors to the south and the long sides are held back from the neighbors to the east and west with on-grade parking as a buffer. A small portion of green space is retained at the southeast and southwest corners.

Establishing clear separation between public parking areas, secure police parking areas, and secure access points is an important function of the site diagrams.

Providing adequate parking on the site to accommodate the needs of the Police Department, the Village, staff, and visitors, proves to be challenging. Two Site Diagrams are provided to show

the number of parking spaces that can be accommodated on-grade, as well as, if a parking deck were to be built.
In both diagrams, visitor parking for 32 vehicles and the public entry are located on the east, and secure squad parking for 32 vehicles is accommodated on-grade to the west. The access drive to the south of the existing building is maintained.

The on-grade parking concept shows a parking lot between the Village Hall and the Police Station Addition to accommodate 46 vehicles. The existing 11 parking stalls to the south of the Village Hall can remain. This concept allows for interaction between buildings and creates a campus feel.

The parking deck concept shows a multi-level parking deck between the existing building and the addition, with the narrow ends facing the residences.

Access to the parking deck is located off Lombard Avenue and Taylor Avenue. The first level provides approximately 40 dedicated secure parking for the police department with secure access points to the lower level garage, and to the sally port. The upper levels serve staff and visitors with approximately 43 spaces per level. The number of levels to be built would be determined by the total number of spaces desired compared to the cost of structure.

Option 2 - Build a New Police Station

No Diagrams were developed for this Option

Option 3 - Renovate Existing Basement Areas Occupied by the Police Department

This Option was not explored beyond the initial concept.

Option 4 - Keep the Existing Building As-Is

This Option was not explored beyond the initial concept.

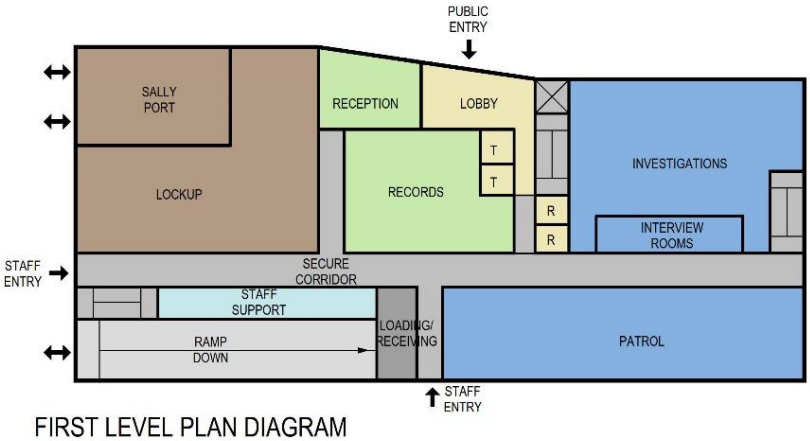
On the following pages are the Final Concept Diagrams:

Final New Building Plan Diagram

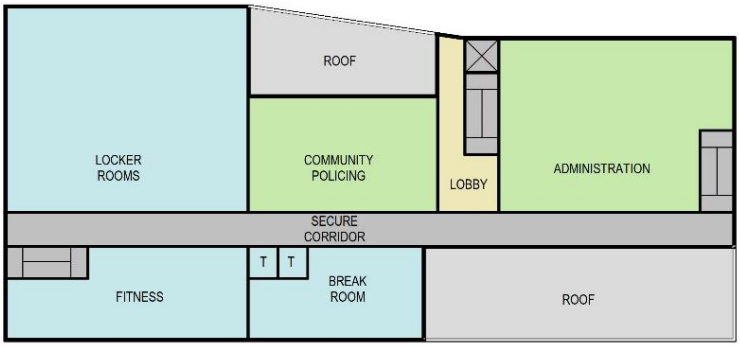
Final Existing Building Renovation Diagram

Final Site Diagram with On-Grade Parking

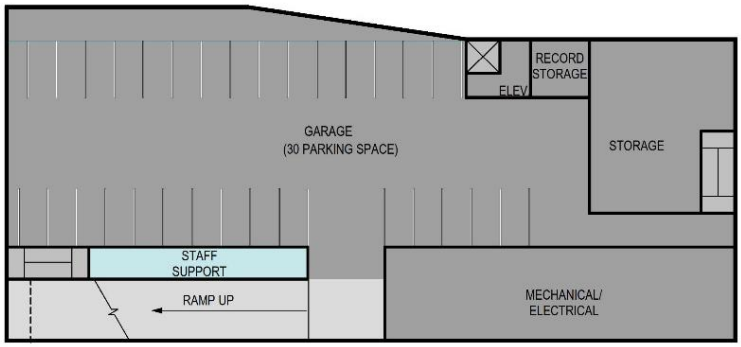
Final Site Diagram with Parking Deck



FIRST LEVEL PLAN DIAGRAM

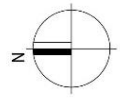


SECOND LEVEL PLAN DIAGRAM



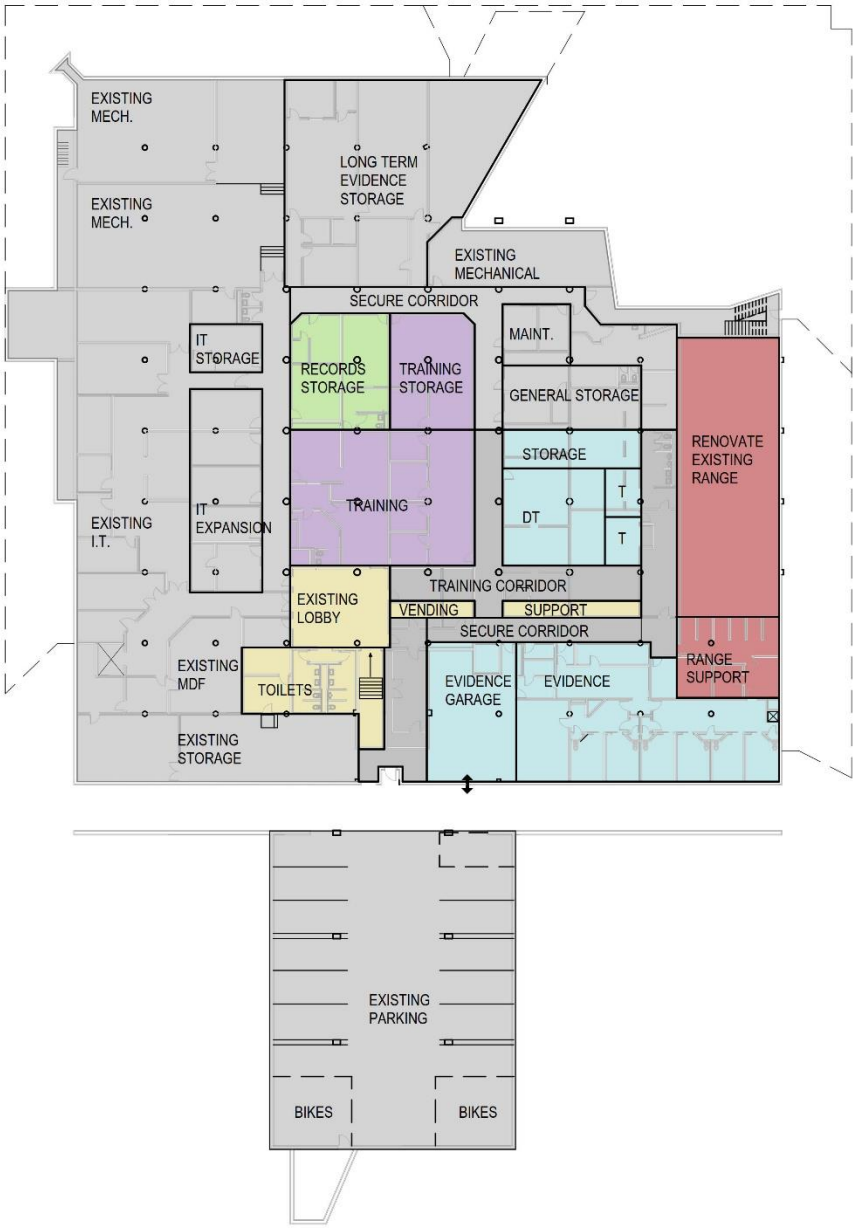
LOWER LEVEL PLAN DIAGRAM

LOWER LEVEL	22,758 SF
FIRST LEVEL	22,758 SF
SECOND LEVEL	18,595 SF
TOTAL	64,111 SF



JUNE 27, 2019

Final New Building Plan Diagram

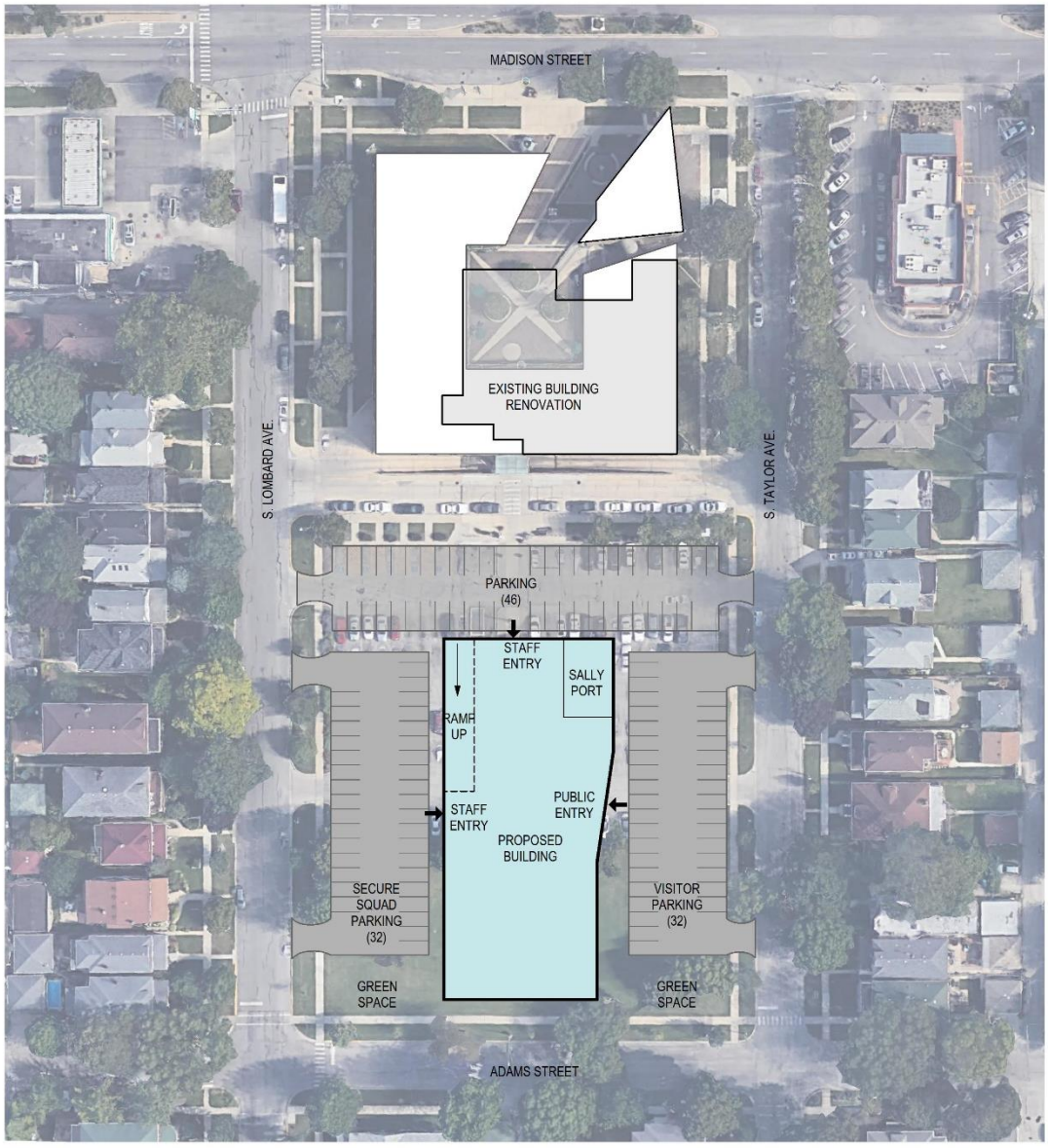


POLICE DEPARTMENT SPACES	13,881 SF
ADDITIONAL RENOVATED AREAS	2,500 SF
TOTAL	16,381 SF

N

JUNE 27, 2019

Final Existing Building Renovation Diagram



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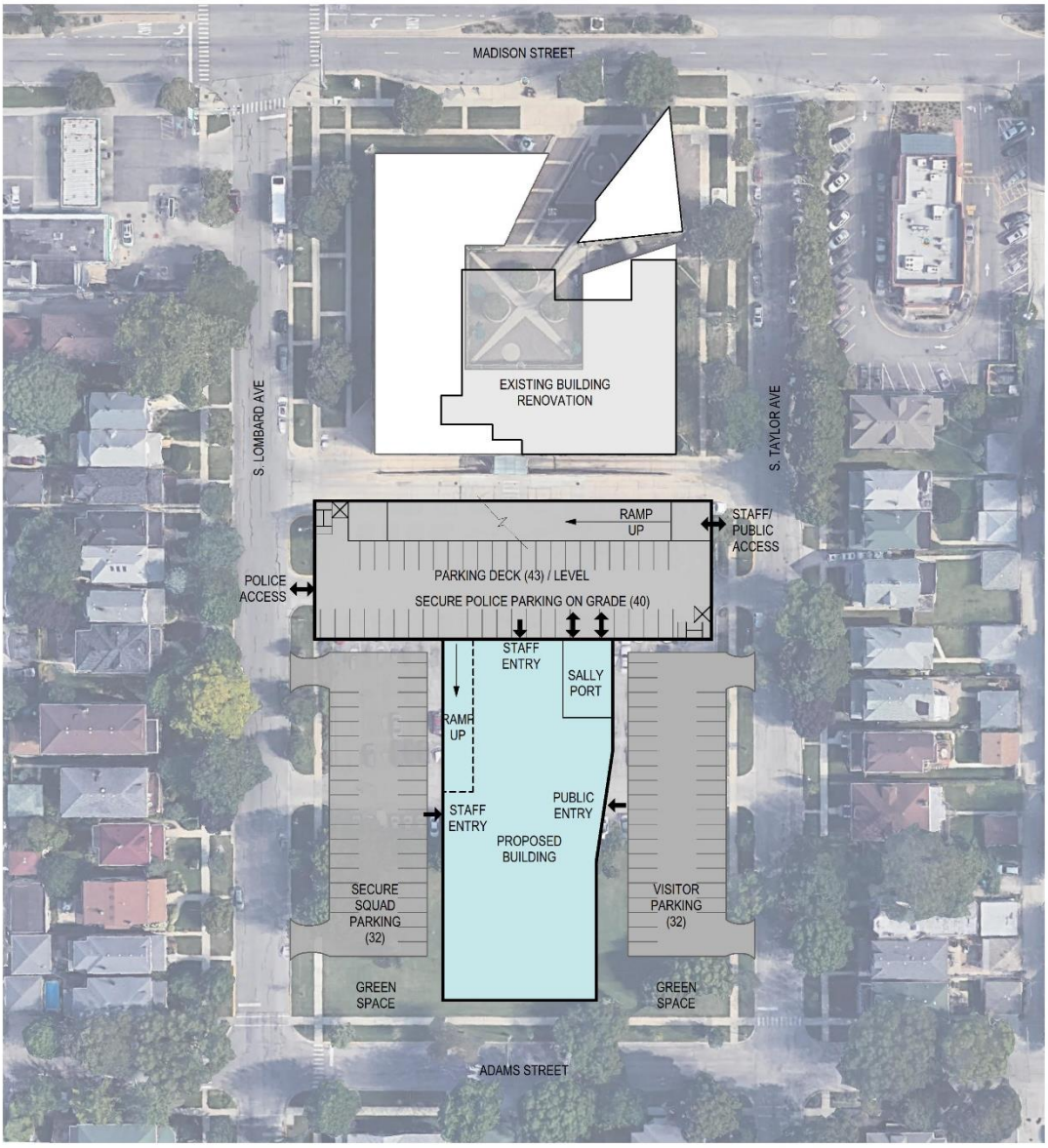
JUNE 27, 2019

Final Site Diagram with On-Grade Parking



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JUNE 27, 2019

Final Site Diagram with Parking Deck

SECTION 8
FINAL CONCEPTUAL SOLUTIONS PROJECT BUDGETS

Project Budgets

As part of this study, FGM has provided conceptual budgets to implement a project. For the attached summaries, the Total Project Budget includes the cost of construction, fees and soft costs for each of the schemes.

Costs are based on a quality municipal structure that will be serviceable for 30+ years assuming an appearance and use of materials that are complimentary to other municipal facilities in Oak Park. Also included are costs to implement green building initiatives to achieve a basic level of United States Green Building Council LEED Certification.

Costs are based on a spring/summer 2020 construction start. Budgets will need to be escalated for inflation as required annually after that time frame. Cost ranges have been provided as design work is no actual design work has been performed.

Budgeting Methodology

FGM has an extensive database of cost information for police stations and used cost per square foot estimates as the budgeting methodology for the conceptual budgets. To verify budgets, FGM also consulted with local area builders. Because no actual design work has been performed, a budget range is provided for construction costs as well as a Total Project Budget.
A summary of costs for Option 1 is as follows.

Option 1 Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.

Item	Low	High
Construction Budget	$37,100,007	$39,057,418
Owner Purchased Items (FF&E, etc.)	$1,046,000	$1,208,000
Fees and Soft Costs	$2,821,500	$3,036,732
Owner Contingency	$386,750	$424,473
Total Project Budget	**$41,354,258**	**$43,726,623**

For additional information, see the Renovated and New Addition to Police Station budget at the end of this section.

* Cost of a parking deck is not included in the budget. To maintain "status quo" in parking, a 90-space parking structure is required at an approximate cost of $34,000 per space + 20% for fees and contingencies. Budget for the cost of a parking structure (2020 costs) = $3,672,000.

Option 2 Build a New Police Station

This option will likely provide the most functional police station, but it will also be the costliest. An adequately sized parcel of land will need to be provided. If a three-level building is assumed, a building of this size will require a site of approximately 3.44 acres.

The benefit of this option is that a new police station will allow for the most functional layout because the building will not be incumbered by an existing footprint or the structural limitations of the existing building. This option will also be the least disruptive to the operations of the Village during construction and the project will be completed faster than Option 1.

The disadvantage of this option is an adequately sized parcel of land will need to be acquired. Land acquisition costs have not been included in the budget.

A summary of costs for Option 2 is as follows.

Build a New Police Station

Item	Low	High
Construction Budget	$38,289,921	$40,204,417
Owner Purchased Items (FF&E, etc.)	$1,046,000	$1,208,000
Fees and Soft Costs	$2,898,845	$3,111,287
Owner Contingency	$394,484	$431,929
Total Project Budget	**$42,629,251**	**$44,955,633**

For additional information, see the Conceptual Budget for New 78,112 sq.ft. Police Station at the end of this section.

* Cost of obtaining land is not included in the budget.

Option 3 Renovate Existing Basement Areas Occupied by Police Department

This option will provide some minor improvements to the existing police station space by increasing functionality. The Police Department would still be severely lacking the required space needed to function effectively as a modern-day Police Department. Additionally, the employees will still work in basement space without windows, views, or natural light.

A summary of costs for Option 3 is as follows.

Renovate Existing Police Station

Item	Low	High
Construction Budget	$9,397,698	$10,113,804
Owner Purchased Items (FF&E, etc.)	$641,000	$743,000
Fees and Soft Costs	$946,816	$1,054,604
Owner Contingency	$158,782	$179,760
Total Project Budget	**$11,144,296**	**$12,091,168**

For additional information, see the Conceptual Budget to Renovate Existing Police Station at the end of this section.

* Cost of temporary facilities is not included in the budget. The Police Department will need to move out during the renovation work as the work will be extensive and systems will be out of service for extended periods of time. It is possible that the Police Department will require 20,000 sq.ft. of temporary space for 14-18 months. The cost for temporary space can vary greatly.

Option 4 – Keep the Existing Building As Is

Doing nothing will only push the space needs and operational issues of the Police Department into the future. At a time when we are seeing increases in crime and more sophisticated criminals, the Police Department requires all the advantages a modern police station can provide. If it is not feasible now to do so, it will still be necessary to provide capital expenditures just to keep the police station in operation. In the Existing Conditions Analysis, there are many items identified that need to be addressed, including life safety issues, accessibility, and heating and cooling systems that are at the end of their useful lives.

Potential capital expenditures, are prioritized based on life safety and welfare of the occupants as follows:

1. Urgent: Items that present an immediate hazard to the life safety of the occupants. We recommended these items be addressed within the next 1 – 2 years.
2. Required: Items that are necessary for a safe environment but present less of an immediate hazard to the safety of the occupants. We recommend these items be addressed within a 2 - 4 year period.

3. Recommended: Items that do not present any immediate hazard to the occupants. We recommend these items be addressed within a 4 - 10 year period if found to be pertinent to the Village's plans for the existing facility.

A summary of costs for items that should be addressed is as follows.

Items to be Addressed as Identified in Section 6

Item	Low	High
Urgent Items (priority a)	$69,000	$105,000
Required Items (priority b)	$3,356,500	$5,306,000
Recommended Items (priority c)	$1,643,600	$2,708,000
Total	**$5,069,100**	**$8,119,000**

Even if nothing is done to address the space and operational needs of the police department, significant capital expenditures will still be necessary to keep the existing police station in operation.

For additional information, see Section 6 Existing Condition Analysis Recommendations on page 71

Project Budget Attachments
Following this page are the conceptual project budgets for the three options discussed in this section

Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site
Conceptual Budget for New and Renovated Police Station Pages 1-2

Build a New Police Station
Conceptual Budget for New 78,112 sq.ft. Police Station Pages 1-2

Renovate Existing Basement Areas Occupied by Police Department
Conceptual Budget to Renovate Existing Police Station Pages 1-2

Village of Oak Park
Oak Park Police Department
Conceptual Budget for Renovated and New Addition to Police Station

FGM ARCHITECTS

June 28, 2019
FGM #: 19-2639.01

Item	Quantity	Unit	Cost/Unit Low	Cost/Unit High	Construction Cost Low	Construction Cost High	Remarks
POLICE STATION							
Construction							
Existing Police Station Renovation	13,882	s.f.	$ 300	$ 320	$ 4,164,600	$ 4,442,240	Incl. reno. of range and MEP systems
Renovation of Adjacent Spaces	2,500	s.f.	$ 260	$ 280	$ 650,000	$ 700,000	To tie work into existing building
New Police Station Construction	64,111	s.f.	$ 400	$ 420	$ 25,644,400	$ 26,926,620	
Green Building Initiatives (4%)					$ 1,025,776	$ 1,077,065	allowance for green building initiatives
Sub-Total					$ 31,484,776	$ 33,145,925	
Escalation (3.5% per annum for two years)					$ 2,242,503	$ 2,360,818	Assume construction in Spring/Summer 2020
Total Police Station Construction Costs					**$ 33,727,279**	**$ 35,506,743**	
Design and Pricing Contingency (5%)					$ 1,686,364	$ 1,775,337	
Construction Contingency (5%)					$ 1,686,364	$ 1,775,337	
Total Police Station Construction Budget					**$ 37,100,007**	**$ 39,057,418**	
Allowances for Items to be Purchased by the Village							
Furniture and Equipment					$ 800,000	$ 900,000	Includes window treatments
Training Equipment					$ -	$ -	Provided by Owner
Computer Systems					$ 80,000	$ 100,000	
Wireless Network System					$ 30,000	$ 40,000	
Maintenance/Janitorial Equipment					$ 6,000	$ 8,000	
Telephone System					$ 75,000	$ 90,000	
Wireless Telephone Boosters/Amplifiers					$ 40,000	$ 50,000	
Miscellaneous Equipment and Furnishings					$ 15,000	$ 20,000	For items such as art, plants, bond safe, etc.
Total Allowances for Items to be Purchased by the Village					$ 1,046,000	$ 1,208,000	
Allowances for Items Fees and Soft Costs							
Architectural and Engineering Fees (6.5%)					$ 2,411,500	$ 2,538,732	Incl. civil, security and landscape design

Village of Oak Park
Oak Park Police Department
Conceptual Budget for Renovated and New Addition to Police Station

FGM ARCHITECTS

June 28, 2019
FGM #: 19-2639.01

Item	Quantity	Unit	Cost/Unit Low	Cost/Unit High	Construction Cost Low	Construction Cost High	Remarks
Furnishings Design Fee					$ 60,000	$ 70,000	Design, bidding and project management
Surveys & Soil Investigations					$ 15,000	$ 20,000	
Environmental Consulting					$ 40,000	$ 50,000	For work in existing building
Material Testing During Construction					$ 25,000	$ 30,000	
Green Building Costs					$ 130,000	$ 150,000	Energy modeling, LEED Registration
Building Commissioning					$ 60,000	$ 70,000	Enhanced for Green Building
Printing Costs					$ 5,000	$ 8,000	
Utility Company Charges (Electric, Gas, Telephone)					$ 30,000	$ 40,000	
Moving Costs					$ 30,000	$ 40,000	
Utility costs during construction					$ 15,000	$ 20,000	
Total Allowances for Fees and Soft Costs					$ 2,821,500	$ 3,036,732	
Owner's Contingency					$ 386,750	$ 424,473	10% of Allowances
TOTAL POLICE STATION BUDGET					**$ 41,354,258**	**$ 43,726,623**	

Notes:
Project Budgets are preliminary and are based on historical square foot cost information.
Project Budgets are based on a Spring 2020 construction start date.
Project Budgets do not include legal fees or financing costs.
Construction Costs are based utilizing a Construction Management project delivery method.
If Police Department moves out of building, additional costs will be incurred.

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Village of Oak Park

Oak Park Police Department

Conceptual Budget for New 78,112 sq.ft. Police Station

FGM ARCHITECTS

June 28, 2019
FGM #: 19-2639.01

Item	Quantity	Unit	Cost/Unit Low	Cost/Unit High	Construction Cost Low	Construction Cost High	Remarks
POLICE STATION							
Construction							
New Police Station Construction	78,112	s.f.	$ 400	$ 420	$ 31,244,800	$ 32,807,040	
Green Building Initiatives (4%)					$ 1,249,792	$ 1,312,282	allowance for green building initiatives
Sub-Total					$ 32,494,592	$ 34,119,322	
Escalation (3.5% per annum for two years)					$ 2,314,427	$ 2,430,149	Assume construction in Spring/Summer 2020
Total Police Station Construction Costs					**$ 34,809,019**	**$ 36,549,470**	
Design and Pricing Contingency (5%)					$ 1,740,451	$ 1,827,474	
Construction Contingency (5%)					$ 1,740,451	$ 1,827,474	
Total Police Station Construction Budget					**$ 38,289,921**	**$ 40,204,417**	
Allowances for Items to be Purchased by the Village							
Furniture and Equipment					$ 800,000	$ 900,000	Includes window treatments
Training Equipment					$ -	$ -	Provided by Owner
Computer Systems					$ 80,000	$ 100,000	
Wireless Network System					$ 30,000	$ 40,000	
Maintenance/Janitorial Equipment					$ 6,000	$ 8,000	
Telephone System					$ 75,000	$ 90,000	
Wireless Telephone Boosters/Amplifiers					$ 40,000	$ 50,000	
Miscellaneous Equipment and Furnishings					$ 15,000	$ 20,000	For items such as art, plants, bond safe, etc.
Total Allowances for Items to be Purchased by the Village					$ 1,046,000	$ 1,208,000	
Allowances for Items Fees and Soft Costs							
Architectural and Engineering Fees (6.5%)					$ 2,488,845	$ 2,613,287	Incl. civil, security and landscape design
Furnishings Design Fee					$ 60,000	$ 70,000	Design, bidding and project management
Surveys & Soil Investigations					$ 15,000	$ 20,000	
Environmental Consulting					$ 40,000	$ 50,000	For work in existing building

Village of Oak Park

Oak Park Police Department

Conceptual Budget for New 78,112 sq.ft. Police Station

FGM ARCHITECTS

June 28, 2019

FGM #: 19-2639.01

Item	Quantity	Unit	Cost/Unit Low	Cost/Unit High	Construction Cost Low	Construction Cost High	Remarks
Material Testing During Construction					$ 25,000	$ 30,000	
Green Building Costs					$ 130,000	$ 150,000	Energy modeling, LEED Registration
Building Commissioning					$ 60,000	$ 70,000	Enhanced for Green Building
Printing Costs					$ 5,000	$ 8,000	
Utility Company Charges (Electric, Gas, Telephone)					$ 30,000	$ 40,000	
Moving Costs					$ 30,000	$ 40,000	
Utility costs during construction					$ 15,000	$ 20,000	
Total Allowances for Fees and Soft Costs					$ 2,898,845	$ 3,111,287	
Owner's Contingency					$ 394,484	$ 431,929	10% of Allowances
TOTAL POLICE STATION BUDGET					$ 42,629,251	$ 44,955,633	

Notes:

Project Budgets are preliminary and are based on historical square foot cost information.
Project Budgets are based on a Spring 2020 construction start date.
Project Budgets do not include legal fees or financing costs.
Construction Costs are based utilizing a Construction Management project delivery method.
If Police Department moves out of building, additional costs will be incurred.

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Village of Oak Park

Oak Park Police Department

Conceptual Budget to Renovate Existing Police Station

FGM ARCHITECTS

June 28, 2019
FGM #: 19-2639.01

Item	Quantity	Unit	Cost/Unit Low	Cost/Unit High	Construction Cost Low	Construction Cost High	Remarks
EXISTING POLICE STATION							
Construction							
Major Renovation Work	20,882	s.f.	$ 300	$ 320	$ 6,264,600	$ 6,682,240	Includes renovation of MEP systems
Minor Renovation Work	9,504	s.f.	$ 180	$ 200	$ 1,710,720	$ 1,900,800	Areas to remain the same with new MEP
Sub-Total					$ 7,975,320	$ 8,583,040	
Escalation (3.5% per annum for two years)					$ 568,042	$ 611,327	Assume construction in Spring/Summer 2020
Total Police Station Construction Costs					**$ 8,543,362**	**$ 9,194,367**	
Design and Pricing Contingency (5%)					$ 427,168	$ 459,718	
Construction Contingency (5%)					$ 427,168	$ 459,718	
Total Police Station Construction Budget					**$ 9,397,698**	**$ 10,113,804**	
Allowances for Items to be Purchased by the Village							
Furniture and Equipment					$ 480,000	$ 530,000	Includes window treatments
Training Equipment					$ -	$ -	Provided by Owner
Computer Systems					$ 40,000	$ 50,000	
Wireless Network System					$ 20,000	$ 30,000	
Maintenance/Janitorial Equipment					$ 6,000	$ 8,000	
Telephone System					$ 55,000	$ 70,000	
Wireless Telephone Boosters/Amplifiers					$ 30,000	$ 40,000	
Miscellaneous Equipment and Furnishings					$ 10,000	$ 15,000	For items such as art, plants, bond safe, etc.
Total Allowances for Items to be Purchased by the Village					$ 641,000	$ 743,000	
Allowances for Items Fees and Soft Costs							
Architectural and Engineering Fees (8.0%)					$ 751,816	$ 809,104	Includes security design
Furnishings Design Fee					$ 40,000	$ 50,000	Design, bidding and project management
Environmental Consulting					$ 40,000	$ 50,000	For work in existing building
Material Testing During Construction					$ 15,000	$ 20,000	

Village of Oak Park
Oak Park Police Department
Conceptual Budget to Renovate Existing Police Station

FGM ARCHITECTS

June 28, 2019
FGM #: 19-2639.01

Item	Quantity	Unit	Cost/Unit Low	Cost/Unit High	Construction Cost Low	Construction Cost High	Remarks
Green Building Costs					$ -	$ -	Energy modeling, LEED Registration
Building Commissioning					$ 40,000	$ 50,000	
Printing Costs					$ 5,000	$ 8,000	
Utility Company Charges (Electric, Gas, Telephone)					$ -	$ -	
Moving Costs					$ 50,000	$ 60,000	Two moves
Utility costs during construction					$ 5,000	$ 7,500	
Total Allowances for Fees and Soft Costs					$ 946,816	$ 1,054,604	
Owner's Contingency					$ 158,782	$ 179,760	10% of Allowances
TOTAL POLICE STATION BUDGET					**$ 11,144,296**	**$ 12,091,168**	

Notes:

Project Budgets are preliminary and are based on historical square foot cost information.
Project Budgets are based on a Spring 2020 construction start date.
Project Budgets do not include legal fees or financing costs.
Construction Costs are based utilizing a Construction Management project delivery method.
If Police Department moves out of building, additional costs will be incurred.

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SECTION 9 RECOMMENDATIONS

Recommendations

Only two of the options discussed in Section 8 will meet the long-term needs of the Police Department:

Option 1 Renovate the basement areas occupied by the Police Department and build a police station addition on the existing Civic Center site to meet the needs of the Police Department.
This option assumes that 16,382 sq. ft. of the existing police station will be renovated and a 64,111 sq.ft. addition will be constructed on the existing site to meet the space needs requirements of the Police Department.

This solution takes advantage of existing space and renovates it to correct accessibility, safety and security concerns, heating and cooling issues, and other items identified in Section 6. By taking advantage of the existing space, the size of the addition can be reduced, which will reduce both land requirements and costs.

This option will require a parking deck to keep the parking situation status quo, with a significant amount of visitor and staff parking on the adjacent residential streets.

Option 2 Build a New Police Station
This option assumes a new police station on a new site with all required areas together. This will provide the most functional police station, but it is also the costliest.

A significant disadvantage of this option is an adequately sized parcel of land will need to be acquired. If a three-level building is assumed, a building of this size will require a site of 3.44 acres.

FGM recommends the village pursue one of the above options as they will meet the long-term needs of the Police Department and the goals established by the Village.

This study is to be utilized as a starting point and is intended to provide the Village with the necessary information to make an informed decision on which direction should be taken to address the space needs issues of the Police Department.

Once the space needs are approved and the Village is ready to move forward, FGM Architects is prepared to assist the Village of Oak Park with the next steps.

SECTION 10
APPENDIX

The following articles support the discussion in Section 4 on page 29 on how the absence of natural light can affect an employee's well-being.

- Daylight, windows and workers' well-being article
- Impact of Windows and Daylight Exposure of Overall Health and Sleep Quality of Office Workers: A Case-Control Pilot Study

Journalist's Resource
Research on today's news topics

HARVARD Kennedy School
SHORENSTEIN CENTER
on Media, Politics and Public Policy

Daylight, windows and workers' well-being: Research review

(Unsplash)

By David Trilling

September 15, 2017

For decades, scientists have known that daylight is essential to human health. Back in 1948, the *British Medical Journal* poked fun at a group of engineers who tried to convince doctors that artificial light was superior to sunlight.

By the 1980s, insufficient daylight came to be seen as a possible factor in "sick building syndrome," a set of symptoms afflicting some office workers. A number of subsequent studies have bolstered the link.

Scholars more recently have established that workers in windowless offices are less happy and less healthy than their colleagues with steady sources of daylight. Workers without daylight are more stressed, too. By contrast, workers with windows are more satisfied; students who sit near windows perform better.

But is there a connection, as some contend, between daylight and worker productivity?

Sadness and stress

Absenteeism costs the American economy about $225.8 billion annually, according to the Centers for Disease Control and Prevention; that's $1,685 per worker. Major causes of absenteeism and "presenteeism" (reduced performance and productivity at work) are stress and depression. And both of these ailments have been associated with a lack of daylight.

In one widely cited 1992 study, Swedish researchers compared students in classrooms with windows and students studying under only florescent lights. They found that students without daylight produced less of a hormone that helps the body deal with stress and infection. "Work in classrooms without daylight may upset the basic hormone pattern, and this in turn may influence the children's ability to concentrate or cooperate, and also eventually have an impact on annual body growth and sick leave," the researchers wrote in the *Journal of Environmental Psychology*. "Windowless classrooms should be avoided for permanent use."

Nurses in a Turkish hospital were subjects in another study, published in 2005. About half of 141 nurses had more than three hours of daylight exposure per day; about half had less. Those with more than three hours were less stressed and more satisfied with their work. Another study of nurses found them 95 percent more likely to make medical errors in mid-winter than in the fall, when there is more light.

Other research has compared workers in the Arctic during winter, when daylight hours are extremely short, and the tropics, where the length of the day is largely consistent year-round. It found workers in the Arctic winter feel they are not getting enough sleep. They are also more prone to depression — a finding backed by extensive research on seasonal affective disorder (SAD), when some people grow depressed during the shorter winter days.

For those suffering bipolar disorder, strong midday light may have therapeutic qualities. A 2017 study in the *American Journal of Psychiatry* found bright light between noon and 230 p.m. may decrease mood swings and depression in bipolar patients.

Health and sleep

Replacing daylight with artificial lamps appears to affect the brain's production of melatonin, a hormone that regulates sleep, enhances immune function and may prevent some forms of cancer. Studies have found lower melatonin levels in night-shift workers and day workers in windowless workspaces; both groups sleep worse than workers with access to daylight. A 2010 study of eighth-grade students found that lack of exposure to morning daylight may delay bedtime that evening, cutting into their sleep.

A poor night's sleep can negatively impact overall health, memory and attention span. A 2014 study in the *Journal of Clinical Sleep Medicine*, led by Mohamed Boubekri of the University of Illinois at Urbana-Champaign, examined the quality of office workers' sleep and found evidence that workers who spend most of their days in rooms without windows sleep worse than those with windows nearby. Moreover, they reported lower scores on all eight factors measured by the short-form health survey (SF-36), an established test of overall physical and mental health.

A 2012 study of patients' average length of stay in a Korean hospital found significant benefits correlated with brighter rooms, especially ones with ample daylight. Patients recovering in rooms facing southeast left the hospital between 16 and 41 percent faster than patients in rooms facing northwest (which receive less direct sunlight in the northern hemisphere). The researchers, led by an engineer at the Missouri University of Science and Technology, also conclude that morning light may be more beneficial to patients' health than afternoon light.

Productivity

Some research has claimed that sustainably designed offices — that is, offices in buildings that are relatively energy efficient, filter air and maximize the use of natural light — improve worker productivity. A number of design standards, such as WELL certification by the International WELL Building Institute in Washington, D.C., are often touted for boosting productivity. But while the evidence is extensive that design features such as windows can improve workers' health and happiness, a 2016 literature review challenges claims that design can impact output. There is "no agreed definition of productivity in an office environment," the paper notes.

Students, however, because they take tests regularly, are easier to measure. A paper funded by the state of California found broad performance improvement among students in classrooms with the most natural light. The 2002 study looked at 21,000 students in three school districts (in California, Washington state and Colorado). Some scholars have questioned the paper's methodology while acknowledging the findings merit further study: The paper suggests that students in classrooms with the most daylight progressed 20 percent faster in math over one year compared to their peers with less light, and 26 percent faster in reading.

Ethical behavior

Probed less often by researchers is the relationship between daylight and moral behavior. But in 2013, two Taiwanese researchers writing in the *Journal of Environmental Psychology* described three experiments that appear to show people acting more ethically in well-lit rooms than in dingy ones — in one of the tests, for example, doling out more money to strangers from a common pot. The researchers found "brighter surroundings can induce people to act less selfishly and increase the likelihood of honesty."

Lastly, scholars have also focused on shoppers, finding that windows allowing daylight into stores may even boost sales.

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NEW RESEARCH

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Impact of Windows and Daylight Exposure on Overall Health and Sleep Quality of Office Workers: A Case-Control Pilot Study

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SCIENTIFIC INVESTIGATIONS

Study Objective: This research examined the impact of daylight exposure on the health of office workers from the perspective of subjective well-being and sleep quality as well as actigraphy measures of light exposure, activity, and sleep-wake patterns.

Methods: Participants (N = 49) included 27 workers working in windowless environments and 22 comparable workers in workplaces with significantly more daylight. Windowless environment is defined as one without any windows or one where workstations were far away from windows and without any exposure to daylight. Well-being of the office workers was measured by Short Form-36 (SF-36), while sleep quality was measured by Pittsburgh Sleep Quality Index (PSQI). In addition, a subset of participants (N = 21; 10 workers in windowless environments and 11 workers in workplaces with windows) had actigraphy recordings to measure light exposure, activity, and sleep-wake patterns.

Results: Workers in windowless environments reported poorer scores than their counterparts on two SF-36 dimensions—role limitation due to physical problems and vitality—as well as poorer overall sleep quality from the global PSQI score and the sleep disturbances component of the PSQI. Compared to the group without windows, workers with windows at the workplace had more light exposure during the workweek, a trend toward more physical activity, and longer sleep duration as measured by actigraphy.

Conclusions: We suggest that architectural design of office environments should place more emphasis on sufficient daylight exposure of the workers in order to promote office workers' health and well-being.

Keywords: light exposure, sleep quality, quality of life, architectural design, office environment

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Since the sick building syndrome of the 1970s and the World Health Organization's Declaration on Occupational Health for All in 1994,[1] occupational health has become a salient issue among health professionals and architects alike. With the increased interest today in green architecture, daylighting is becoming an important design consideration. Typically, daylighting recommendations are made in the form of daylight factor levels ranging between 2% to 6% depending on building types and activities. A daylight factor is a percentage of indoor illuminance compared to the outdoor illuminance on a horizontal surface. The daylight factor principle is valid for stable overcast sky conditions only; sunny conditions are too dynamic and changing to be considered.

Although there are many studies that have explored the relationship between daylighting, psychological well-being, and workers' productivity or school children's performance,[2-4] few have addressed the impact of daylight at the workplace on sleep, quality of life, and overall health. Exposure to light-dark patterns is one of the main environmental cues for circadian rhythms that influence approximately 24-hour biological, mental, and behavioral patterns such as sleep and activity.[5] The timing of light exposure is very influential on these rhythms, and previous research has shown that office environment lighting during work hours can act as a regulator of circadian physiology and behavior, with blue-enriched artificial lighting even competing with natural light as an entrainer.[6] Given that office hours occur during biologically natural daylight hours, we posit that light exposure in the office environment will have effects on sleep, and via sleep and other influences also have effects on physical and mental health.

There is much evidence that links insufficient sleep and/or reduced sleep quality to a range of significant short-term impairments such as memory loss, slower psychomotor

BRIEF SUMMARY

Current Knowledge/Study Rationale: Both the amount and timing of light exposure is important for physical and mental health. While research indicates possible links between light exposure in workplaces and workers' productivity and performance, less is known about the role of workplace light exposure on workers' quality of life and sleep quality.

Study Impact: Office workers with more light exposure at the workplace tended to have longer sleep duration, better sleep quality, more physical activity, and better quality of life compared to office workers with less light exposure at the workplace. Office workers' physical and mental well-being may be improved via enhanced indoor lighting for those with insufficient daylight in current offices as well as increased emphasis on light exposure in the design of future offices.

reflexes, and diminished attention.[7-9] If windowless environments or lack of daylight affect office workers' sleep quality, there will be subsequent effects not only individually but also on a societal level, leading to more accidents, workplace errors, and decreased productivity. Sleep quality is also an important health indicator that may have effects on, and interactions with mood, cognitive performance, and health outcomes such as diabetes and other illnesses.[10-13] Therefore, it is crucial to investigate the effects of daylight as it may provide a profound way to improve office workers' productivity and health as well as the safety of the community they work and live in. Deprivation to light damages monoamine neurons and produces a depressive behavioral phenotype in rats.[14] In humans, a direct correlation between the severity level of seasonal affective disorder and exposure to natural light is well documented.[15-17] Results of several studies suggest that both natural and artificial bright light, particularly in the morning, can improve significantly health outcomes such as depression, agitation, sleep, circadian rest-activity, and seasonal affective disorder.[18-26]

These effects of light exposure, or the lack thereof, illustrate the importance of proper light exposure for physical well-being and mental health. In our modern society, many responsibilities at the workplace and at home dictate self-imposed alterations and/or loss of daylight in our daily lives. Findings from the previously discussed research suggest that the light exposure determined by our daily schedules will have subsequent consequences on our mood, cognitive performance, and overall well-being. However, studies exploring the impact of daylight exposure, or the lack thereof, on the health of office workers are very scarce. Therefore, the aim of this study was to examine the influence of light exposure at the workplace, through the existence or absence of windows and of daylight, on office workers' sleep patterns, physical activity, and quality of life via actigraphy and subjective measures. In our study we compared two groups of office workers—those with windows and abundant levels of daylight and those without windows and with no direct contact with daylight at their workstations—in terms of overall health and well-being and subjective sleep quality using well-validated scales, and objective measures of sleep, activity levels, and light exposure via actigraphy. We hypothesized that office workers with windows in the workplace would have more light exposure, better sleep quality, more physical activity, and higher quality of life ratings compared to office workers without windows in the workplace.

METHODS

Participants

A total of 49 participants were recruited, including 27 day-shift workers in windowless workplaces and 22 comparable day-shift workers in workplaces with windows. Workers were selected from volunteers within administrative support staff and other office workers on the campus of the University of Illinois at Urbana-Champaign (UIUC) whose work schedule was from 08:00 to 17:00. The typical recruitment process was done by contacting an office manager, who in turn provided names of volunteers from his/her group. The participants were not told about the specific objectives of the study but were informed that the study was about the impact of workplace physical and social conditions on productivity and well-being.

In addition, a subset of the participants had actigraphy recordings to measure light exposure, activity, and sleep. A total of 21 participants had actigraphy recordings, including 10 office workers in windowless workplaces and 11 office workers in workplaces with windows. Participants were selected for actigraphy based on a convenience sample with volunteers from office locations with and without windows.

Once the volunteers were identified, daylight factors at their workstations were measured. Only daylight factors > 2% were kept in the study for workers in workplaces with windows. Generally, daylight factors < 2% are deemed not useful for task performance illumination. In this study, we define a windowless workplace as one without any windows or one where workstations were far away from windows and therefore had no exposure to daylight and no views to the outside world. The Institutional Review Board of the University of Illinois at Urbana-Champaign (UIUC) approved the research study, and all volunteers gave informed written consent as required by UIUC regulations and standards. The cities of Urbana-Champaign are relatively small, and the commute for most participants is generally less than 15 minutes by car. Nearly all participants drove individual cars to work.

Measures - Questionnaires

Office workers' health related quality of life was measured by Short Form 36 (SF-36), a questionnaire with 36 items related to the physical and psychosocial domains of health influenced by a person's experiences, beliefs, and perceptions of health. The SF-36 survey is a well-validated health status questionnaire that measures an individual's physical functioning, bodily pain, and perception of the ability to perform physical, social, and emotional role functions.[27]

The Pittsburgh Sleep Quality Index (PSQI) was utilized to evaluate subjective sleep quality of the participants. This self-rated questionnaire assesses sleep quality and disturbances over a 1-month time interval.[28] The PSQI is composed of 19 self-rated questions and 5 questions rated by a bed partner or roommate. Only the self-rated items were used in scoring the scale. The 19 questions generate 7 component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each component score ranges from 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score with a range of 0–21. A higher score indicates lower sleep quality. A PSQI global score > 5 is considered suggestive of significant sleep disturbance.

A daylight deprivation survey was administered that includes questions pertaining to demographic characteristics (age, gender, race, and working experience) and behavioral characteristics (self-reported amount of exposure to daylight on a scale of 1-10 [with 1 being always exposed and 10 being never exposed], hours of outdoor activities per day, eating behavior prior going to bed, and duration of current light exposure level).

Measures - Actigraphy

Participants wore an Actiwatch-L (Minimitter) on their non-dominant wrist. An actiwatch device is an ambulatory

physiological data logger often used in research and clinical settings to detect and record motion during wake and sleep. The Actiwatch-L has an accelerometer sensitivity of 0.05 g-force and is equipped with a photodiode for measuring amount and duration of light illuminance. Participants were instructed to continuously wear these actiwatches for 2 weeks without removing them (except for bathing) during the period of time they were answering the questionnaires. Participants were also instructed to leave the actiwatches exposed to the environment at all times and to avoid covering them with clothing. The questionnaires and actiwatches were administered during late spring and summer seasons.

Valid data were recorded for a range of 6 to 10 workdays and 2 to 4 free days in participants, with the average participant yielding 8.4 workdays and 3.4 free days of actigraphy data meeting inclusion criteria for analysis, as determined by < 4 h off-wrist time per day. Analysis was conducted on Actiware software version 5 (Philips Respironics) with 30-sec sampling epochs and wake threshold value of 40 activity counts. Sleep start was defined as the first 10-min period in which no more than one epoch was scored as mobile. Sleep end was defined as the last 10-min period in which no more than one epoch was scored as immobile. Wake threshold selection was set at medium.

Actigraphy measures were calculated as the average of each participant's valid workdays (split into wake time to 08:00 for workday mornings, 08:00 to 17:00 for work hours, and 17:00 to sleep start for workday evenings) and valid free days for activity and light exposure variables, and for nighttime hours following workdays and free days for sleep variables. Actigraphy variables analyzed include total activity counts (sum of all valid physical activity counts for all epochs in the active period from wake time to 08:00 for workday mornings, 08:00 to 17:00 on workdays for work hours, 17:00 to sleep start for workday evenings, and for wake periods during free days), sleep onset time (clock time of sleep start on nights following workdays and free days), sleep onset latency (time elapsed between the start time of a given rest interval and the following sleep start time on nights following workdays and free days), sleep efficiency (the percentage of scored total sleep time to interval duration minus total invalid time for the given rest period on nights following workdays and free days), wake after sleep onset (total minutes between the start time and end time of a given sleep interval scored as wake on nights following workdays and free days), sleep time (total minutes between the start time and end time of a given interval scored as sleep on nights following workdays and free days), sleep fragmentation (sum of percent mobile and percent immobile bouts < 1 min duration to the number of immobile bouts for the given interval on nights following workdays and free days), and average light exposure (sum of all valid illuminance data in lux on a logarithmic scale for all epochs from the start time to the end time of a given interval multiplied by the epoch length in minutes from wake time to 08:00 for workday mornings, 08:00 to 17:00 on workdays for work hours, 17:00 to sleep start for workday evenings, and for wake periods during free days).

Statistical Methods

First, we performed a χ^2 test (homogeneity for proportions) to compare distributions of the demographics and behavioral characteristics as measured by the daylight deprivation survey (age, race, gender, working experience, self-reported amount of exposure to daylight, hours of outdoor activities per day, eating behavior prior to going to bed, and duration of current light level exposure) between participants working in workplaces without windows and participants working in workplaces with windows. Secondly, we performed t-tests to determine any statistical difference between the two groups in terms of office workers' health related quality of life and sleep quality as measured on the SF-36 and PSQI.

For the subset of participants with actigraphy recording, distributions of the demographics and behavioral characteristics as measured by the daylight deprivation survey between workers in workplaces with no windows and workers in workplaces with windows were compared to distributions in the overall group. T-tests were then utilized to gauge differences between the two groups in terms of the following previously defined actigraphy measures: total activity counts, sleep onset time, sleep onset latency, sleep efficiency, wake after sleep onset, sleep time, fragmentation index, and light exposure. Pearson bivariate correlations were run between work hour light exposure as measured by actigraphy and subjective questionnaires and other actigraphy variables.

RESULTS

Demographics and Behavioral Characteristics of the Two Groups of Workers

Results of the χ^2 test show no significant differences between these two groups in terms of distributions of age, race, gender, working experience, hours of outdoor activities per day, eating behavior prior to going to bed, and duration of current light level exposure (**Table 1**). Therefore, these two groups were comparable except in their amount of self-reported amount of exposure to daylight (**Table 2**).

For the subset of participants with actigraphy recording, distributions of the demographic and behavioral characteristics as measured by the daylight deprivation survey between workers in workplaces with no windows and workers in workplaces with windows are comparable to respective distributions in the overall group, again with no significant differences in these distributions between groups except in their amount of self-reported amount of exposure to daylight.

Light Exposure of the Two Groups of Workers

The self-reported amount of exposure to daylight scale shows office workers in workplaces without windows perceived they had significantly less exposure to daylight than office workers in workplaces with windows, as expected (**Table 2**). Results from actigraphy confirm average light exposure differences during work hours for the two groups, with workers in workplaces with windows receiving more light exposure than workers in workplaces without windows (**Table 3** and **Figure 1A**; 3.00 log lux versus 2.58 log lux; $p = 0.02$). There was no significant difference in light exposure from wake time to start of the work period (**Table 3**; 2.57 log lux versus 2.38 log lux; $p = 0.32$); however, workers with windows in the workplace had more light exposure during workday evenings (**Table 3**; 2.50 log lux

Table 1—Demographic and behavioral characteristics of the two groups

Variables	Work place without windows (N = 27)	Work place with windows (N = 22)	All (N = 49)	p value
Demographic Characteristics				
Gender				
Males	44.4% (12)	31.8% (7)	38.78% (19)	0.37
Females	55.6% (15)	68.2% (15)	61.22% (30)	
Age (years)				
19-30	11.1% (3)	18.2% (4)	14.29% (7)	
31-45	40.7% (11)	27.3% (6)	34.69% (17)	0.65
46-59	44.4% (12)	45.5% (10)	44.90% (22)	
60+	3.7% (1)	9.1% (2)	6.12% (3)	
Race				
Black/African-American	0	9.1% (2)	4.08% (2)	
American Indian/Alaskan Native	0	4.5% (1)	2.04% (1)	
White/Non-Hispanic	92.6% (25)	86.4% (19)	89.80% (44)	0.25
Asian/Pacific Islander	0	0	0	
Latino/Hispanic	3.7% (1)	0	2.04% (1)	
Other	3.7% (1)	0	2.04% (1)	
Working experience (years)				
0-1	7.4% (2)	4.5% (1)	6.12% (3)	
2-4	18.5% (5)	22.7% (5)	20.41% (10)	
5-7	25.9% (7)	18.2% (4)	26.83% (11)	0.79
8-10	18.5% (5)	31.8% (7)	24.49% (12)	
> 11	29.6% (8)	22.7% (5)	26.53% (13)	
Behavioral Characteristics				
Outdoor activities (hours per day)				
0-1	81.5% (22)	68.2% (15)	75.51% (37)	
2-4	18.5% (5)	31.8% (7)	24.49% (12)	0.28
4-6	0	0	0	
Years at current light exposure level				
0-1	7.4% (2)	9.1% (2)	8.16% (4)	
2-4	25.9% (7)	31.8% (7)	28.57% (14)	
5-7	25.9% (7)	27.3% (6)	26.53% (13)	0.98
8-10	18.5% (5)	13.6% (3)	16.33% (8)	
> 11	22.2% (6)	18.2% (4)	20.41% (10)	
Eating behavior prior going to bed				
Eating directly prior going to bed	25.9% (7)	13.6% (3)	20.41% (10)	0.29
No eating prior going to bed	74.1% (20)	86.4% (19)	79.59% (39)	

Table 2—Self-reported amount of exposure to daylight between the two groups

Levels of exposure to daylight		Work place without windows (N = 27)	Work place with windows (N = 22)	All (N = 49)	p value
1	Always Exposed	0	18.2% (4)	8.16% (4)	
2		3.7% (1)	27.3% (6)	14.29% (7)	
3		3.7% (1)	4.5% (1)	4.08% (2)	
4		0	9.1% (2)	4.08% (2)	
5	Sometimes Exposed	3.7% (1)	4.5% (1)	4.08% (2)	
6		7.4% (2)	9.1% (2)	8.16% (4)	0.02*
7		14.8% (4)	9.1% (2)	12.24% (6)	
8		33.3% (9)	13.6% (3)	24.49% (12)	
9		18.5% (5)	4.5% (1)	12.24% (6)	
10	Never Exposed	14.8% (4)	0	8.16% (4)	

* $p \leq 0.05$.

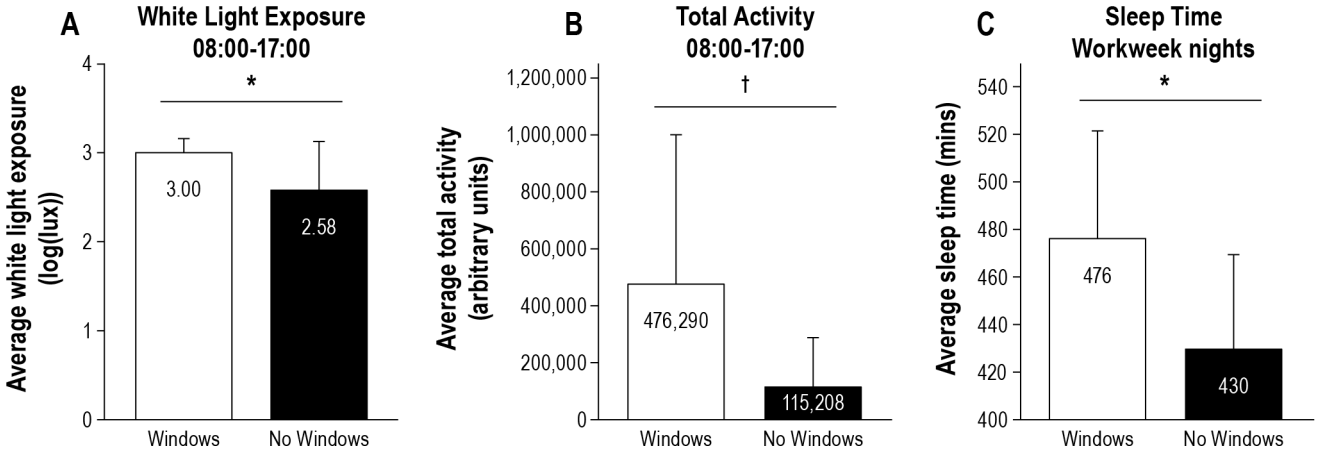
versus 1.93 log lux; p = 0.008) and during free days (**Table 3**; 3.30 log lux versus 2.37 log lux; p = 0.003) than workers without windows in the workplace. While we cannot say from our data collection whether this difference is from natural daylight or artificial lighting in the office building, workers without windows at the workplace had significantly lower average light

Table 3—Results of t-tests for actigraphy measures between the two groups

	Mean ± SD		
	Work place without windows (N = 10)	Work place with windows (N = 11)	p value
Workdays			
Mornings			
Total activity counts (arbitrary units)	36,274 ± 48,654	135,071 ± 163,184	0.07†
Average light exposure (log lux-min)	2.38 ± 0.51	2.57 ± 0.36	0.32
Work hours			
Total activity counts (arbitrary units)	115,208 ± 172,793	476,290 ± 523,782	0.06†
Average light exposure (log lux-min)	2.58 ± 0.55	3.00 ± 0.16	0.02*
Evenings			
Total activity counts (arbitrary units)	69,083 ± 96,477	295,188 ± 412,374	0.09†
Average light exposure (log lux-min)	1.93 ± 0.51	2.50 ± 0.36	0.008**
Sleep onset time (hour: minute)	22:04 ± 1:34	21:46 ± 0:48	0.58
Sleep onset latency (min)	19.16 ± 38.88	9.61 ± 7.15	0.43
Sleep efficiency (%)	89.35 ± 4.22	91.24 ± 3.29	0.26
Wake after sleep onset (min)	37.25 ± 13.38	30.10 ± 14.87	0.26
Sleep time (min)	429.65 ± 39.84	476.31 ± 45.23	0.02*
Sleep fragmentation	22.23 ± 11.06	18.84 ± 5.81	0.38
Free days			
Total activity counts (arbitrary units)	224,696 ± 262,373	839,780 ± 1,113,613	0.12
Average light exposure (log lux-min)	2.37 ± 0.55	3.03 ± 0.32	0.003**
Sleep onset time (hour: minute)	22:48 ± 1:48	22:06 ± 1:08	0.29
Sleep onset latency (min)	19.56 ± 50.04	15.03 ± 17.97	0.78
Sleep efficiency (%)	90.13 ± 4.46	90.82 ± 6.02	0.77
Wake after sleep onset (min)	36.38 ± 17.53	31.13 ± 19.00	0.52
Sleep time (min)	413.67 ± 71.45	506.17 ± 62.86	0.005**
Sleep fragmentation	21.55 ± 9.11	20.27 ± 8.30	0.74

†p ≤ 0.10, *p ≤ 0.05, **p ≤ 0.01. Workday mornings refer to wake time to 08:00 period on workdays; Workday work hours refers to 08:00 to 17:00 work period on workdays; Workday evenings refers to 17:00 to sleep onset period for activity and light measures and refers to the sleep period following a workday for the sleep measures; Free days refer to days spent away from the office environment without work hours.

Figure 1—Actigraphy measures of light exposure, total activity, and sleep time between workers in workplaces with windows (N = 11) and without windows (N = 10).



Actigraphy data collected in a subset of the office workers show that those with windows in the workplace had higher light exposure **(A)**, more total activity **(B)**, and longer sleep time **(C)** than workers without windows in the workplace. * p < 0.05, † p < 0.10.

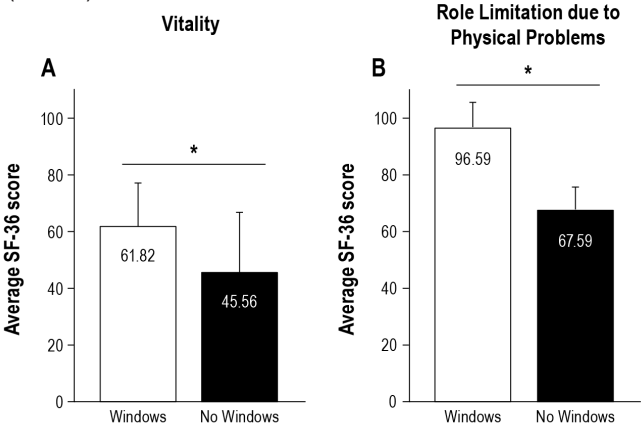
exposure than workers with windows during workday work hours and evenings as well as during free days.

Physical and Mental Conditions of the Two Groups of Workers

Workers in workplaces without windows had significantly worse scores on two of the SF-36 dimensions—role limitation due to physical problems (RP) and vitality (VT)—than workers in workplaces with windows (**Figure 2**; p = 0.001 and p = 0.004, respectively). There was also a positive correlation between light exposure during work hours and role limitation due to physical problems (R = 0.503, p = 0.02). Overall, both the physical component summary (PCS) (p = 0.09) and mental component summary (MCS) (p = 0.11) scores of those in workplaces without windows were lower than scores of those working in workplaces with windows (**Table 4**). Participants in workplaces without windows reported poorer scores on all eight dimensions of the SF-36 than participants in workplaces with windows.

In addition, actigraphy monitoring indicated that workers with windows had more than four times as much activity on average during work hours than workers without windows, although this difference did not reach statistically significance (**Table 3** and **Figure 1B**; 476,290 activity counts versus 115,280 activity counts; p = 0.06). There was also a trend for workers with windows to have more physical activity during workday mornings (**Table 3**; 135,071 activity counts versus 36,274 activity counts; p = 0.07) and workday evenings (**Table 3**; 295,188 activity counts versus 69,083 activity counts; p = 0.09) than workers without windows; however, there was no significant statistical difference during free days (**Table 3**; 839,780 activity counts versus 224,696 activity counts; p = 0.12). There was little correlation between activity and light exposure levels during work hours (R = -0.075, p = 0.75), workday evenings (R = -0.025, p = 0.91), and free days (R = -0.138, p = 0.55).

Figure 2—Short Form 36 (SF-36) measures of vitality and role limitation due to physical problems between workers in workplaces with windows (N = 22) and without windows (N = 27).



Workers with windows in the workplace reported better scores on vitality **(A)** and role limitation due to physical problems **(B)** on the SF-36 compared to workers with no windows in the workplace. * p < 0.05.

Sleep Quality of the Two Groups of Workers

Workers without windows had a tendency toward poorer scores on overall sleep quality from the global PSQI score than workers with windows (**Table 5** and **Figure 3**; p = 0.05), although we did note that the global PSQI score in both groups was high, as a score > 5 is considered suggestive of poor sleep quality. The significant difference in global score may be attributed mainly to sleep disturbance, which was found to be different between the two groups (**Table 5** and **Figure 3**; p = 0.02), while differences in daytime dysfunction and sleep efficiency components contributed only moderately to poorer global PSQI scores for workers without windows than workers with windows (**Table 5** and **Figure 3**; p = 0.08 and p = 0.07, respectively). Other PSQI subscores did not differ significantly between the two groups.

Analysis of rest and activity patterns from actigraphy data showed workers with windows at the workplace slept an average of 46 minutes more per night during the workweek than workers without windows at the workplace (**Table 3** and **Figure 1C**; 476 min versus 430 min; p = 0.02). There was also a positive correlation between light exposure during work hours and sleep

Table 4—Results of t-tests for Short Form-36 between the two groups

	Mean ± SD			
	Work place without windows (N = 27)	Work place with windows (N = 22)	Norms of USA general population	p value
PCS (physical component summary)	50.09 ± 7.83	53.57 ± 5.86	50.00 ± 10	0.09†
MCS (mental component summary)	44.47 ± 10.71	49.51 ± 10.86	50.00 ± 10	0.11
Physical Function (PF)	89.07 ± 13.45	91.36 ± 10.49	82.29 ± 23.76	0.52
Role limitation due to physical problems (RP)	67.59 ± 37.86	96.59 ± 8.78	82.51 ± 25.52	0.001***
Bodily Pain (BP)	74.81 ± 19.67	78.32 ± 19.79	71.33 ± 23.66	0.54
General Health (GH)	67.59 ± 20.40	75.91 ± 19.50	70.85 ± 20.98	0.15
Vitality (VT)	45.56 ± 21.27	61.82 ± 15.32	58.31 ± 20.02	0.004**
Social Function (SF)	79.63 ± 21.13	88.07 ± 18.29	84.30 ± 22.92	0.15
Role limitation due to emotional problems (RE)	69.14 ± 42.29	81.82 ± 36.70	87.40 ± 21.44	0.27
Mental Health (MH)	68.15 ± 15.59	75.64 ± 16.37	74.99 ± 17.76	0.10†

† p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001.

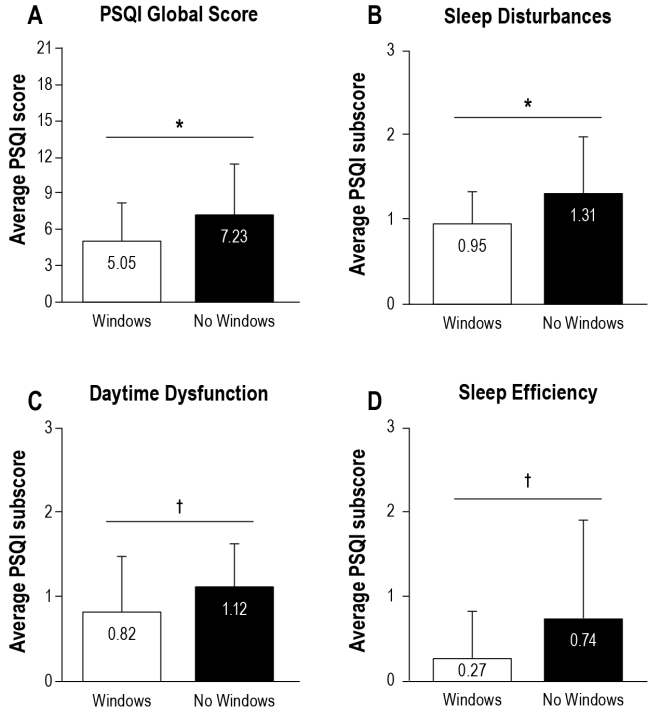
Table 5—Results of t-tests for Pittsburgh Sleep Quality Index between the two groups

	Mean ± SD		
	Work places without windows (N = 27)	Work places with windows (N = 22)	p value
Component 1: Subjective sleep quality	1.11 ± 0.64	1.00 ± 0.76	0.58
Component 2: Sleep latency	1.00 ± 1.07	0.73 ± 0.88	0.34
Component 3: Sleep duration	1.48 ± 0.94	1.14 ± 0.89	0.29
Component 4: Sleep efficiency	0.74 ± 1.16	0.27 ± 0.55	0.07†
Component 5: Sleep disturbance	1.31 ± 0.67	0.95 ± 0.38	0.02*
Component 6: Use of sleep medication	0.42 ± 1.00	0.14 ± 0.64	0.23
Component 7: Daytime dysfunction	1.12 ± 0.51	0.82 ± 0.66	0.08†
Global PSQI Score	7.23 ± 4.21	5.05 ± 3.17	0.05*

† p ≤ 0.10, * p ≤ 0.05.

time on workday nights (R = 0.483, p = 0.03). While there were no significant differences between workers with windows and workers without windows in sleep onset time (21:46 versus 22:04), sleep onset latency (10 min vs 19 min), sleep efficiency (91% vs 89%), wake after sleep onset (30 min vs 37 min), and sleep fragmentation (19 vs 22) on workday nights, the averages point toward better measures of sleep quality for workers with windows at the workplace than workers without windows at the workplace during the workweek. Similarly, workers with windows at the workplace slept more than their counterparts on free day nights (506 min vs 389 min; p = 0.005), and although there were no differences in sleep onset time (22:06 vs 22:48), sleep onset latency (15 min vs 20 min), sleep efficiency (91% vs 90%), wake after sleep onset (31 min vs 36 min), and sleep fragmentation (20 vs 22) on free day nights, the averages point toward better measures of sleep quality for workers with windows at the workplace than workers without windows at the workplace during free day nights.

Figure 3—Pittsburgh Sleep Quality Index (PSQI) measures between workers in workplaces with windows (N = 22) and without windows (N = 27).



Workers with windows in the workplace reported better overall global score on the PSQI **(A)** compared to workers with no windows in the workplace. The difference in global score is made up mainly of differences in sleep disturbances **(B)**, daytime dysfunction **(C)**, and sleep efficiency **(D)**, with workers without windows reporting poorer scores than workers with windows on all three PSQI subscores. * p < 0.05, † p < 0.10.

DISCUSSION

These results demonstrate a relationship between workplace light exposure and office workers' sleep quality, activity patterns, and quality of life. Workers in workplaces with windows not only had significantly more light exposure during work hours but also slept an average of 46 minutes more per night during the workweek than workers in workplaces without windows. Workers with windows in the workplace also had more light exposure during the workday evenings and during free days, as well as longer sleep time compared to workers without windows in the workplace. However, there were no differences in light exposure in the mornings before the work period. Workers without windows also reported poorer scores than their counterparts on the global PSQI score and the PSQI component score for sleep disturbances. None of the other component scores of the PSQI were significantly different between groups, nor were actigraphy sleep variables other than sleep time different between the groups.

These findings suggest that light exposure, or the lack thereof, during work hours may have effects beyond the workplace that impact sleep duration and quality, which may then have further effects on other health factors. Research indicates that insufficient sleep and reduced sleep quality have myriad health and safety consequences. For example, insufficient sleep and reduced sleep quality have been associated with higher evening levels of cortisol, impaired glucose metabolism, increases in appetite via decreased leptin and increased ghrelin levels, and higher body mass index, as well as increased fatigue and deterioration of performance, alertness, and mental concentration, which can lead to increased error rates and subsequent risk of injury.[7-9,29-32]

These health and performance consequences may affect perceived health related quality of life, as measured by the

SF-36. Our results from the SF-36 show workplaces without windows have significantly negative impact on workers' role limitation due to physical problems (RP) and vitality (VT), as well as a marginal negative impact on workers' mental health compared to workplaces with windows. These results are similar to the findings of a study that examined five dimensions (GH, V, SF, RE, and MH) of the SF-36 and found that the scores of vitality (VT), social functioning (SF), and mental health (MH) for those working in dark offices are lower than scores for those working in offices with more lighting.[33] Another study focusing on predictors of burnout among nurses found that exposure to at least three hours of daylight per day resulted in less stress and higher satisfaction at work.[34] While those with more daylight in the workplace also have higher daily physical activity during work hours and workday evenings, our analysis cannot determine whether the workers get more activity because of the daylight or whether they have more daylight exposure due to activity. There was no difference in physical activity between the two groups during free days despite differences in light exposure during free days, and correlations between physical activity levels and light exposure during work hours, workday evenings, and free days did not suggest a strong relationship. Nonetheless, it remains a possibility that differences in activity level may influence light exposure and also sleep, yet the tendency towards higher activity levels indicates workers with more daylight exposure may have fewer physical problems or complaints regarding vitality in parallel with our findings on subjective measures of the SF-36.

Prior to this study, little was known about how architectural features such as windows impact light exposure and subsequent effects on physical and mental factors. Via examination of the influence of office settings with and without windows on office workers' light exposure, sleep, physical activity, and quality of life via actigraphy and subjective measures, this research study shows office workers in workplaces with windows may have more light exposure, better sleep quality, more physical activity, and higher quality of life ratings than office workers in workplaces without windows.

This study has some limitations that could be addressed in future work. For example, the small sample size and sampling methodology could be addressed in a larger study. Participants for this study were volunteers based on a convenience sample, which may have introduced bias. The amount of light in an office may be associated with position or level of experience in the workplace; however, we found no differences in age, race, gender, years at current job, and duration of working in current light levels between workers in office settings with and without windows. We also do not have data from the participants on caffeine use, measurements of stress levels, and chronotype, which is of interest given the outcome measures of this study. Although we observed no differences in sleep onset time between the two groups of workers on workday nights and free day nights, the possibility remains that chronotype, circadian timing, or other behavioral measures may be responsible for some of the differences observed in the two groups of workers. This warrants further investigation. The objective measures of wrist actigraphy support the subjective findings; however, actigraphy data were collected for only 21 of the 49 total participants. Furthermore, although actigraphy has reasonable validity and reliability and is often used as a sleep assessment tool in sleep medicine, this methodology has some limitations. Sleep diaries were not collected in this study, and therefore were unavailable for the actigraphy analysis. For sleep-wake periods, actigraphy has low specificity for detecting wakefulness within sleep periods. Actigraphy is also neither sensitive to low light levels nor calibrated for artificial fluorescent lighting. As such, light exposure measurements for workers in office settings without windows may be an underestimate. In addition, since light exposure data are collected from the wrist, there is the possibility that error may be introduced by covering of the actiwatch, and therefore, reported values may not be fully representative of the light levels reaching the retina. Our data collection methods also do not allow for differentiation between natural daylight and artificial lighting, and do not allow for analysis of specific wavelengths of light exposure. Future studies would benefit from using devices that collect spectral distribution for comparison between the two workplace groups. Lastly, additional benefits of workplaces with windows, such as the roles of views and other dimensions, were not taken into account in this study. Views may bring some psychological dimension while daylight may have physiological effects. Future research may be able to dissociate the different roles of views and daylighting of windows. This can be done, for example, by exploring the differences between skylights that provide very limited views to the sky only versus side windows. Despite these limitations, significant differences are seen with light exposure levels and subsequent measures of sleep quality and physical and mental well-being.

As emphasized in the World Health Organization's Declaration on Occupational Health for All,[1] the focal point for practical occupational health activities is the workplace. Therefore, employers have a social responsibility to plan and design a safe and healthy working environment for their employees. Some countries (such as Canada, Germany, and France) recommend certain amounts of daylight in schools and offices. Yet even in these countries it is not a requirement. In the United States, the national building code lists windows primarily as a means of emergency escape and rescue as opposed to natural lighting. Given the results of this study, we conclude that emphasizing daylight exposure and lighting in the workplace may positively affect the well-being of people working in those spaces. Lower amounts of light exposure in the workplace was associated with reduced sleep duration, poorer sleep quality, lower activity levels, and reduced quality of life in this sample of office workers. Light exposure in the workplace may therefore have long-lasting and compounding effects on the physical and mental health of the workers not only during but also beyond work hours. Enhanced indoor lighting for those with insufficient lighting in current offices as well as increased emphasis on light exposure in the architectural design of future office environments is recommended to improve office workers' sleep quality and physical well-being. Workers with limited or no access to windows in the workplace may increase their light exposure during work hours in various ways. Taking a walk during a break and enjoying lunch outdoors are simple ways to increase daytime natural light exposure. Further research is needed to determine what light exposure durations or intensities are sufficient or optimal for benefits to well-being.

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